

Overview



SITRANS LU150 is a short-range integrated ultrasonic level transmitter. This general purpose, 2-wire, 4 to 20 mA loop powered transmitter is ideal for liquids, slurries, and bulk materials in open or closed vessels to 5 m (16.4 ft).

Benefits

- Easy to install, program, and maintain
- Accurate and reliable
- Sanitary models available
- Patented Sonic Intelligence echo processing
- Integral temperature compensation

Application

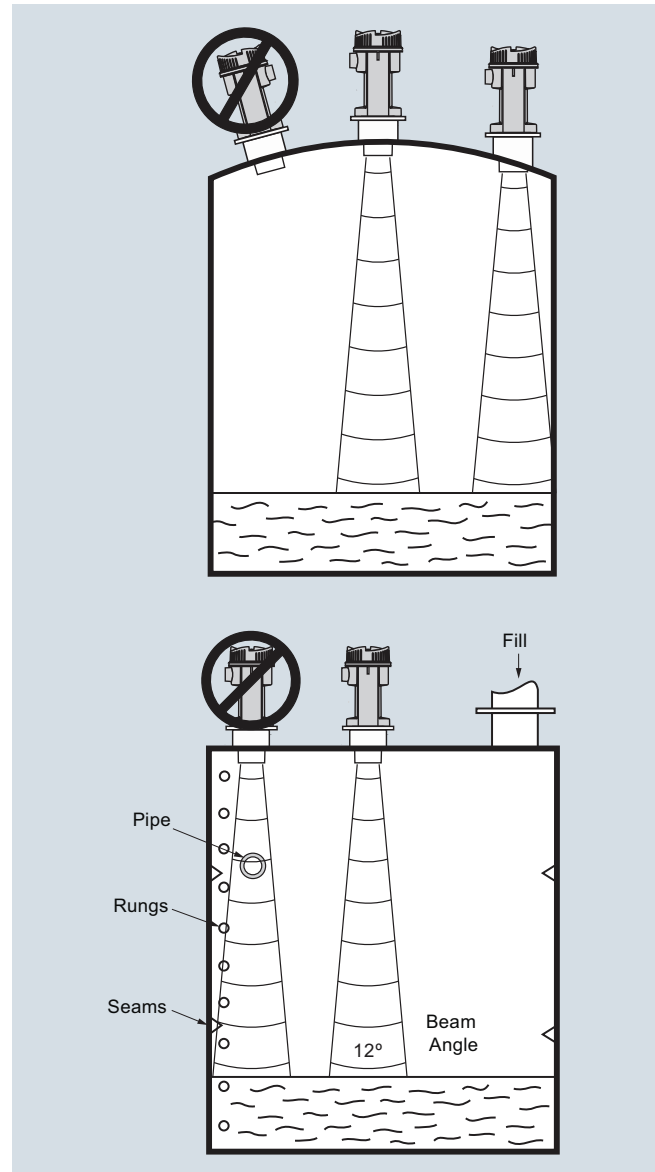
The transducer is available in PVDF copolymer, making the device suitable for use in a wide variety of applications.

SITRANS LU150 is easy to install and maintain, and can be quickly removed for cleaning as required by the food, beverage and pharmaceutical industries.

The reliability of the level data is based on the Sonic Intelligence echo processing algorithms. A filter discriminates between the true echo and false echoes from acoustic or electrical noises and agitator blades in motion. The ultrasonic pulse propagation time to the material and back is temperature-compensated and converted into distance for display, analog output.

- Key Applications: chemical storage vessels, filter beds, mud pits, liquid storage vessels, food applications

Configuration



SITRANS LU150 mounting

Level Measurement

Continuous level measurement - Ultrasonic transmitters

SITRANS LU150

Technical specifications

Mode of Operation	
Measuring principle	Ultrasonic level measurement
Input	
Measuring range	0.25 ... 5 m (0.8 ... 16.4 ft)
Frequency	54 kHz
Output	
mA	4 ... 20 mA
• Span	Proportional/ inversely proportional
• Max. load	600 Ω in the loop at 24 V DC
Power supply	
Supply voltage	12 ... 30 V DC, 0.1 A surge
Max. power consumption	0.75 W (25 mA at 24 V DC)
Certificates and approvals	
	CE, CSA _{US/C}
Accuracy	
Error in measurement	0.25 % of measuring range (in air)
Resolution	3 mm (0.125 inch)
Temperature compensation	Built in
Echo processing	Sonic Intelligence
Rated operation conditions	
Beam angle	12°
Ambient temperature	
• Standard	-30 ... +60 °C (-22 ... +140 °F)
• Metallic mounting	-20 ... +60 °C (-4 ... +140 °F)
Max. static operating pressure	Normal atmospheric pressure
Design	
Weight	1.3 kg (2.9 lb)
Material	
• Electronics enclosure	PBT
• Transducer	PVDF copolymer
Degree of protection	IP68 / NEMA 6 / TYPE 6
Process connection	<ul style="list-style-type: none"> • 2" NPT [(Taper), ANSI/ASME B1.20.1] • R 2" [(BSPT), EN 10226] • G 2" [(BSPP), EN ISO 228-1] • 4" sanitary
Flange adapter	3" Universal, (fits DN 65, PN 10 and 3" ASME)
Cable inlet	1 inlet for M20, optional 1/2" NPT

Selection and Ordering data

SITRANS LU150

Short-range integrated ultrasonic level transmitter, general purpose, 2-wire, 4 to 20 mA loop powered ideal for liquids, slurries, and bulk materials in open or closed vessels to 5 meters (16.4 feet)

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Transducer/Process connection (PVDF)

PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1] **E**
 PVDF copolymer, R 2" [(BSPT), EN 10226] **F**
 PVDF copolymer, G 2" [(BSPP), EN ISO 228-1] **G**
 PVDF copolymer, 4" Sanitary mounting **J**

Cable inlet

M20 x 1.5 [General Purpose cable gland -20 ... +60 °C (-4 ... +140 °F) included] **B**
 1/2" NPT stainless steel entry (no cable gland included) **C**

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Article No.

7ML5201-

0 0

0 0

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]; Measuring-point number/ identification (max. 20 characters) specify in plain text **Y15**

Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 **C11**

Operating Instructions

English

German

Note: Operating instructions should be ordered as a separate line on the order

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line **7ML1930-1AC**

Universal Box Bracket Mounting kit **7ML1830-1BK**

Sanitary 4" mounting clamp **7ML1830-1BR**

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT **7ML1830-1BT**

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT **7ML1830-1BU**

2" NPT locknut, plastic **7ML1830-1DT**

2" BSPT locknut, plastic **7ML1830-1DQ**

Cable Gland - General Purpose -20 ... +60 °C (-4 ... +140 °F) **A5E34457564**

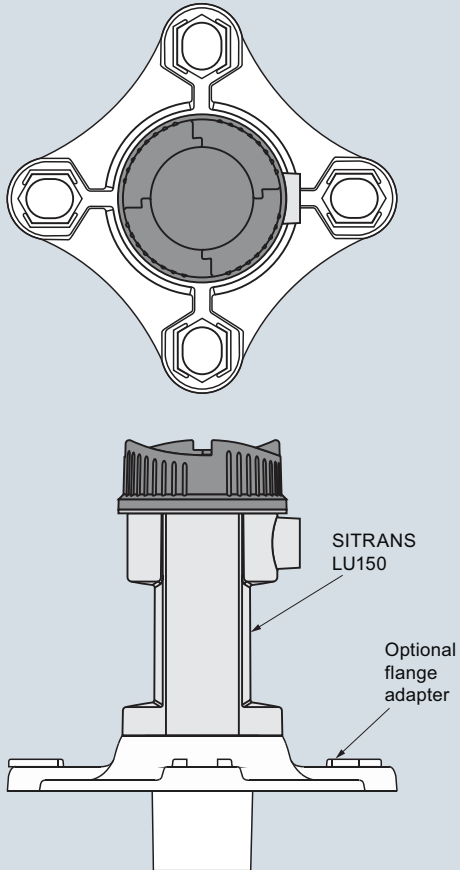
Article No.

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A5E36369862

Options**SITRANS LU150, Flange Adapter**

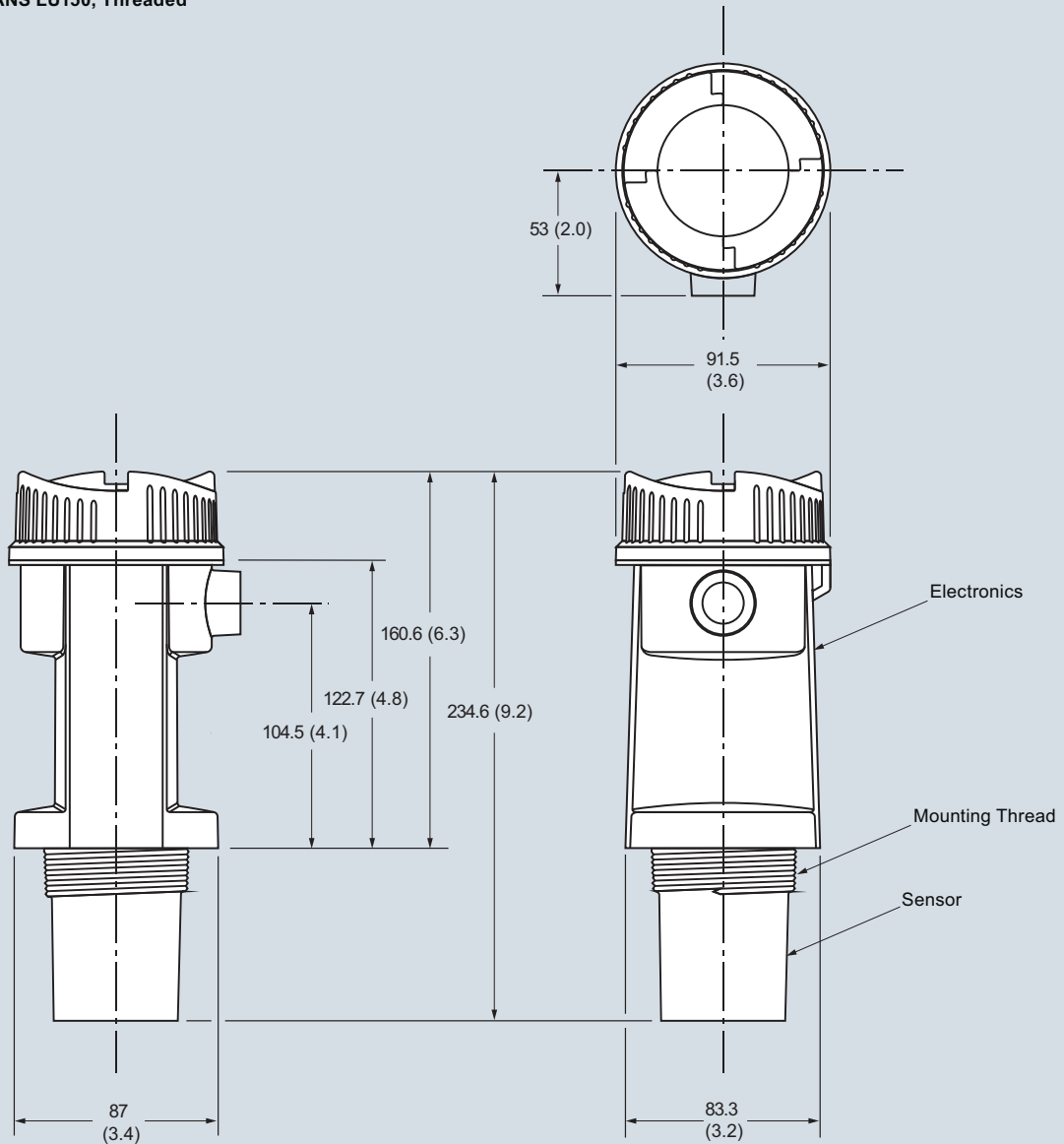
The SITRANS LU150 can be fitted with the optional 75 (3) flange adapter for mating to 3" ANSI, DIN 65 PN10 and JIS 10K3B flanges.



SITRANS LU150 optional flange adapter, dimensions in mm (inch)

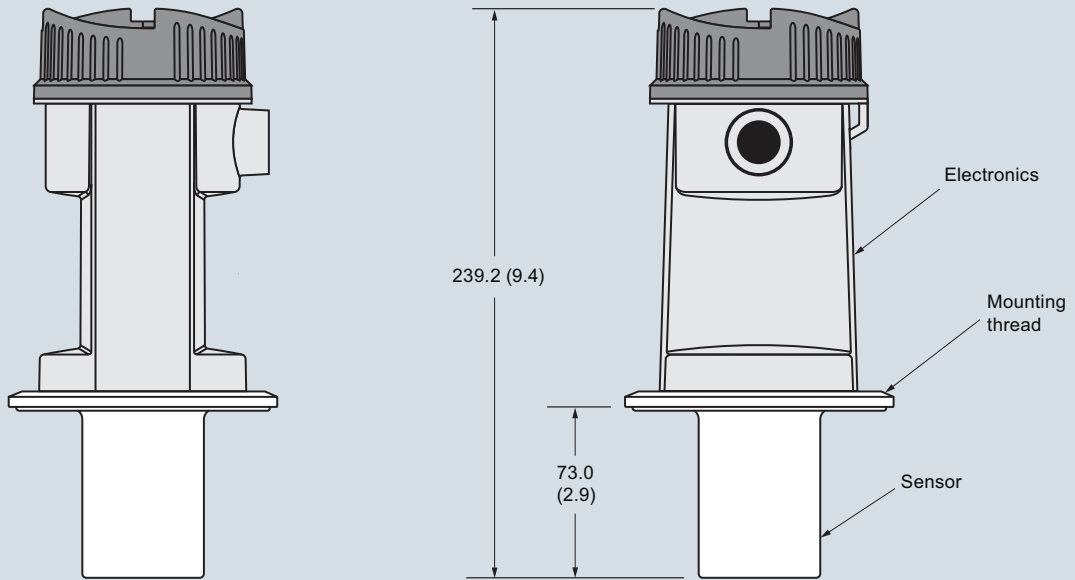
Level Measurement

Continuous level measurement - Ultrasonic transmitters

SITRANS LU150**Dimensional drawings****SITRANS LU150, Threaded**

SITRANS LU150, dimensions in mm (inch)

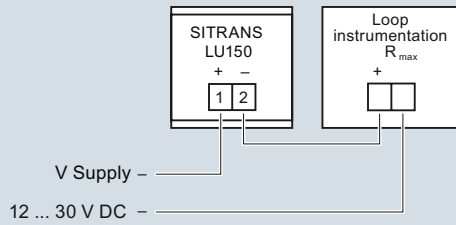
SITRANS LU150, Sanitary



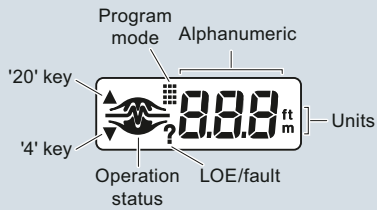
SITRANS LU150, dimensions in mm (inch)

Schematics

Threaded and Sanitary models



Display



SITRANS LU150 connections

Level Measurement

Continuous level measurement - Ultrasonic transmitters

SITRANS LU180

Overview



SITRANS LU180 is a short-range integrated ultrasonic level transmitter. This intrinsically safe, 2 wire, 4 to 20 mA loop powered transmitter is ideal for liquids, slurries, and bulk materials in open or closed vessels to 5 m (16.4 ft).

Benefits

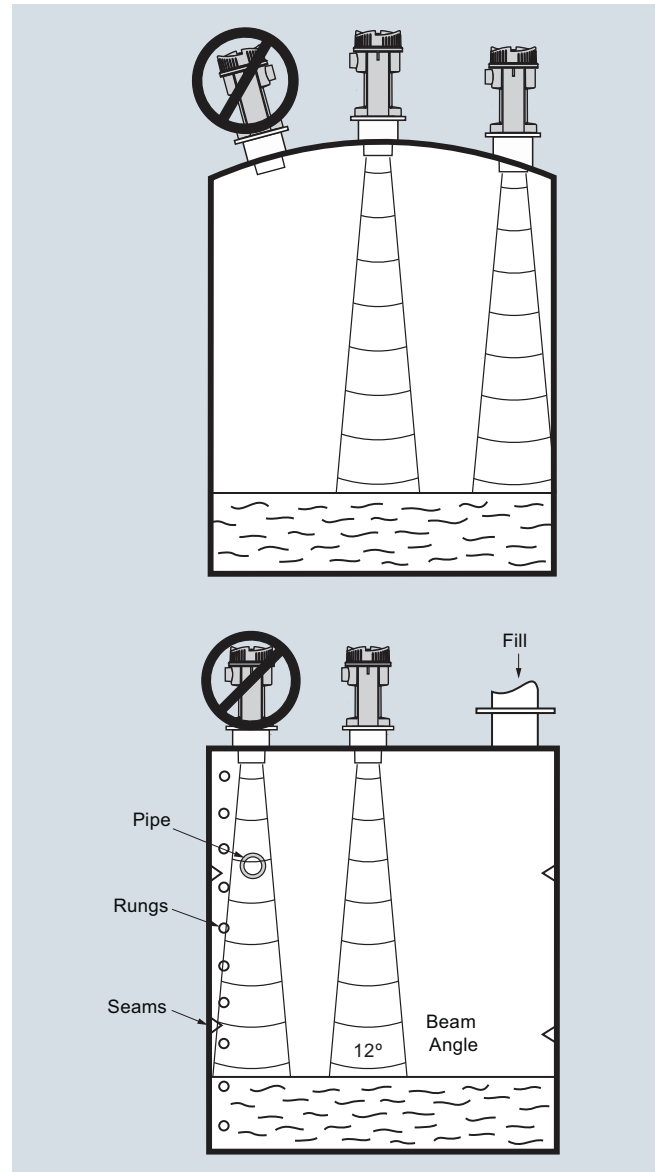
- Easy to install, program, and maintain
- Accurate and reliable
- Sanitary models available
- Patented Sonic Intelligence echo processing
- Integral temperature compensation

Application

The transducer is available in PVDF copolymer, making the device suitable for use in a wide variety of applications. SITRANS LU180 is easy to install and maintain, and can be quickly removed for cleaning as required by the food, beverage and pharmaceutical industries. The reliability of the level data is based on the Sonic Intelligence echo processing algorithms. A filter discriminates between the true echo and false echoes from acoustic or electrical noises and agitator blades in motion. The ultrasonic pulse propagation time to the material and back is temperature compensated and converted into distance for display, analog output.

- Key Applications: chemical storage vessels, filter beds, mud pits, liquid storage vessels, food applications

Configuration



SITRANS LU180 mounting

Level Measurement

Continuous level measurement - Ultrasonic transmitters

SITRANS LU180

Technical specifications		Selection and Ordering data	Article No.
Mode of operation		SITRANS LU180	7ML5202-0000
Measuring principle	Ultrasonic level measurement	Short-range integrated ultrasonic level transmitter, intrinsically safe, 2 wire, 4 to 20 mA loop powered ideal for liquids, slurries, and bulk materials in open or closed vessels to 5 m (16.4 ft).	
Input		Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Measuring range	0.25 ... 5 m (0.8 ... 16.4 ft)	Transducer/Process connection	
Frequency	54 kHz	PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]	E
Output		PVDF copolymer, R 2" [(BSPT), EN 10226]	F
mA	4 ... 20 mA	PVDF copolymer, G 2" [(BSPP), EN ISO 228-1]	G
• Span	Proportional/ inversely proportional	PVDF copolymer, 4" Sanitary mounting	J
• Max. load	600 Ω in the loop at 24 V DC	Cable inlet	
Power supply		M20 x 1.5 [General Purpose cable gland -20 ... +60 °C (-4 ... +140 °F) included]	B
Supply voltage	12 ... 30 V DC, 0.1 A surge	1/2" NPT stainless steel entry (no cable gland included)	C
Max. power consumption	0.75 W (25 mA at 24 V DC)		
Certificates and approvals			
CSA:			
IS/ Class I, II, III, Div. 1, Groups: A, B, C, D, E, F, G T4			
FM:			
IS/ Class I, II, III, Div. 1, Groups: A, B, C, D, E, F, G T4			
ATEX:			
II 1G Ex ia IIC T4 Ga			
IECEX Ex ia IIC T4 Ga			
NEPSI Ex ia IIC T4 Ga			
Accuracy			
Error in measurement	0.25 % of measuring range (in air)	Selection and Ordering data	Order code
Resolution	3 mm (0.125 inch)	Further designs	
Temperature compensation	Built in	Please add "-Z" to Article No. and specify Order code(s).	
Echo processing	Sonic Intelligence	Stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/ identification (max. 20 characters) specify in plain text	Y15
Rated operation conditions		Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Beam angle	12°	Operating Instructions	Article No.
Ambient temperature		English	A5E37100674
• Standard	-40 ... +60 °C (-40 ... +140 °F)	German	A5E37100685
• Metallic mounting	-20 ... +60 °C (-4 ... +140 °F)	Note: Operating instructions should be ordered as a separate line on the order	
Max. static operating pressure	Normal atmospheric pressure	All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation	
Design		Accessories	
Weight	1.3 kg (2.9 lb)	Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line	7ML1930-1AC
Material		Universal box bracket mounting kit	7ML1830-1BK
• Electronics enclosure	PBT	Sanitary 4" mounting clamp	7ML1830-1BR
• Transducer	PVDF copolymer	3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT	7ML1830-1BT
Degree of protection	IP68 / NEMA 6 / TYPE 6	3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT	7ML1830-1BU
Process connection	<ul style="list-style-type: none"> • 2" NPT [(Taper), ANSI/ASME B1.20.1] • R 2" [(BSPT), EN 10226] • G 2" [(BSPP), EN ISO 228-1] • 4" sanitary 	2" NPT locknut, plastic	7ML1830-1DT
Flange adapter	3" Universal (fits DN 65, PN 10 and 3" ASME)	2" BSPT locknut, plastic	7ML1830-1DQ
Cable inlet	1 inlet for M20, optional 1/2" NPT	Cable Gland, General Purpose -20 ... +60 °C (-4 ... +140 °F)	A5E34457564

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Level Measurement

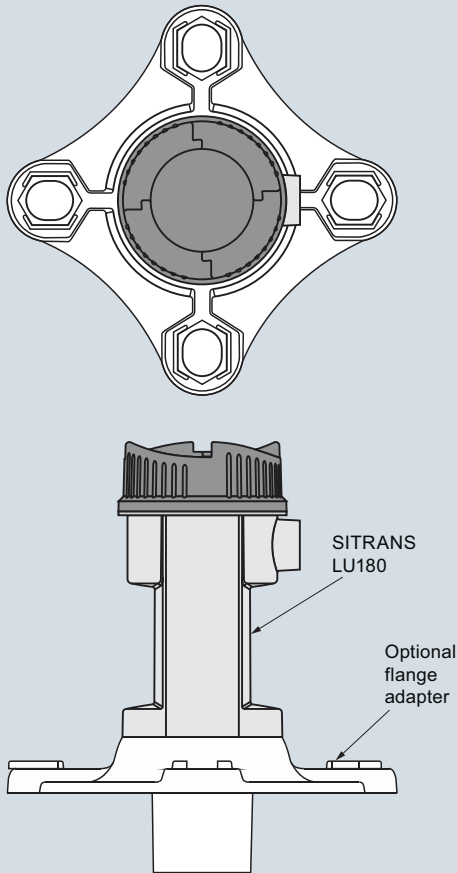
Continuous level measurement - Ultrasonic transmitters

SITRANS LU180

Options

SITRANS LU180, Flange Adapter

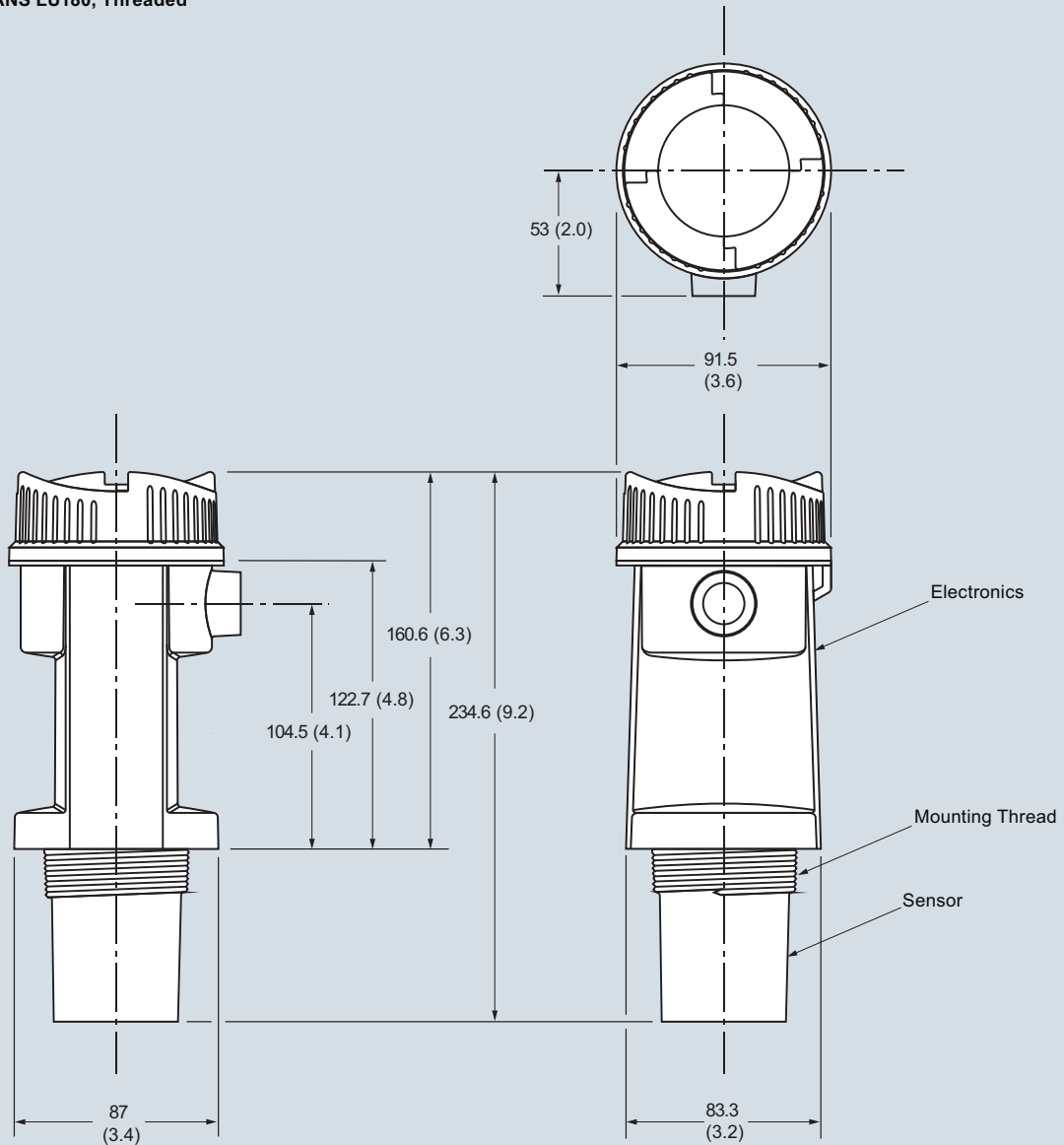
The SITRANS LU180 can be fitted with the optional 75 (3) flange adapter for mating to 3" ANSI, DIN 65 PN10 and JIS 10K3B flanges.



SITRANS LU180 optional flange adapter, dimensions in mm (inch)

Dimensional drawings

SITRANS LU180, Threaded



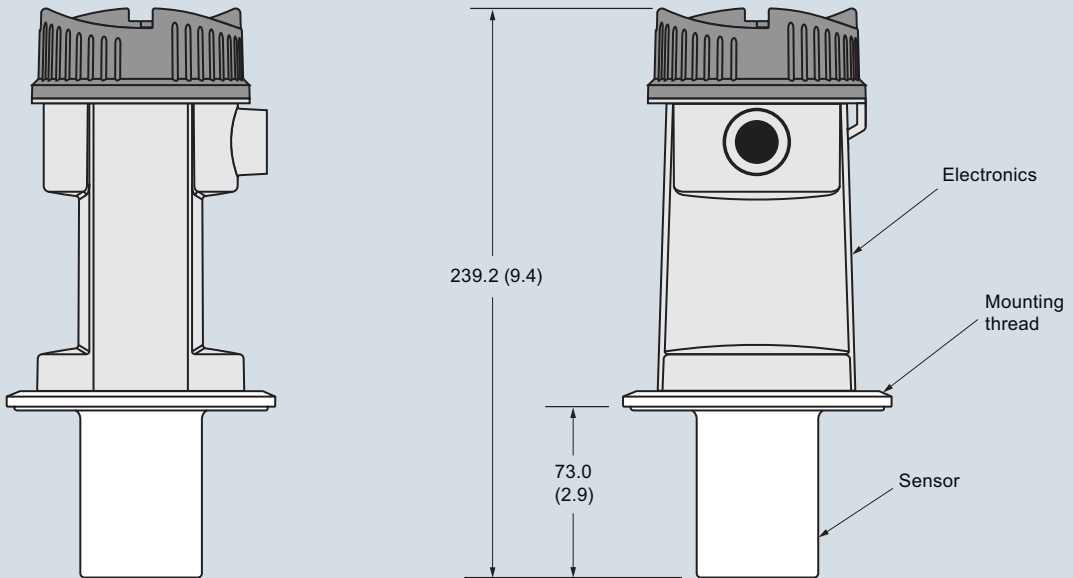
SITRANS LU180, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Ultrasonic transmitters

SITRANS LU180

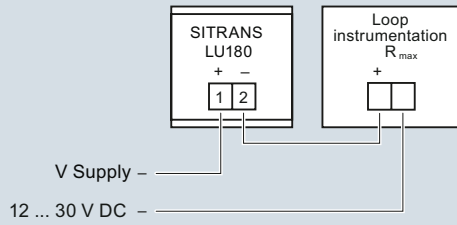
SITRANS LU180, Sanitary



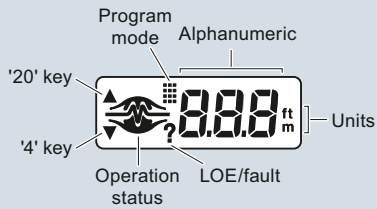
SITRANS LU180, dimensions in mm (inch)

Schematics

SITRANS LU180, Threaded and sanitary models



Display



SITRANS LU180 connections

Overview



SITRANS Probe LU is a 2-wire loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels, and simple process vessels.

Benefits

- Continuous level measurement up to 12 m (40 ft) range
- Easy installation and simple startup
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART Communicator
- Communication using HART or PROFIBUS PA
- ETFE or PVDF transducers for chemical compatibility
- Sonic Intelligence signal processing
- Auto False-Echo Suppression for fixed obstruction avoidance
- Level to volume or level to flow conversion

Application

The SITRANS Probe LU is ideal for level monitoring in the water and wastewater industry, chemical storage vessels, and small bulk hoppers.

The range of SITRANS Probe LU is 6 or 12 m (20 or 40 ft). Using Sonic Intelligence, Auto False Echo Suppression for fixed obstruction avoidance, and accuracy of 0.15 % of range or 6 mm (0.25 inch), the Probe LU provides unmatched reliability.

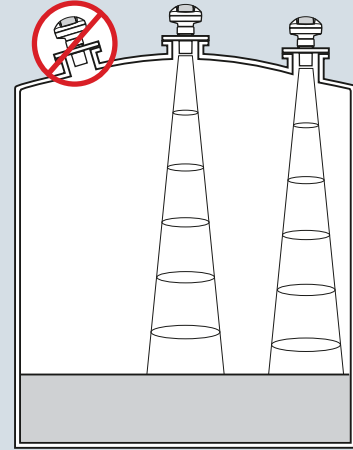
The Probe LU offers two communications options: HART or PROFIBUS PA (Profile version 3.0, Class B).

The transducer on the Probe LU is available as ETFE or PVDF to suit the chemical conditions of your application. As well, for applications with varying material and process temperatures, the Probe LU incorporates an internal temperature sensor to compensate for temperature changes.

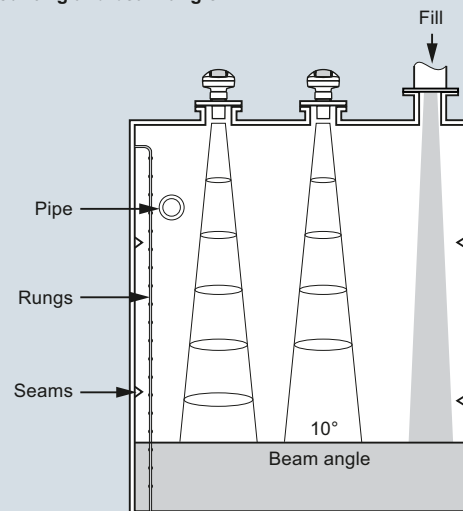
- Key Applications: chemical storage vessels, filter beds, liquid storage vessels

Configuration

Parabolic mounting



Flat mounting and beam angle



SITRANS Probe LU mounting

Level Measurement

Continuous level measurement - Ultrasonic transmitters

SITRANS Probe LU

Technical specifications

Mode of operation		Process connection	
Measuring principle	Ultrasonic level measurement	Threaded connection	2" NPT [(Taper), ANSI/ASME B1.20.1] R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
Typical application	Level measurement in storage vessels and simple process vessels	Flange connection	3 inch (80 mm) universal flange
Inputs		Other connection	FMS 200 mounting bracket (see page 4/179) or customer supplied mount
Measuring range	0.25 ... 6 m (10 inch ... 20 ft)	Display and Controls	
• 6 m (20 ft) model	0.25 ... 12 m (10 inch ... 40 ft)	Interface	Local: LCD display with bar graph Remote: Available via HART or PROFIBUS PA
• 12 m (40 ft) model		Configuration	Using Siemens SIMATIC PDM (PC) or HART handheld communicator or Siemens infrared handheld programmer
Frequency	54 kHz	Memory	Non-volatile EEPROM
Outputs		Power supply	
mA/HART		4 ... 20 mA/HART	Nominal 24 V DC with 550 Ω maximum; maximum 30 V DC 4 ... 20 mA
• Range	4 ... 20 mA	PROFIBUS PA	12, 13, 15, or 20 mA depending on programming (General Purpose or Intrinsically Safe version) per IEC 61158-2
• Accuracy	± 0.02 mA	Certificates and Approvals	
PROFIBUS PA	Profile 3, Class B	General	CSA _{US/IC} , FM, CE, RCM
Performance		Marine (only applies to HART communication option)	• Lloyd's Register of Shipping • ABS Type Approval
Resolution	≤ 3 mm (0.12 inch)	Hazardous	
Accuracy	± the greater of 0.15 % of range or 6 mm (0.24 inch)	• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga
Repeatability	≤ 3 mm (0.12 inch)	• Intrinsically Safe (USA/Canada)	CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Blanking distance	0.25 m (10 inch)	• Intrinsically Safe (International)	SIR 13.0008X Ex ia IIC T4 Ga
Update time	≤ 5 s	• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga
• 4/20 mA/HART version	≤ 5 s at 4 mA	• Non-incendive (USA)	FM Class I, Div. 2, Groups A, B, C, D T4
• PROFIBUS version	≤ 4 s at 15 mA current loop	Handheld Programmer	
Temperature compensation	Built-in to compensate over temperature range	Intrinsically Safe Siemens handheld programmer	Infrared receiver
Beam angle	10°	• Approvals for handheld programmer	ATEX II 1GD / IECEx SIR 09.0073 Ex ia IIC T4 Ga Ex iaD 20 T135 °C FM/CSA Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T6
Rated operating conditions		Ambient temperature	-20 ... 50 °C (-5 ... 122 °F)
Ambient conditions		Interface	Proprietary infrared pulse signal
• Location	Indoor/outdoor	Power	3 V lithium battery (non-replaceable)
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)		
• Relative humidity/ingress protection	Suitable for outdoor		
• Installation category	I		
• Pollution degree	4		
Medium conditions			
• Temperature at flange or threads	-40 ... +85 °C (-40 ... +185 °F)		
• Pressure (vessel)	0.5 bar g (7.25 psi g)		
Design			
Material (enclosure)	PBT (Polybutylene Terephthalate)		
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6/IP67/IP68 enclosure		
Weight	2.1 kg (4.6 lb)		
Cable inlet	2 x M20 x 1.5 cable gland or 2 x ½" NPT thread or 1 x M20 x 1.5 and 1 x ½" NPT		
Material (transducer)	Buna-N seal with ETFE (Ethylene Tetrafluoroethylene) or PVDF (Polyvinylidene Fluoride)		

Level Measurement

Continuous level measurement - Ultrasonic transmitters

SITRANS Probe LU

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS Probe LU 2-wire, loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels, and simple process vessels. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5221- 	Further designs Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Enclosure/Cable Inlet Plastic (PBT), 1 x M20 x 1.5 and 1 x 1/2" NPT (no cable glands supplied) ● 0 Plastic (PBT), 2 x M20 x 1.5 (includes 1 general purpose cable gland: 7ML1930-1AM) ● 1 Plastic (PBT), 2 x 1/2" NPT (no cable glands supplied) ● 2	A B C D	Operating Instructions for HART/mA device English Note: The Operating Instructions should be ordered as a separate item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. A5E32337695
Range/Transducer material 6 m (20 ft), ETFE ● A 6 m (20 ft), PVDF Copolymer ● B 12 m (40 ft), ETFE ● C 12 m (40 ft), PVDF Copolymer ● D	A B C D	Accessories Handheld programmer, Intrinsically Safe, EEx ia Handheld programmer, General Purpose approvals Handheld programmer, Infrared, Intrinsically Safe, PROFIBUS PA HART modem/USB (for use with a PC and SIMATIC PDM) 2" NPT locknut, plastic 2" BSPT locknut, plastic 3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT 3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT One General Purpose polymeric cable gland M20 x 1.5, rated for -20 ... +80 °C (-4 ... +176 °F) One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) for General Purpose or ATEX EEx e installations (available for HART only) One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) with integrated shield connection (available for PROFIBUS PA) Universal box bracket, FMS-200 Probe LU, rock guard/sunshield kit, 304 stainless steel	7ML5830-2AH A5E36563512 7ML5830-2AJ 7MF4997-1DB 7ML1830-1DT 7ML1830-1DQ 7ML1830-1BT 7ML1830-1BU 7ML1930-1AM 7ML1930-1AP 7ML1930-1AQ 7ML1830-1BK 7ML1930-1GH
Process connection 2" NPT [(Taper), ANSI/ASME B1.20.1] ● A R 2" [(BSPT), EN 10226] ● B G 2" [(BSPP), EN ISO 228-1] ● C	A B C	2" NPT locknut, plastic 2" BSPT locknut, plastic 3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT 3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT One General Purpose polymeric cable gland M20 x 1.5, rated for -20 ... +80 °C (-4 ... +176 °F) One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) for General Purpose or ATEX EEx e installations (available for HART only) One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) with integrated shield connection (available for PROFIBUS PA) Universal box bracket, FMS-200 Probe LU, rock guard/sunshield kit, 304 stainless steel SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 For applicable back up point level switch see point level measurement section.	7ML1830-1DT 7ML1830-1DQ 7ML1830-1BT 7ML1830-1BU 7ML1930-1AM 7ML1930-1AP 7ML1930-1AQ 7ML1830-1BK 7ML1930-1GH 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...
Communication/Output 4 ... 20 mA, HART ● 1 PROFIBUS PA ● 2	1 2	Spare Parts Plastic lid	7ML1830-1KB
Approvals General Purpose, FM, CSA _{US/C} , CE, RCM, KCC Non-incendive, FM Class I, Div. 2, Groups A, B, C, D T5 ¹⁾ ● 1 Intrinsic Safe, CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 ²⁾ ● 4 Intrinsic Safe ATEX 1G / IECEx / INMETRO Ex ia IIC T4 Ga, RCM, KCC ²⁾ ● 5 Intrinsic Safe ATEX 1G / IECEx / INMETRO Ex ia IIC T4 Ga, RCM, KCC ³⁾ ● 6 Intrinsic safe, CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 ³⁾ ● 7 Intrinsic safe, CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 ³⁾ ● 8	1 4 5 6 7 8	SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 For applicable back up point level switch see point level measurement section.	
1) Available with Enclosure/Cable Inlet option 2 only. 2) Available with communication option 2 only. 3) Available with communication option 1 only. ● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 10/11 in the appendix.		● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 10/11 in the appendix.	

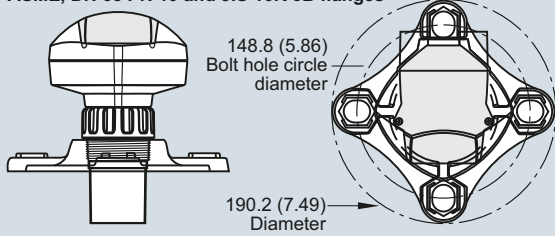
Level Measurement

Continuous level measurement - Ultrasonic transmitters

SITRANS Probe LU

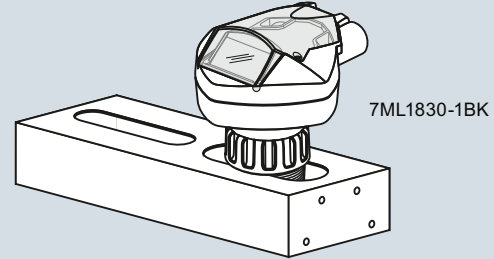
Options

Flange adapter for mating 2" NPT or 2" BSP process connections to 3" ASME, DN 65 PN 10 and JIS 10K 3B flanges



SITRANS Probe LU optional flange adapter, dimensions in mm (inch)

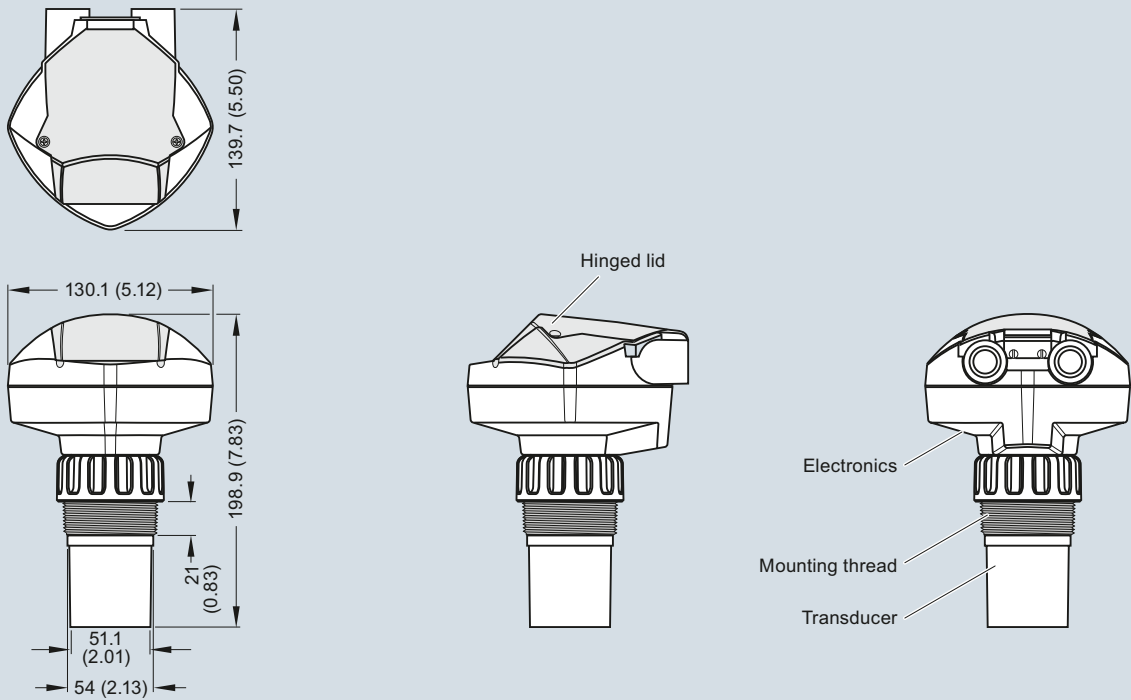
SITRANS Probe LU with FMS 200 universal box bracket



SITRANS Probe LU with optional mounting bracket

4

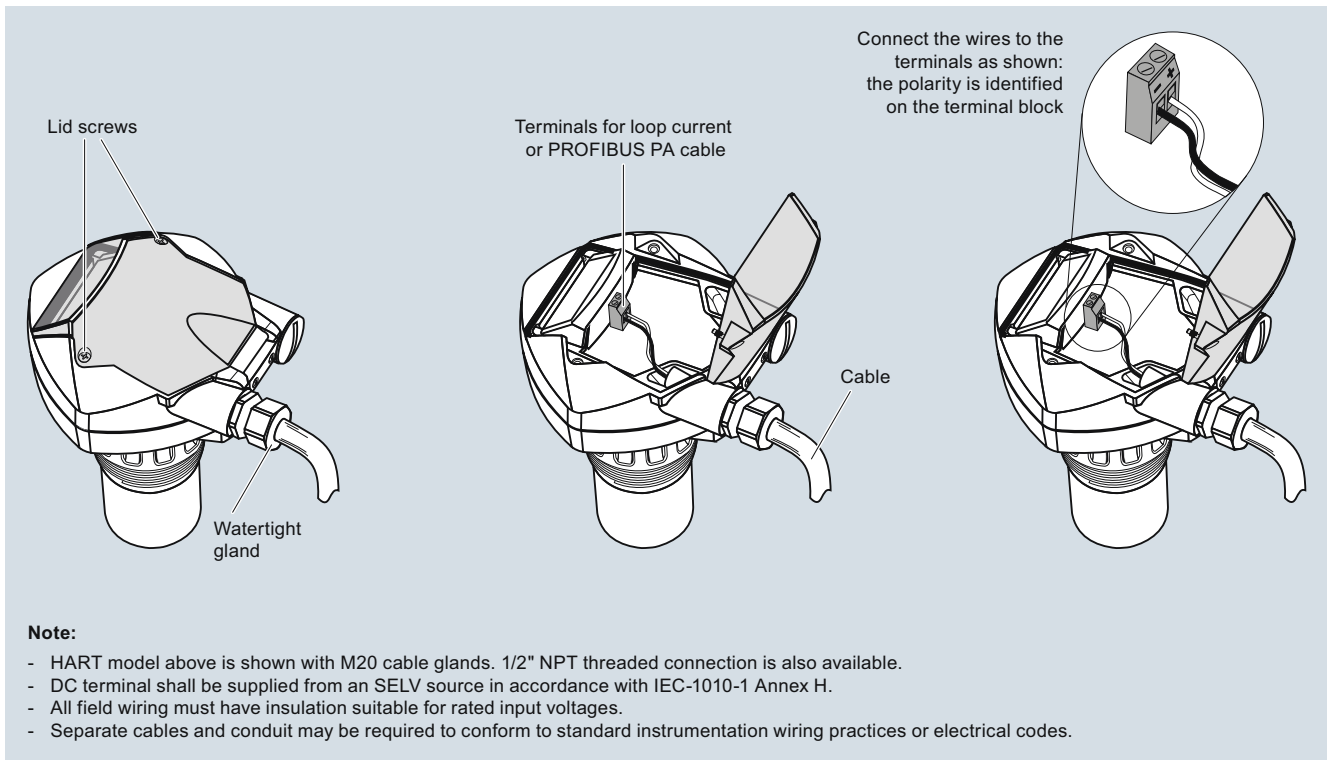
Dimensional drawings



Note: Above model is shown without M20 cable glands or 1/2" NPT conduit connectors.

SITRANS Probe LU, dimensions in mm (inch)

Schematics



SITRANS Probe LU connections

Level Measurement

Continuous level measurement - Ultrasonic transmitters

The Probe

Overview



The Probe is a short-range integrated ultrasonic level transmitter, ideal for liquids and slurries in open or closed vessels.

Benefits

- Easy to install, program, and maintain
- Accurate and reliable
- Sanitary models available
- Sonic Intelligence echo processing
- Integral temperature compensation

Application

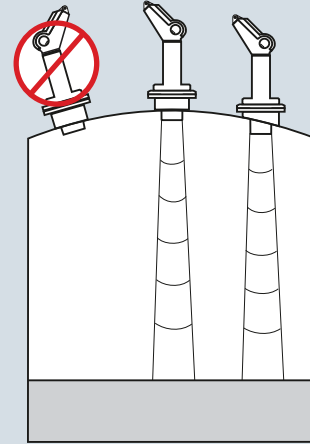
The transducer is available in PVDF copolymer, making the device suitable for use in a wide variety of applications. The Probe is easy to install and maintain, and can be quickly removed for cleaning as required by the food, beverage and pharmaceutical industries.

The reliability of the level data is based on the Sonic Intelligence echo processing algorithms. A filter discriminates between the true echo and false echoes from acoustic or electrical noises and agitator blades in motion. The ultrasonic pulse propagation time to the material and back is temperature-compensated and converted into distance for display, analog output and relay actuation.

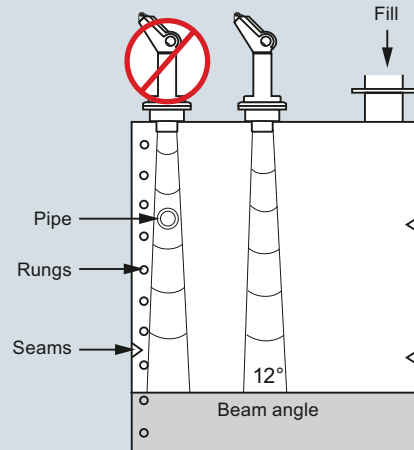
- Key Applications: chemical storage vessels, filter beds, mud pits, liquid storage vessels, food applications

Configuration

Parabolic mounting



Flat mounting and beam angle



The Probe mounting

Technical specifications

3-wire version	
Mode of operation	
Measuring principle	Ultrasonic level measurement
Input	
Measuring range	0.25 ... 5 m (0.8 ... 16.4 ft)
Frequency	54 kHz
Output	
mA	4 ... 20 mA
• Span	Proportional/inversely proportional
• Max. load	750 Ω at 24 V DC
Relay	For level alarm or fault
Power supply	
Supply voltage	18 ... 30 V DC, max. 0.2 A
Max. power consumption	5 W (200 mA at 24 V DC)
Certificates and approvals	
CE, RCM, CSA _{US/C} , FM	
Accuracy	
Error in measurement	0.25 % of measuring range (in air)
Resolution	3 mm (0.125 inch)
Temperature compensation	Built in
Echo processing	Sonic Intelligence
Rated operation conditions	
Beam angle	12°
Ambient temperature	
• Standard	-40 ... +60 °C (-40 ... +140 °F)
• Metallic mounting	-20 ... +60 °C (-4 ... +140 °F)
Max. static operating pressure	Normal atmospheric pressure
Degree of protection	IP65
Design	
Weight	
• Without flange adapter	1.5 kg (3.3 lb)
• With flange adapter	1.7 kg (3.7 lb)
Material	
• Electronics enclosure	PVC
• Transducer	PVDF copolymer
Degree of protection	IP65
Process connection	<ul style="list-style-type: none"> • 2" NPT [(Taper), ANSI/ASME B1.20.1] • R 2" [(BSPT), EN 10226] • G 2" [(BSPP), EN ISO 228-1] • 4" sanitary
Flange adapter	3" Universal (fits DN 65, PN 10 and 3"ASME)
Cable inlet	2 inlets for PG 16 or ½" NPT cable glands

Selection and Ordering data

Article No.

The Probe

7ML1201-

Short-range integrated ultrasonic level transmitter, ideal for liquids and slurries in open or closed vessels

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Measuring range

5 m (16.40 ft)

Transducer/Process connection

PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]

PVDF copolymer, R 2" [(BSPT), EN 10226]

PVDF copolymer, G 2" [(BSPP), EN ISO 228-1]

PVDF copolymer, 4" Sanitary mounting

Model/Approval

3-wire, 24 V DC, CE, RCM, CSA, FM

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol. For details see page 10/1110/11 in the appendix.

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 20 characters) specify in plain text

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

Universal Box Bracket Mounting kit

Sanitary 4" mounting clamp

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT

2" NPT locknut, plastic

2" BSPT locknut, plastic

Plastic M20 cable gland with metal locknut

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

For applicable back up point level switch see point level measurement section.

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol. For details see page 10/11 in the appendix.

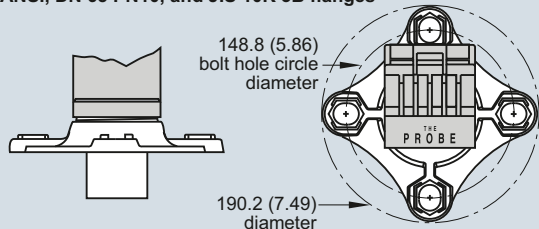
Level Measurement

Continuous level measurement - Ultrasonic transmitters

The Probe

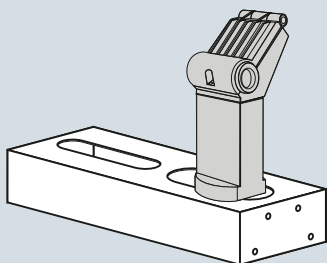
Options

Flange adapter for mating 2" NPT or 2" BSP process connections to 3" ANSI, DN 65 PN10, and JIS 10K 3B flanges



The Probe optional flange adapter, dimensions in mm (inch)

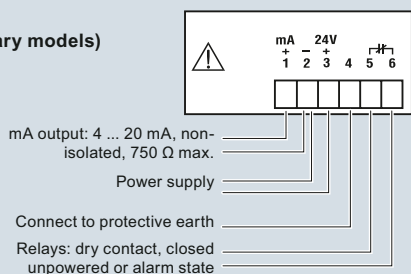
The Probe with FMS 200 mounting bracket



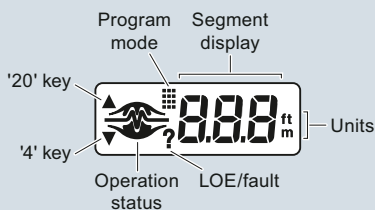
The Probe with optional mounting bracket

Schematics

3 wire model
(standard and sanitary models)



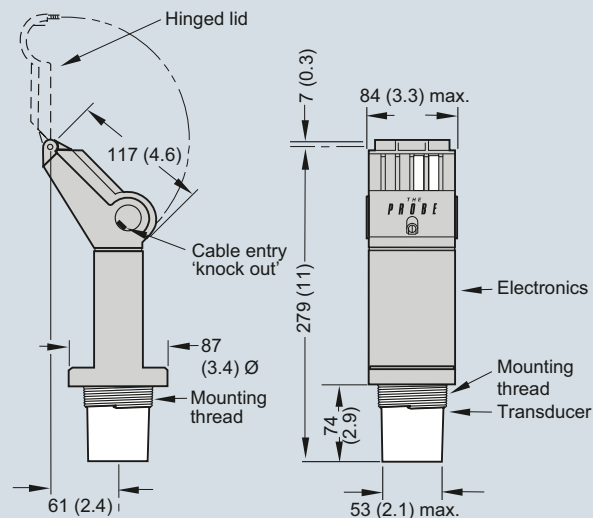
Display



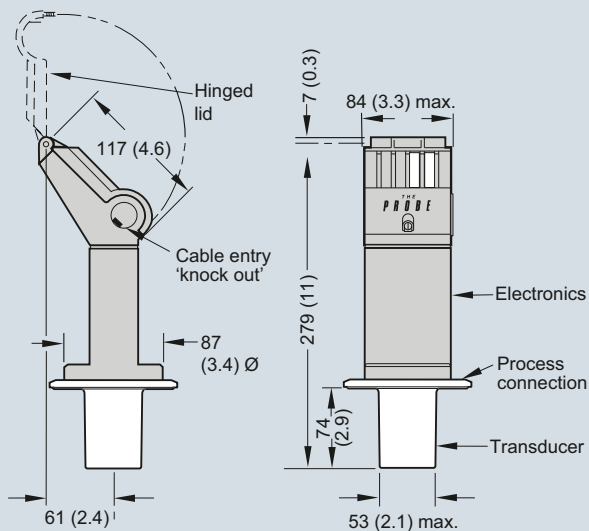
The Probe connections

Dimensional drawings

Standard model



Sanitary model



The Probe, dimensions in mm (inch)

Overview



The SITRANS LUT400 series controllers are compact, single point, long-range ultrasonic controllers for continuous level or volume measurement of liquids, slurries, solids, and high accuracy monitoring of open channel flow.

Benefits

- Small 1/2 DIN enclosure [144 h x 144 d x 146 w mm (5.7 x 5.7 x 5.75 inch)] with standard universal mounting bracket for wall, pipe, and DIN rail, plus an optional panel mount
- Easy to use HMI display with local four-button programming, menu-driven parameters, and Wizard support for key applications
- English, German, French, Spanish, Chinese, Italian, Portuguese, and Russian texts on the HMI.
- Level, Volume, OCM Flow monitoring
- Three relays combined with a suite of pump, alarm, and relay control features
- HART Communications
- EDDs for SIMATIC PDM, AMS Device Manager, and Field Communicator 375/475, plus DTMs for FDTs (Field Device Tools)
- Web browser for local programming from an intuitive web-based interface
- Two discrete inputs for backup level override and pump interlock functions
- Echo profile and trend views from the local display
- Patented digital receiver for improved performance in electrically noisy applications (close proximity to VSDs)
- Real time clock with daylight savings time, supporting an integrated datalogger and energy saving algorithms for minimizing pump operation during high cost energy periods
- Removable terminal blocks for ease of wiring
- MCERTS Certified for Open Channel Flow

Application

The SITRANS LUT400 comes in three different models, depending on the application, level of performance and functionality required:

- SITRANS LUT420 Level Controller: Level or volume measurement of liquids, slurries, and solids, as well as basic pump control functions, and basic data logging capability
- SITRANS LUT430 Level, Pump and Flow Controller: Includes all features of the LUT420 plus a full suite of advanced pump control and alarm functionality, open channel flow monitoring, and basic flow data logging capability
- SITRANS LUT440 High Accuracy OCM: Our most featured, highest accuracy model. Includes all features of the LUT430, plus the industry's best accuracy (± 1 mm within 3 m), full suite of advanced control functionality, and enhanced flow logging capability
- Key Applications: wet wells, reservoirs, flumes/weirs, chemical storage, liquid storage, hoppers, crusher bins, dry solids storage

Level Measurement

Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Technical specifications

Mode of Operation	Ultrasonic level, volume, pump, and open channel flow
Measuring range	0.3 ... 60 m (1 ... 196 ft), transducer dependent
Input	
Discrete	0 ... 50 V DC switching level Logical 0 ≤ 10 V DC Logical 1 = 10 ... 50 V DC Max. 3 mA
Output	
Transducer frequency	10 ... 52 kHz
Ultrasonic transducer	Compatible transducers: All Echo-Max and ST-H series transducers
Relays	<ul style="list-style-type: none"> • 1 SPDT Form C, NO or NC relay, rated 1A at 250 V AC, non-inductive and 3A at 30 V DC • 2 SPST Form A, NO relays, rated 5A at 250 V AC, non-inductive and 3 A at 30 V DC
mA output	4 ... 20 mA, isolated
Max. load	600 Ω max. in ACTIVE mode, 750 Ω max. in PASSIVE mode
Resolution	0.1 % of range
Accuracy	
Error in measurement	<ul style="list-style-type: none"> • Standard operation: ± 1 mm (0.04 inch) plus 0.17 % of measured distance • High accuracy OCM: ± 1 mm (0.04 inch), within 3 m (9.84 ft) range
Resolution	<ul style="list-style-type: none"> • Standard operation: 0.1 % of range or 2 mm (0.08 inch), whichever is greater • High accuracy OCM: 0.6 mm (0.02 inch), within 3 m (9.84 ft) range
Temperature compensation	<ul style="list-style-type: none"> • -40 ... +150 °C (-40 ... +300 °F) • Integral temperature sensor in transducer • External TS-3 temperature sensor (optional) • Programmable fixed temperature values
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Ambient conditions	
• Ambient temperature (enclosure)	-20 ... +50 °C (-4 ... +122 °F)

Design	
Weight	
• Enclosure with display lid	1.3 kg (2.87 lb)
• Enclosure with blank lid	1.2 kg (2.65 lb)
Material (enclosure)	Polycarbonate
Degree of protection	
• Enclosure with display or blank lid	IP65/Type 4X/NEMA 4X
• Enclosure with blank lid and knock-out removed	IP20
Remote display lid	IP65/Type 3/NEMA 3
Cable	
Transducer and mA output signal	<ul style="list-style-type: none"> • Transducer, mA output: 2 copper conductors, twisted, with foil shield/drain wire, 300 V 0.5 ... 0.75 mm² (22 ... 18 AWG) • Relay/power to be copper conductors per local requirements to meet 250 V 5 A contact rating
Max. separation between transducer and transceiver	365 m (1 200 ft)
Displays and controls	60 x 40 mm (2.36 x 1.57 inch) removable LCD, 240 x 160 pixels resolution, operational up to 5 m from enclosure base
Programming	
• Primary	4 Local push buttons
• Secondary	<ul style="list-style-type: none"> • PC running SIMATIC PDM • PC running Emerson AMS Device Manager • PC running a web browser • PC running a Field Device Tool (FDT) • Field Communicator 375/475 (FC375/FC475)
Memory	<ul style="list-style-type: none"> • 512 kB flash EPROM • 1.5 MB flash for data logging
Power supply	
AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA Fuse: 5 x 20 mm, Slow Blow, 0.25 A, 250 V
DC version	10 ... 32 V DC, 10 W Fuse: 5 x 20 mm, Slow Blow, 1.6 A, 125 V
Certificates and approvals	
General	CSA _{US/CA} , CE, FM, UL listed, RCM, MCERTS certified for Open Channel Flow
Hazardous	
• Non-incendive (Canada)	CSA Class I, Div. 2, Groups A, B, C, D; Class II, Div. 2, Groups F, G; Class III
• Shipping	Lloyd's Register, ABS
Communication	HART 7.0, USB

Level Measurement

Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Category	Feature	SITRANS LUT420	SITRANS LUT430	SITRANS LUT440
		Level Controller	Level, pump and flow controller	High accuracy OCM controller
Operations	Level, space, and distance measurement	✓	✓	✓
	Open channel flow measurement		✓	✓
	Volume conversion	✓	✓	✓
Specifications	Compatible with EchoMax and ST-H transducers	✓	✓	✓
	Standard accuracy: ± 1 mm + 0.17 % of measured distance	✓	✓	✓
	High accuracy: ± 1 mm within 3 meters			✓
	Mounting options: wall or panel, pipe, DIN-rail	✓	✓	✓
Data logging and communications	HART communications	✓	✓	✓
	4 ... 20 mA output (active and passive)	✓	✓	✓
	Integrated datalogger for measurement value and alarms	✓	✓	✓
	Integrated datalogger for fixed rate flow logging		✓	✓
	Integrated datalogger for variable rate flow logging triggered by changes in flow condition			✓
	Daily data logging for maximum, minimum and average flow, daily totalized volume, and minimum and maximum temperature		✓	✓
Flow monitoring	High accuracy open channel flow measurement			✓
	9 digit daily and running flow totalizers		✓	✓
	High and low flowrate alarms		✓	✓
	External totalizer and sampler control		✓	✓
	MCERTS Class 1 Certification			✓
	MCERTS Class 2 Certification		✓	
Pump control	Energy saving algorithms for pump control		✓	✓
	Wall cling reduction	✓	✓	✓
	Pump run-on functionality		✓	✓
	Pump start and power resumption delays		✓	✓
	Alternate duty pump routines	✓	✓	✓
	Fixed duty and service ratio pump routines		✓	✓
	Pumped volume totalizer		✓	✓
	Submergence detection	✓	✓	✓
	Discrete input pump interlocks		✓	✓
	Time to spill calculation		✓	✓

Level Measurement

Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Selection and Ordering data	Article No.
SITRANS LUT420 and LUT430 Compact ultrasonic level controllers for continuous short to long-range level or volume measurement of liquids, slurries, and solids. Both units include basic relay functions for pumps, alarms, and other controls, plus onboard data logging. LUT430 offers additional advanced pump control and alarm functionality, open channel flow monitoring, and basic flow data logging capability. Functionality varies by model.	7ML5050-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Model SITRANS LUT420 - Level controller A SITRANS LUT430 - Level, Pump & Flow controller B	
Enclosure display options With display A With remote panel mount display B [Includes panel mount cable extension, 2.5 m (8.2 ft)] No display (blank lid provided) C Note: Enclosure includes back-plate for wall and pipe mounting, and an integrated clip for DIN-rail mounting. DIN-rail mounting for standard TS35 x 7.5 and TS35 x 15 mm DIN-rail to IEC 60715, EN 60715	
Input voltage 100 ... 230 V AC ± 15 % 1 10 ... 32 V DC 2	
Cable inlet 3 cable inlets, cable glands not supplied 1 3 cable inlets, 3 M20 plastic cable glands supplied 2	
Number of measurement points Single point system (includes one transducer input, one mA output, and one external temperature sensor input) 1	
Communications and I/O HART, 2 discrete inputs, 3 relays D	
Approvals General purpose CE, FM, CSA _{US/C} , UL, RCM Hazardous locations CSA Class I, II, III, Div. 2, Groups A, B, C, D, F, G A C	
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.	

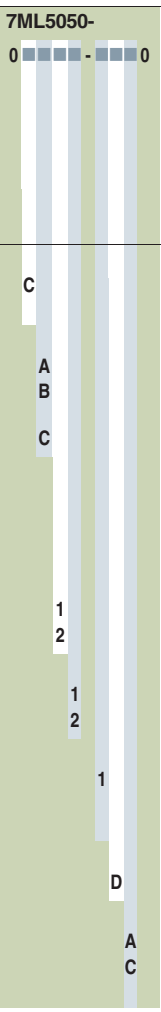
Selection and Ordering data	Article No.
Accessories Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure 7ML1930-1AC TS-3 Temperature Sensor - see TS-3 on page 4/181 7ML1813-... Panel mount cable extension, 2.5 m (8.2 ft) 7ML1930-1GF Qty 3 cable glands and retaining nuts 7ML1930-1GB USB cable, 2 m (6.56 ft) - Standard USB-A to USB-mini B 7ML1930-1GD Hart modem/USB (for use with a PC and SIMATIC PDM) 7MF4997-1DB Sunshield, 304 stainless steel 7ML1930-1GE SITRANS RD100, loop powered display - see Chapter 7 7ML5741-... SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 7ML5740-... SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 7ML5744-... SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 7ML5750-...	
Spare parts Panel mount retrofit kit (convert standard unit with display to panel mount version) 7ML1830-1PA Terminal block replacement kit (5 piece kit with one of each removable terminal) 7ML1830-1PB Wall/Pipe mount plate 7ML1830-1PC Enclosure (include blank label) 7ML1830-1PD SITRANS LUT400 Lid (with Display) 7ML1830-1PE SITRANS LUT400 Lid (blank) 7ML1830-1PF Fuse - AC (0.25 A, 250 V, Slow Blow) 7ML1830-1PG Fuse - DC (1.6 A, 125 V, Slow Blow) 7ML1830-1PH Panel mount gasket and fastener kit 7ML1830-1PK DIN-rail clip 7ML1830-1PL	
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.	

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 C11	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text Y15	
Namur NE43 failsafe setting - device preset to failsafe < 3.6 mA N07	
Operating Instructions English A5E33329501 German A5E35690863 Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

Level Measurement

Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LUT440 The SITRANS LUT440 is the most accurate and featured model in the LUT400 series. It includes high accuracy open channel monitoring, relay functions for external samplers, totalizers, alarms, and enhanced data logging, as well as all pump and control functions available with other models in the LUT400 series. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5050- 	Accessories Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure TS-3 Temperature Sensor - see TS-3 on page 4/181 Panel mount cable extension 2.5 m (8.2 ft) Qty 3 cable glands and retaining nuts USB cable 2 m (6.56 ft) - Standard USB-A to USB-mini B HART modem/USB (for use with PC and SIMATIC PDM) Sunshield, 304 stainless steel SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML1930-1AC 7ML1813-... 7ML1930-1GF 7ML1930-1GB 7ML1930-1GD 7MF4997-1DB 7ML1930-1GE 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...
Model SITRANS LUT440 - High accuracy Open Channel Monitor ¹⁾	C	Spare parts Panel mount retrofit kit (convert standard unit with display to panel mount version) Terminal block replacement kit (5 piece kit with one of each removable terminal) Wall/Pipe mount plate Enclosure (include blank label) SITRANS LUT400 Lid (with Display) SITRANS LUT400 Lid (blank) Fuse - AC (0.25 A, 250 V, Slow Blow) Fuse - DC (1.6 A, 125 V, Slow Blow) Panel mount gasket and fastener kit DIN-rail clip	7ML1830-1PA 7ML1830-1PB 7ML1830-1PC 7ML1830-1PD 7ML1830-1PE 7ML1830-1PF 7ML1830-1PG 7ML1830-1PH 7ML1830-1PK 7ML1830-1PL
Enclosure display options With display With remote panel mount display [includes panel mount cable extension, 2.5 m (8.2 ft)] No display (blank lid provided) Note: Enclosure includes back-plate for wall and pipe mounting, and an integrated clip for DIN-rail mounting. DIN-rail mounting for standard TS35 x 7.5 and TS35 x 15 mm DIN-rail to IEC 60715, EN 60715	A B C		
Input voltage 100 ... 230 V AC ± 15 % 10 ... 32 V DC	1 2		
Cable inlet 3 cable inlets, cable glands not supplied 3 cable inlets, 3 M20 plastic cable glands supplied	1 2		
Number of measurement points Single point system (includes one transducer input, one mA output, and one external temperature sensor input)	1		
Communications and I/O HART, 2 discrete inputs, 3 relays	D		
Approvals General purpose CE, FM, CSA _{US/C} , UL, RCM Hazardous locations CSA Class I, II, III, Div. 2, Groups A, B, C, D, F, G	A C		

¹⁾ Compatible with all EchoMax Transducers. High accuracy OCM performance with the use of an XRS-5 transducer and TS-3 temperature sensor (each sold separately).

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

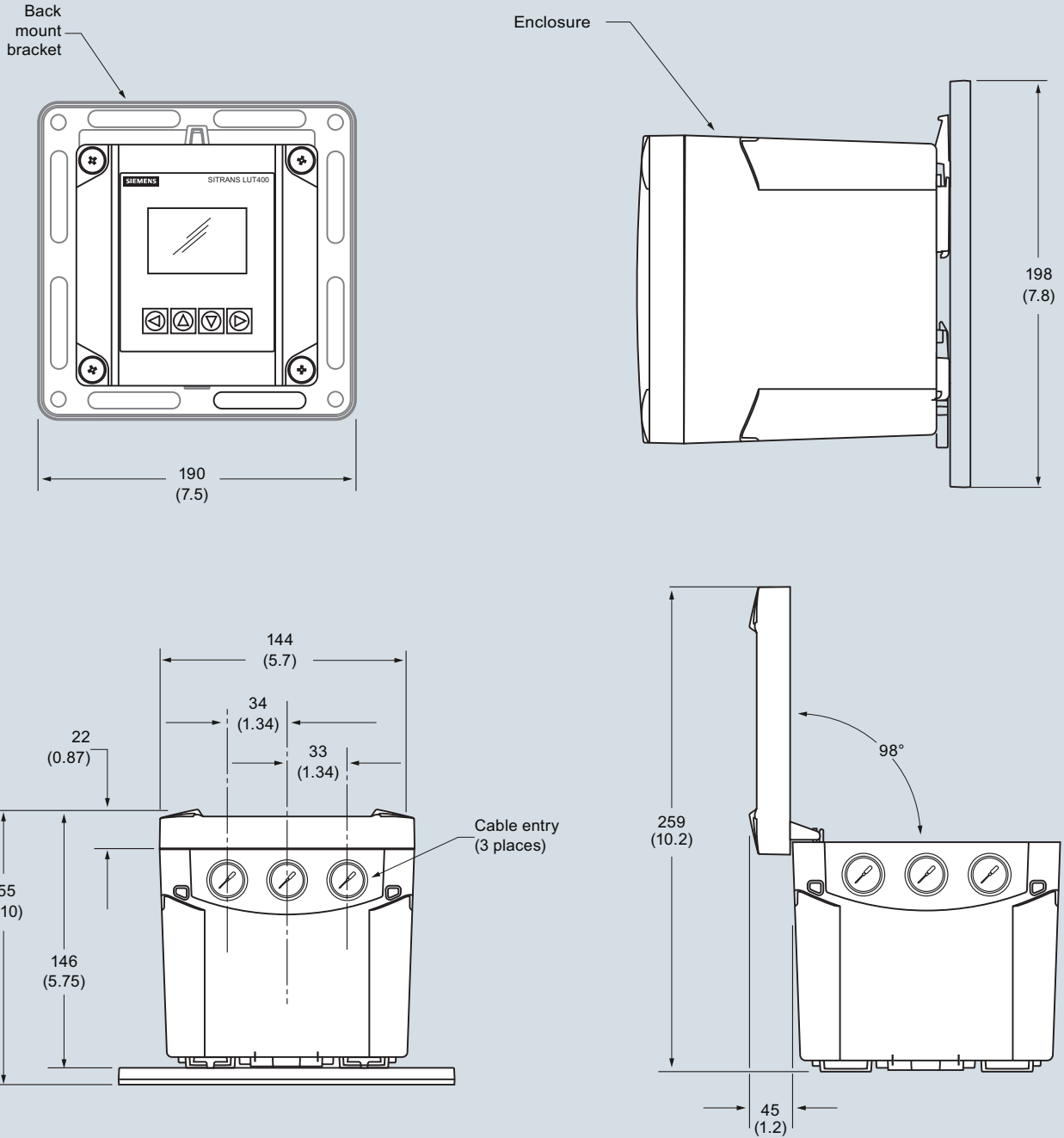
Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Namur NE43 failsafe setting - device preset to failsafe < 3.6 mA	N07
Operating Instructions English German Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. A5E33329501 A5E35690863

Level Measurement

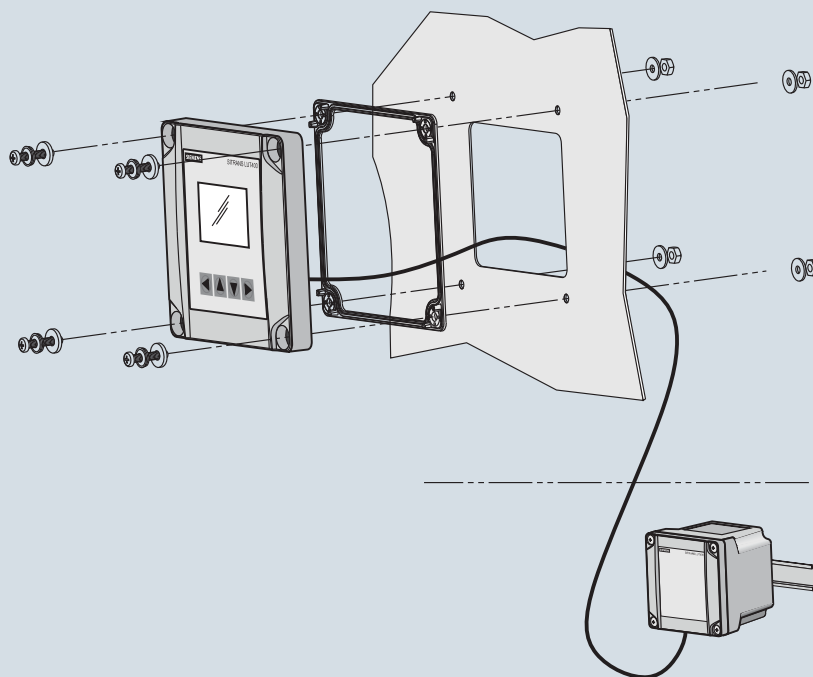
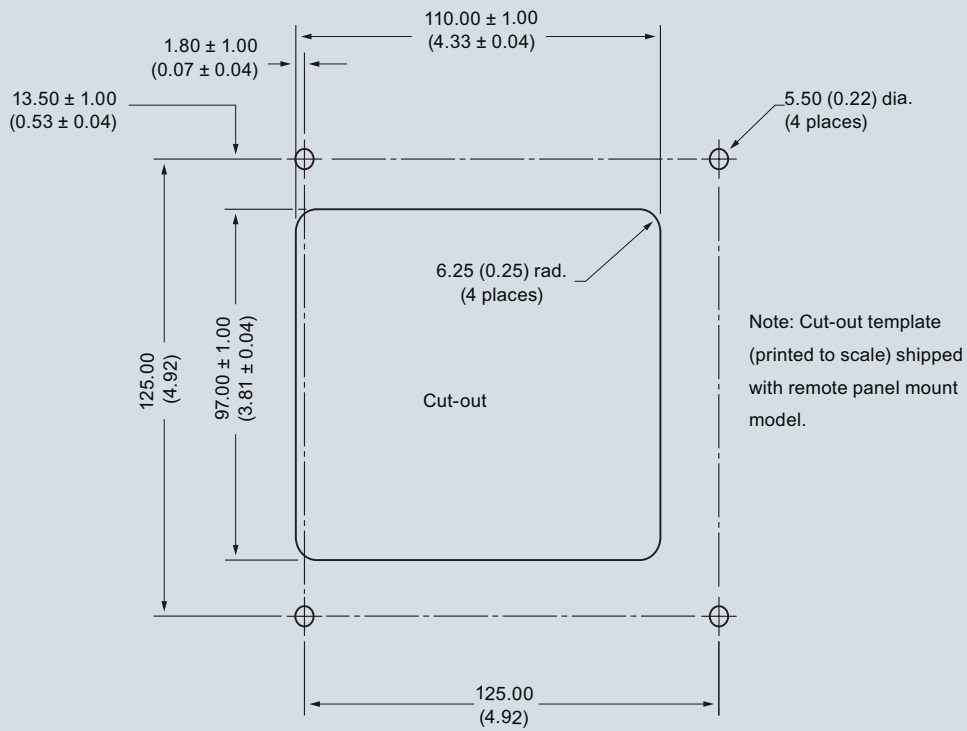
Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Dimensional drawings



SITRANS LUT400, dimensions in mm (inch)



SITRANS LUT400, dimensions in mm (inch)

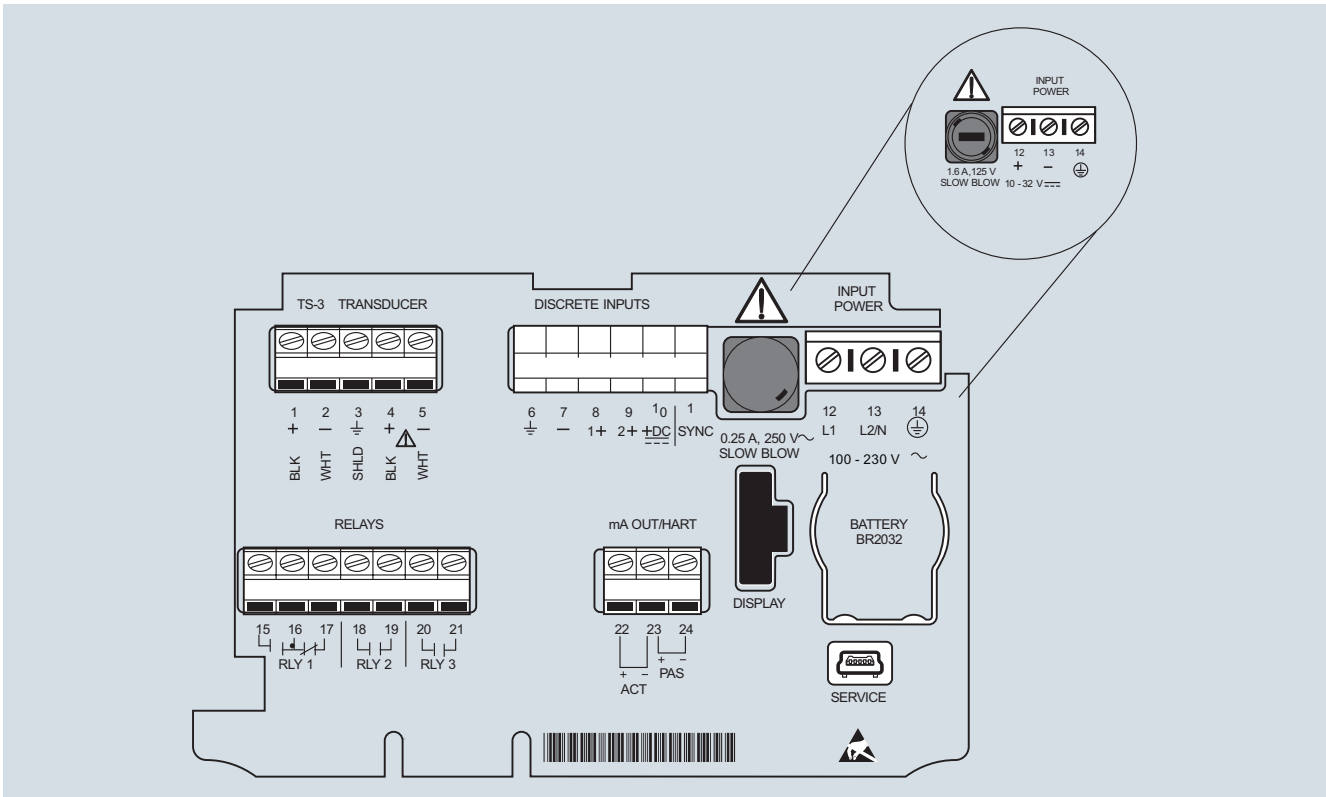
Level Measurement

Continuous level measurement - Ultrasonic controllers

SITRANS LUT400 series

Schematics

4



SITRANS LUT400 connections

Overview

MultiRanger 200 HMI is a versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.

Benefits

- Easy to use HMI display with local four-button programming, menu-driven parameters, and Wizard support for key applications
- English, German, French, Spanish, Chinese, Italian, Portuguese, and Russian texts on the HMI
- Removable terminal blocks for ease of wiring
- Digital input for back-up level override from point level device
- Communication using built-in Modbus RTU via RS 485 and SIMATIC PDM configuration software
- Compatible with SmartLinx system: PROFIBUS DP (cyclic access of process values only) and DeviceNET
- Single or dual point level monitoring
- Auto False-Echo Suppression for fixed obstruction avoidance
- Differential amplifier transceiver for common mode noise reduction and improved signal-to-noise ratio
- Level, volume, and flow measurements in open channels, differential control, extended pump control, and alarm functions
- Wall and panel mounting options

Application

MultiRanger 200 HMI can be used with various materials, including, water, municipal waste, acids, woodchips, or on materials with high angles of repose. MultiRanger 200 HMI offers true dual point monitoring, digital communications with built-in Modbus RTU via RS 485, as well as compatibility with SIMATIC PDM, allowing PC configuration and set-up. MultiRanger 200 HMI features Sonic Intelligence advanced echo-processing software for increased reading reliability.

MultiRanger 200 HMI will monitor open channel flow and features more advanced relay alarming and pump control functions as well as volume conversion.

It is compatible with chemical-resistant EchoMax transducers that are approved for hostile environments.

- Key Applications: wet wells, flumes/weirs, bar screen control, hoppers, chemical storage, liquid storage, crusher bins, dry solids storage

Design

The MultiRanger 200 HMI is available in wall or panel mounting options.

Level Measurement

Continuous level measurement - Ultrasonic controllers

MultiRanger 200 HMI

Technical specifications

Mode of Operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 15 m (1 ... 50 ft)
Measuring points	1 or 2
Input	
Analogue	0 ... 20 mA or 4 ... 20 mA, from alternate device, scalable
Discrete	10 ... 50 V DC switching level Logical 0 ≤ 0.5 V DC Logical 1 = 10 ... 50 V DC max. 3 mA
Output	
EchoMax transducer	44 kHz
Ultrasonic transducer	Compatible transducers: ST-H and EchoMax series XPS-10, XPS-15/15F, and XRS-5
Relays	Rating 5 A at 250 V AC, non-inductive
mA output	0 ... 20 mA or 4 ... 20 mA
• Max. load	750 Ω, isolated
• Resolution	0.1 % of range
Accuracy	
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater
Resolution	0.1 % of measuring range ¹⁾ or 2 mm (0.08 inch), whichever is greater
Temperature compensation	<ul style="list-style-type: none"> -50 ... +150 °C (-58 ... +302 °F) Integral temperature sensor External TS-3 temperature sensor (optional) Programmable fixed temperature values
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Ambient conditions	
• Ambient temperature (housing)	-20 ... +50 °C (-4 ... +122 °F)

Design	
Weight	
• Wall mount	1.22 kg (2.68 lb)
• Panel mount	1.35 kg (2.97 lb)
Material (enclosure)	Polycarbonate
Degree of protection (enclosure)	
• Wall mount	IP65/Type 4X/NEMA 4X
• Panel mount	IP54/Type 3/NEMA 3
Electrical connection	
• Transducer and mA output signal	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm ² (22 ... 18 AWG), Belden 8760 or equivalent is acceptable
• Max. separation between transducer and transceiver	365 m (1 200 ft)
Displays and controls	
	60 x 40 mm (2.36 x 1.57 inch) LCD 240 x 160 pixels resolution
Power supply	
AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W)
DC version	12 ... 30 V DC (20 W)
Certificates and approvals	
	<ul style="list-style-type: none"> CE, RCM²⁾ FM, CSA_{US/C}, UL CSA Class I, Div. 2, Groups A, B, C, and D, Class II, Div. 2, Groups F and G, Class III (wall mount only)
Communication	
	<ul style="list-style-type: none"> RS 232 with Modbus RTU or ASCII via RJ-11 connector RS 485 with Modbus RTU or ASCII via terminal strips Optional: SmartLinx cards for <ul style="list-style-type: none"> - PROFIBUS DPV1 (cyclic access of process values only) - DeviceNet

¹⁾ Program range is defined as the empty distance to the face of the transducer plus any range extension

²⁾ EMC performance available on request

Level Measurement

Continuous level measurement - Ultrasonic controllers

MultiRanger 200 HMI

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
MultiRanger 200 HMI Versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5033- 	Further designs Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Y15 Measuring-point number/identification (max. 27 characters) specify in plain text Test Certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Versions MultiRanger 200, level, volume, flow, and differential measurements	2	Operating Instructions English German Note: The instruction manual should be ordered as a separate line on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. AE535857004 A5E36182123
Mounting, enclosure design 4 button HMI, Wall mount, standard enclosure 4 button HMI, Wall mount, 4 entries, 4 M20 cable glands included 4 button HMI, Panel Mount	D E F	Other Operating Instructions SmartLinX PROFIBUS DPV1, English SmartLinX PROFIBUS DPV1, German Note: The appropriate SmartLinX Operating Instructions should be ordered as a separate line on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	A5E36197302 A5E36197305
Input voltage 100 ... 230 V AC 12 ... 30 V DC	A B	Optional equipment Tag, stainless steel, 12 x 45 mm, one text line, suitable for enclosures Sun-shield, 304 Stainless steel USB to RS 232 adapter RS 232 to RJ11 COMMS adapter SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML1930-1AC 7ML1930-1GA 7ML1930-6AK 7ML1830-1MC 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...
Number of measurement points Single point version Dual point version	0 1	Spare parts Power Supply Board (100 ... 230 V AC) Power Supply Board (12 ... 30 V DC) Removable terminal blocks Spare lid with HMI, MultiRanger 200 HMI/HydroRanger 200 HMI, wall Spare lid with HMI, MultiRanger 200 HMI/HydroRanger 200 HMI, panel SmartLinX PROFIBUS DP V1 module	7ML1830-1MD 7ML1830-1ME A5E38824197 A5E35778738 A5E35778740 A5E35778741
Data communications (SmartLinX) Without module SmartLinX PROFIBUS DPV0 module SmartLinX DeviceNet module SmartLinX PROFIBUS DPV1 module See SmartLinX product page 4/337 for more information.	0 2 3 4	We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆ . For details see page 10/11 in the appendix.	
Output relays 6 relays (4 Form A, 2 Form C), 250 V AC	2		
Approvals General Purpose CE, FM, CSA _{US/IC} , UL listed, RCM CSA Class I, Div. 2, Groups A, B, C, and D; Class II, Div. 2, Groups F and G; Class III ¹⁾	A B		

¹⁾ Available with Mounting/Enclosure design options D or E

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol **◆**. For details see page 10/11 in the appendix.

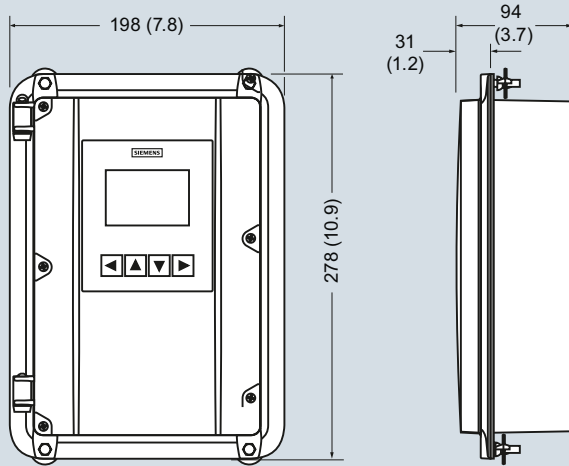
Level Measurement

Continuous level measurement - Ultrasonic controllers

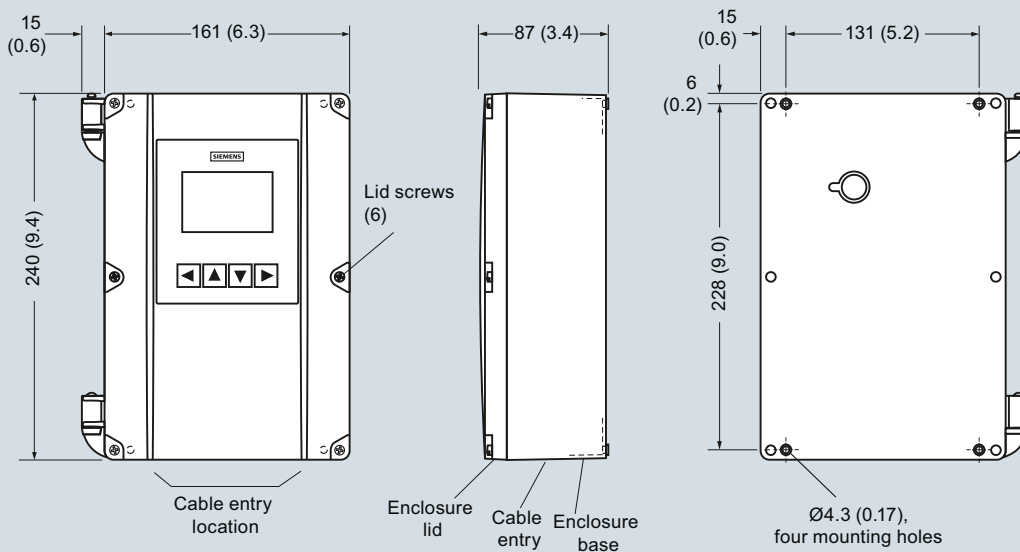
MultiRanger 200 HMI

Dimensional drawings

Panel mount dimensions

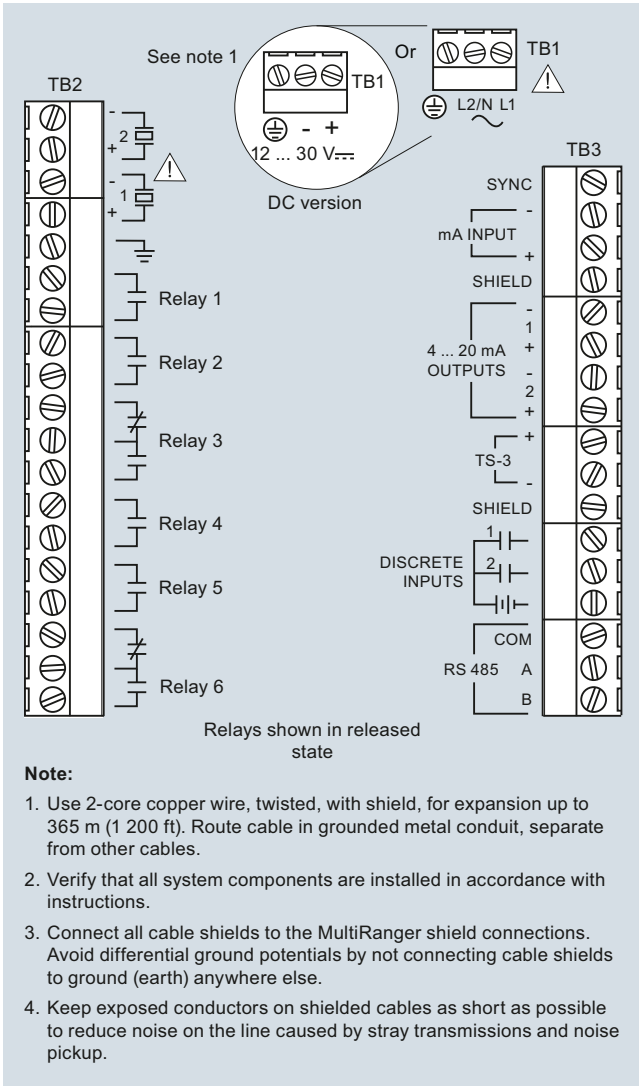


Wall mount dimensions



MultiRanger 200 HMI, dimensions in mm (inch)

Schematics



MultiRanger 200 HMI connections

Level Measurement

Continuous level measurement - Ultrasonic controllers

MultiRanger 100/200

Overview



MultiRanger is a versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.

Benefits

- Digital input for back-up level override from point level device
- Communication using built-in Modbus RTU via RS 485
- Compatible with SmartLinX communication options or SIMATIC PDM via RS 485
- Single or dual point level monitoring
- Auto False-Echo Suppression for fixed obstruction avoidance
- Differential amplifier transceiver for common mode noise reduction and improved signal-to-noise ratio
- MultiRanger 100: level measurements, simple pump control, and level alarm functions
- MultiRanger 200: level, volume, and flow measurements in open channels, differential control, extended pump control, and alarm functions
- Wall and panel mounting options

Application

MultiRanger can be used on different materials, including fuel oil, municipal waste, acids, woodchips, or on materials with high angles of repose. MultiRanger offers true dual point monitoring, digital communications with built-in Modbus RTU via RS 485, as well as compatibility with SIMATIC PDM, allowing PC configuration and setup. MultiRanger features Sonic Intelligence advanced echo-processing software for increased reading reliability.

MultiRanger 100 offers cost-effective level alarming, as well as on/off and alternating pump control. MultiRanger 200 will monitor open channel flow and features more advanced relay alarming and pump control functions as well as volume conversion.

It is compatible with chemical-resistant EchoMax transducers that can be used in hostile environments at temperatures as high as 145 °C (293 °F).

- Key Applications: wet wells, flumes/weirs, bar screen control, hoppers, chemical storage, liquid storage, crusher bins, dry solids storage

Design

The MultiRanger is available in wall or panel mounting options.

Level Measurement

Continuous level measurement - Ultrasonic controllers

MultiRanger 100/200

Technical specifications

Mode of Operation

Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 15 m (1 ... 50 ft)
Measuring points	1 or 2

Input

Analog (MultiRanger 200 only)	0 ... 20 mA or 4 ... 20 mA, from alternate device, scalable
Discrete	10 ... 50 V DC switching level Logical 0 ≤ 0.5 V DC Logical 1 = 10 ... 50 V DC Max. 3 mA

Output

EchoMax transducer	44 kHz
Ultrasonic transducer	Compatible transducers: ST-H and EchoMax series XPS-10, XPS 15/15F, and XRS-5
Relays	Rating 5 A at 250 V AC, non-inductive
• Version with 1 relay (MultiRanger 100 only)	1 SPST Form A
• Version with 3 relays	2 SPST Form A/1 SPDT Form C
• Version with 6 relays	4 SPST Form A/2 SPDT Form C
mA output	0 ... 20 mA or 4 ... 20 mA
• Max. load	750 Ω isolated
• Resolution	0.1 % of range

Accuracy

Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater
Resolution	0.1 % of measuring range ¹⁾ or 2 mm (0.08 inch), whichever is greater
Temperature compensation	<ul style="list-style-type: none"> -50 ... +150 °C (-58 ... +302 °F) Integral temperature sensor External TS-3 temperature sensor (optional) Programmable fixed temperature values

Rated operating conditions

Installation conditions	
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Ambient conditions	
• Ambient temperature (housing)	-20 ... +50 °C (-4 ... +122 °F)

Design

Weight	
• Wall mount	1.37 kg (3.02 lb)
• Panel mount	1.50 kg (3.31 lb)
Material (enclosure)	Polycarbonate
Degree of protection (enclosure)	
• Wall mount	IP65/Type 4X/NEMA 4X
• Panel mount	IP54/Type 3/NEMA 3
Electrical connection	
• Transducer and mA output signal	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm ² (22 ... 18 AWG), Belden 8760 or equivalent is acceptable
• Max. separation between transducer and transceiver	365 m (1 200 ft)

Displays and controls

	100 x 40 mm (4 x 1.5 inch) multi-block LCD with backlighting
Programming	Programming using hand-held programmer, SIMATIC PDM or via PC with Dolphin Plus software

Power supply

AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W)
DC version	12 ... 30 V DC (20 W)

Certificates and approvals

- CE, RCM²⁾
- Lloyd's Register of Shipping
- ABS Type Approval
- FM, CSA_{US/C}, UL listed
- CSA Class I, Div. 2, Groups A, B, C, and D, Class II, Div. 2, Groups F and G, Class III (wall mount only), ATEX II 3D

Communication

- RS 232 with Modbus RTU or ASCII via RJ-11 connector
- RS 485 with Modbus RTU or ASCII via terminal strips
- Optional: SmartLinX cards for
 - PROFIBUS DP
 - DeviceNet

- ¹⁾ Program range is defined as the empty distance to the face of the transducer plus any range extension
- ²⁾ EMC performance available on request

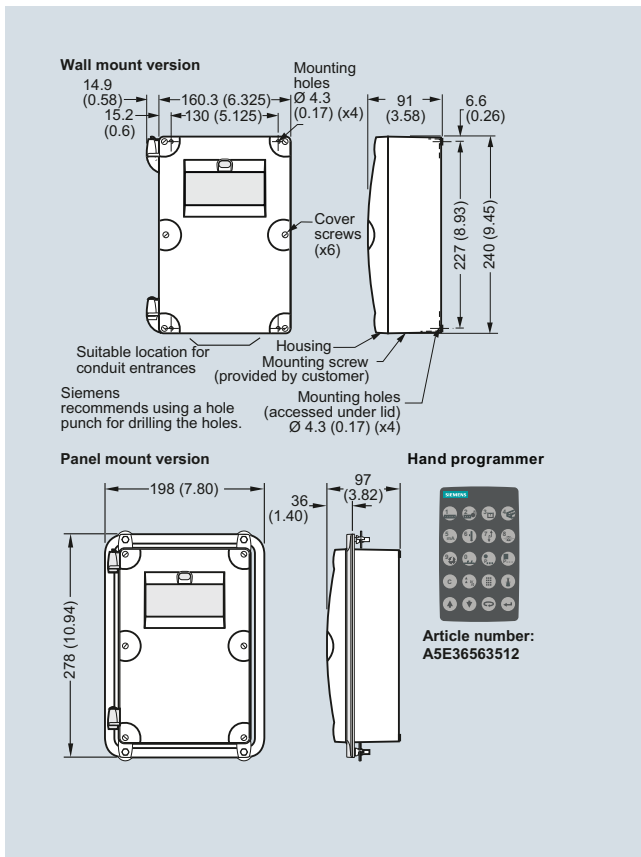
Level Measurement

Continuous level measurement - Ultrasonic controllers

MultiRanger 100/200

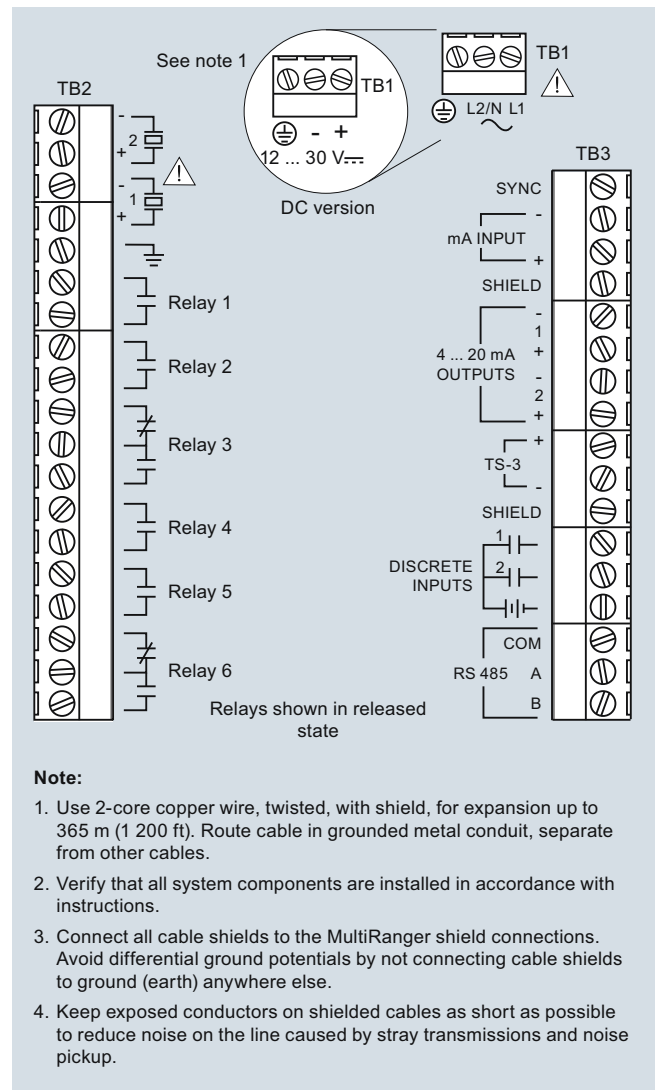
Selection and Ordering data	Article No.	Selection and Ordering data	Order code
MultiRanger 100/200 Versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5033- 	Further designs Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: ◆ Y15 Measuring-point number/identification (max. 27 characters) specify in plain text	
Versions MultiRanger 100, level measurement only ◆ 1 MultiRanger 200, level, volume, flow, and differential measurements ◆ 2		Operating Instructions English German Note: The Operating Instructions should be ordered as a separate item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. 7ML1998-5FB06 7ML1998-5FB36
Mounting, enclosure design Wall mount, standard enclosure ◆ A Wall mount, 4 entries, 4 M20 cable glands included ◆ B Panel mount (CE, CSA _{US/IC} , FM, UL) ◆ C		Accessories Handheld programmer A5E36563512 Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure 7ML1930-1AC M20 cable gland kit (4 M20 cable glands, 4 M20 nuts, 4 washers) 7ML1930-1FV Sunshield kit, 304 stainless steel 7ML1930-1GA USB to RS 232 adapter 7ML1930-6AK SITRANS RD100, loop powered display - see Chapter 7 7ML5741-... SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 7ML5740-... SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 7ML5744-... SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 7ML5750-...	
Power supply 100 ... 230 V AC ◆ A 12 ... 30 V DC ◆ B		Spare parts Power Supply Board (100 ... 230 V AC) 7ML1830-1MD Power Supply Board (12 ... 30 V DC) 7ML1830-1ME MultiRanger 100/200/ HydroRanger 200 display, non-HMI 7ML1830-1MF Removable terminal blocks A5E38824197	
Number of measurement points Single point version ◆ 0 Dual point version ◆ 1			
Communication (SmartLinX) Without module ◆ 0 SmartLinX PROFIBUS DP module ◆ 2 SmartLinX DeviceNet module ◆ 3 See SmartLinX product on page 4/337 for more information.			
Output relays 3 relays (2 Form A, 1 Form C), 250 V AC ◆ 1 6 relays (4 Form A, 2 Form C), 250 V AC ◆ 2 1 relay (1 Form A), 250 V AC (available on MultiRanger 100 model only) ◆ 3			
Approvals General Purpose CE, FM, CSA _{US/IC} , UL listed, RCM ◆ A CSA Class I, Div. 2, Groups A, B, C, and D; Class II, Div. 2, Groups F and G; Class III ¹⁾ ◆ B ATEX II 3D ²⁾ ◆ C			
¹⁾ For wall mount applications only ²⁾ For standard enclosure wall mount, option A only ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.		◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.	

Dimensional drawings



MultiRanger 100/200, dimensions in mm (inch)

Schematics



MultiRanger 100/200 connections

Level Measurement

Continuous level measurement - Ultrasonic controllers

HydroRanger 200 HMI

Overview



HydroRanger 200 HMI is an ultrasonic level controller for up to six pumps and provides control, differential control, and open channel flow monitoring.

Benefits

- Easy to use HMI display with local four-button programming, menu-driven parameters, and Wizard support for key applications
- English, German, French, Spanish, Chinese, Italian, Portuguese, and Russian texts on the HMI
- Removable terminal blocks for ease of wiring
- Monitors wet wells, weirs, and flumes
- Communication using built-in Modbus RTU via RS 485 and SIMATIC PDM configuration software
- Compatible with SmartLinx system: PROFIBUS DP (cyclic access of process values only) and DeviceNET
- Single or dual point level monitoring
- 6 relays
- Auto False-Echo Suppression for fixed obstruction avoidance
- Anti-grease ring/tide mark buildup
- Differential amplifier transceiver for common mode noise rejection and improved signal-to-noise ratio
- Wall and panel mounting options

Application

For water authorities, municipal water, and wastewater plants, HydroRanger 200 HMI is an economical, low-maintenance solution delivering control efficiency and productivity needed to meet today's exacting standards. It offers single point monitoring with all models, and optional dual-point monitoring with 6 relay model. As well, it has digital communications with built-in Modbus RTU via RS 485.

The standard 6 relay HydroRanger 200 HMI will monitor open channel flow and features advanced relay alarming and pump control functions as well as volume conversion. It is compatible with SIMATIC PDM, allowing for PC configuration and set-up. Sonic Intelligence advanced echo-processing software provides increased reading reliability.

HydroRanger 200 HMI uses proven continuous ultrasonic echo ranging technology to monitor water and wastewater of any consistency up to 15 m (50 ft) in depth. Achievable resolution is 0.1 % with accuracy to 0.25 % of range. Unlike contacting devices, HydroRanger 200 HMI is immune to problems caused by suspended solids, harsh corrosives, grease or silt in the effluent, reducing downtime.

- Key Applications: wet wells, flumes/weirs, bar screen control

Technical specifications

Mode of Operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 15 m (1 ... 50 ft), transducer dependent
Measuring points	1 or 2
Input	
Analog	0 ... 20 mA or 4 ... 20 mA, from alternate device, scalable (6 relay model)
Discrete	10 ... 50 V DC switching level Logical 0 ≤ 0.5 V DC Logical 1 = 10 ... 50 V DC max. 3 mA
Output	
EchoMax transducer	44 kHz
Ultrasonic transducer	Compatible transducers: ST-H and EchoMax series XPS-10, XPS-15/15F, and XRS-5
Relays ¹⁾	Rating 5 A at 250 V AC, non-inductive 4 SPST Form A/2 SPDT Form
mA output	0 ... 20 mA or 4 ... 20 mA
• Max. load	750 Ω, isolated
• Resolution	0.1 % of range
Accuracy	
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater
Resolution	0.1 % of measuring range or 2 mm (0.08 inch), whichever is greater ²⁾
Temperature compensation	<ul style="list-style-type: none"> • -50 ... +150 °C (-58 ... +302 °F) • Integral temperature sensor in transducer • External TS-3 temperature sensor (optional) • Programmable fixed temperature values
Rated operating conditions	
Installation conditions	Indoor / outdoor
• Location	II
• Installation category	4
• Pollution degree	
Ambient conditions	
• Ambient temperature (enclosure)	-20 ... +50 °C (-4 ... +122 °F)
Design	
Weight	
• Wall mount	1.22 kg (2.68 lb)
• Panel mount	1.35 kg (2.97 lb)
Material (enclosure)	Polycarbonate
Degree of protection (enclosure)	
• Wall mount	IP65/Type 4X/NEMA 4X
• Panel mount	IP54/Type 3/NEMA 3
Cable	
• Transducer and mA output signal	2-core copper conductor, twisted, shielded, 300 Vrms, 0.82 mm ² (18 AWG), Belden 8760 or equivalent is acceptable
• Max. separation between transducer and transceiver	365 m (1 200 ft)
Displays and controls	
	60 x 40 mm (2.36 x 1.57 inch) LCD 240 x 160 pixels resolution
Power supply³⁾	
AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W)
DC version	12 ... 30 V DC (20 W)

Level Measurement

Continuous level measurement - Ultrasonic controllers

HydroRanger 200 HMI

Certificates and approvals	<ul style="list-style-type: none"> • CE, RCM⁴⁾ • FM, CSA_{US/C}, UL listed • CSA_{US/C} Class I, Div. 2, Groups A, B, C and D, Class II, Div. 2, Groups F and G, Class III (wall mount only) • MCERTS Class 2 approved for Open Channel Flow
Communication	<ul style="list-style-type: none"> • RS 232 with Modbus RTU or ASCII via RJ-11 connector • RS 485 with Modbus RTU or ASCII via terminal blocks • Optional: SmartLinX cards for <ul style="list-style-type: none"> - PROFIBUS DPV1 (cyclic access of process values only) - DeviceNet

- 1) All relays certified for use with equipment that fails in a state at or under the rated maximums of the relays.
- 2) Program range is defined as the empty distance to the face of the transducer plus any range extension.
- 3) Maximum power consumption is listed
- 4) EMC performance available upon request

Selection and Ordering data	Article No.
Siemens HydroRanger 200 HMI Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5034-
Mounting, enclosure design	4 5 6
4 button HMI, Wall mount, standard enclosure 4 button HMI, Wall mount, 4 entries, 4 M20 cable glands included 4 button HMI, Panel Mount	
Input voltage	A B
100 ... 230 V AC 12 ... 30 V DC	
Number of measurement points	A B
Single point model, 6 relays Dual point model, 6 relays	
Communication (SmartLinX)	0 2 3 4
Without module SmartLinX PROFIBUS DP V0 module SmartLinX DeviceNet module SmartLinX PROFIBUS DP V1 module See SmartLinX product page 4/337 for more information	
Approvals	1 2
General Purpose CE, FM, CSA _{US/C} , UL listed, RCM CSA Class I, Div. 2, Groups A, B, C, and D; Class II, Div. 2, Groups F and G; Class III ¹⁾	

- 1) Available with Mounting/Enclosure design options 4 or 5

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters), specify in plain text	Y15
Test Certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Operating Instructions	Article No.
English	A5E36281317
German	A5E36281391
Note: The Operating Instructions should be ordered as a separate item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Other Operating Instructions	
SmartLinX PROFIBUS DPV1, English	A5E36197302
SmartLinX PROFIBUS DPV1, German	A5E36197305
Note: The appropriate SmartLinX Operating Instructions should be ordered as a separate line on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure	7ML1930-1AC
Sunshield kit, 304 stainless steel	7ML1930-1GA
USB to RS 232 adapter	7ML1930-6AK
RS 232 to RJ11 COMMS adapter	7ML1830-1MC
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
Spare parts	
Power Supply Board (100 ... 230 V AC)	7ML1830-1MD
Power Supply Board (12 ... 30 V DC)	7ML1830-1ME
Removable terminal blocks	A5E38824197
Spare lid with HMI, MultiRanger 200 HMI/ HydroRanger 200 HMI, wall	A5E35778738
Spare lid with HMI, MultiRanger 200 HMI/ HydroRanger 200 HMI, panel	A5E35778740
SmartLinX PROFIBUS DP V1 module	A5E35778741

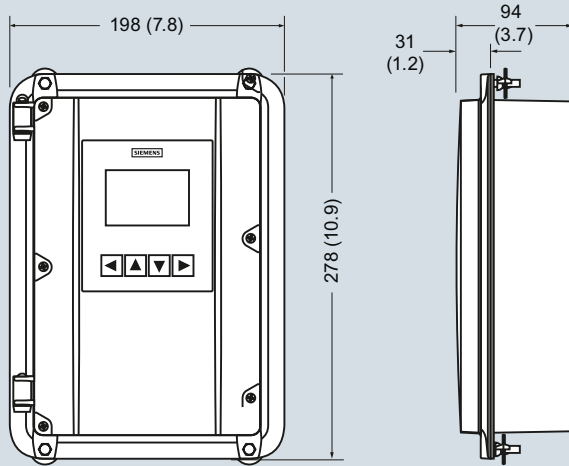
Level Measurement

Continuous level measurement - Ultrasonic controllers

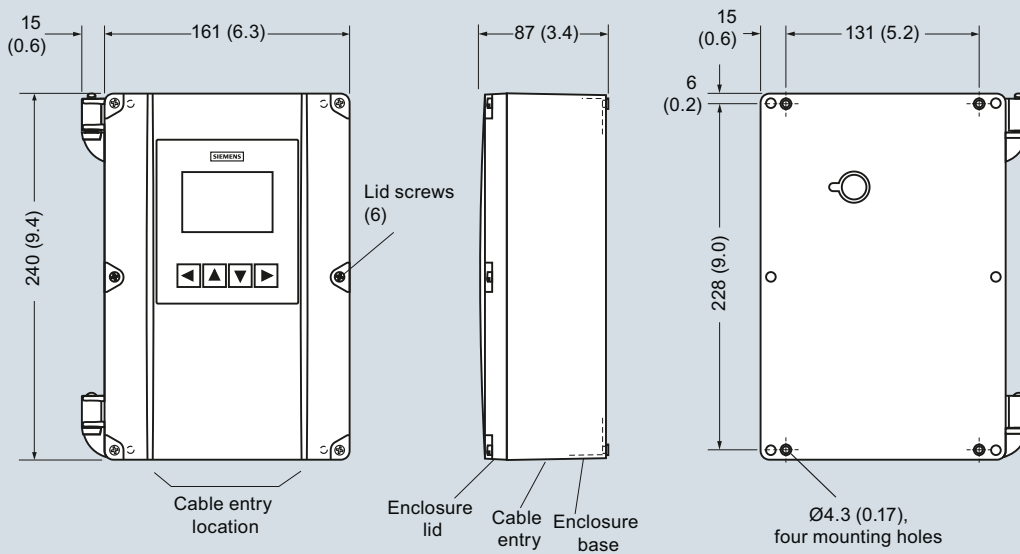
HydroRanger 200 HMI

Dimensional drawings

Panel mount dimensions

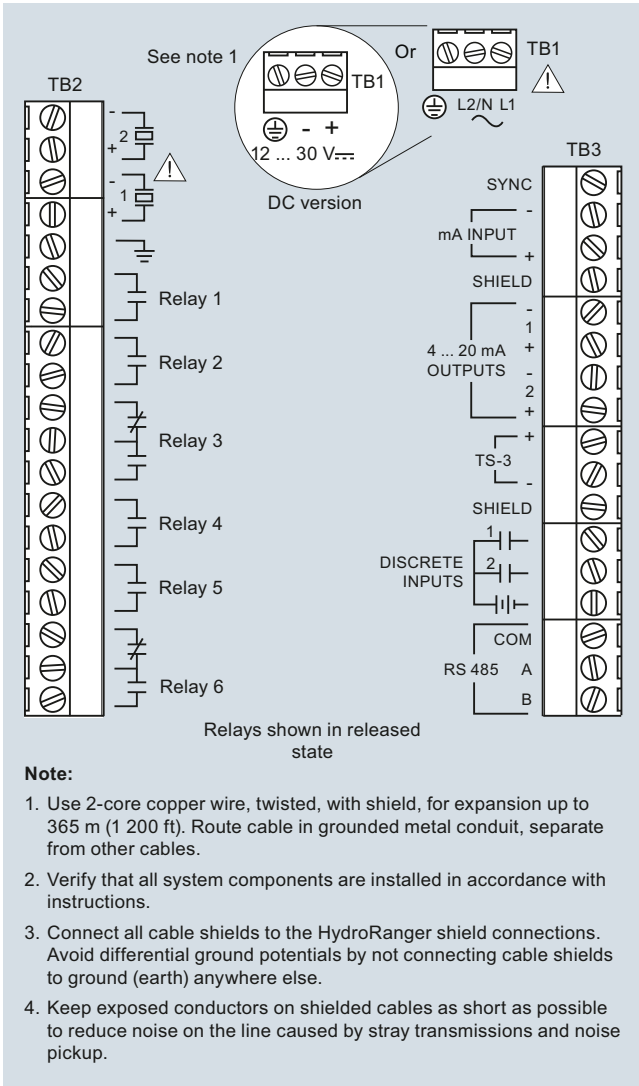


Wall mount dimensions



HydroRanger 200 HMI, dimensions in mm (inch)

Schematics



HydroRanger 200 HMI connections

Level Measurement

Continuous level measurement - Ultrasonic controllers

HydroRanger 200

Overview



HydroRanger 200 is an ultrasonic level controller for up to six pumps and provides control, differential control, and open channel flow monitoring.

Benefits

- Monitors wet wells, weirs and flumes
- Digital communications with built-in Modbus RTU via RS 485
- Compatible with SmartLinX communication options or SIMATIC PDM via RS 485
- Single or dual point level monitoring
- 6 relay (standard), 1 or 3 relay (optional)
- Auto False-Echo Suppression for fixed obstruction avoidance
- Anti-grease ring/tide mark buildup
- Differential amplifier transceiver for common mode noise rejection and improved signal-to-noise ratio
- Wall and panel mounting options

Application

For water authorities, municipal water, and wastewater plants, HydroRanger 200 is an economical, low-maintenance solution delivering control efficiency and productivity needed to meet today's exacting standards. It offers single point monitoring with all models, and optional dual-point monitoring with 6 relay model. As well, it has digital communications with built-in Modbus RTU via RS 485.

The standard 6 relay HydroRanger 200 will monitor open channel flow and features more advanced relay alarming and pump control functions as well as volume conversion. It is compatible with SIMATIC PDM, allowing for PC configuration and setup. Sonic Intelligence advanced echo-processing software provides increased reading reliability. The optional 1 or 3 relay models provide accurate level measurement functions only; these two models do not provide open channel flow, differential level measurement or volume conversion functions.

HydroRanger 200 uses proven continuous ultrasonic echo ranging technology to monitor water and wastewater of any consistency up to 15 m (50 ft) in depth. Achievable resolution is 0.1 % with accuracy to 0.25 % of range. Unlike contacting devices, HydroRanger 200 is immune to problems caused by suspended solids, harsh corrosives, grease or silt in the effluent, reducing downtime.

- Key Applications: wet wells, flumes/weirs, bar screen control

Level Measurement

Continuous level measurement - Ultrasonic controllers

HydroRanger 200

Technical specifications

Mode of Operation		Design	
Measuring principle	Ultrasonic level measurement	Weight	
Measuring range	0.3 ... 15 m (1 ... 50 ft), transducer dependent	• Wall mount	1.37 kg (3.02 lb)
Measuring points	1 or 2	• Panel mount	1.50 kg (3.31 lb)
Input		Material (enclosure)	Polycarbonate
Analog	0 ... 20 mA or 4 ... 20 mA, from alternate device, scalable (6 relay model)	Degree of protection (enclosure)	
Discrete	10 ... 50 V DC switching level Logical 0 ≤ 0.5 V DC Logical 1 = 10 ... 50 V DC Max. 3 mA	• Wall mount	IP65/Type 4X/NEMA 4X
Output		• Panel mount	IP54/Type 3/NEMA 3
EchoMax transducer	44 kHz	Cable	
Ultrasonic transducer	Compatible transducers: ST-H and EchoMax series XPS-10, XPS 15/15F, and XRS-5	• Transducer and mA output signal	2-core copper conductor, twisted, shielded, 300 Vrms, 0.82 mm ² (18 AWG), Belden 8 760 or equivalent is acceptable
Relays ¹⁾	Rating 5 A at 250 V AC, non-inductive	• Max. separation between transducer and transceiver	365 m (1 200 ft)
• Model with 1 relay ²⁾	1 SPST Form A	Displays and controls	
• Model with 3 relays ²⁾	2 SPST Form A/1 SPDT Form C	100 x 40 mm (4 x 1.5 inch) multi-block LCD with backlighting	
• Model with 6 relays	4 SPST Form A/2 SPDT Form C	Programming	Programming using handheld programmer or via PC with SIMATIC PDM software
mA output	0 ... 20 mA or 4 ... 20 mA	Power supply⁴⁾	
• Max. load	750 Ω isolated	AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W)
• Resolution	0.1 % of range	DC version	12 ... 30 V DC (20 W)
Accuracy		Certificates and approvals	
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater	<ul style="list-style-type: none"> • CE, RCM⁵⁾ • Lloyd's Register of Shipping • ABS Type Approval • FM, CSA_{US/C}, UL listed • CSA_{US/C} Class 1, Div. 2, Groups A, B, C, and D, Class II, Div. 2, Groups F and G, Class III (wall mount only) • MCERTS Class 3 approved for Open Channel Flow 	
Resolution	0.1 % of measuring range or 2 mm (0.08 inch), whichever is greater ³⁾	Communication	
Temperature compensation	<ul style="list-style-type: none"> • -50 ... +150 °C (-58 ... +302 °F) • Integral temperature sensor in transducer • External TS-3 temperature sensor (optional) • Programmable fixed temperature values 	<ul style="list-style-type: none"> • RS 232 with Modbus RTU or ASCII via RJ-11 connector • RS 485 with Modbus RTU or ASCII via terminal blocks • Optional: SmartLinX cards for <ul style="list-style-type: none"> - PROFIBUS DP - DeviceNet 	
Rated operating conditions		<ol style="list-style-type: none"> 1) All relays certified for use with equipment that fails in a state at or under the rated maximums of the relays 2) This model is level control only; no open channel flow, differential level or volume conversion functions 3) Program range is defined as the empty distance to the face of the transducer plus any range extension 4) Maximum power consumption is listed 5) EMC performance available upon request 	
Installation conditions			
• Location	Indoor / outdoor		
• Installation category	II		
• Pollution degree	4		
Ambient conditions			
• Ambient temperature (enclosure)	-20 ... +50 °C (-4 ... +122 °F)		

Level Measurement

Continuous level measurement - Ultrasonic controllers

HydroRanger 200

Selection and Ordering data

Siemens HydroRanger 200

Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring. The HydroRanger 200 is also available as a level measurement controller only. Select option from number of measurement points options below.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Mounting

Wall mount, standard enclosure
Wall mount, 4 entries, 4 M20 cable glands included
Panel mount¹⁾

Power supply

100 ... 230 V AC
12 ... 30 V DC

Number of measurement points

Single point model, 6 relays
Dual point model, 6 relays
Single point model, level only, 1 relay²⁾
Single point model, level only, 3 relays²⁾

Communication (SmartLinx)

Without module
SmartLinx PROFIBUS DP module
SmartLinx DeviceNet module
See SmartLinx product on page 4/337 for more information.

Approvals

General Purpose CE, FM, CSA_{USC}, UL listed, RCM
CSA Class I, Div. 2, Groups A, B, C, and D;
Class II, Div. 2, Groups F and G; Class III
(for wall mount applications only)

¹⁾Available with approval option 1 only

²⁾This model is level control only; no open channel flow, differential level, or volume conversion functions.

Article No.

7ML5034-

1

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A

B

C

D

0

2

3

1

2

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:
Measuring-point number/identification
(max. 27 characters) specify in plain text

Operating Instructions

English

German

French

Note: The Operating Instructions should be ordered as a separate item on the order.

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

Handheld programmer

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure

Sunshield kit, 304 stainless steel

USB to RS 232 adapter

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

Spare parts

Power Supply Board (100 ... 230 V AC)

Power Supply Board (12 ... 30 V DC)

MultiRanger 100/200/ HydroRanger 200 display, non-HMI
Siemens FI 01 · 2017

Removable terminal blocks

Order code

Y15

Article No.

7ML1998-5FC03

7ML1998-5FC33

7ML1998-5FC11

A5E36563512

7ML1930-1AC

7ML1930-1GA

7ML1930-6AK

7ML5741-...

7ML5740-...

7ML5744-...

7ML5750-...

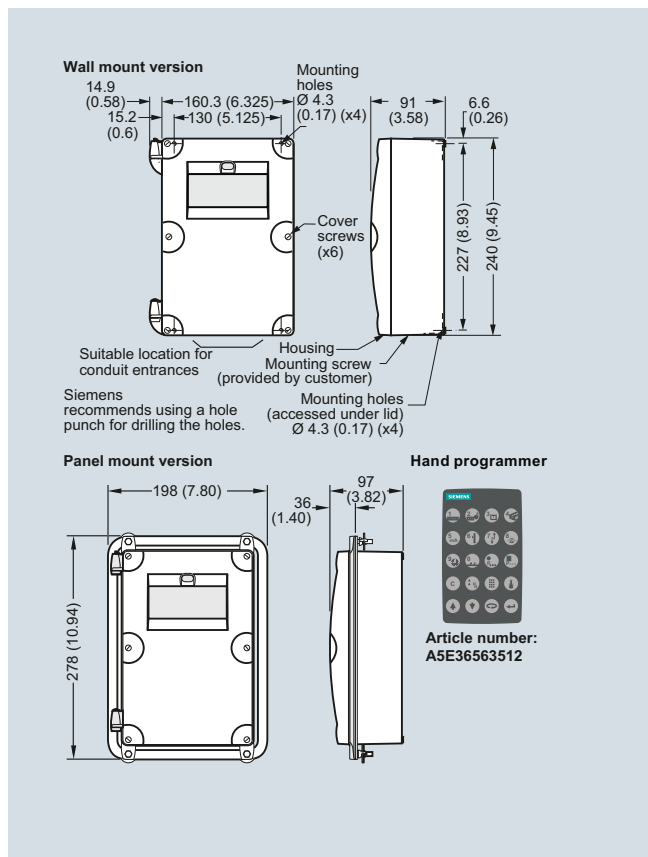
7ML1830-1MD

7ML1830-1ME

7ML1830-1MF

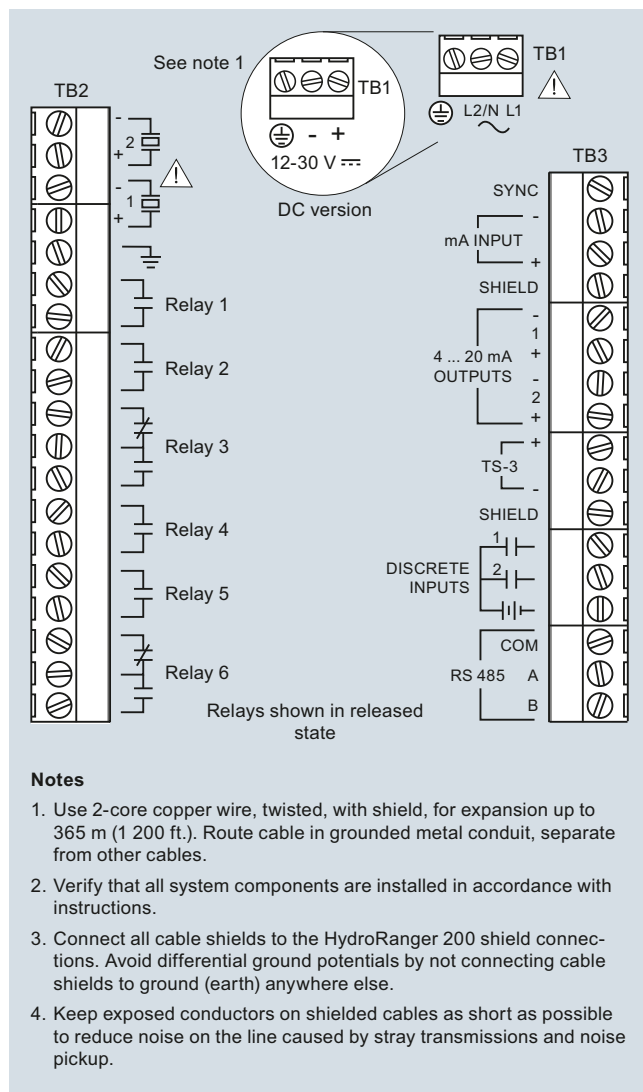
A5E38824197

Dimensional drawings



HydroRanger 200, dimensions in mm (inch)

Schematics



HydroRanger 200 connections

Level Measurement

Continuous level measurement - Ultrasonic transducers

Ultrasonic transducers

Overview

Ultrasonic Transducers

Ultrasonic measuring systems are the cost-effective choice for monitoring and control in short- to long-range applications for liquids, slurries, and solids in a wide range of industries. Transducers are impervious to dust, moisture, corrosion, vibration, flooding, and extreme temperature. They are easy to install and virtually maintenance-free. Choose from a wide selection of models designed for short or long range applications on liquids or solids.

Technical specifications

EchoMax Transducers					
	Liquids		Liquids and Solids		
	XRS-5	ST-H	Standard XPS-10	XPS-15	XPS-30
Max. range¹⁾	8 m (26 ft)	10 m (33 ft)	10 m (33 ft)	15 m (50 ft)	30 m (100 ft)
Min. range	0.3 m (1 ft)	0.3 m (1 ft)	0.3 m (1 ft)	0.3 m (1 ft)	0.6 m (2 ft)
Max. temperature	65 °C (149 °F)	73 °C (164 °F)	95 °C (203 °F)	95 °C (203 °F)	95 °C (203 °F)
Min. temperature	-20 °C (-4 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)
Typical Applications	Wet wells and open channels	Chemical storage and liquid tanks	Dusty solids and slurries	Deep wet wells and solids	Powders, pellets and solids
Frequency	44 kHz	44 kHz	44 kHz	44 kHz	30 kHz
Beam angle (-3dB)	10°	12°	12°	6°	6°
Thread size	R 1" [(BSPT), EN 10226] 1" NPT	1" and 2" NPT R 2" [(BSPT), EN 10226] 2" [(BSPP), EN ISO 228-1]	R 1" [(BSPT), EN 10226] 1" NPT	R 1" [(BSPT), EN 10226] 1" NPT	R 1.5" [(BSPT), EN 10226] Universal thread 1.5" NPT
Enclosure	<ul style="list-style-type: none"> PVDF Copolymer CSM Option: Flange with PTFE facing 	<ul style="list-style-type: none"> ETFE Option: PVDF 	<ul style="list-style-type: none"> PVDF Option: foam facing Flange with PTFE facing 	<ul style="list-style-type: none"> PVDF Option: foam facing Flange with PTFE facing 	<ul style="list-style-type: none"> PVDF Option: foam facing Flange with PTFE facing
Compatible with:					
SITRANS LUT400	•	•	•	•	•
HydroRanger 200	•	•	•	•	
MultiRanger 100/200	•	•	•	•	

¹⁾ Application conditions such as extreme dust or angle of repose may reduce the usable maximum range. Consult a local sales person for more details.

Level Measurement

Continuous level measurement - Ultrasonic transducers

ST-H

Overview



ST-H transducers use ultrasonic technology to measure level in chemical storage and liquid tanks.

Benefits

- Can be mounted on a narrow standpipe
- Immune to corrosive and harsh environments
- Integral temperature sensor

Application

The narrow design of the ST-H allows the transducer to be mounted on a narrow standpipe. When mounted correctly, it is completely protected from the process and can even be used in harsh, corrosive environments.

During operation, the ultrasonic transducer emits acoustic pulses in a narrow beam perpendicular to the transducer face. The level transceiver measures the propagation time between pulse emission and reception of the echo to calculate the distance from the transducer to the material. Variations in sound velocity due to changes in temperature within the permissible range are automatically compensated by the integral temperature sensor.

- Key Applications: chemical storage, liquid tanks

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic transducer
Input	
Measuring range	0.3 ... 10 m (1 ... 33 ft)
Output	
Frequency	44 kHz
Beam angle	12°
Accuracy	
Temperature compensation	Compensated by integral temperature sensor
Rated operating conditions	
Pressure	Normal atmospheric pressure
Ambient conditions	
Ambient temperature	-20 ... +60 °C (-5 ... +140 °F) (ATEX approved model) -40 ... +73 °C (-40 ... +163 °F) (CSA/FM approved model)
Design	
Weight ¹⁾	1.4 kg (3 lb)
Material (enclosure)	Base and lid made of ETFE or PVDF (epoxy fitted joint) ²⁾
Process connection	2" NPT [(Taper), ANSI/ASME B1.20.1], R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
Degree of protection	IP68
Cable connection	2-core shielded/twisted, 0.519 mm ² (20 AWG), PVC sheath
Cable (max. length)	365 m (1 200 ft) with RG 62 A/U coaxial cable
Options	
Flange adapter	3" Universal (fits DN 65, PN 10 and 3" ASME)
Certificates and approvals	
CE, CSA Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T3 (ETFE only), FM Class I, II, Div. 1, Groups C, D, E, F, G T4A, ATEX II 2G / INMETRO Ex mb IIC T5 Gb, RCM, KCC	

¹⁾ Approximate shipping weight of transducer with standard cable length

²⁾ When measuring chemicals, check compatibility of ETFE or PVDF and epoxy, or mount joint external to process.

Level Measurement

Continuous level measurement - Ultrasonic transducers

ST-H

Selection and Ordering data

EchoMax ST-H ultrasonic transducer

Level measurement in chemical storage and liquid tanks. The narrow design of the ST-H allows the transducer to be mounted on a 2 inch standpipe. Measuring range: min. 0.3 m (1 ft), max. 10 m (33 ft).

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Process connection

ETFE, 2" NPT [(Taper), ANSI/ASME B1.20.1]

ETFE, R 2" [(BSPT), EN 10226]

ETFE, G 2" [(BSPP), EN ISO 228-1]

PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]

PVDF copolymer, R 2" [(BSPT), EN 10226]

PVDF copolymer, G 2" [(BSPP), EN ISO 228-1]

Cable length

5 m (16.40 ft)

10 m (32.81 ft)

30 m (98.43 ft)

50 m (164.04 ft)

100 m (328.08 ft)

Approvals

CE, FM Class I, II, Div. 1, Groups C,D,E,F,G T4A

ATEX 2G / INMETRO Ex mb IIC T5 Gb, RCM, KCC

CSA Class I, II, III, Div. 1, Groups A,B,C,D,E,F,G T3

CE, ATEX 2G / INMETRO Ex mb IIC T5 Gb, RCM, KCC

Operating Instructions

Quick Start Manual, multi-language

Note: The Operating Instructions should be ordered as a separate line item on the order.

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

1) Available with Process connection options 0 ... 2 only

2) Available with Process connection options 3 ... 5 only

3) Not suitable for Ketone, Hexane, Ester or Ethyl Acetate atmospheres

Article No.

➤ **7ML1100-**

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Article No.

A5E32105880

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text

Accessories

Universal box bracket, mounting kit

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" NPT

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" BSPT

Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling

Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings

Easy Aimer 304, NPT with 1" stainless steel coupling

Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings

Plastic adapter 1" NPT

Plastic adapter 1" NPT/M20

Order code

Y17

Article No.

7ML1830-1BK

7ML1830-1BT

7ML1830-1BU

7ML1830-1AQ

7ML1830-1AX

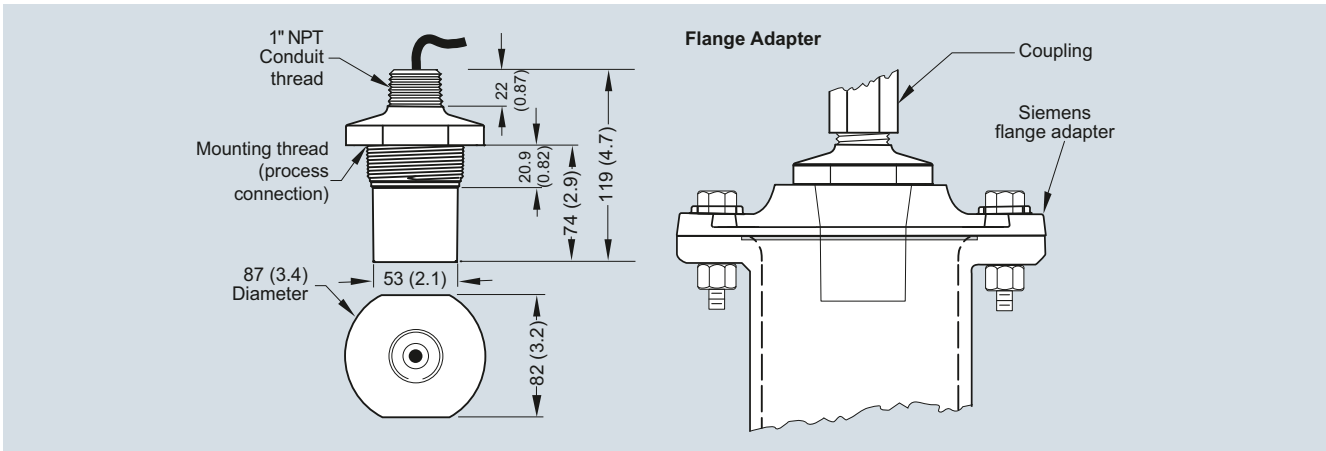
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7ML1830-1GN

7ML1930-1FX

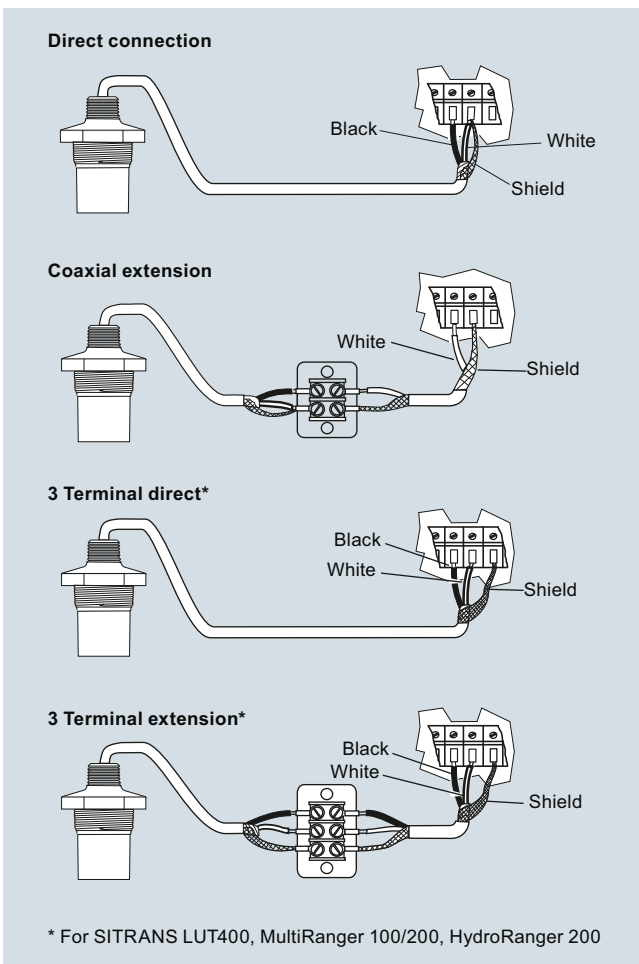
7ML1830-1EF

Dimensional drawings



ST-H ultrasonic transducer, dimensions in mm (inch)

Schematics



ST-H ultrasonic transducer connections

4

Level Measurement

Continuous level measurement - Ultrasonic transducers

EchoMax XRS-5

Overview



EchoMax XRS-5 ultrasonic transducer provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/wet wells, flumes, weirs and filter beds using a beam angle of just 10° and a CSM rubber face.

Benefits

- Narrow beam angle of only 10°
- Chemically resistant PVDF copolymer enclosure and CSM rubber face
- Measuring range: 8 m (26 ft) for measurement of liquids and slurries
- Fully submersible: IP68 degree of protection
- Easy installation with 1" NPT or R 1" BSPT connection

Application

The XRS-5 is non-contacting with a measuring range from 0.3 to 8 m (1 to 26 ft). Advanced echo processing ensures reliable data even in conditions with obstructions, turbulence, and foam.

The hermetically sealed CSM rubber face and the PVDF copolymer enclosure are designed for maximum resistance to methane, salt water, caustics, and harsh chemicals common to wastewater installations. With an IP68 degree of protection, this rugged sensor is fully submersible in the event of flood conditions. Use a submergence shield if full submergence is possible in the application. A submergence shield will maintain a high level reading output during submerged conditions.

The low-cost XRS-5 transducer is compatible with a full range of Siemens controllers, from a basic system for high/low alarm or simple pump control, up to advanced control systems with communications, telemetry and SCADA integration capabilities.

- Key Applications: wet wells, flumes, weirs, filter beds

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic transducer
Input	
Measuring range	0.3 ... 8 m (1 ... 26 ft), dependent on application
Output	
Frequency	44 kHz
Beam angle	10°
Accuracy	
Temperature error	Compensated by integral temperature sensor
Rated operating conditions	
Vessel pressure	Normal atmospheric pressure
Ambient Conditions	
• Ambient temperature	-20 ... +65 °C (-4 ... +149 ° F)
Design	
Weight (approximate shipping weight of sensor with standard cable length)	1.2 kg (2.6 lb)
Material (enclosure)	PVDF copolymer enclosure and CSM face
Process connection	1" NPT [(Taper), ANSI/ASME B1.20.1] or R 1" [(BSPT), EN 10226]
Degree of protection	IP65/IP68
Cable connection	2-core shielded/twisted, 0.5 mm ² (20 AWG), PVC sheath
Cable (max. length)	<ul style="list-style-type: none"> • 365 m (1 200 ft) with RG 62 A/U coaxial cable • 365 m (1 200 ft) with 2-core twisted pair, foil shield, 0.5 mm² (20 AWG), PVC sheath, only for MultiRanger 100/200
Options	
Flange version	Factory flange with PTFE face for ASME, EN or JIS configuration
Submergence shield	For applications with flooding possible
Certificates and approvals	
CE, RCM, KCC	
CSA Class I, Div. 2, Groups A, B, C, D, Class II, Div. 1 Groups E, F, G	
FM Class I, Zone 1, AEx m IIC, T6 Class II, III, Div. 1, Groups E, F, G T6	
ATEX II 2GD / IECEx / INMETRO Ex mb IIC T6 Gb, Ex tb IIIC T85 °C Db	

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
<p>EchoMax XRS-5 transducer</p> <p>With a beam angle of 10°, the XRS-5 provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/wet wells, flumes, weirs and filter beds. Measuring range: min. 0.3 m (1 ft), max. 8 m (26 ft)</p> <p>➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	<p>➤ 7ML1106-</p> <p>■ ■ ■ ■ ■ 0 - 0 ■</p>	<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p> <p>Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text</p>	<p>➤ Y17</p>
<p>Process connection</p> <p>1" NPT [(Taper), ANSI/ASME B1.20.1] ➤ 1</p> <p>R 1" [(BSPT), EN 10226] ➤ 2</p>	<p>■ 1</p> <p>■ 2</p>	<p>Accessories</p> <p>Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors</p>	<p>Article No.</p> <p>7ML1930-1BJ</p>
<p>Cable length</p> <p>5 m (16.40 ft) ➤ A</p> <p>10 m (32.81 ft) ➤ B</p> <p>30 m (98.43 ft) ➤ C</p>	<p>■ A</p> <p>■ B</p> <p>■ C</p>	<p>Submergence shield kit</p> <p>Easy Aimer 2, aluminum, NPT with 3/4" x 1" PVC coupling</p>	<p>7ML1830-1BH</p> <p>7ML1830-1AQ</p>
<p>Facing</p> <p>Standard (CSM rubber) ➤ A</p> <p>PTFE (flange versions) ➤ B</p>	<p>■ A</p> <p>■ B</p>	<p>Easy Aimer 2, aluminum with M20 adapter and 1" and 1 1/2" BSPT aluminum couplings</p>	<p>7ML1830-1AX</p>
<p>Approvals</p> <p>CE, RCM, KCC, CSA Class I, Div. 2, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G FM Class I, Zone 1, AEx m IIC, T6 Class II, III, Div. 1, Groups E, F, G T6 ATEX II 2GD / IECEx / INMETRO Ex mb IIC T6 Gb, Ex tb IIIC T85 °C Db</p>	<p>■ 2</p>	<p>Easy Aimer 304, NPT with 1" stainless steel coupling</p> <p>Easy Aimer 304, with M20 adapter and 1" and 1 1/2" BSPT 304 stainless steel couplings</p>	<p>7ML1830-1AU</p> <p>7ML1830-1GN</p>
<p>Mounting flange (flush mount)</p> <p>None ➤ A</p> <p>3" ASME, 150 lb, flat faced ➤ B</p> <p>4" ASME, 150 lb, flat faced ➤ C</p> <p>6" ASME, 150 lb, flat faced ➤ D</p> <p>DN 80, PN 10/16, Type A, flat faced ➤ J</p> <p>DN 100, PN 10/16, Type A, flat faced ➤ K</p> <p>DN 150, PN 10/16, Type A, flat faced ➤ L</p> <p>JIS10K 3B style ➤ Q</p> <p>JIS10K 4B style ➤ R</p> <p>JIS10K 6B style ➤ S</p> <p>Note: flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.</p>	<p>■ A</p> <p>■ B</p> <p>■ C</p> <p>■ D</p> <p>■ J</p> <p>■ K</p> <p>■ L</p> <p>■ Q</p> <p>■ R</p> <p>■ S</p>	<p>FMS-200 universal box bracket, mounting kit</p> <p>FMS-210 channel bracket, wall mount</p> <p>FMS-220 extended channel bracket, wall mount</p> <p>FMS-310 channel bracket, floor mount</p> <p>FMS-320 extended channel bracket, floor mount</p> <p>FMS-350 bridge channel bracket, floor mount (see Mounting Brackets on page 4/179 for more information)</p> <p>1" NPT locknut, plastic</p> <p>1" BSPT locknut, plastic</p> <p>Plastic adapter 1" BSP - 20 mm</p> <p>Plastic adapter 1" NPT</p> <p>Plastic adapter 1" NPT/M20</p>	<p>7ML1830-1BK</p> <p>7ML1830-1BL</p> <p>7ML1830-1BM</p> <p>7ML1830-1BN</p> <p>7ML1830-1BP</p> <p>7ML1830-1BQ</p> <p>7ML1830-1DS</p> <p>7ML1830-1DR</p> <p>7ML1830-1EA</p> <p>7ML1930-1FX</p> <p>7ML1830-1EF</p>
<p>Operating Instructions</p> <p>All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation</p> <p>➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ➤. For details see page 10/11 in the appendix.</p>		<p>➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ➤. For details see page 10/11 in the appendix.</p>	

Level Measurement

Continuous level measurement - Ultrasonic transducers

EchoMax XRS-5

Selection and Ordering data

EchoMax XRS-5C transducer

With a beam angle of 10°, the XRS-5 provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/wet wells, flumes, weirs and filter beds.

Measuring range: min. 0.3 m (1 ft), max. 8 m (26 ft)

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Process connection

1" NPT [(Taper), ANSI/ASME B1.20.1]

Cable length

5 m (16.40 ft)

10 m (32.81 ft)

30 m (98.43 ft)

Facing

Standard (CSM rubber)

PTFE (flange versions)

Approvals

CSA Class I Div. 1, Groups A, B, C, D; Class II

Div. 1, Groups E, F, G; Class III

Mounting flange (flush mount)

None

3" ASME, 150 lb, flat faced

4" ASME, 150 lb, flat faced

6" ASME, 150 lb, flat faced

Note: flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⚡. For details see page 10/11 in the appendix.

Article No.

➤ 7ML1105-

1 - 0

A B C

A B

1

A B

A B C D

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text

Accessories

Submergence shield kit

Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling

Easy Aimer 304, NPT with 1" stainless steel coupling

FMS-200 universal box bracket, mounting kit

FMS-210 channel bracket, wall mount

FMS-220 extended channel bracket, wall mount

FMS-310 channel bracket, floor mount

FMS-320 extended channel bracket, floor mount

FMS-350 bridge channel bracket, floor mount (see Mounting Brackets on page 4/179 for more information)

➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⚡. For details see page 10/11 in the appendix.

Order code

➤ Y17

Article No.

7ML1830-1BH

7ML1830-1AQ

7ML1830-1AU

7ML1830-1BK

7ML1830-1BL

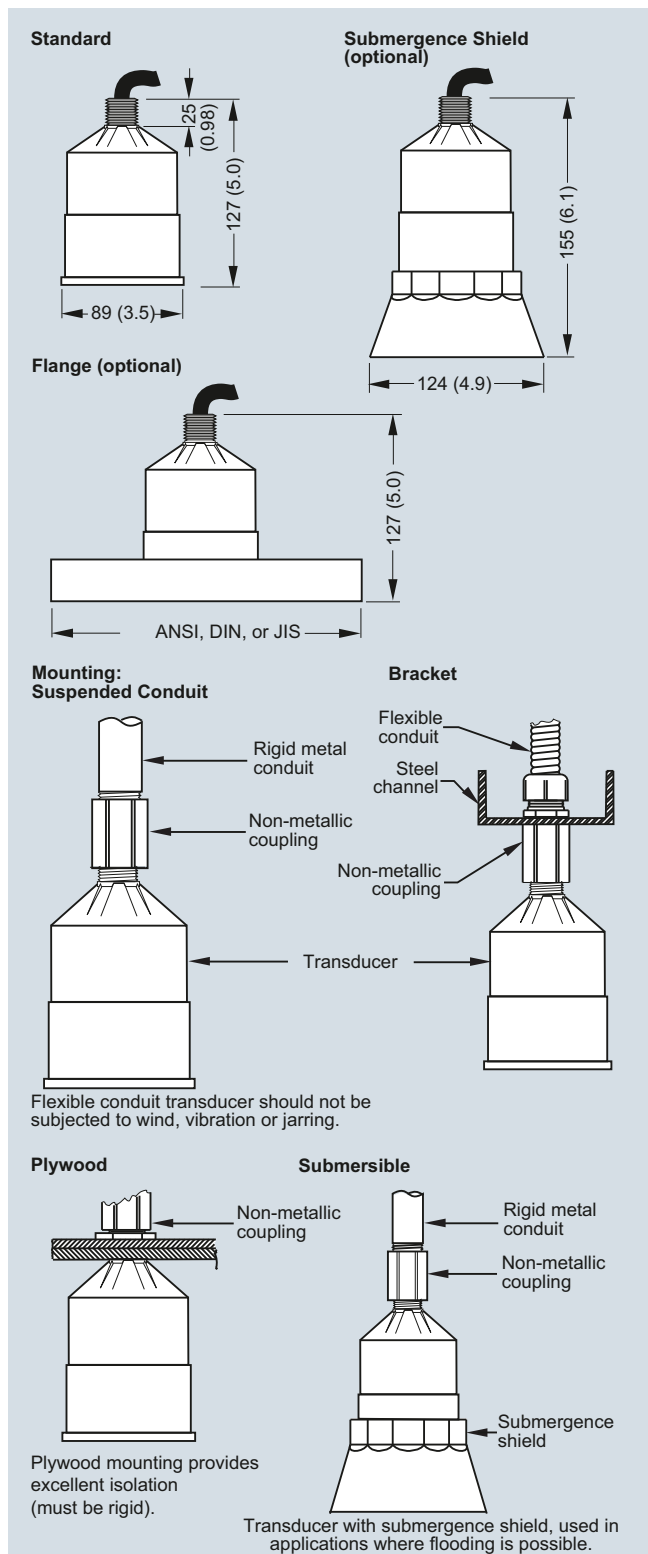
7ML1830-1BM

7ML1830-1BN

7ML1830-1BP

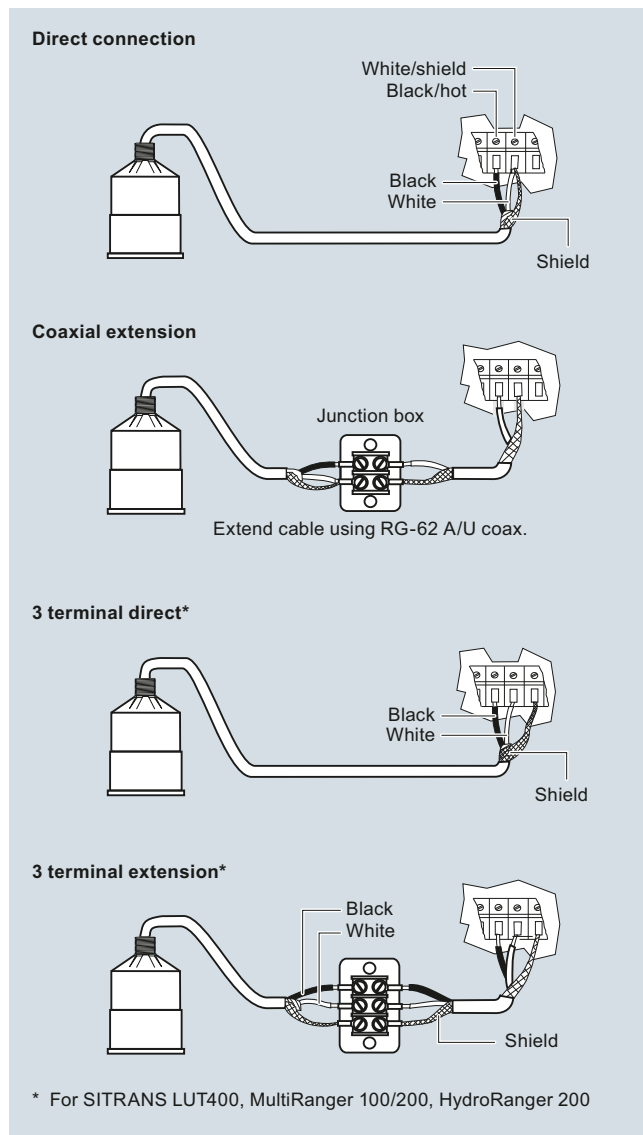
7ML1830-1BQ

Dimensional drawings



XRS-5 ultrasonic transducer, dimensions in mm (inch)

Schematics



XRS-5 ultrasonic transducer connections

Level Measurement

Continuous level measurement - Ultrasonic transducers

EchoMax XPS

Overview



EchoMax XPS transducers use ultrasonic technology to measure level in a wide range of liquids and solids.

Benefits

- Integral temperature compensation
- Low ringing effect reduces blanking distance
- Optional foam facing for dusty applications
- Self-cleaning and low-maintenance
- Chemically resistant
- Hermetically sealed

Application

XPS transducers can be fully immersed, are resistant to steam and corrosive chemicals, and can be installed without flanges.

The XPS series offers versions for various measuring ranges up to 30 m (100 ft) and up to a max. temperature of 95 °C (203 °F).

During operation, the EchoMax transducers emit acoustic pulses in a narrow beam. The level monitor measures the propagation time between pulse emission and its reflection (echo) to calculate the distance.

Level Measurement

Continuous level measurement - Ultrasonic transducers

EchoMax XPS

Technical specifications

Input	XPS-10	XPS-15 (standard and F models)	XPS-30
Measuring range	0.3 ... 10 m (1 ... 33 ft)	<u>Standard:</u> 0.3 ... 15 m (1 ... 50 ft) <u>XPS-15F:</u> 0.45 ... 15 m (1.5 ... 50 ft)	0.6 ... 30 m (2 ... 100 ft)
Output			
Frequency	44 kHz	44 kHz	30 kHz
Beam angle	12°	6°	6°
Environmental			
Location	Indoors/outdoors		
Ambient temperature	-40 ... +95 °C (-40 ... +203 °F)	<u>Standard:</u> -40 ... +95 °C (-40 ... +203 °F) <u>XPS-15F:</u> -20 ... +95 °C (-4 ... +203 °F)	-40 ... +95 °C (-40 ... +203 °F)
Pollution degree	4		
Pressure	8 bar g (120 psi g) <u>Flanged:</u> 0.5 bar g (7.25 psi g)	8 bar g (120 psi g) <u>Flanged:</u> 0.5 bar g (7.25 psi g)	0.5 bar g (7.25 psi g) <u>Flanged:</u> 0.5 bar g (7.25 psi g)
Design			
Weight	0.8 kg (1.8 lb)	1.3 kg (2.8 lb) <u>Flanged:</u> 2 kg (4.4 lb)	4.3 kg (9.5 lb)
Power supply	Operation of transducer only with approved Siemens controllers		
Material	<u>Standard:</u> PVDF <u>Flanged:</u> PVDF with CPVC flange <u>Option:</u> PTFE face with CPVC flange	<u>Standard:</u> PVDF <u>Flanged:</u> PVDF with CPVC flange <u>Option:</u> PTFE face with CPVC flange	<u>Standard:</u> PVDF <u>Flanged:</u> PVDF with CPVC flange <u>Option:</u> PTFE face with CPVC flange
Color	Blue	<u>Standard:</u> Blue <u>XPS-15F:</u> Gray	Blue
Process connection	1" NPT or 1" BSPT	<u>Standard:</u> 1" NPT or 1" BSPT <u>XPS-15F:</u> 1" NPT	1.5" universal thread (NPT or BSPT)
Degree of protection	IP66/68	IP66/68	IP66/68
Cable	2-wire twisted pair/braided and foil shielded 0.5 mm ² (20 AWG) PVC jacket		
Separation	Max. 365 m (1 200 ft)		
Certificates and approvals	<u>Standard:</u> CE, CSA, FM, ATEX, IECEx	<u>Standard:</u> CE, CSA, FM, ATEX, IECEx <u>XPS-15F:</u> FM Class I, Div. 1, Groups A, B, C, and D, Class II Div. 1, Groups E, F, and G, Class III	CE, CSA, FM, ATEX, IECEx

1) EMC certificate available on request.

Level Measurement

Continuous level measurement - Ultrasonic transducers

EchoMax XPS

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
EchoMax XPS-10 ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Measuring range: min. 0.3 m, max. 10 m ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML1115- 0	Further designs Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring point number/ identification (max. 27 characters) specify in plain text	Y15
Mounting thread and facing 1" NPT [(Taper), ANSI/ASME B1.20.1] 0 1" NPT [(Taper), ANSI/ASME B1.20.1] with foam facing ¹⁾ 1 1" NPT [(Taper), ANSI/ASME B1.20.1] with PTFE facing ²⁾ 2 R 1" [(BSPT), EN 10226] 3 R 1" [(BSPT), EN 10226] with foam facing ¹⁾ 4 R 1" [(BSPT), EN 10226] with PTFE facing ²⁾ 5		Operating Instructions Quick Start guide, multi-language Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. A5E32282889
Cable length 5 m (16.40 ft) B 10 m (32.81 ft) C 30 m (98.43 ft) E 50 m (164.04 ft) F 100 m (328.08 ft) K		Accessories Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors 7ML1930-1BJ Submergence shield kit 7ML1830-1BH Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling 7ML1830-1AQ Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings 7ML1830-1AX Easy Aimer 304, NPT with 1" stainless steel coupling 7ML1830-1AU Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings 7ML1830-1GN Universal box bracket, mounting kit 7ML1830-1BK Channel bracket, wall mount 7ML1830-1BL Extended channel bracket, wall mount 7ML1830-1BM Channel bracket, floor mount 7ML1830-1BN Extended channel bracket, floor mount 7ML1830-1BP Bridge channel bracket, floor mount (see Mounting Brackets on page 4/179 for more information) 7ML1830-1BQ 1" NPT locknut, plastic 7ML1830-1DS 1" BSPT locknut, plastic 7ML1830-1DR Plastic adapter 1" BSP - 20 mm 7ML1830-1EA Plastic adapter 1" NPT 7ML1930-1FX Plastic adapter 1" NPT/M20 7ML1830-1EF	
Mounting flange None A 3" ASME, 150 lb, flat faced C 4" ASME, 150 lb, flat faced D 6" ASME, 150 lb, flat faced E 8" ASME, 150 lb, flat faced F DN 80, PN 10/16, Type A, flat faced G DN 100, PN 10/16, Type A, flat faced J DN 150, PN 10/16, Type A, flat faced L JIS10K3B Style M JIS10K4B Style P JIS10K6B Style R (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)			
Approvals ATEX 2GD Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; 3 IECEx SIR 13.0009X Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; FM Class I, Div. 2, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III ³⁾ 4			

¹⁾ Not available with flanged versions

²⁾ Available with flanged versions only

³⁾ Valid with mounting thread and facing options 0 ... 2 only

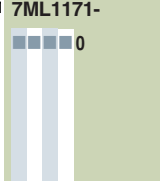
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
EchoMax XPS-15 ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Measuring range: min. 0.3 m, max. 15 m ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML118- ■ ■ ■ ■ ■ 0	Further designs Please add "-Z" to Article No. and specify Order code(s).	
Mounting thread and facing 1" NPT [(Taper), ANSI/ASME B1.20.1] ◆ 0 1" NPT [(Taper), ANSI/ASME B1.20.1] with foam facing ¹⁾ ◆ 1 1" NPT [(Taper), ANSI/ASME B1.20.1] with PTFE facing ²⁾ ◆ 2 R 1" [(BSPT), EN 10226] ◆ 3 R 1" [(BSPT), EN 10226] with foam facing ¹⁾ ◆ 4 R 1" [(BSPT), EN 10226] with PTFE facing ²⁾ ◆ 5	■ ■ ■ ■ ■ B C E F K A D E J K N P	Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: ◆ Y15 Measuring point number/ identification (max. 27 characters) specify in plain text	
Cable length 5 m (16.40 ft) ◆ 10 m (32.81 ft) ◆ 30 m (98.43 ft) ◆ 50 m (164.04 ft) ◆ 100 m (328.08 ft) ◆	B C E F K	Operating Instructions Quick Start guide, multi-language ◆ A5E32282889 Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. A5E32282889
Mounting flange None ◆ 6" ASME, 150 lb, flat faced 8" ASME, 150 lb, flat faced DN 150, PN 10/16, Type A, flat faced DN 200, PN 10, Type A, flat faced JIS10K 6B JIS10K 8B (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)	A D E J K N P	Accessories Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors ◆ 7ML1930-1BJ Submergence shield kit ◆ 7ML1830-1BJ Universal box bracket, mounting kit ◆ 7ML1830-1BK Channel bracket, wall mount ◆ 7ML1830-1BL Extended channel bracket, wall mount ◆ 7ML1830-1BM Channel bracket, floor mount ◆ 7ML1830-1BN Extended channel bracket, floor mount ◆ 7ML1830-1BP Bridge channel bracket, floor mount (see Mounting Brackets on page 4/179 for more information) ◆ 7ML1830-1BQ 1" NPT locknut, plastic ◆ 7ML1830-1DS 1" BSPT locknut, plastic ◆ 7ML1830-1DR Easy Aimer 2, aluminum, NPT with 3/4" x 1" PVC coupling ◆ 7ML1830-1AQ Easy Aimer 2, aluminum with M20 adapter and 1" and 1 1/2" BSPT aluminum couplings ◆ 7ML1830-1AX Easy Aimer 304, NPT with 1" stainless steel coupling ◆ 7ML1830-1AU Easy Aimer 304, with M20 adapter and 1" and 1 1/2" BSPT 304 stainless steel couplings ◆ 7ML1830-1GN Plastic adapter 1" BSP - 20 mm ◆ 7ML1830-1EA Plastic adapter 1" NPT ◆ 7ML1930-1FX Plastic adapter 1" NPT/M20 ◆ 7ML1830-1EF	7ML1930-1BJ 7ML1830-1BJ 7ML1830-1BK 7ML1830-1BL 7ML1830-1BM 7ML1830-1BN 7ML1830-1BP 7ML1830-1BQ 7ML1830-1DS 7ML1830-1DR 7ML1830-1AQ 7ML1830-1AX 7ML1830-1AU 7ML1830-1GN 7ML1830-1EA 7ML1930-1FX 7ML1830-1EF
Approvals ATEX 2GD Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; ◆ IECEx SIR 13.0009X Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; FM Class I, Div. 2, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III ³⁾ ◆ 1) Not available with flanged versions 2) Available with flanged versions only 3) Available with mounting options 0 ... 2 only ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.	3 4	◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.	

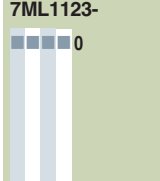
Level Measurement

Continuous level measurement - Ultrasonic transducers

EchoMax XPS

Selection and Ordering data	Article No.
EchoMax XPS-15F ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Measuring range: min. 0.45 m, max. 15 m ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML1171- 
Mounting thread and facing 1" NPT [(Taper), ANSI/ASME B1.20.1]	1
Cable length 5 m (16.40 ft) 10 m (32.81 ft) 30 m (98.43 ft) 50 m (164.04 ft) 100 m (328.08 ft)	B C D E F
Mounting flange, flush mount None 6" ASME, 150 lb, flat faced 8" ASME, 150 lb, flat faced (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.)	A B C
Approvals FM Class I, Div. 1, Groups A, B, C, and D, Class II Div. 1, Groups E, F, and G, Class III	1

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring point number/ identification (max. 27 characters) specify in plain text	Y15
Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	Article No.
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors	7ML1930-1BJ
Submergence shield kit	7ML1830-1BJ
Universal box bracket, mounting kit	7ML1830-1BK
Channel bracket, wall mount	7ML1830-1BL
Extended channel bracket, wall mount	7ML1830-1BM
Channel bracket, floor mount	7ML1830-1BN
Extended channel bracket, floor mount	7ML1830-1BP
Bridge channel bracket, floor mount (see Mounting Brackets on page 4/179 for more information)	7ML1830-1BQ
1" NPT locknut, plastic	7ML1830-1DS
Easy Aimer 2, aluminum, NPT with 3/4" x 1" PVC coupling	7ML1830-1AQ
Easy Aimer 304, NPT with 1" stainless steel coupling	7ML1830-1AU

Selection and Ordering data	Article No.
EchoMax XPS-30 ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. 1½" universal thread compatible with 1½" NPT and R 1½" [(BSPT), EN 10226] Measuring range: min. 0.6 m (1.97 ft), max. 30 m (98.43 ft) ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML1123- 
Mounting thread and facing 1½" universal thread 1½" universal thread, foam facing ¹⁾ 1½" universal thread, PTFE facing ²⁾	0 1 2
Cable length 5 m (16.40 ft) 10 m (32.81 ft) 30 m (98.43 ft) 50 m (164.04 ft) 100 m (328.08 ft)	B C E F K
Mounting flange None 6" ASME, 150 lb, flat faced 8" ASME, 150 lb, flat faced DN 150, PN 10/16, Type A, flat faced DN 200, PN 10, Type A, flat faced JIS10K 6B JIS10K 8B (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)	A D E J K N P
Approvals ATEX 2G 1D Ex mb IIC T4 Gb, Ex ta IIIC T135 °C Da; IECEx SIR 13.0009X Ex mb IIC T4 Gb, Ex ta IIIC T135 °C Da	5
¹⁾ Not available with flanged versions ²⁾ Available with flanged versions only	

Level Measurement

Continuous level measurement - Ultrasonic transducers

EchoMax XPS

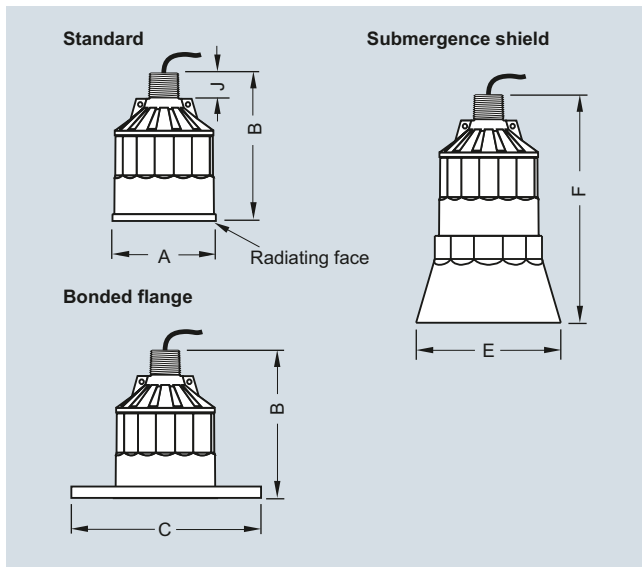
Selection and Ordering data	Order code	Selection and Ordering data	Article No.
<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p>		<p>EchoMax XPS-30C ultrasonic transducer ↗</p> <p>High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor.</p> <p>1½" universal thread compatible with 1½" NPT and R 1½" [(BSPT), EN 10226]</p> <p>Measuring range: min. 0.6 m (1.97 ft), max. 30 m (98.43 ft)</p> <p>↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	<p>7ML1155-</p> <p>1</p>
<p>Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: measuring-point number/identification (max. 27 characters) specify in plain text</p>	Y15	<p>Mounting thread and facing</p> <p>1½" universal thread</p> <p>1½" universal thread, foam facing¹⁾</p> <p>1½" universal thread, PTFE facing²⁾</p>	<p>0</p> <p>1</p> <p>2</p>
<p>Operating Instructions</p> <p>Quick Start guide, multi-language</p> <p>Note: The Operating Instructions should be ordered as a separate line item on the order.</p> <p>All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation</p>	<p>Article No.</p> <p>A5E32282889</p>	<p>Cable length</p> <p>5 m (16.40 ft)</p> <p>10 m (32.81 ft)</p> <p>30 m (98.43 ft)</p> <p>50 m (164.04 ft)</p> <p>100 m (328.08 ft)</p>	<p>B</p> <p>C</p> <p>E</p> <p>F</p> <p>K</p>
<p>Accessories</p> <p>Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors</p> <p>1½" BSPT locknut, plastic</p> <p>Easy Aimer 2, aluminum, NPT with 1½" galvanized coupling</p> <p>Easy Aimer 304, NPT with 1½" stainless steel coupling</p> <p>Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings</p> <p>Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings</p> <p>Adapter 1½" BSP</p>	<p>7ML1930-1BJ</p> <p>7ML1830-1DP</p> <p>7ML1830-1AN</p> <p>7ML1830-1AT</p> <p>7ML1830-1AX</p> <p>7ML1830-1GN</p> <p>7ML1830-1EB</p>	<p>Mounting flange</p> <p>None</p> <p>6" ASME, 150 lb, flat faced</p> <p>8" ASME, 150 lb, flat faced</p> <p>DN 150, PN 10/16, Type A, flat faced</p> <p>DN 200, PN 10, Type A, flat faced</p> <p>JIS10K 6B</p> <p>JIS10K 8B</p> <p>(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)</p>	<p>A</p> <p>D</p> <p>E</p> <p>J</p> <p>K</p> <p>N</p> <p>P</p>
		<p>Approvals</p> <p>CSA, Class I, Div. 2, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III</p>	<p>4</p>
Selection and Ordering data	Order code	Selection and Ordering data	Order code
<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p>		<p>Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]: Measuring-point number / identification (max. 27 characters) specify in plain text</p>	Y15
<p>Operating Instructions</p> <p>Quick Start guide, multi-language</p> <p>Note: The Operating Instructions should be ordered as a separate line item on the order.</p> <p>All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation</p>	<p>Article No.</p> <p>A5E32282889</p>	<p>Accessories</p> <p>Easy Aimer 2, aluminum, NPT with 1½" galvanized coupling</p> <p>Easy Aimer 304, NPT with 1½" stainless steel coupling</p> <p>1½" BSPT locknut, plastic</p> <p>Adapter 1½" BSP</p>	<p>7ML1830-1AN</p> <p>7ML1830-1AT</p> <p>7ML1830-1DP</p> <p>7ML1830-1EB</p>
		<p>¹⁾ Not available with flanged version</p> <p>²⁾ Available for flanged versions only</p>	

Level Measurement

Continuous level measurement - Ultrasonic transducers

EchoMax XPS

Dimensional drawings

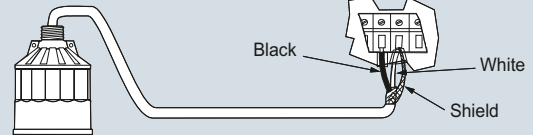


XPS ultrasonic transducer

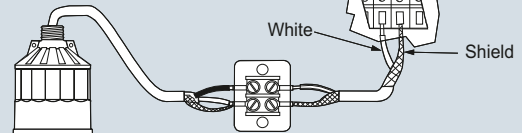
Version			
Dimension	XPS-10	XPS-15	XPS-30
A	88 mm (3.464 inch)	121 mm (4.764 inch)	175 mm (6.890 inch)
B	122 mm (4.803 inch)	132 mm (5.197 inch)	198 mm (7.795 inch)
C	According to ASME, DIN, and JIS		
E	124 mm (4.882 inch)	158 mm (6.220 inch)	n/a
F	152 mm (5.984 inch)	198 mm (7.795 inch)	n/a
J	28 mm (1.1 inch)	28 mm (1.1 inch)	28 mm (1.1 inch)

Schematics

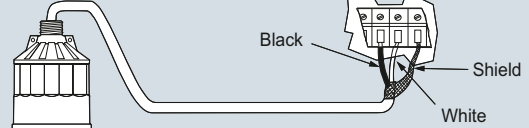
Direct connection



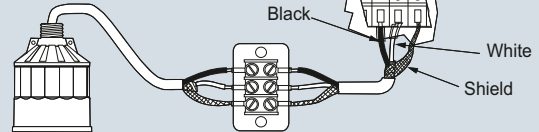
Coaxial connection



3 terminal direct*



3 terminal extension*



* For SITRANS LUT400, MultiRanger 100/200, HydroRanger 200

Mounting

Make particularly sure that the radiating face of the transducer is protected from damage. Mount the transducer so that it is above the maximum material level by at least the blanking value. On liquid applications, the transducer must be mounted so that the axis of transmission is perpendicular to the liquid surface. On solids applications, an Easy Aimer should be used to facilitate aiming the transducer. Consider the optional temperature sensor when mounting the transducer.

Interconnection

Do not route cable openly or near high voltage or current runs, contactors and SCR control drives. For optimum isolation against electrical noise, run cable separately in a grounded metal conduit. Seal all thread connections to prevent ingress of moisture.

XPS ultrasonic transducer connections

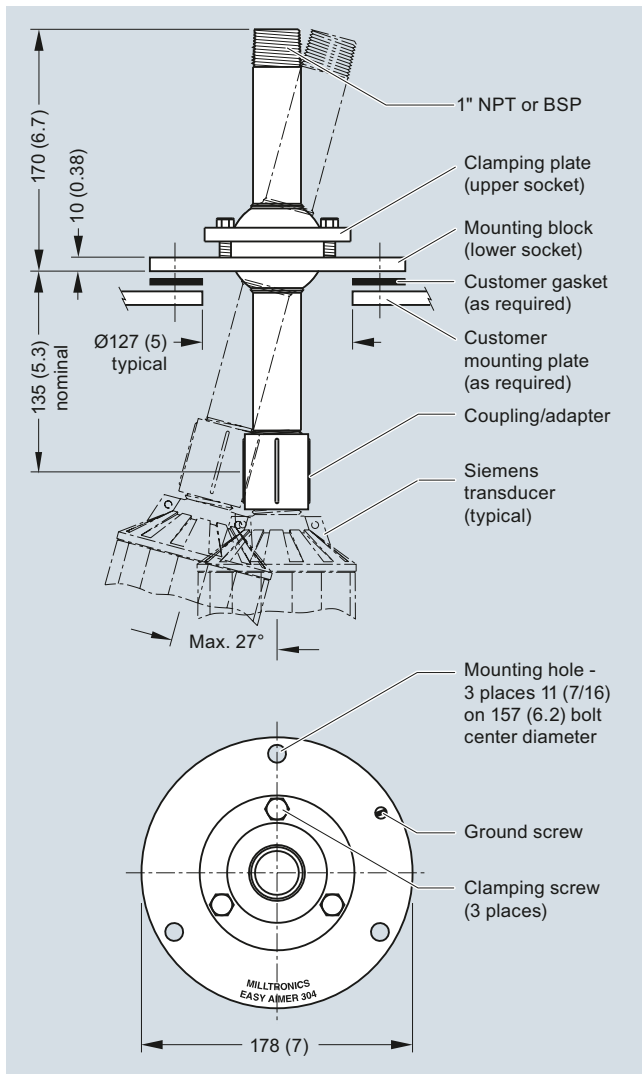
Application

EA 304 aiming device

The Easy Aimer 304 flange is a stainless steel aiming device for alignment of Siemens ultrasonic transducers used for level measurement of bulk solids.

The sensor must be mounted aimed towards the low level draw point in the silo. The sensor can be rotated through 360° and angled at 0 to 27° off vertical. It must be mounted using an access plate with welded studs or a flange in order to isolate the mounting holes from the pressurized environment. When installed properly, the EA 304 aiming device is capable of withstanding pressures up to 0.5 bar (Europe) or 15 psi (North America). It can even be used in corrosive and aggressive environments.

Dimensional drawings



EA 304 aiming device, dimensions in mm (inch)

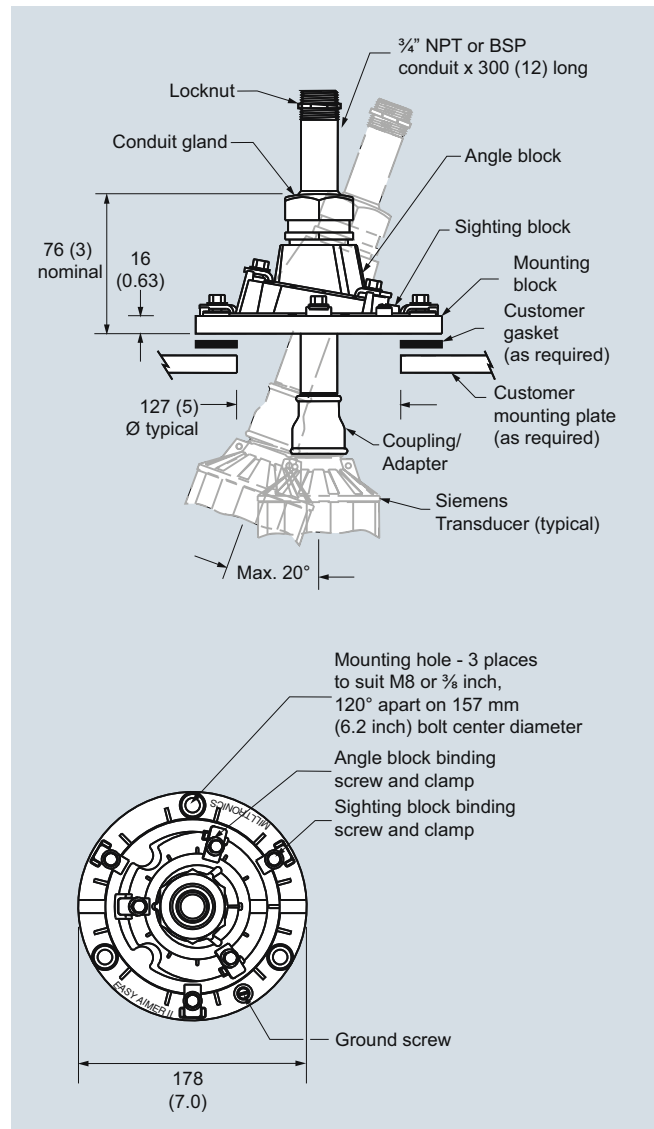
Application

EA 2 aiming device

The Easy Aimer 2 flange is a cast aluminum aiming device for alignment of Siemens ultrasonic transducers.

The flange has graduated adjustments and an adjustable insertion length. When used for applications with bulk solids, the sensor is mounted so that it is aimed towards the lower level draw point in the silo. The sensor can be rotated through 360° and angled at 0 to 20° off vertical. It must be mounted using an access plate with welded studs or a flange in order to isolate the mounting holes from the pressurized environment. When installed properly, the EA 2 aiming device is capable of withstanding pressures up to 0.5 bar (Europe) or 15 psi (North America). It can even be used in corrosive and aggressive environments.

Dimensional drawing



EA 2 aiming device, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Accessories for ultrasonic

EA aiming devices

Selection and Ordering data	Article No.
Easy aimer Used on solids applications to aim transducers for optimal performance. Available in a 304 stainless steel model, or a cast aluminum model.	
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	7ML1830-1AX
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	7ML1830-1GN
Easy Aimer 2, aluminum, BSPT conduit	7ML1830-1AL
Easy Aimer 2, aluminum, NPT with 1½" galvanized coupling ¹⁾	7ML1830-1AN
Easy Aimer 2, aluminum, NPT with 1" galvanized coupling	7ML1830-1AP
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	7ML1830-1AQ
Easy Aimer 304, BSPT conduit	7ML1830-1AS
Easy Aimer 304, NPT with 1½" stainless steel coupling ¹⁾	7ML1830-1AT
Easy Aimer 304, NPT with 1" stainless steel coupling	7ML1830-1AU
Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

¹⁾ For use with XPS-30 transducers only

Application

Siemens mounting brackets permit simple, fast installation of ultrasonic transducers. These rugged, high quality mounting brackets are constructed of 304 (1.4301) stainless steel and are suitable for use indoors and outdoors. They adjust to fit almost any application, saving you the time and expense of building custom brackets. Each kit includes all mounting parts.

**FMS-200
universal box bracket system**

Mounting of units with 1 inch or 2 inch threaded connection.

Distance from sensor to wall or beam: 20 ... 31 cm (8 ... 12 inch).

The unique box design also acts as a sun shield for transducers with 1 inch threaded connections.

**FMS-210
wall mounting set**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to wall or beam:
12 ... 48 cm (5 ... 19 inch).

**FMS-220
extended wall mounting set**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to wall or beam:
32 ... 98 cm (13 ... 39 inch).

**FMS-310
floor mounting set**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to floor: 20 ... 48 cm (8 ... 19 inch).

Distance from mounting support: 5 ... 57 cm (2 ... 22 inch).

**FMS-320
extended floor mounting set**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to floor: 20 ... 48 cm (8 ... 19 inch).

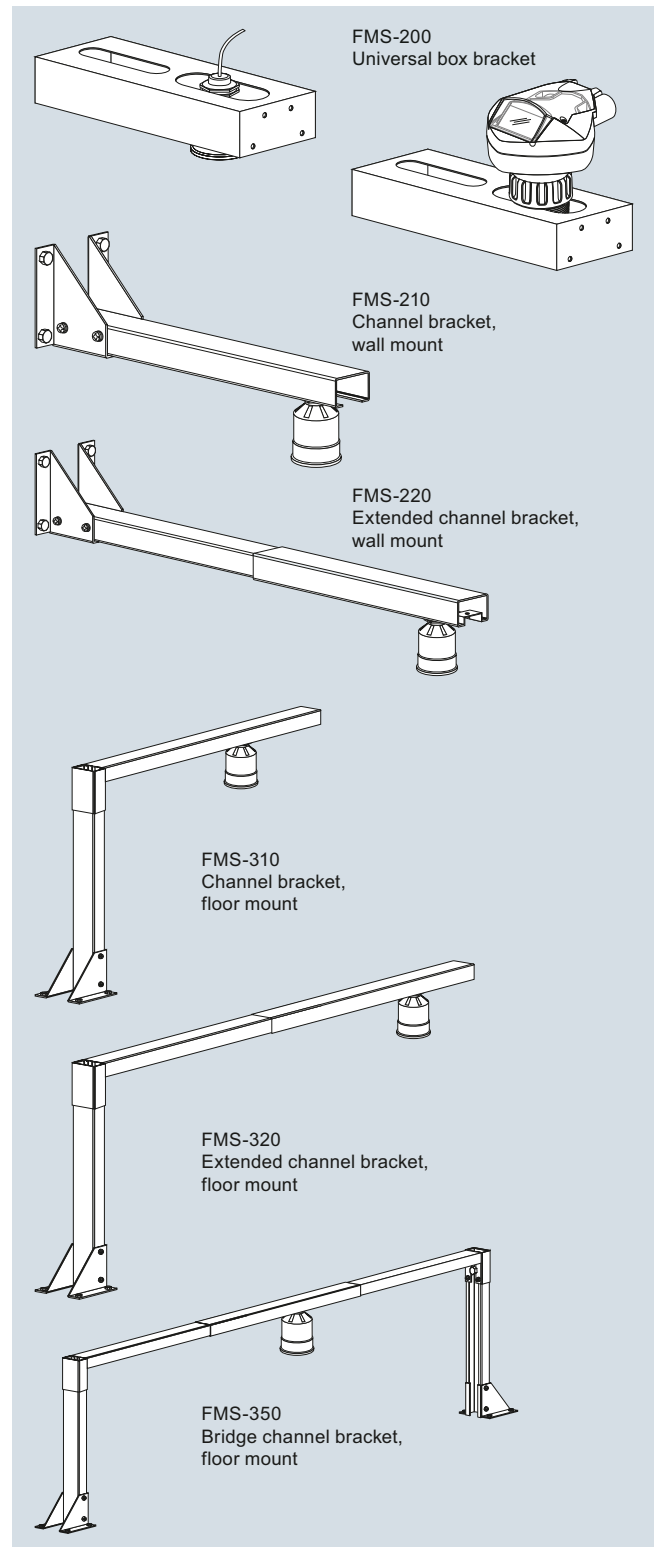
Distance from mounting support: 41 ... 108 cm (16 ... 43 inch).

**FMS-350
floor mounting set, bridge**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to floor: 20 ... 48 cm (8 ... 19 inch),
anywhere along the complete width of the bridge
[166 cm (65 inch)].

This kit is particularly suitable for measurements on open channels (OCM) by providing a very stable mount for the transducer above a flume or weir.

Integration

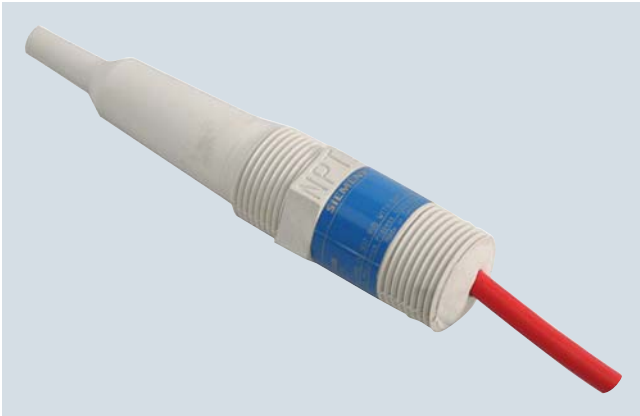
FMS mounting brackets

Level Measurement

Continuous level measurement - Accessories for ultrasonic

FMS mounting brackets

Selection and Ordering data	Article No.
Mounting brackets for XPS-10 sensors	
FMS-200 universal box bracket set	7ML1830-1BK
FMS-210 wall mounting set	7ML1830-1BL
FMS-220 extended wall mounting set	7ML1830-1BM
FMS-310 floor mounting set	7ML1830-1BN
FMS-320 extended floor mounting set	7ML1830-1BP
FMS-350 floor mounting set, bridge	7ML1830-1BQ
<i>Additional Operating Instructions</i>	
FMS-200	7ML1998-5BK61
FMS-210	7ML1998-5BL61
FMS-220	7ML1998-5BM61
FMS-310	7ML1998-5BN61
FMS-320	7ML1998-5BP61
FMS-350	7ML1998-5BQ61
<p>Note: The Operating Instructions should be ordered as a separate line item on the order.</p> <p>All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation</p>	

Overview

The TS-3 temperature sensor provides an input signal for temperature compensation of specific Siemens ultrasonic level controllers.

Benefits

- Chemically resistant ETFE enclosure
- Fast response time
- Approved for use in potentially explosive atmospheres

Application

Temperature compensation is essential in applications where temperature variations of the sound medium are expected.

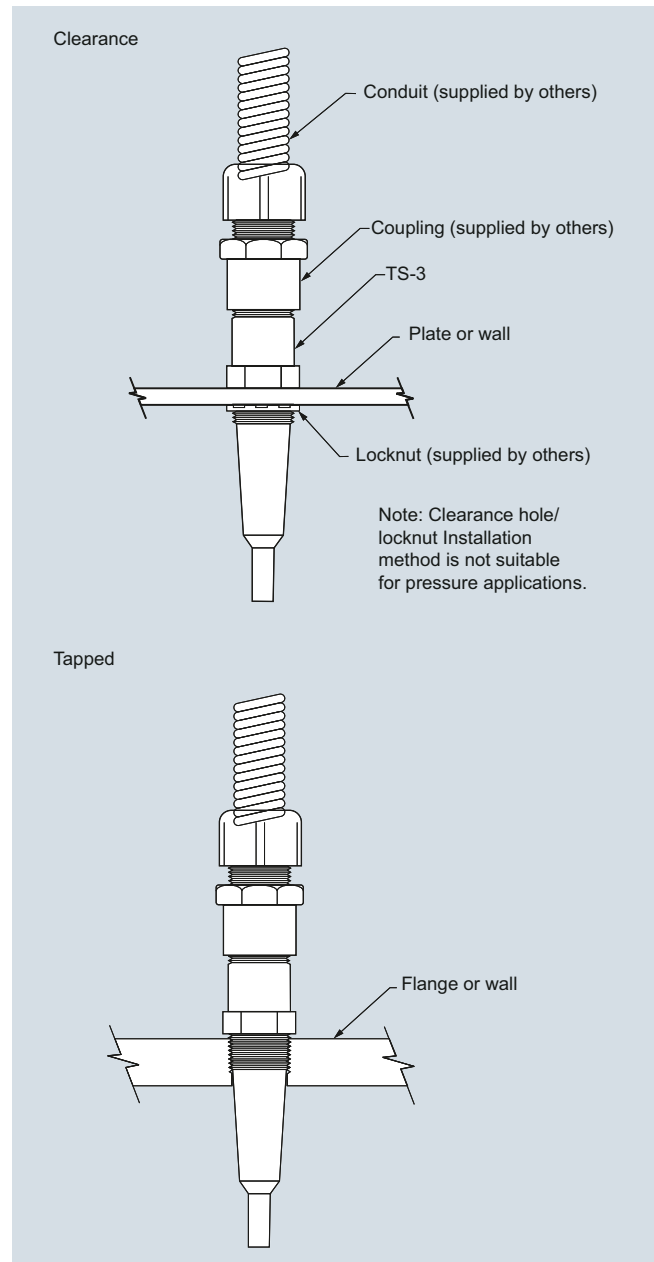
By installing the temperature sensor close to the sound path of the associated ultrasonic transducer, a signal representative of the sound medium's ambient temperature is obtained. The temperature sensor should not be mounted in direct sunlight.

The TS-3 is used in conjunction with ultrasonic transducers that do not have an integral temperature sensor. It is also recommended in cases where the integral temperature sensor of the transducer cannot be used.

The following conditions are typical for use of the TS-3 sensor: where a fast reaction to temperature variations is required, where a flanged ultrasonic transducer is used, or where high temperatures are encountered.

The TS-3 is not compatible with devices using the TS-2 or LTS-1 temperature sensors. Refer to the associated controller manual for more details.

- Key Applications: for use in applications where temperature sensor measurement from transducer does not accurately represent vessel temperature. Used for applications requiring quick temperature response (open channel monitoring).

Design

TS-3 temperature sensor

Level Measurement

Continuous level measurement - Accessories for ultrasonic

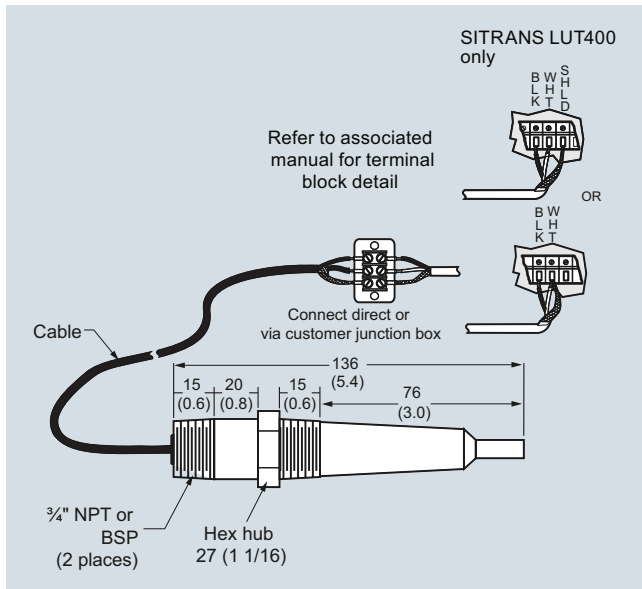
TS-3 temperature sensor

Technical specifications

Mode of operation	
Measuring principle	Temperature sensor
Input	
Measuring range	-40 ... +100 °C (-40 ... +212 °F)
Output	
Response time	
• Forced circulation (temperature variation: 63 %)	55 s
• Flange, forced circulation	90 s
• Natural convection	150 s
Rated operating conditions	
Installation instructions	Mounted indoors/outdoors, but not exposed to direct sunlight
Pressure	Max. 4 bar (60 psi/400 kPa)
Design	
Material (enclosure)	ETFE ¹⁾
Cable connection	2-core, 0.5 mm ² (20 AWG), shielded, silicone sheath
Process connection	¾" NPT [(Taper), ANSI/ASME B1.20.1] R ¾" [(BSPT), EN 10226], totally encapsulated
Certificates and approvals	
	CE, IEC-Ex, FM, CSA, ATEX

¹⁾ETFE is a fluoropolymer inert to most chemicals. For exposure to specific environments, check the chemical compatibility charts before installing the TS-3 in your application.

Dimensional drawings



TS-3 temperature sensor, dimensions in mm (inch)

Selection and Ordering data

TS-3 temperature sensor

TS-3 provides an input signal for temperature compensation of specific Siemens ultrasonic level controllers.

Compensation is essential in applications where variation in temperature of the sound medium is expected.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Cable length

- 1 m (3.28 ft)
- 5 m (16.40 ft)
- 10 m (32.81 ft)
- 30 m (98.43 ft)
- 50 m (164.04 ft)
- 70 m (229.66 ft)
- 90 m (295.28 ft)

Process connection

- ¾" NPT [(Taper), ANSI/ASME B1.20.1]
- R ¾" [(BSPT), EN 10226]

Approvals

- CSA, FM
- CE, ATEX, IEC Ex

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

- ¾" NPT locknut, aluminum
- Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch) for fastening on sensors

Article No.

7ML1813-

B

1
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A
B

3
4

7ML1930-1BE

7ML1930-1BJ

Overview

Radar measurement technology is non-contacting and low maintenance. Because microwaves require no carrier medium, they are virtually unaffected by the process atmosphere (vapor, pressure, dust, or temperature extremes). Siemens offers a variety of models to meet the specific needs of your application.

SITRANS Probe LR is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).

SITRANS LR200 is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature, pressure, agitation, and turbulence, to a range of 20 m (66 ft).

SITRANS LR250 is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, corrosive or aggressive materials, to a range of 20 m (66 ft). Ideal for small vessels and low dielectric media.

SITRANS LR260 is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of solids and liquids in vessels, to a range of 30 m (98.4 ft). It is ideal for level measurement with quick response or intrinsically safe requirements.

SITRANS LR460 is a 4-wire, 24 GHz FMCW radar level transmitter with extremely high signal to noise ratio and advanced signal processing for continuous monitoring of solids, up to 100 m (328 ft). It is ideal for measurement in extreme dust and high temperature applications.

SITRANS LR560 2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids and liquids, to a range of 100 m (329 ft). It is easy to install, plug and play, and there is virtually no maintenance.

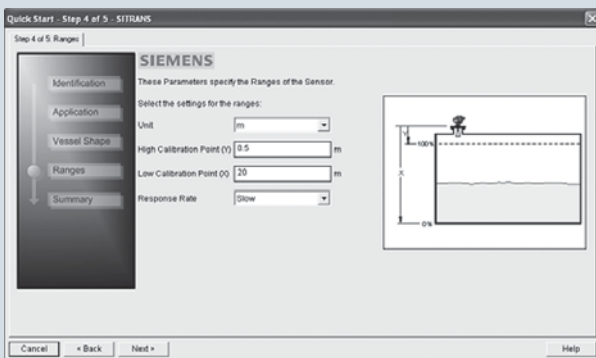
Auto False-Echo Suppression

SITRANS LR instruments offer the unique advantage of Process Intelligence signal processing technology. This in-depth knowledge and experience is built into the software's advanced algorithms to provide intelligent processing of echo profiles. The result is repeatable, fast and reliable measurement.

A special feature of SITRANS radar devices is Auto False-Echo Suppression, an echo processing technique that automatically detects and suppresses false echoes from vessel obstructions. You can implement this feature using two parameters on the local interface or SIMATIC PDM communicating over HART or PROFIBUS PA.



Local display interface – graphically displays echo profiles and diagnostic information (available with LR200, LR250, LR260 and LR560)
Quick to configure – Quick Start Wizard via SIMATIC PDM guides you during setup (available with LR200, LR250, LR260, LR460, LR560)



Mode of operation

Principle of Operation

Radar measurement technology measures the time of flight from the transmitted signal to the return signal. From this time, distance measurement and level are determined.

Unlike ultrasonic measurement, radar technology does not require a carrier medium and travels at the speed of light (300 000 000 m/s). Most industrial radar devices operate from 6 to 78 GHz.

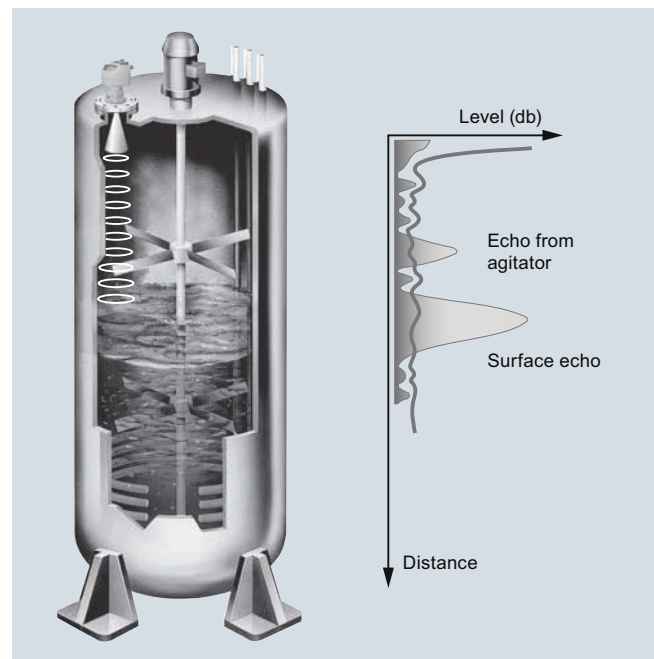
Siemens offers pulse radar transmitters (SITRANS Probe LR, SITRANS LR200, SITRANS LR250, SITRANS LR260) and FMCW (Frequency Modulated Continuous Wave) radar transmitters (SITRANS LR460, SITRANS LR560).

Pulse radar emits a microwave pulse from the antenna at a fixed repetition rate that reflects off the interface between the two materials with different dielectric constants (the atmosphere and the material being monitored).

The echo is detected by a receiver and the transmit time is used to calculate level.

Reflected echoes are digitally converted to an echo profile. The profile is analyzed to determine the distance from the material surface to the reference point on the instrument.

FMCW (Frequency Modulated Continuous Wave) radar devices send microwaves to the surface of the material. The wave frequency is modulated continuously. At the same time, the receiver is also receiving continuously and the difference in frequency between the transmitter and the receiver is directly proportional to the distance to the material.



Radar operation in a reactor vessel

Level Measurement

Continuous level measurement - Radar transmitters

Radar transmitters

Technical specifications

Radar Selection Guide

Criteria	SITRANS Probe LR	SITRANS LR200	SITRANS LR250	SITRANS LR260	SITRANS LR460	SITRANS LR560
Typical industries	Chemicals, petrochemicals, water/waste-water, drilling mud	Chemicals, petrochemicals, aluminum, wastewater	Chemicals, petrochemicals, oil and gas, mining, marine, food and beverage, pharmaceutical	Cement, power generation, chemical, petrochemical, food processing, mineral processing, mining	Cement, power generation, food processing, mineral processing, mining	Cement, chemical, power generation, grain, food processing, mineral processing, mining
Typical applications	Liquids, storage vessels, wet wells, drilling mud tanks	Liquids, process vessels with agitators, buildup, high temperatures	Liquids, storage and process vessels with agitators, vaporous liquids, high temperatures, low dielectric media, crude oil produced water	Cement, plastics, grain, flour, coal, fast moving solids, liquids, low dielectric liquids	Cement, fly ash, grain, coal, flour, plastics	Cement, fly ash, chemical fertilizer, grain, coal, flour, plastics
Range	0.3 ... 20 m (1 ... 65 ft)	0.4 ... 20 m (1.3 ... 65 ft)	50 mm (2 inch) from end of horn to 20 m (65 ft), horn dependent	30 m (98.4 ft)	100 m (328 ft)	40 m (131 ft) 100 m (328 ft)
Frequency	5.8 GHz (North America 6.3 GHz)	5.8 GHz (North America 6.3 GHz)	K-band (25.0 GHz)	K-band (25.0 GHz)	24 ... 25 GHz FMCW	78 ... 79 GHz
Performance accuracy	0.1 % of range or 10 mm (0.4 inch)	0.1 % of range or 10 mm (0.4 inch)	≤ 3 mm (0.118 inch)	<ul style="list-style-type: none"> • 25 mm (1 inch) from minimum detectable distance to 300 mm (11.8 inch) • Remainder of range = 6 mm (0.23 inch) or 0.05 % of spa (whichever is greater) 	0.25 %	5 mm (0.2 inch)
Temperature	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +80 °C (-40 ... +176 °F)	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +200 °C (-40 ... +392 °F), dependent on antenna type	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +200 °C (-40 ... +392 °F), dependent on antenna type	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +200 °C (-40 ... +392 °F), dependent on antenna type	Ambient: 65 °C (149 °F) Process: 200 °C (392 °F)	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +100 °C (-40 ... 212 °F) Optional: 200 °C (392 °F)
Output/communications/remote configuration and diagnostics	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • SIMATIC PDM 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • PROFIBUS PA • SIMATIC PDM • AMS • SITRANS DTM/FDT for PACTware, Fieldcare, etc. 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • AMS • SITRANS DTM/FDT for PACTware, Fieldcare, etc. 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • PROFIBUS PA • SIMATIC PDM 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • PROFIBUS PA • SIMATIC PDM 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • AMS • SITRANS DTM/FDT for PACTware, Fieldcare, etc.
Power	<ul style="list-style-type: none"> • 24 V DC nominal • Loop powered 	<ul style="list-style-type: none"> • 24 V DC nominal • Loop powered 	<ul style="list-style-type: none"> • 24 V DC nominal • Loop powered 	<ul style="list-style-type: none"> • 24 V DC nominal • Loop powered 	<ul style="list-style-type: none"> • 100 ... 230 V AC, ± 15 %, 50/60 Hz, 6 W • 24 V DC, +25/-20 %, 6 W 	<ul style="list-style-type: none"> • 24 V DC nominal • Loop powered
Approvals	CE, RCM, Lloyds Register of Shipping, ABS, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, EAC, IECEX, ANZEx, TIIS	CE, RCM, Lloyds Register of Shipping, ABS, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, EAC, IECEX, ANZEx, TIIS, NEPSI	CE, RCM, Lloyds Register of Shipping, ABS, BV, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, EAC, IECEX, TIIS, NEPSI Functional safety SIL-2, EHEDG, 3-A, USP Class VI	CE, RCM, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, EAC, IECEX	CE, RCM, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, IECEX, EAC	CE, RCM, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, IECEX, NEPSI, EAC

Overview



SITRANS Probe LR is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).

Benefits

- Uni-Construction polypropylene rod antenna standard
- Easy installation and simple startup
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART handheld communicator
- Communication using HART
- Process Intelligence signal processing
- Auto False-Echo Suppression of false echoes

Application

The Probe LR is ideal for applications with chemical vapors, temperature gradients, vacuum or pressure, such as simple chemical storage or water treatment vessels. SITRANS Probe LR has a range of 0.3 to 20 m (1 to 65 ft).

Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna includes an internal, integrated shield that eliminates vessel nozzle interference.

SITRANS Probe LR incorporates Process Intelligence signal processing. The Probe LR also has a high signal-to-noise ratio leading to improved reliability.

Startup is easy with as few as two parameters for basic operation. Programming is simple using SIMATIC PDM, HART handheld communicator or the Intrinsically Safe handheld programmer.

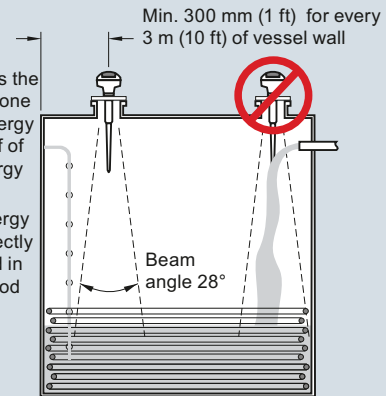
- Key Applications: chemical storage, wastewater wet well, and drilling mud

Configuration

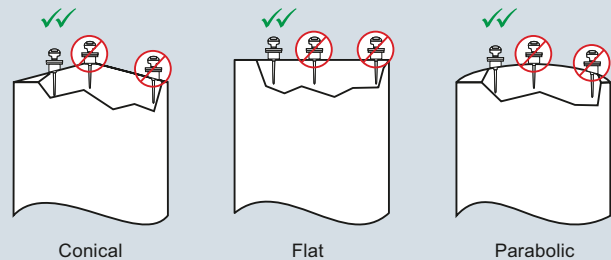
Installation

Note:

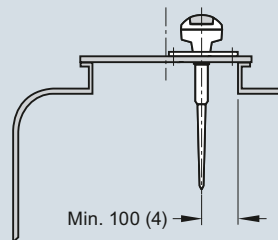
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the rod antenna.



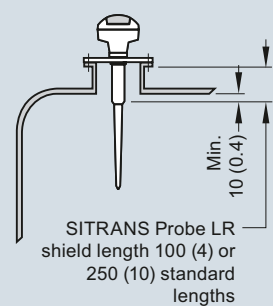
Mounting unit on vessel



Mounting on a manhole cover



Mounting on a nozzle



SITRANS Probe LR installation, dimensions in mm (inch)

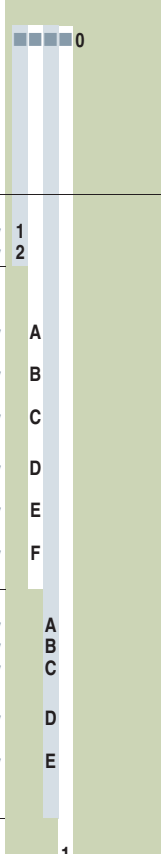
Level Measurement

Continuous level measurement - Radar transmitters

SITRANS Probe LR

Technical specifications

Mode of operation		Power supply	
Measuring principle	Pulse radar level measurement		<ul style="list-style-type: none"> Nominal 24 V DC with max. 550 Ω, maximum 30 V DC 4 ... 20 mA
Frequency	5.8 GHz (North America 6.3 GHz)	Certificates and approvals	
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)	General	CSA _{US/CA} , CE, FM, RCM
Output		Marine	<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval
Analog output	4 ... 20 mA	Radio	FCC, Industry Canada, and European (R&TTE), RCM
Accuracy	± 0.02 mA	Hazardous	
Span	Proportional or inversely proportional	<ul style="list-style-type: none"> Intrinsically Safe (Brazil) Intrinsically Safe (Canada) Intrinsically Safe (Europe) Intrinsically Safe (International) Intrinsically Safe (Russia/Kazakhstan) Intrinsically Safe (USA) 	INMETRO Ex ia IIC T4 Ga CSA Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Group G; Class III ATEX II 1G EEx ia IIC T4 IECEx Ex ia IIC T4 EAC Ex ia
Communications	HART		FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
Performance (reference conditions)		Programming	
Accuracy	± the greater of 0.1 % of range or 10 mm (0.4 inch)	Handheld programmer	HART communicator 375
<ul style="list-style-type: none"> From end of antenna to 600 mm (23.62 inch) Remainder of range 	40 mm (1.57 inch)	PC	SIMATIC PDM
Influence of ambient temperature	10 mm (0.4 inch) or 0.1 % of span	Intrinsically safe Siemens handheld programmer (optional)	Infrared receiver
Repeatability	0.003 %/K	<ul style="list-style-type: none"> Approvals (handheld programmer) 	ATEX II 1G EEx ia IIC T4 CSA and FM Class I, Div. 1, Groups A, B, C, D, T6 at max. ambient
Fail-safe	± 5 mm (2 inch)		Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages
	mA signal programmable as high, low or hold (LOE)	Display (local)	
Rated operating conditions			
Installation conditions			
<ul style="list-style-type: none"> Location 	Indoor/outdoor		
Ambient conditions (enclosure)			
<ul style="list-style-type: none"> Ambient temperature Installation category Pollution degree 	-40 ... +80 °C (-40 ... +176 °F) I 4		
Medium conditions			
Dielectric constant ϵ_r	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$, use stillpipe)		
Vessel temperature	-40 ... +80 °C (-40 ... +176 °F)		
Vessel pressure	3 bar g (43.5 psi g)		
Design			
Enclosure			
<ul style="list-style-type: none"> Body construction Lid construction Cable inlet 	PBT (Polybutylene Terephthalate) PEI (Polyether Imide) 2 x M20 x 1.5 or 2 x 1/2" NPT with adapter		
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68		
Weight	1.97 kg (4.35 lb)		
Antenna			
<ul style="list-style-type: none"> Material Dimensions 	Polypropylene rod, hermetically sealed construction Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle or optional 250 mm (10 inch) long shield		
Process connections	1 1/2" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2" [(BSPT), EN 10226] G 1 1/2" [(BSPP), EN ISO 228-1]		

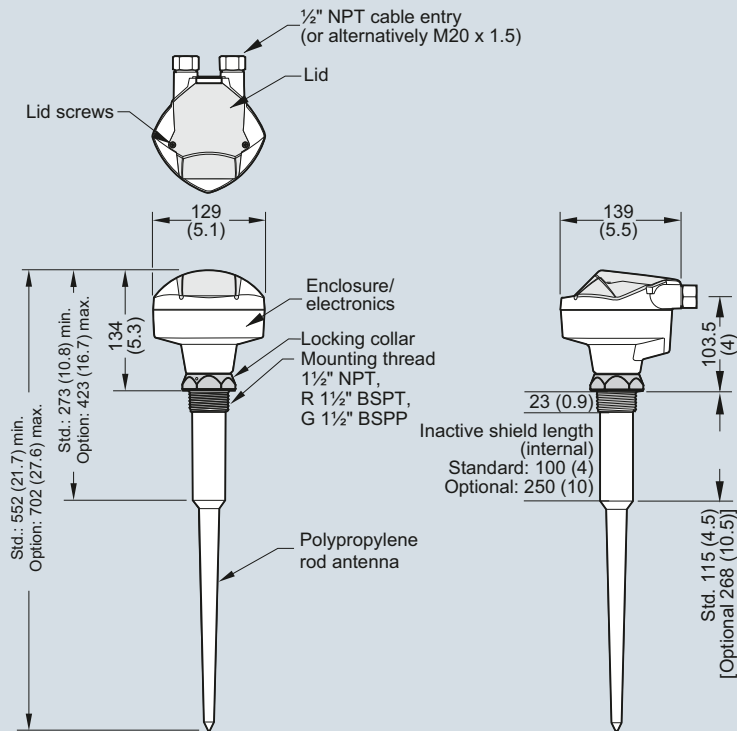
Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS Probe LR 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft). Max. 3 bar g (43.5 psi g) pressure and 80 °C (176 °F) ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5430- 	Further designs Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: ● Y15 Measuring-point number/identification (max. 27 characters) specify in plain text Manufacturer's test certificate: ● C11 M to DIN 55350, Part 18 and to ISO 9000 Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation Accessories Handheld programmer, Intrinsically Safe, ATEX II 1G, Ex ia HART modem/USB (for use with a PC and SIMATIC PDM) One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 For applicable back up point level switch - see point level measurement section Spare parts Plastic lid For applicable back up point level switch - see point level measurement section ● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 10/11 in the appendix.	
Enclosure/Cable inlet Plastic, (PBT), 2 x 1/2" NPT ● 1 Plastic, (PBT), 2 x M20 x 1.5 ● 2			
Antenna type/Material - (max. 3 bar and 80 °C) Polypropylene Antenna 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 100 mm shield R 1 1/2" [(BSPT), EN 10226], comes with integral 100 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 100 mm shield 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 250 mm shield R 1 1/2" [(BSPT), EN 10226], comes with integral 250 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 250 mm shield	● A ● B ● C ● D ● E ● F		
Approvals General Purpose, CE, R&TTE, RCM ● A General Purpose, CSA _{US/C} , FM, FCC ● B CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Group G, Class III, FCC, Intrinsically Safe ● C FM, Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Intrinsically Safe ● D IECEx Ex ia IIC T4; ATEX II 1G EEx ia IIC T4, R&TTE, RCM, Intrinsically Safe; INMETRO Ex ia IIC T4 Ga; EAC ● E			
Communication/Output 4 ... 20 mA, HART ● 1 ● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 10/11 in the appendix.			

Level Measurement

Continuous level measurement - Radar transmitters

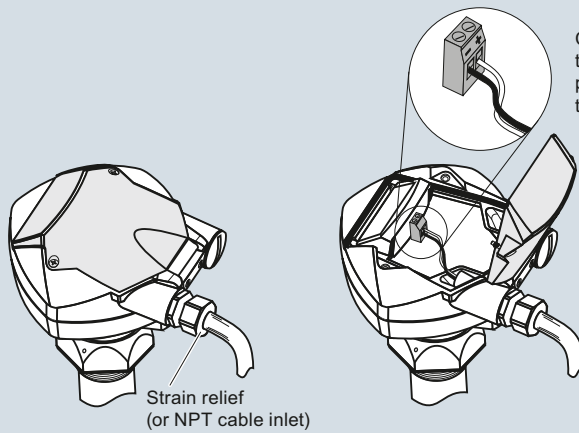
SITRANS Probe LR

Dimensional drawings

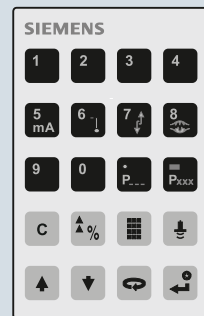


SITRANS Probe LR, dimensions in mm (inch)

Schematics



Hand Programmer



SITRANS Probe LR
Part number: 7ML5830-2AH

Notes:

- DC terminal shall be supplied from an SELV source in accordance with IEC-1010-1 Annex H.
- All field wiring must have insulation suitable for rated input voltages.
- Use shielded twisted pair cable (14-22 AWG).
- Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS Probe LR connections

Overview



SITRANS LR200 is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature, pressure, agitation, and turbulence to a range of 20 m (65 ft).

Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- Communication using HART or PROFIBUS PA
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or SIMATIC PDM

Application

SITRANS LR200's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It also features a built-in alphanumeric display in four languages.

The SITRANS LR200 has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna features an internal, integrated shield that eliminates vessel nozzle interference.

Startup is easy with as few as two parameters for basic operation. Installation is simplified as the electronics are mounted on a rotating head that swivels, allowing the instrument to line up with conduit or wiring connections or simply to adjust the position for easy viewing. SITRANS LR200 features Process Intelligence signal-processing technology for superior reliability.

- Key Applications: liquid process vessels with agitators, vaporous liquids, high temperatures, asphalt, digesters

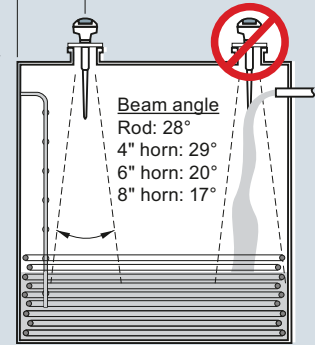
Configuration

Installation

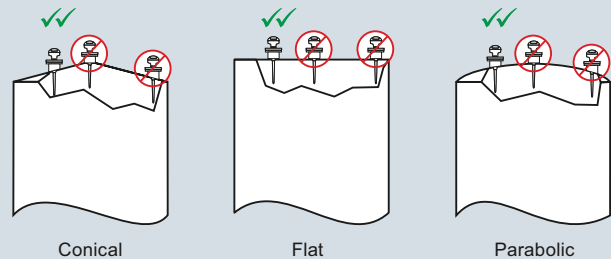
Min. 300 mm (1 ft) for every 3 m (10 ft) of vessel wall.

Note:

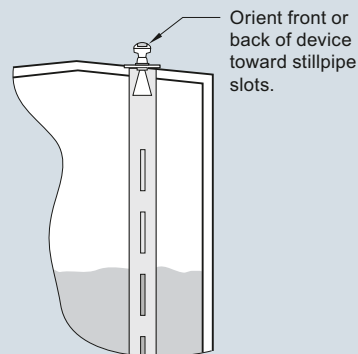
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- Beam angle for horn antenna dependent on horn size
- The peak energy density is directly in front of and in line with the rod antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



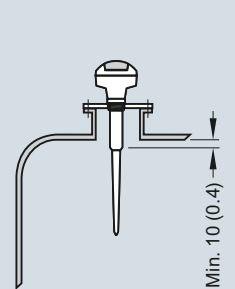
Mounting unit on vessel



Mounting unit on stilling well



Mounting on a nozzle



SITRANS LR200 installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200

Technical specifications

Mode of operation		Power supply	
Measuring principle	Radar level measurement	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
Frequency	5.8 GHz (North America 6.3 GHz)	<ul style="list-style-type: none"> General Purpose, Non-incendive, Intrinsically Safe Flame proof, Increased safety, Explosion proof 	Nominal 24 V DC (max. 30 V DC) with max. 250 Ω
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)	PROFIBUS PA	<ul style="list-style-type: none"> 10.5 mA Per IEC 61158-2
Output		Certificates and approvals	
Analog output	4 ... 20 mA	General	CSA _{US/C} , CE, FM, RCM
Accuracy	± 0.02 mA	Marine	<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval
Span	Proportional or inversely proportional	Radio	FCC, Industry Canada, and European (R&TTE), RCM
Communications	HART Optional: PROFIBUS PA (Profile 3.0, Class B)	Hazardous	<ul style="list-style-type: none"> INMETRO Ex ia IIC T4 Ga CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, T4 CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, T4 FM, Class I, Div. 2, Groups A, B, C, D, T5 NEPSI Ex d mb ia IIC T4/ Ex e mb ia IIC T4 ATEX II 1/2 G Ex d mb ia IIC T4 Ga/Gb ATEX II 1/2 G Ex e mb ia IIC T4 Ga/Gb ATEX II 1G Ex ia IIC T4 IECEX Ex ia IIC T4 EAC Ex ia
Fail-safe	Programmable as high, low or hold (Loss of Echo)	<ul style="list-style-type: none"> Intrinsically Safe (Brazil) Explosion Proof (Canada/USA) Intrinsically Safe (Canada/USA) Non-incendive (USA) Flame Proof/Increased Safety (China) Flame Proof (Europe) Increased Safety (Europe) Intrinsically Safe (Europe) Intrinsically Safe (International) Intrinsically Safe (Russia/Kazakhstan) 	
Performance (according to reference conditions IEC60770-1)		Programming	
From end of antenna to 600 mm	40 mm (1.57 inch)	Intrinsically Safe Siemens handheld programmer	Infrared receiver
Remainder of range	10 mm (0.4 inch) or 0.1 % of span (whichever is greater)	<ul style="list-style-type: none"> Approvals for handheld programmer 	IS model: ATEX II 1GD Ex ia IIC T4 Ga Ex iaD 20 T135 °C T _a = -20 ... +50 °C CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = +50 °C
Rated operating conditions		Handheld communicator	HART communicator 375
Installation conditions		PC	<ul style="list-style-type: none"> SIMATIC PDM AMS SITRANS DTM (for connecting to FDT such as PACTware or Field-care)
<ul style="list-style-type: none"> Location 	Indoor/outdoor	Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages
Ambient conditions (enclosure)			
<ul style="list-style-type: none"> Ambient temperature Installation category Pollution degree 	-40 ... +80 °C (-40 ... +176 °F) I 4		
Medium conditions			
Dielectric constant ϵ_r	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$, use stillpipe)		
Vessel temperature and pressure	Varies with connection type; see Pressure/Temperature curves for more information		
Design			
Enclosure			
<ul style="list-style-type: none"> Material Cable inlet 	Aluminum, polyester powder coated 2 x M20 x 1.5 or 2 x 1/2" NPT		
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68		
Weight	< 2.82 kg (6.21 lb) (polypropylene rod antenna)		
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages		
Antenna			
<ul style="list-style-type: none"> Material Dimensions Optional rods and horn 	Polypropylene rod, hermetically sealed construction, optional PTFE Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle, or optional 250 mm (10 inch) long shield Refer to SITRANS LR200 Antennas for optional rods and horns		
Process connections			
<ul style="list-style-type: none"> Process connection Flange connection 	1 1/2" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2" [(BSPT), EN 10226], or G 1 1/2" [(BSPP), EN ISO 228-1] (polypropylene rod antenna) Refer to SITRANS LR200 Antennas for more connections		

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR200

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
<p>SITRANS LR200, Uni-Construction polypropylene rod antenna version</p> <p>2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft). Max. 3 bar g (43.5 psi g) pressure and 80 °C (176 °F)</p> <p>➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	<p>➤ 7ML5422-0</p>	<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p> <p>Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters); specify in plain text Y15</p> <p>Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 C11</p> <p>Namur NE43 compliant, device preset to failsafe < 3.6 mA¹⁾ N07</p>	
<p>Enclosure/Cable inlet</p> <p>Aluminum, epoxy painted 2 x 1/2" NPT 2 x M20 x 1.5</p>	<p>2 3</p>	<p>Operating Instructions for PROFIBUS PA device</p> <p>English A5E32337680</p> <p>German A5E34942820</p>	
<p>Polypropylene antenna type - (Max. 3 Bar pressure and 80 °C)</p> <p>1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield R 1 1/2" [(BSPT), EN 10226], c/w integral 100 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield</p> <p>1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield R 1 1/2" [(BSPT), EN 10226], c/w integral 250 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield</p>	<p>A B C D E F</p>	<p>Note: The Operating Instructions should be ordered as a separate item on the order.</p> <p>All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation</p>	
<p>Approvals</p> <p>General Purpose, CE, R&TTE, RCM General Purpose, CSA, FM, Industry Canada, FCC Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada</p> <p>Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, RCM; EAC Non incandive, FM Class I, Div. 2, Groups A, B, C, D, FCC¹⁾</p> <p>Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; EAC²⁾³⁾ Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; EAC³⁾ Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC¹⁾³⁾</p>	<p>A B C D E F G H J</p>	<p>Accessories</p> <p>Handheld programmer, Intrinsically safe, EEx ia 7ML1930-1BK</p> <p>HART modem/USB (for use with a PC and SIMATIC PDM) 7MF4997-1DB</p> <p>One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART²⁾ 7ML1930-1AP</p> <p>One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA²⁾ 7ML1930-1AQ</p> <p>One general purpose polymeric cable gland M20 x 1.5, rated -20 ... +80 °C (-40 ... +176 °F) 7ML1930-1AM</p> <p>SITRANS RD100, loop powered display - see Chapter 7 7ML5741-...</p> <p>SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 7ML5740-...</p> <p>SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 7ML5744-...</p> <p>SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 7ML5750-...</p>	<p>Article No.</p>
<p>Communication/Output</p> <p>PROFIBUS PA 2</p> <p>4 ... 20 mA, HART, start-up at < 3.6 mA 3</p> <p>1) Available with enclosure option 2 only 2) Available with enclosure option 3 only 3) Available with communication option 3 only</p>	<p>2 3</p>	<p>For applicable back up point level switch - see point level measurement section</p> <p>1) Available with communication option 3 only 2) Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.</p>	

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200

Selection and Ordering data	Article No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft). ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5423-
Antenna material (uses antenna adapter) PTFE, uses antenna adapter and additional process connection below	1
Process connection (refer to Pressure/Temperature curves, page 4/199) Flanges (316L stainless steel) DN 50 PN 16, Type A, flat faced DN 80 PN 16, Type A, flat faced DN 100 PN 16, Type A, flat faced DN 150 PN 16, Type A, flat faced 2" ASME 150 lb, flat faced 3" ASME 150 lb, flat faced 4" ASME 150 lb, flat faced 6" ASME 150 lb, flat faced DN 50 PN 40, flat faced DN 80 PN 40, flat faced DN 100 PN 40, flat faced DN 150 PN 40, flat faced 2" ASME 300 lb, flat faced, available with Pressure rating option 1 only due to flange hole spacing 3" ASME 300 lb, flat faced 4" ASME 300 lb, flat faced 6" ASME 300 lb, flat faced JIS DN 50 10K JIS DN 80 10K JIS DN 100 10K JIS DN 150 10K (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.) Threaded connection (316L stainless steel) 1½" NPT [(Taper), ANSI/ASME B1.20.1] 2" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226] R 2" [(BSPT), EN 10226] G 1½" [(BSPP), EN ISO 228-1] G 2" [(BSPP), EN ISO 228-1]	AA BA CA DA FB GB HB JB AC BC CC DC FD GD HD JD AE BE CE DE LA MA LC MC LE ME
Antenna extensions or Inactive shield length No antenna extension 50 mm (2 inch) extension, PTFE 100 mm (4 inch) extension, PTFE 100 mm (4 inch) extension, 316L stainless steel shield ¹⁾ 150 mm (6 inch) extension, 316L stainless steel shield ¹⁾ 200 mm (8 inch) extension, 316L stainless steel shield ¹⁾ 250 mm (10 inch) extension, 316L stainless steel shield ¹⁾	0 1 2 3 4 5 6
Process seal/gasket Integral Gasket, for flat faced flange process connections only, not for Antenna extension options 3 ... 6 FKM O-ring, not available for combination of flat faced flanges with Antenna extension options 0, 1 or 2	0 1

Selection and Ordering data	Article No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft).	7ML5423-
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x ½" NPT 2 x M20 x 1.5	2 3
Communication/Output PROFIBUS PA 4 ... 20 mA, HART, start-up at < 3.6 mA	B C
Approvals General Purpose, CE, R&TTE, RCM General Purpose, CSA FM, Industry Canada, FCC Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, RCM; EAC Non incensive, FM Class I, Div. 2, Groups A, B, C, D, FCC ²⁾ Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; EAC ³⁾⁴⁾ Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; EAC ⁴⁾ Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC ²⁾⁴⁾	A B C D E F G H J
Pressure rating Rating per Pressure/Temperature curves in manual 0.5 bar g (7.25 psi g) maximum	0 1
¹⁾ Available with process connection options BA, CA, DA, GB, HB, JB, BC, CC, DC, GD, HD, JD, BE, CE, DE, MA, MC, ME only ²⁾ Available with enclosure option 2 only ³⁾ Available with enclosure option 3 only ⁴⁾ Available with communication option C only	

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters); specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Material inspection Certificate Type 3.1 per EN 10204	C12
Namur NE43 compliant, device preset to failsafe < 3.6 mA ³)	N07
Operating Instructions for PROFIBUS PA device	
English	A5E32337680
German	A5E34942820
Note: The Operating Instructions should be ordered as a separate item on the order.	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Handheld programmer, Intrinsically safe, EEx ia	7ML1930-1BK
Antenna, rod, PTFE	7ML1830-1HC
Antenna extension, 50 mm (2 inch), PTFE	7ML1830-1CH
Antenna extension, 100 mm (4 inch), PTFE	7ML1830-1CG
HART modem / USB (for use with PC and SIMATIC PDM)	7MF4997-1DB
Metallic cable gland M20 x 1.5, rated -40 °C (-40 °F) ... 80 °C (176 °F), HART (two are required)	7ML1930-1AP
Metallic cable gland M20 x 1.5, rated -40 °C (-40 °F) ... 80 °C (176 °F), PROFIBUS PA (two required)	7ML1930-1AQ
One General Purpose polymeric cable gland M20 x 1.5, rating for -20 °C (-4°F) ...+ 80 °C (176 °F)	7ML1930-1AM
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200


Selection and Ordering data	Article No.
SITRANS LR200, Flange adapter/Horn Antenna version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft). ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5425-
Antenna material (uses antenna adapter) 316L stainless steel with PTFE cone emitter 316L stainless steel with PTFE cone emitter and purge connection with 1/8" NPT inlet ¹⁾ Sliding waveguide system with 1 000 mm (40 inch) waveguide ¹⁾²⁾	0 1 2
Process connection (refer to Pressure/Temperature curves, page 4/199) Flanges (316L stainless steel) DN 50 PN 16 EN 1092-1 Type A flat faced ¹⁾ DN 80 PN 16 EN 1092-1 Type A flat faced DN 100 PN 16 EN 1092-1 Type A flat faced DN 150 PN 16 EN 1092-1 Type A flat faced DN 200 PN 16 EN 1092-1 Type A flat faced DN 80 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾ DN 100 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾ DN 150 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾ DN 200 PN 16 DIN EN 1092-1 Type B1 raised face ³⁾ 2" ASME 150 lb, flat faced ¹⁾ 3" ASME 150 lb, flat faced 4" ASME 150 lb, flat faced 6" ASME 150 lb, flat faced 8" ASME 150 lb, flat faced DN 50 PN 40, flat faced ³⁾ DN 80 PN 40, flat faced ³⁾ DN 100 PN 40, flat faced ³⁾ DN 80 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾ DN 100 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾ DN 150 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾ 2" ASME 300 lb, flat faced ¹⁾³⁾ 3" ASME 300 lb, flat faced ³⁾ 4" ASME 300 lb, flat faced ³⁾ JIS DN 50 10K ¹⁾ JIS DN 80 10K JIS DN 100 10K JIS DN 150 10K JIS DN 200 10K (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.)	AA BA CA DA EA BF CF DF EF FB GB HB JB KB AC BC CC CG DG EG FD GD HD AE BE CE DE EE
Communication/Output PROFIBUS PA 4 ... 20 mA, HART, start-up at < 3.6 mA	1 2

Selection and Ordering data	Article No.
SITRANS LR200, Flange adapter/Horn Antenna version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft).	↗ 7ML5425-
Process seal/gasket FKM (-40 ... +200 °C) Nitrile (-40 ... +60 °C), sliding waveguide systems only FFKM (-35 ... +200 °C)	0 1 2
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x 1/2" NPT 2 x M20 x 1.5	2 3
Horn size/Waveguide options 80 mm (3 inch) horn ⁴⁾ 100 mm (4 inch) horn ⁴⁾ 150 mm (6 inch) horn 200 mm (8 inch) horn 100 mm (4 inch) horn with 100 mm (4 inch) waveguide extension ⁴⁾ 100 mm (4 inch) horn with 150 mm (6 inch) waveguide extension ⁴⁾ 100 mm (4 inch) horn with 200 mm (8 inch) waveguide extension ⁴⁾ 100 mm (4 inch) horn with 250 mm (10 inch) waveguide extension ⁴⁾ 150 mm (6 inch) horn with 100 mm (4 inch) waveguide extension 150 mm (6 inch) horn with 150 mm (6 inch) waveguide extension 150 mm (6 inch) horn with 200 mm (8 inch) waveguide extension 150 mm (6 inch) horn with 250 mm (10 inch) waveguide extension 200 mm (8 inch) horn with 100 mm (4 inch) waveguide extension 200 mm (8 inch) horn with 150 mm (6 inch) waveguide extension 200 mm (8 inch) horn with 200 mm (8 inch) waveguide extension 200 mm (8 inch) horn with 250 mm (10 inch) waveguide extension	B C D E F G H J K L M N P Q R S

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS LR200, Flange adapter/Horn Antenna version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft).	7ML5425- 	Further designs Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	Y15
Approvals General Purpose, CE, R&TTE, RCM General Purpose, CSA, FM, Industry Canada, FCC Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, RCM; EAC Non Incendive, FM Class I, Div. 2, Groups A, B, C, D, FCC ⁵⁾ Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; EAC ⁶⁾⁷⁾ Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; EAC ⁷⁾ Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC ⁵⁾⁷⁾	A B C D E F G H J	Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 Material inspection Certificate Type 3.1 per EN 10204 Namur NE43 compliant, device preset to failsafe < 3.6 mA ¹⁾	C11 C12 N07
Pressure rating Rating per Pressure/Temperature curves in manual 0.5 bar g (7.25 psi g) maximum 1) Available with pressure rating option 1 only 2) Maximum Process Temperature 60 °C (140 °F) 3) Available with Antenna Material options 0 and 1 only 4) For stillpipe applications only 5) Available with enclosure option 2 only 6) Available with enclosure option 3 only 7) Available with communication option 2 only	0 1	Operating Instructions for PROFIBUS PA device English German Note: The Operating Instructions should be ordered as a separate item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. A5E32337680 A5E34942820
		Accessories Handheld programmer, Intrinsically safe, EEx ia HART modem/USB (for use with a PC and SIMATIC PDM) One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART ²⁾ One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA ³⁾ One general purpose polymeric cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 For applicable back up point level switch - see point level measurement section 1) Available with communication option 2 only 2) Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended. 3) Available with enclosure option 2 only	7ML1930-1BK 7MF4997-1DB 7ML1930-1AP 7ML1930-1AQ 7ML1930-1AM 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...

Level Measurement

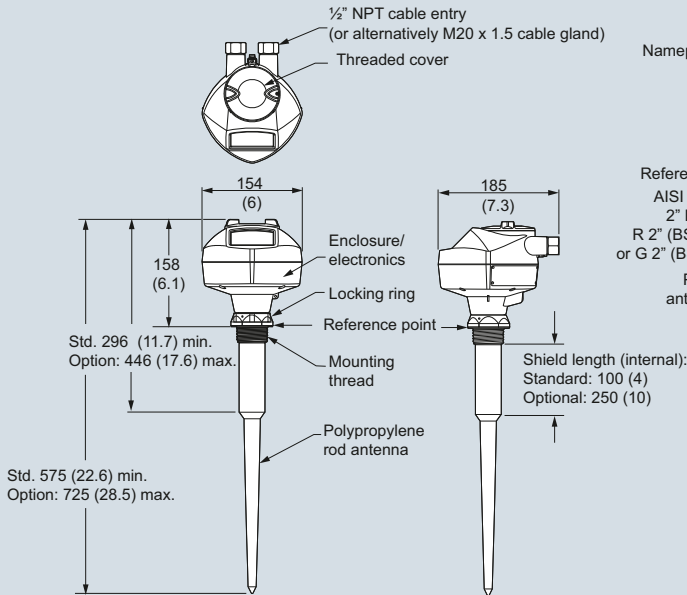
Continuous level measurement - Radar transmitters

SITRANS LR200

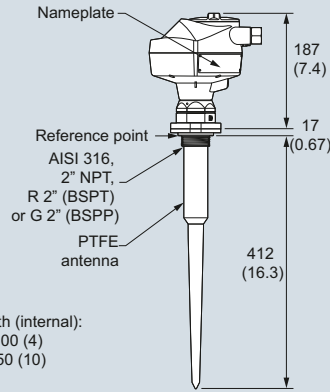
Dimensional drawings

4

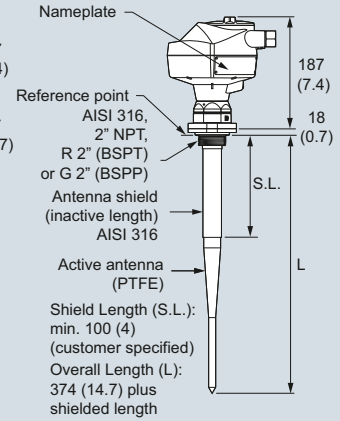
SITRANS LR200 with polypropylene shielded rod antenna



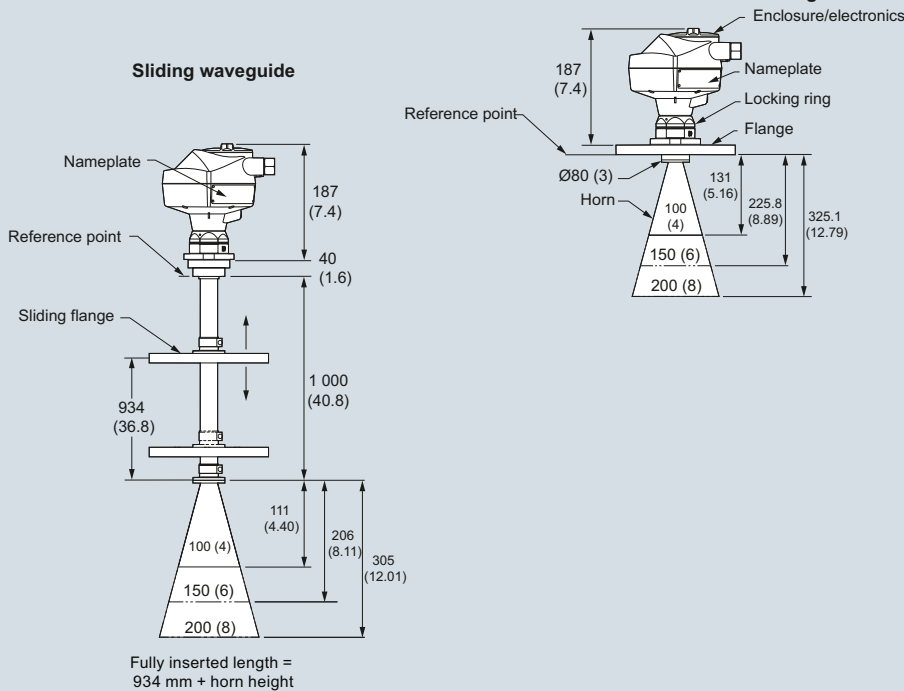
PTFE rod antenna, threaded



Threaded connection PTFE rod, external shield

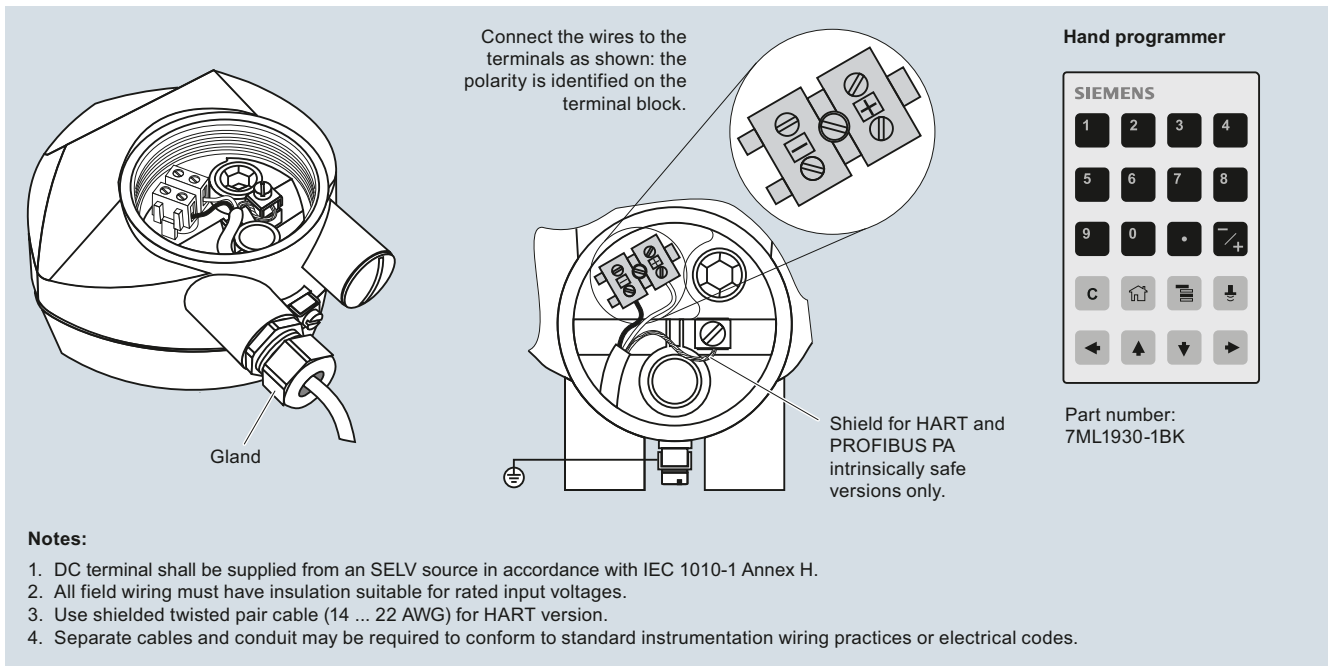


Horn antenna with flat faced flange



SITRANS LR200, dimensions in mm (inch)

Schematics



Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

Gland

Shield for HART and PROFIBUS PA intrinsically safe versions only.

Hand programmer

SIEMENS			
1	2	3	4
5	6	7	8
9	0	.	/+
C	⏪	⏩	⏴
⏴	⏵	⏶	⏷

Part number:
7ML1930-1BK

Notes:

1. DC terminal shall be supplied from an SELV source in accordance with IEC 1010-1 Annex H.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR200 connections

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200

Integration



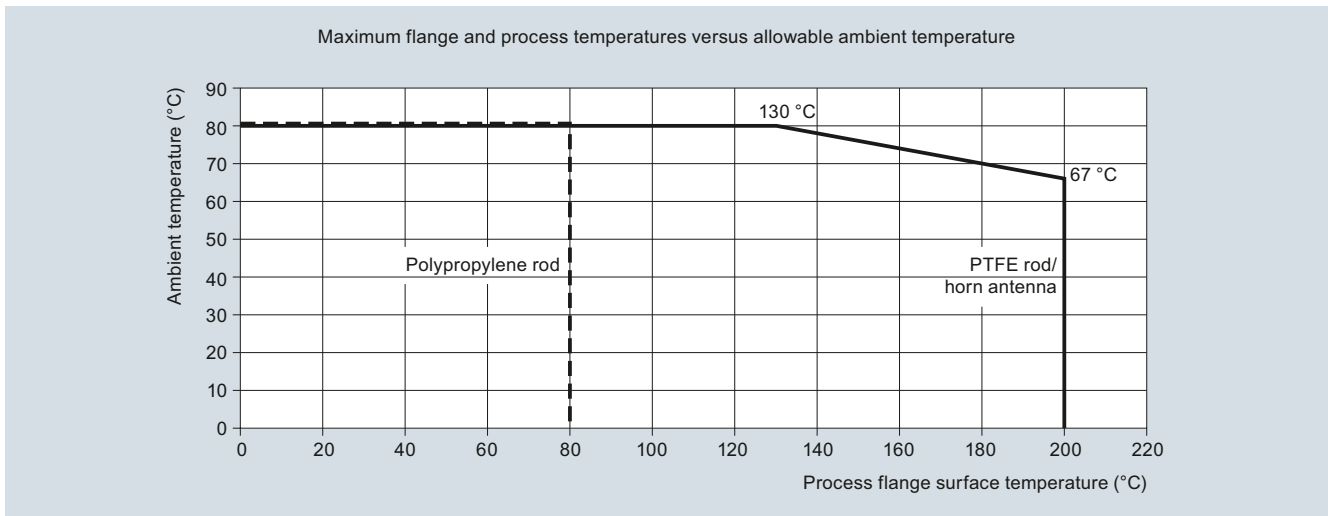
Antenna configurations for SITRANS LR200

Technical specifications

Antenna types	Flat Faced Flange with Rod	Shielded Rod	Horn (4", 6", 8" sizes available)
Connection type	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6 inch)	Threaded 2" NPT, R 2" (BSPT), G 2" (BSPP) or flat faced flange nominal pipe sizes 80, 100 mm (3, 4 inch)	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6 inch)
Wetted parts	PTFE	PTFE, 316L stainless steel, FKM O-ring	316L stainless steel PTFE, FKM O-ring
Extensions	50 or 100 mm (2 or 4 inch) PTFE or UHMW-PE	100, 150, 200 or 250 mm (4, 6, 8 or 10 inch) standard shield length	Use waveguide for extensions to 6 m (20 ft) long
Dielectric constant	> 3	> 3	> 3
Insertion length (max.)	41 cm (16.3 inch)	Variable	Variable with extension
Purging option (liquid or gas)	No	No	Yes
Sliding waveguide option for digesters¹⁾	Yes	No	Yes
Weight²⁾	6.5 kg (14.3 lb)	5.0 kg (11 lb)	7.5 kg (16.5 lb)

¹⁾ Maximum pressure 0.5 bar g at 60 °C (7.25 psi g at 140 °F)

²⁾ Not including extensions, includes SITRANS LR200 and smallest process connection

Characteristic curves

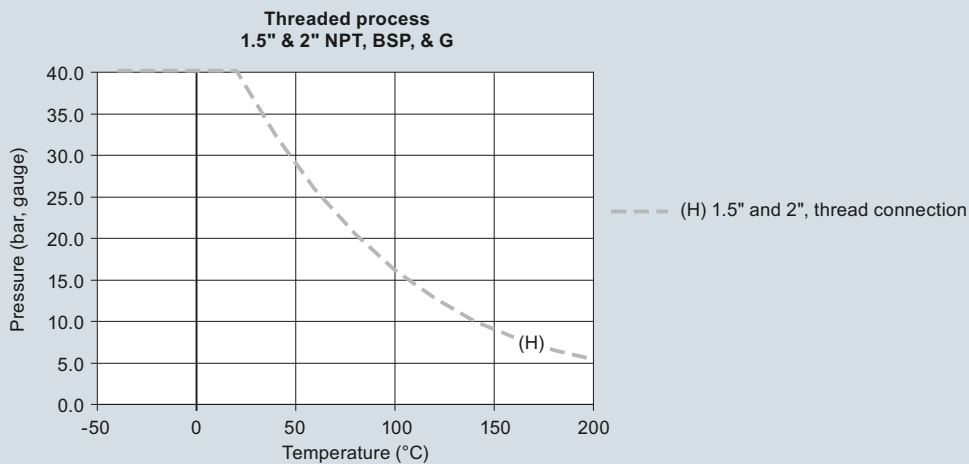
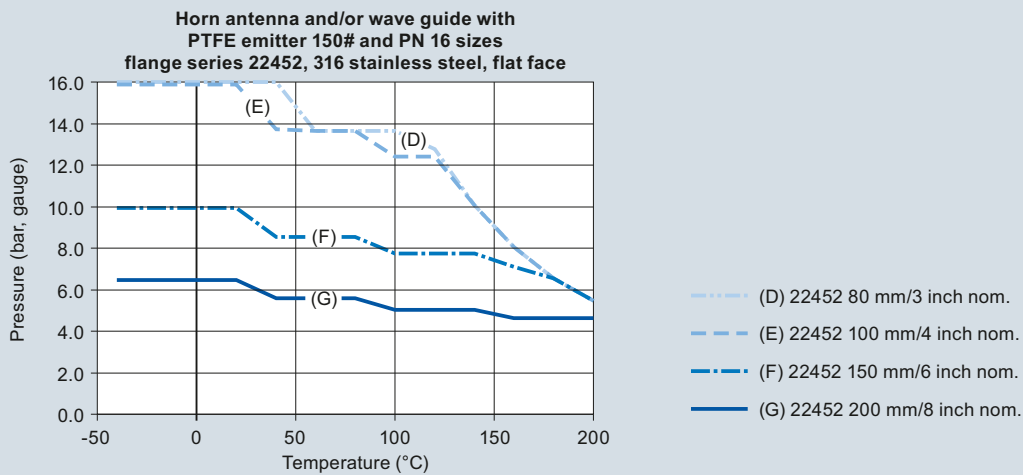
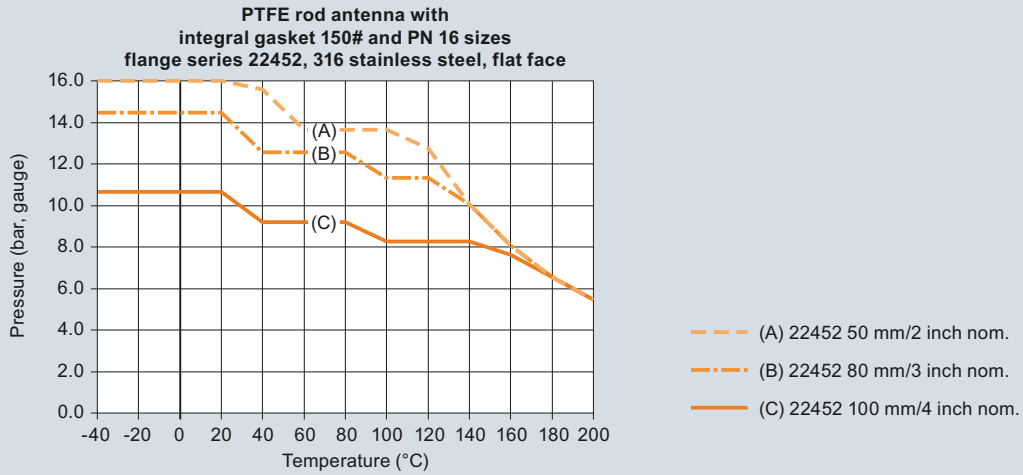
SITRANS LR200 ambient/process flange surface temperature curve

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200

4





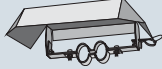
SITRANS LR200 process pressure/temperature derating curves

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR200 Specials

Selection and ordering data

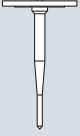

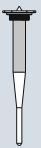
SITRANS LR200 Specials		SITRANS LR200 Specials	
	Article No.		Article No.
SITRANS LR200 PROFIBUS PA Aluminum Enclosure Kit with electronics and covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna		SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection.	A5E03617085
	A5E01483420	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection.	A5E03617086
	A5E01483440	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection.	A5E03617087
	A5E01483456	SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection.	A5E03617088
	A5E01483547	SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection.	
	A5E01483559	SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option E, with PROFIBUS PA communication, no process connection.	
SITRANS LR200 HART aluminum enclosure kit with electronics and covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna		Sun shield for SITRANS LR200 enclosure, stainless steel	
	A5E02956419	SITRANS LR200 Horn Antenna Kits with mounting screws (no emitter supplied)	A5E39142556
	A5E02956420	80 mm (3 inch) horn antenna kit	PBD:25500K02A
	A5E02956421	100 mm (4 inch) horn antenna kit	PBD:25500K03A
	A5E02956422	150 mm (6 inch) horn antenna kit	PBD:25500K05A
		200 mm (8 inch) horn antenna kit	PBD:25500K07A
		SITRANS LR200 Extension Kits for Horn Antenna with mounting screws	
		100 mm (4 inch) extension kit for horn antenna	PBD:25501K0100A
		150 mm (6 inch) extension kit for horn antenna	PBD:25501K0150A
		200 mm (8 inch) extension kit for horn antenna	PBD:25501K0200A
	250 mm (10 inch) extension kit for horn antenna	PBD:25501K0250A	
	500 mm (20 inch) extension kit for horn antenna	PBD:25501K0500A	
	1 000 mm (40 inch) extension kit for horn antenna	PBD:25501K1000A	

Level Measurement


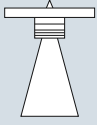
Continuous level measurement - Radar transmitters


SITRANS LR200 Specials

SITRANS LR200 Specials

	Article No.
SITRANS LR200 Flanged Rod Antenna Kit with 316L stainless steel flat faced flanges	
Flanged PTFE rod antenna kit, 2" ASME, 150 lb. See drawing 51003 on http://www.siemens.com/radar ¹⁾⁴⁾	PBD: 51003K020AAAA
Flanged PTFE rod antenna kit, DN 50 PN 16. See drawing 51003 on http://www.siemens.com/radar ¹⁾⁴⁾	PBD: 51003K050AJAA
Flanged PTFE rod antenna kit, JIS 10K DN 50. See drawing 51003 on http://www.siemens.com/radar ¹⁾⁴⁾	PBD: 51003K050AOAA
SITRANS LR200 PTFE Rod Antenna Kit with 316L stainless steel 1½" pipe thread process connection	
PTFE rod antenna kit, 1½" NPT 316L stainless steel process connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar ⁴⁾	PBD: 51004K1AAA
PTFE rod antenna kit, R 1½" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring; see drawing 51004 on http://www.siemens.com/radar ⁴⁾	PBD: 51004K2AAA
PTFE rod antenna kit, 1½" G 316L stainless steel process connection, FKM O-ring; see drawing 51004 on http://www.siemens.com/radar ⁴⁾	PBD: 51004K3AAA
SITRANS LR200 PTFE Rod Antenna Kit with 316L stainless steel 2" pipe thread process connection	
PTFE rod antenna kit, 2" NPT 316L stainless steel process connection, FKM O-ring; see drawing 51005 on http://www.siemens.com/radar ⁴⁾	PBD: 51005K1AAA
PTFE rod antenna kit, R 2" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring; see drawing 51005 on http://www.siemens.com/radar ⁴⁾	PBD: 51005K2AAA
PTFE rod antenna kit, 2" G 316L stainless steel process connection, FKM O-ring; see drawing 51005 on http://www.siemens.com/radar ⁴⁾	PBD: 51005K3AAA

SITRANS LR200 Specials

	Article No.
SITRANS LR200 PTFE Rod Antenna Kit (100 mm shield) with 316L stainless steel 2" pipe thread process connection	
PTFE rod antenna shielded kit, 2" NPT 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on http://www.siemens.com/radar ³⁾⁴⁾	PBD: 51002K0100AAA
PTFE rod antenna shielded kit, R 2" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on http://www.siemens.com/radar ³⁾⁴⁾	PBD: 51002K0100BAA
PTFE rod antenna shielded kit, 2" G 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on http://www.siemens.com/radar ³⁾⁴⁾	PBD: 51002K0100CAA
SITRANS LR200 Horn Antenna Kit with 316L stainless steel flat faced flange, with PTFE emitter (without waveguide)	
Horn antenna kit, 2" ASME 316L stainless steel flange 3 inch horn, PTFE emitter ¹⁾⁴⁾	PBD: 51006K020AAAA
Horn antenna kit, 2" ASME 316L stainless steel flange 4 inch horn, PTFE emitter ¹⁾²⁾	PBD: 51006K020AABA
Horn antenna kit, 2" ASME 316L stainless steel flange 6 inch horn, PTFE emitter ¹⁾²⁾	PBD: 51006K020AACA
Horn antenna kit, 2" ASME 316L stainless steel flange 8 inch horn, PTFE emitter ¹⁾²⁾	PBD: 51006K020AADA
Horn antenna kit, DN 50 PN 16 316L stainless steel flange 80 mm horn, PTFE emitter ¹⁾²⁾	PBD: 51006K050AJAA
Horn antenna kit, DN 50 PN 16 316L stainless steel flange 100 mm horn, PTFE emitter ¹⁾²⁾	PBD: 51006K050AJBA
Horn antenna kit, DN 50 PN 16 316L stainless steel flange 150 mm horn, PTFE emitter ¹⁾²⁾	PBD: 51006K050AJCA
Horn antenna kit, DN 50 PN 16 316L stainless steel flange 200 mm horn, PTFE emitter ¹⁾²⁾	PBD: 51006K050AJDA

SITRANS LR200 Specials	Article No.
<p>SITRANS LR200 PTFE flanged rod antenna kit with 316L stainless steel shield and 316L stainless steel flat faced flange</p>	
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 100 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0100AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 100 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0100EJA
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 150 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0150AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 150 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0150EJA
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 200 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0200AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 200 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0200EJA
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 250 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0250AAA
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 250 mm 316L stainless steel shield. ¹⁾⁴⁾	PBD: 51014K0250EJA
PTFE paste	
Kit, PTFE paste, tube, 250 ml	PBD:51036065
Cable gland	
One polymeric cable gland M20 x 1.5, rated -20 ... +80 °C (-4 ... +176 °F) for General Purpose and ATEX EEx e	7ML1930-1AN
One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART	7ML1930-1AP
One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA	7ML1930-1AQ

1) Available in flange sizes including ASME, DIN and JIS.
Please consult a local sales person for details.

2) Available with no pressure rating.
Please consult a local sales person for details.

3) Available in other shield lengths.
Please consult a local sales person for details.

4) Available with Pressure rating.
Please consult a local sales person for details.

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Overview



SITRANS LR250 is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).

Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency allows for small antennas for easy mounting in nozzles
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Short blanking distance for improved minimum measuring range to 50 mm (2 inch) from the end of the antenna
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools such as PACTware or Fieldcare via SITRANS DTM
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511
- 3 mm (0.118 inch) accuracy in accordance with IEC 60770-1
- Suitable for API 2350

Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller horn antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without saving to open the instrument's lid.

SITRANS LR250 measures superbly on low dielectric media, and in small vessels, as well as tall and narrow vessels.

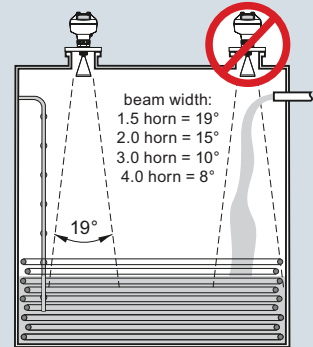
- Key Applications: liquid bulk storage tanks, process vessels, vaporous liquids, high temperatures, low dielectric media and applications with functional safety requirements

Configuration

Installation

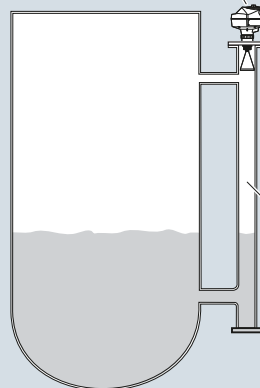
Note:

- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the horn antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.
- Use largest possible antenna.



Mounting on bypass

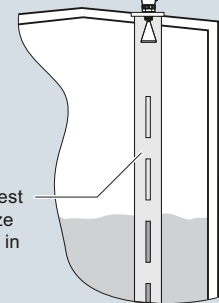
Orient front or back of device toward vent.



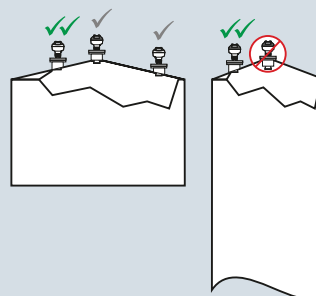
Mounting on stilling well

Orient front or back of device toward stillpipe slots.

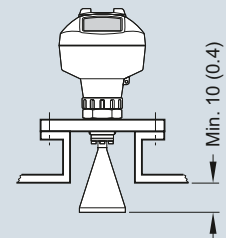
Use largest horn size possible in pipe.



Mounting on vessel



Mounting on a nozzle



SITRANS LR250 installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Technical specifications

Mode of operation		Power supply	
Measuring principle	Radar level measurement	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
Frequency	K-band (25.0 GHz)	PROFIBUS PA	<ul style="list-style-type: none"> • 15 mA • Per IEC 61158-2
Minimum measuring range	50 mm (2 inch) from end of antenna	FOUNDATION Fieldbus	<ul style="list-style-type: none"> • 20.0 mA • Per IEC 61158-2
Maximum measuring range	20 m (65 ft), antenna dependent		
Output		Certificates and approvals	
HART	Version 5.1	General	CSA _{US/CA} , CE, FM, NE 21, RCM
<ul style="list-style-type: none"> • Analog output • Accuracy • Fail-safe 	4 ... 20 mA ± 0.02 mA <ul style="list-style-type: none"> • Programmable as high low or hold (loss of echo) • NE 43 programmable 	Radio	FCC, Industry Canada, and Europe ETSI EN 302-372, RCM
PROFIBUS PA	Profile 3.01	Hazardous	
<ul style="list-style-type: none"> • Function blocks 	2 Analog Input (AI)	<ul style="list-style-type: none"> • Explosion Proof (Brazil) 	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
FOUNDATION Fieldbus	H1	<ul style="list-style-type: none"> • Increased Safety (Brazil) 	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
<ul style="list-style-type: none"> • Functionality • Version • Function blocks 	Basic or LAS ITK 5.2.0 2 Analog Input (AI)	<ul style="list-style-type: none"> • Intrinsically Safe (Brazil) 	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
Performance (according to reference conditions IEC60770-1)		<ul style="list-style-type: none"> • Explosion Proof (Canada/USA) 	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Maximum measured error	3 mm (0.118 inch)	<ul style="list-style-type: none"> • Intrinsically Safe (Canada/USA) 	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Influence of ambient temperature	< 0.003 %/K	<ul style="list-style-type: none"> • Non-incendive (Canada/USA) 	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
Rated operating conditions		<ul style="list-style-type: none"> • Flame Proof/Increased Safety (China) 	NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C
Installation conditions		<ul style="list-style-type: none"> • Intrinsically Safe (China) 	NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C
<ul style="list-style-type: none"> • Location 	Indoor/outdoor	<ul style="list-style-type: none"> • Non-sparking (China) 	NEPSI Ex nA IIC T4 Gc
Ambient conditions (enclosure)		<ul style="list-style-type: none"> • Intrinsically Safe (Europe) 	ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia IIIC T100 °C Da
<ul style="list-style-type: none"> • Ambient temperature • Installation category • Pollution degree 	-40 ... +80 °C (-40 ... +176 °F) I 4	<ul style="list-style-type: none"> • Non-sparking (Europe) • Flame Proof (International/Europe) 	ATEX II 3G Ex nA IIC T4 Gc IECEX/ATEX II 1/2 GD, 1D, 2D, Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da
Medium conditions		<ul style="list-style-type: none"> • Increased Safety (International/Europe) 	IECEX/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Dielectric constant ϵ_r	> 1.6, antenna and application dependent	<ul style="list-style-type: none"> • Intrinsically Safe (International) 	IECEX/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIC T100 °C Da
Process temperature	-40 ... +200 °C (-40 ... +392 °F) (at process connection with FKM O-ring) -20 ... +200 °C (-4 ... +392 °F) (at process connection with FFKM O-ring)	<ul style="list-style-type: none"> • Explosion Proof (Russia/Kazakhstan) • Increased Safety (Russia/Kazakhstan) • Intrinsically Safe (Russia/Kazakhstan) • Marine 	EAC Ex d EAC Ex e EAC Ex ia
Process pressure	Up to 40 bar g (580 psi g), process connection and temperature dependent. See Pressure/Temperature curves for more information	<ul style="list-style-type: none"> • Functional Safety 	<ul style="list-style-type: none"> • Lloyd's Register of Shipping • ABS Type Approval • Bureau Veritas SIL-2 suitable in accordance with IEC 61508/61511
Design			
Enclosure			
<ul style="list-style-type: none"> • Material • Cable inlet 	Aluminum, polyester powder-coated 2 x M20 x 1.5 or 2 x 1/2" NPT		
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68		
Weight	< 3 kg (6.6 lb) 3.75 mm (1/2 inch) threaded connection with 1/2" horn antenna		
Display (local)	Graphic local user interface including quick start wizard and echo profile display		
Antenna			
<ul style="list-style-type: none"> • Material 	316L stainless steel [optional alloy N06022/2.4602 (Hastelloy C-22 or equivalent)]		
<ul style="list-style-type: none"> • Dimensions (nominal horn sizes) 	Standard 1.5 inch (40 mm), 2 inch (48 mm), 3 inch (75 mm), 4 inch (95 mm) horn, and optional 100 mm (4 inch) horn extension		
Process connections			
<ul style="list-style-type: none"> • Process connection 	1 1/2", 2" or 3" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2", 2" or 3" [(BSPT), EN 10226] G 1 1/2", 2" or 3" [(BSPP), EN ISO 228-1]		
<ul style="list-style-type: none"> • Flange connection 	2", 3", 4" (ANSI 150, 300 lb), 50, 80, 100 mm (PN 16, 40, JIS 10K)		

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Programming

Intrinsically Safe Siemens handheld programmer	Infrared receiver
<ul style="list-style-type: none"> • Approvals for handheld programmer 	IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C T _a = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = +50 °C IECEx SIR 09.0073
Handheld communicator	HART communicator 375/475
PC	<ul style="list-style-type: none"> • SIMATIC PDM • Emerson AMS • SITRANS DTM (for connection into FDT such as PACTware or Fieldcare)
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LR250 horn antenna	7ML5431-	SITRANS LR250 horn antenna	7ML5431-
2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft) (antenna dependent). Ideal for small vessels and low dielectric media.	0 -	2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft) (antenna dependent). Ideal for small vessels and low dielectric media.	0 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		<u>Flanged connection Hastelloy C</u>	
Process Connection and Antenna Material		2" Class 150 ASME B16.5 raised face ⁴⁾	J A
316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FKM seal ¹⁾	0	3" Class 150 ASME B16.5 raised face ⁴⁾	J B
316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FFKM seal ¹⁾	1	4" Class 150 ASME B16.5 raised face ⁴⁾	J C
Hastelloy C-22/2.4602 (or equivalent), PTFE emitter, FKM seal ²⁾	2	2" Class 300 ASME B16.5 raised face ⁴⁾	J D
Hastelloy C-22/2.4602 (or equivalent), PTFE emitter, FFKM seal ²⁾	3	3" Class 300 ASME B16.5 raised face ⁴⁾	J E
Process Connection Type		4" Class 300 ASME B16.5 raised face ⁴⁾	J F
<u>Threaded connection 316L</u>		DN 50 PN 16 EN 1092-1 Type B1 raised face ⁴⁾	K A
1½" NPT (ASME B1.20.1) (tapered thread) ³⁾	A A	DN 80 PN 16 EN 1092-1 Type B1 raised face ⁴⁾	K B
R 1½" [(BSPT), EN 10226-1] (tapered thread) ³⁾	A B	DN 100 PN 16 EN 1092-1 Type B1 raised face ⁴⁾	K C
G 1½" [(BSPP), EN ISO 228-1] (parallel thread) ³⁾	A C	DN 50 PN 40 EN 1092-1 Type B1 raised face ⁴⁾	K D
2" NPT (ASME B1.20.1) (tapered thread)	A D	DN 80 PN 40 EN 1092-1 Type B1 raised face ⁴⁾	K E
R 2" [(BSPT), EN 10226-1] (tapered thread)	A E	DN 100 PN 40 EN 1092-1 Type B1 raised face ⁴⁾	K F
G 2" [(BSPP), EN ISO 228-1] (parallel thread)	A F	50A 10K JIS B 2220 raised face ⁴⁾	L A
3" NPT (ASME B1.20.1) (tapered thread)	A G	80A 10K JIS B 2220 raised face ⁴⁾	L B
R 3" [(BSPT), EN 10226-1] (tapered thread)	A H	100A 10K JIS B 2220 raised face ⁴⁾	L C
G 3" [(BSPP), EN ISO 228-1] (parallel thread)	A J	DN 50 PN 16 EN 1092-1 Type B1 raised face	M A
<u>Flanged connection 316L</u>		DN 80 PN 16 EN 1092-1 Type B1 raised face	M B
2" Class 150 ASME B16.5, raised face	B D	DN 100 PN 16 EN 1092-1 Type B1 raised face	M C
3" Class 150 ASME B16.5, raised face	B E	DN 150 PN 16 EN 1092-1 Type B1 raised face	M D
4" Class 150 ASME B16.5, raised face	B F	DN 50 PN 40 EN 1092-1 Type B1 raised face	M E
2" Class 300 ASME B16.5, raised face	C D	DN 80 PN 40 EN 1092-1 Type B1 raised face	M F
3" Class 300 ASME B16.5, raised face	C E	DN 100 PN 40 EN 1092-1 Type B1 raised face	M G
4" Class 300 ASME B16.5, raised face	C F	DN 150 PN 40 EN 1092-1 Type B1 raised face	M H
50A 10K JIS B 2220 flat face ⁴⁾	F A	Communication/Output	
80A 10K JIS B 2220 flat face ⁴⁾	F B	PROFIBUS PA ⁶⁾	1
100A 10K JIS B 2220 flat face ⁴⁾	F C	4 ... 20 mA, HART, start-up at < 3.6 mA	2
DN 50 PN 16 EN 1092-1 Type B1 raised face	G A	FOUNDATION Fieldbus ⁶⁾	3
DN 80 PN 16 EN 1092-1 Type B1 raised face	G B	Enclosure/Cable inlet	
DN 100 PN 16 EN 1092-1 Type B1 raised face	G C	<u>Aluminum, Epoxy painted</u>	
DN 150 PN 16 EN 1092-1 Type B1 raised face	G D	2 x ½" NPT	0
DN 50 PN 40 EN 1092-1 Type B1 raised face	H A	2 x M20 x 1.5	1
DN 80 PN 40 EN 1092-1 Type B1 raised face	H B	Antenna	
DN 100 PN 40 EN 1092-1 Type B1 raised face	H C	1½" horn ³⁾	A
DN 150 PN 40 EN 1092-1 Type B1 raised face	H D	2" horn (fits 2" ASME or DN 50 nozzles)	B
		3" horn (fits 3" ASME or DN 80 nozzles)	C
		4" horn (fits 4" ASME or DN 100 nozzles)	D
		1½" horn with 100 mm extension ³⁾	E
		2" horn with 100 mm extension	F
		3" horn with 100 mm extension	G
		4" horn with 100 mm extension	H
		<u>Hastelloy C22 (or equivalent)</u>	
		2" horn (fits 2" ASME or DN 50 nozzles)	J
		3" horn (fits 3" ASME or DN 80 nozzles)	K
		4" horn (fits 4" ASME or DN 100 nozzles)	L
		2" horn (fits 2" ASME or DN 50 nozzles) with 100 mm extension	M
		3" horn (fits 3" ASME or DN 80 nozzles) with 100 mm extension	N
		4" horn (fits 4" ASME or DN 100 nozzles) with 100 mm extension	P

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Selection and Ordering data	Article No.
SITRANS LR250 horn antenna	7ML5431-
2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft) (antenna dependent). Ideal for small vessels and low dielectric media.	0 -
Approvals	
General Purpose, CE, CSA, FM, FCC, R&TTE, RCM	A
Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 FCC, Industry Canada	B
Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM	C
Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada	D
Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, R&TTE, RCM	E
Increased Safety: IECEx/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ⁴⁾	F
Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ⁵⁾	G
Explosion proof: CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada ⁵⁾	H
Non Sparking: NEPSI Ex nA IIC T4 Gc	K
Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C	L
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C ⁵⁾	M
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C ⁵⁾	N
Pressure rating	
Rating per Pressure/Temperature curves in manual	0
0.5 bar g (7.25 psi g) maximum ⁷⁾	1

1) Available with process connection options AA ... HD and Antenna Versions A ... H only

2) Available with process connection options JA ... MH and Antenna Versions J ... P only

3) Available for Antenna versions A and E only, max. range 10 m (32.8 ft), dk > 3 and A and E only available for Process Connection options AA, AB, and AC

4) Applicable with communication option 2 only

5) Available with Approval options A, B, C, D, K, and L

7) Available with Process Connection and Antenna Material 0, 1, 2, and 3 only

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs Please add "-Z" to Article No. and specify Order code(s).		Compact Operating Instructions for FOUNDATION Fieldbus device English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish A5E33472700 English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian A5E33472738 English, Portuguese (Brazil), Chinese A5E34046626 Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Plug M12 with mating Connector ¹⁾²⁾³⁾	◆ A50		
Plug 7/8" with mating Connector ²⁾³⁾⁴⁾	◆ A55		
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	◆ Y15		
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	◆ C11		
Material inspection certificate 3.1 of EN 10204	◆ C12		
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ³⁾⁵⁾	◆ C20		
Namur NE43 compliant, device preset to failsafe < 3.6 mA ⁵⁾	◆ N07		
Compact Operating Instructions for HART/ mA device English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish A5E33469191 English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian A5E33469171 English, Portuguese (Brazil), Chinese A5E34046583 Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		Other Operating Instructions SITRANS LR250 Functional Safety manual, English A5E32286471 Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Compact Operating Instructions for PROFIBUS PA device English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish A5E33469239 English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian A5E33472685 English, Portuguese (Brazil), Chinese A5E34046624 Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		Accessories Handheld programmer, Intrinsically safe, EEx ia 7ML1930-1BK HART modem/USB (for use with a PC and SIMATIC PDM) 7MF4997-1DB One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required) 7ML1930-1AP One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (two are required) ⁶⁾ 7ML1930-1AQ FDA approved FKM O-ring for 2" G (BSP) process connections -28 ... +80 °C (-28 ... +176 °F) 7ML1830-3AN SITRANS RD100, loop powered display - see Chapter 7 7ML5741-... SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 7ML5740-... SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 7ML5744-... SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 7ML5750-... For applicable back up point level switch - see point level measurement section	

- 1) Available with enclosure option 1 only
- 2) To be used with communication options 1 and 3 only. Connector has IP67 rating.
- 3) Available with approval options A and B. Available with approval option C for use on intrinsically safe applications only. Not rated for dust Ex.
- 4) Available with enclosure option 0 only
- 5) Applicable to communication option 2 only
- 6) For use with communication options 1 and 3 only

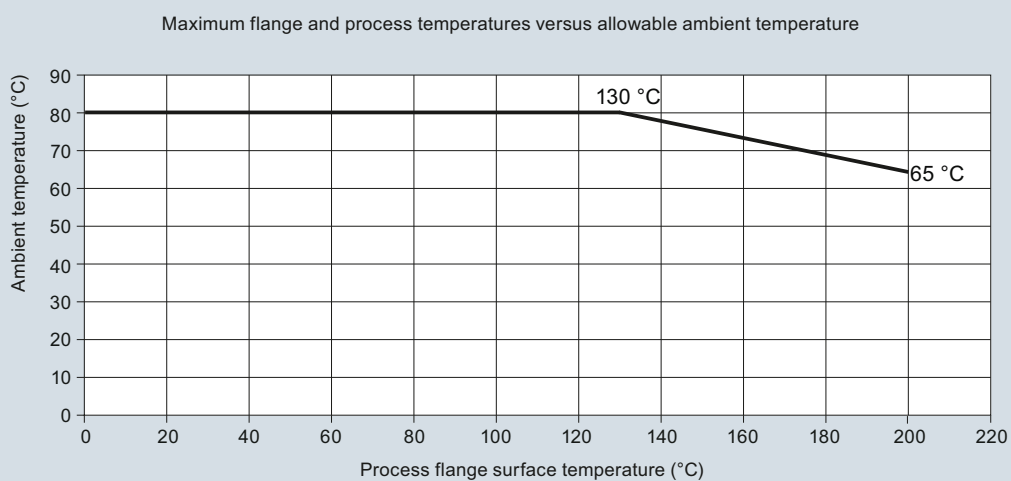
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

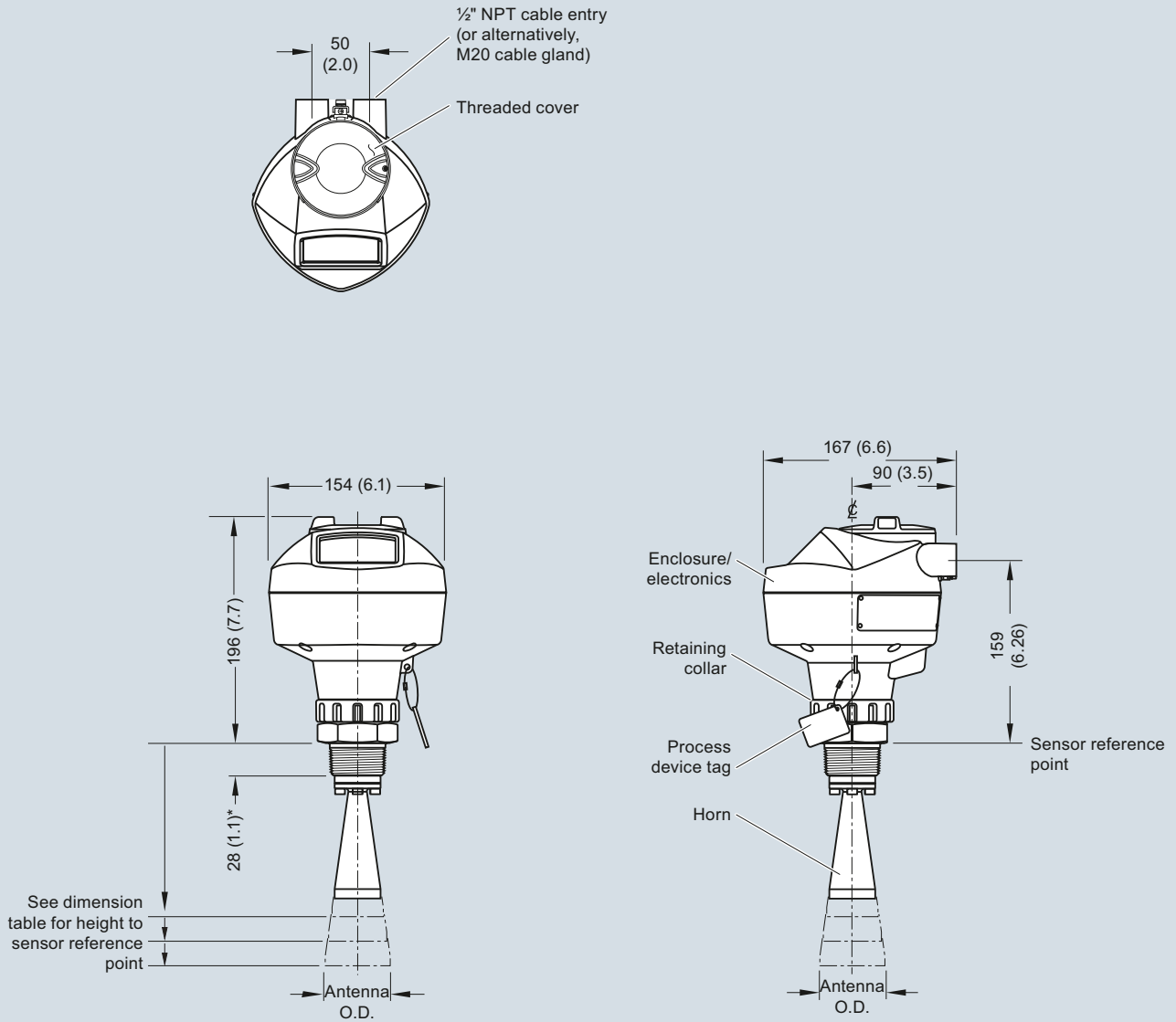
Characteristic curves



SITRANS LR250 ambient/process flange surface temperature curve

Dimensional drawings

Threaded Horn Antenna



*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

Antenna Type	Antenna O.D.	Height to sensor reference point			Beam angle	Measurement range
		1-1/2" threaded connection	2" threaded connection	3" threaded connection		
1.5" horn	39.8 (1.57)	135 (5.3)	N/A	N/A	19 degrees	10 m (32.8 ft)
2" horn	47.8 (1.88)	N/A	166 (6.55)	180 (7.09)	15 degrees	20 m (65.6 ft)
3" horn	74.8 (2.94)	N/A	199 (7.85)	213 (8.39)	10 degrees	20 m (65.6 ft)
4" horn	94.8 (3.73)	N/A	254 (10)	268 (10.55)	8 degrees	20 m (65.6 ft)

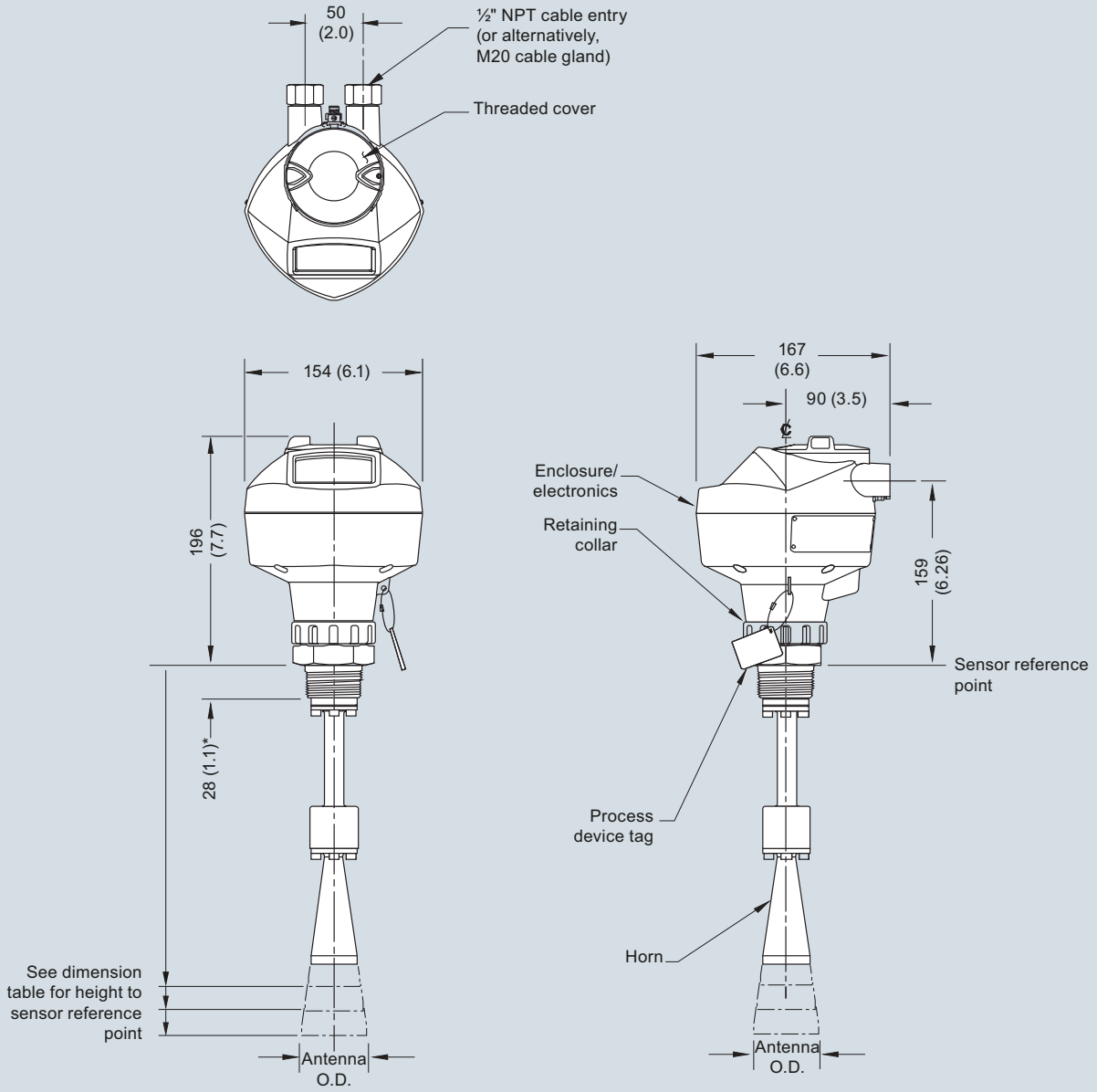
SITRANS LR250 Threaded Horn Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Threaded Horn Antenna with Extension



*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

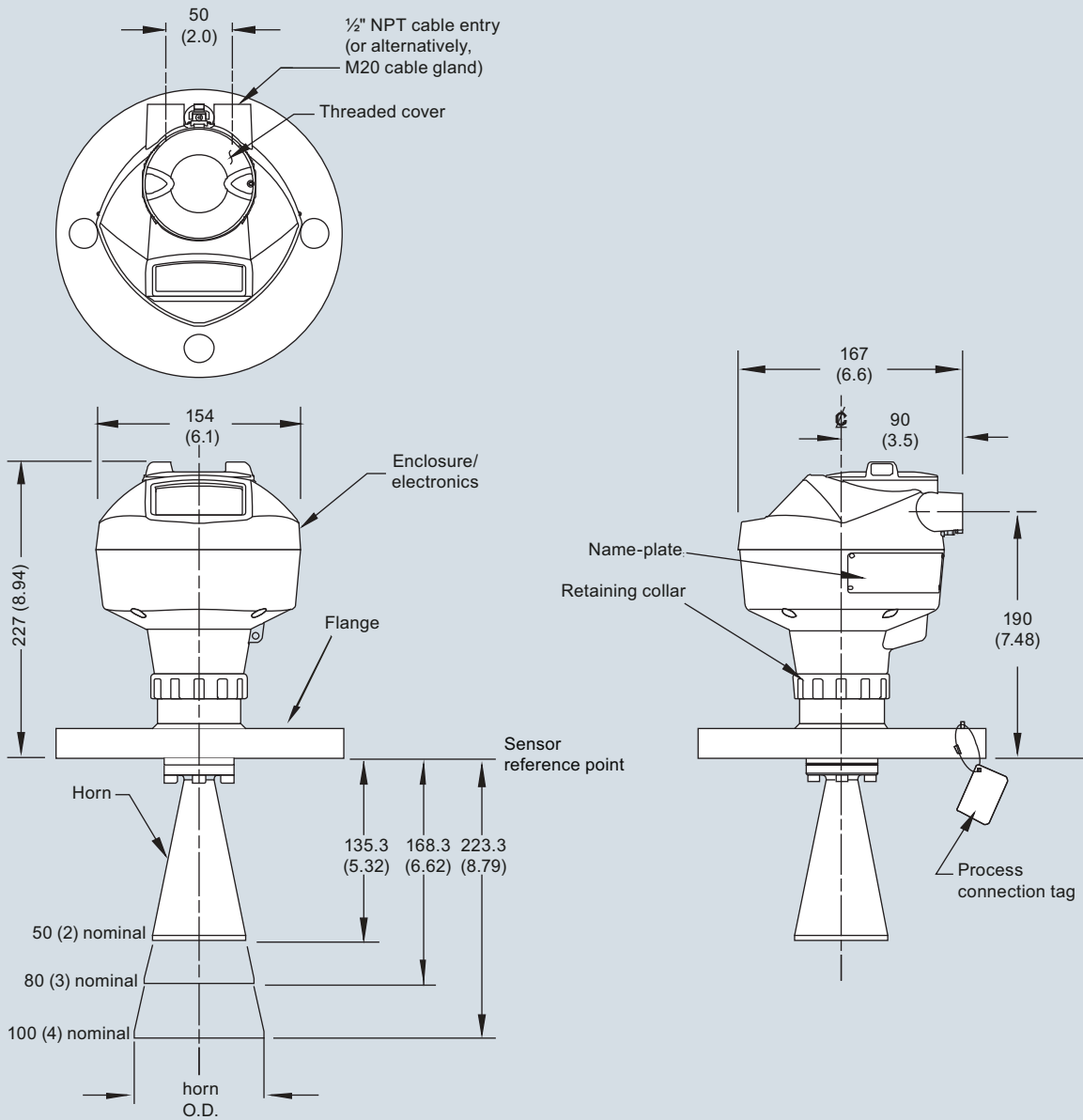
Antenna Type	Antenna O.D.	Height to sensor reference point			Beam angle	Measurement range
		1-1/2" threaded connection	2" threaded connection	3" threaded connection		
1.5" horn	39.8 (1.57)	235 (9.3)	N/A	N/A	19 degrees	10 m (32.8 ft)
2" horn	47.8 (1.88)	N/A	266 (10.47)	280 (11.02)	15 degrees	20 m (65.6 ft)
3" horn	74.8 (2.94)	N/A	299 (11.77)	313 (12.32)	10 degrees	20 m (65.6 ft)
4" horn	94.8 (3.73)	N/A	354 (13.94)	368 (14.49)	8 degrees	20 m (65.6 ft)

SITRANS LR250 Threaded Horn Antenna with extension, dimensions in mm (inch)

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Flanged Horn



Nominal Horn Size	Horn O.D.	Height to sensor reference point		Beam angle	Measurement range
		Stainless steel flange raised or flat-faced	Optional alloy flange		
50 (2)	47.8 (1.88)	135.3 (5.32)	138.3 (5.44)	15 degrees	20 m (65.6 ft)
80 (3)	74.8 (2.94)	168.3 (6.62)	171.3 (6.74)	10 degrees	20 m (65.6 ft)
100 (4)	94.8 (3.73)	223.3 (8.79)	226.3 (8.90)	8 degrees	20 m (65.6 ft)

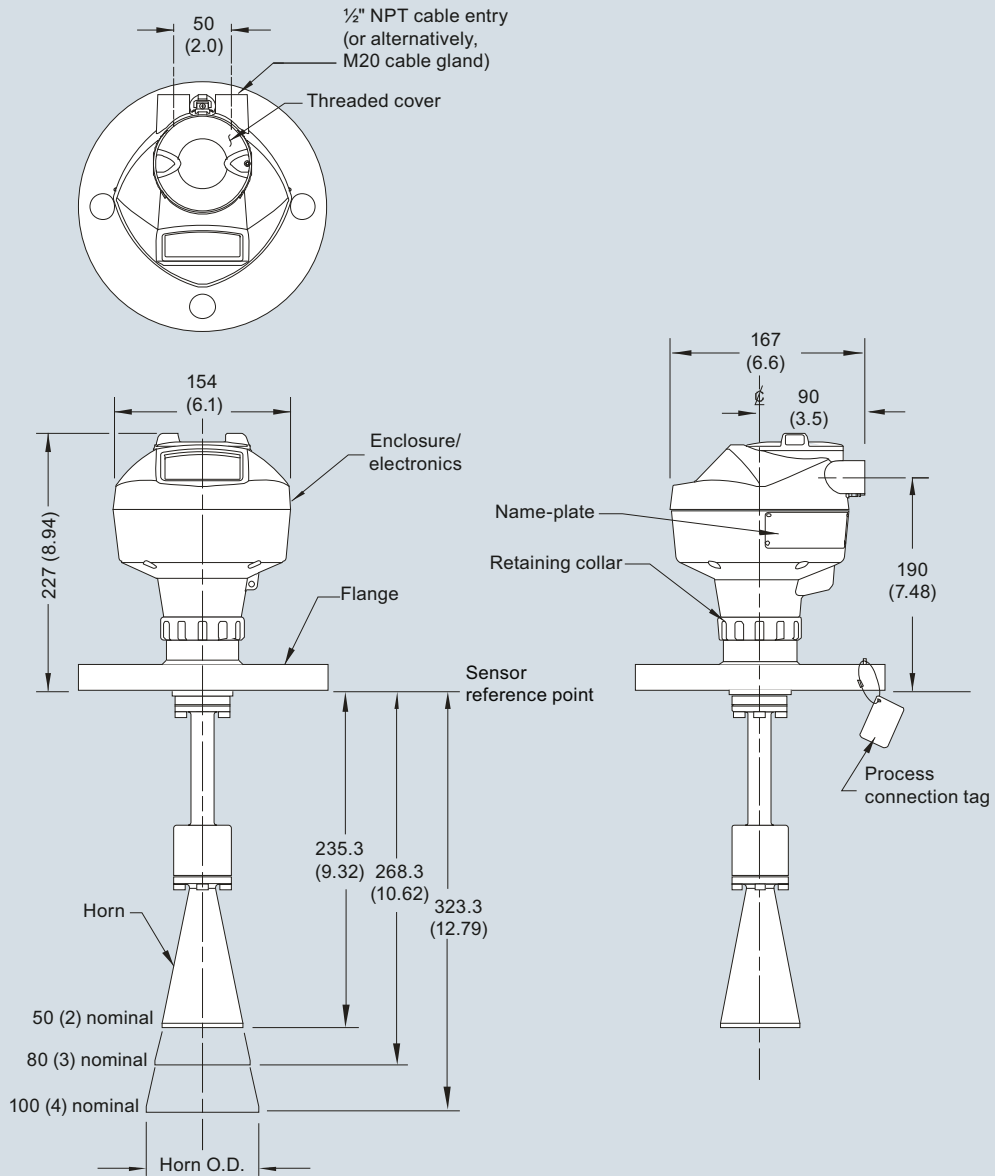
SITRANS LR250 Flanged Horn Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Flanged Horn with Extension



Nominal Horn Size	Horn O.D.	Height to sensor reference point		Beam angle	Measurement range
		Stainless steel flange raised or flat-faced	Optional alloy flange		
50 (2)	47.8 (1.88)	235.3 (9.26)	238.3 (9.38)	15 degrees	20 m (65.6 ft)
80 (3)	74.8 (2.94)	268.3 (10.56)	271.3 (10.68)	10 degrees	20 m (65.6 ft)
100 (4)	94.8 (3.73)	323.3 (12.73)	326.3 (12.85)	8 degrees	20 m (65.6 ft)

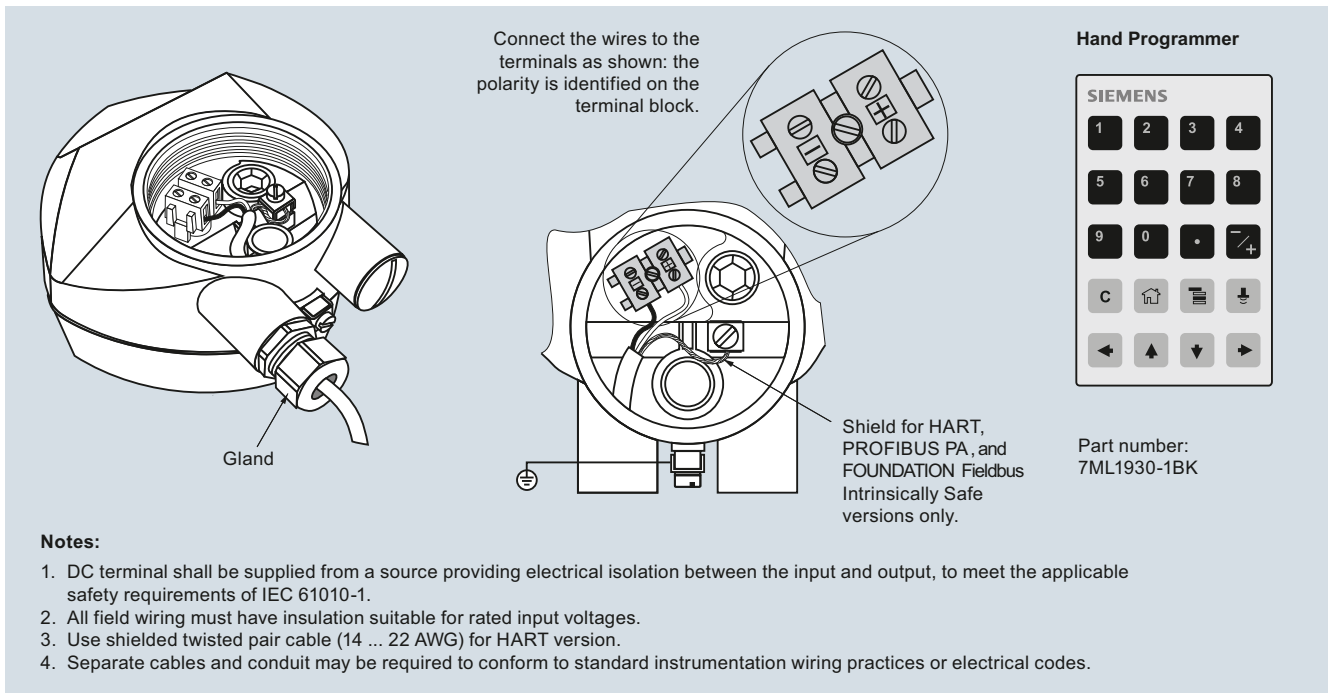
SITRANS LR250 Flanged Horn Antenna with extension, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Horn Antenna

Schematics



Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

Shield for HART, PROFIBUS PA, and FOUNDATION Fieldbus Intrinsically Safe versions only.

Hand Programmer

SIEMENS			
1	2	3	4
5	6	7	8
9	0	.	+/−
C	↑	↓	↔
←	→	↕	↔

Part number:
7ML1930-1BK

Notes:

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Specials

Selection and ordering data

SITRANS LR250 Specials

Article No.

SITRANS LR250 horn version enclosures (PROFIBUS PA models)



SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection

A5E01156836

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection

A5E01156838

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option B, with PROFIBUS PA communication, no process connection

A5E01156841

SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection

A5E01156843

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection

A5E01156844

SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS communication, no process connection

A5E01156846

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option D, with PROFIBUS PA communication, no process connection

A5E01156848

SITRANS LR250 horn version enclosures (FOUNDATION Fieldbus models)



SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection

A5E03769538

SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection

A5E03769539

SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection

A5E03769543

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection

A5E02654608

SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection

A5E02653792

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection

A5E02653793

SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection

A5E02654606

SITRANS LR250 Specials

Article No.

SITRANS LR250 horn version enclosures (< 3.6 mA start-up HART)



SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection

A5E02956317

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection

A5E02956319

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection

A5E02956320

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection

A5E02956322

SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection

A5E02956323

SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection

A5E03441096

SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection

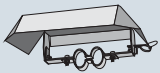

A5E03441097

SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection

A5E03441098

SITRANS LR250 horn version enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection

A5E03441099

SITRANS LR250 Specials	
	Article No.
Sun shield for SITRANS LR250 enclosure, stainless steel	
	A5E39142556
SITRANS LR250 horn antenna and extension kits	
38 mm (1.5 inch) horn antenna kit, 1.5" process connections only	A5E01151539
100 mm (4 inch) horn antenna extension kit, 1.5" process connections only	A5E01151553
50 mm (2 inch) stainless steel 316L horn antenna kit	A5E01151569
75 mm (3 inch) stainless steel 316L horn antenna kit	A5E01151571
100 mm (4 inch) stainless steel 316L horn antenna kit	A5E01151573
100 mm (4 inch) horn antenna extension kit, 50 mm (2 inch), 75 mm (3 inch), and 100 mm (4 inch) process connection	A5E01151577
50 mm (2 inch) horn antenna kit, Hastelloy C-22	A5E01151584
75 mm (3 inch) horn antenna kit, Hastelloy C-22	A5E01151585
100 mm (4 inch) horn antenna kit, Hastelloy C-22	A5E01151587
5 Dupont 1Gr Polyback, PTFE grease kit	A5E01151626
SITRANS LR250 lid with O-ring	A5E02465410

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 threaded PVDF antenna

Overview



SITRANS LR250 with threaded PVDF antenna is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including corrosives or aggressive materials, to a range of 10 m (32.8 ft) or 20 m (66 ft) when used in a stilling pipe.

Benefits

- Fully insulated PVDF antenna design for use in chemical and sanitary environments where aggressive and corrosive materials are used
- Cost effective replacement for transmitters made of exotic materials
- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency and 50 mm (2 inch) process connection/antenna allow for easy mounting in nozzles
- Short blanking distance for improved minimum measuring range to 50 mm (2 inch) from the end of the antenna
- Communication using HART or PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools such as PACTware or Fieldcare via SITRANS DTM
- Suitable for use in Safety Related Systems in accordance with IEC 61508/61511 (SIL-2)
- 3 mm (0.118 inch) accuracy in accordance with IEC 60770-1

Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 10 m (32 ft) on materials with $dk > 3$ or 20 m (66 ft) when used in a stilling pipe with $dk \geq 1.6$.

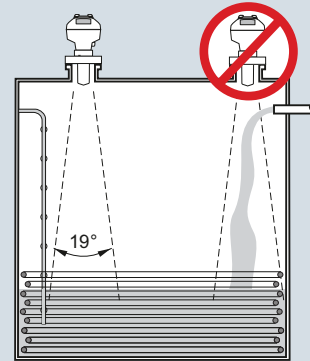
- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, temperatures to 80 °C (176 °F), corrosive and aggressive materials and applications requiring functional safety

Configuration

Installation

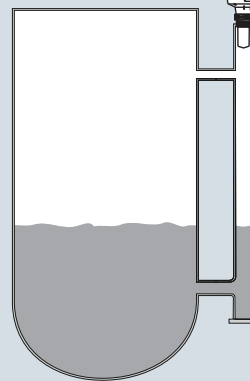
Note:

- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



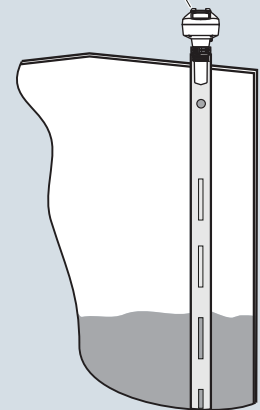
Mounting on bypass

Orient front or back of device toward vent.

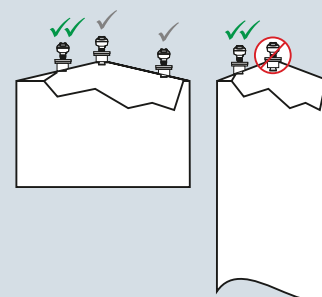


Mounting on stilling well

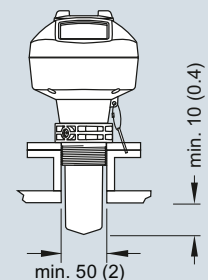
Orient front or back of device toward stillpipe slots.



Mounting on vessel



Mounting on a nozzle



SITRANS LR250 PVDF Antenna installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 threaded PVDF antenna

Technical specifications

Mode of operation		Certificates and approvals	
Measuring principle	Radar level measurement	General	CSA _{US/CA} , CE, FM, NE 21, RCM
Frequency	K-band (25.0 GHz)	Radio	FCC, Industry Canada, and Europe ETSI EN 302-372, RCM
Minimum measuring range	50 mm (2 inch) from end of antenna	Hazardous	
Maximum measuring range	10 m (32.8 ft) or 20 m (66 ft) when used in a stilling pipe with $dk \geq 1.6$	• Explosion Proof (Brazil)	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Output		• Increased Safety (Brazil)	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
HART	Version 5.1	• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
• Analog output	4 ... 20 mA	• Explosion Proof (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
• Accuracy	± 0.02 mA	• Intrinsically Safe (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
• Fail-safe	<ul style="list-style-type: none"> Programmable as high low or hold (loss of echo) NE 43 programmable 	• Non-incendive (Canada/USA)	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
PROFIBUS PA	Profile 3.1	• Flame Proof/Increased Safety (China)	Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C
• Function blocks	2 Analog Input (AI)	• Intrinsically Safe (China)	Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C
FOUNDATION Fieldbus	H1	• Non-sparking (China)	NEPSI Ex nA IIC T4 Gc
• Functionality	Basic or LAS	• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga
• Version	ITK 5.2.0	• Non-sparking/Energy Limited (Europe)	ATEX II 1D Ex ia ta IIC T100 °C Da
• Function blocks	2 Analog Input (AI)	• Flame Proof (International/Europe)	ATEX II 3G Ex nA IIC T4 Gc
Performance (according to reference conditions IEC60770-1)		• Increased Safety (International/Europe)	IECEX/ATEX II 1/2 GD, 1D, 2D, Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Maximum measured error	<ul style="list-style-type: none"> > 500 mm from sensor reference point: 3 mm (0.118 inch) < 500 mm from sensor reference point: 25 mm (1 inch) 	• Intrinsically Safe (International)	IECEX/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIC T100 °C Da
Influence of ambient temperature	< 0.003 %/K	• Explosion Proof (Russia/Kazakhstan)	EAC Ex d
Rated operating conditions		• Increased Safety (Russia/Kazakhstan)	EAC Ex e
Installation conditions		• Intrinsically Safe (Russia/Kazakhstan)	EAC Ex ia
• Location	Indoor/outdoor	• Marine	<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval Bureau Veritas
Ambient conditions (enclosure)		Functional Safety	SIL-2 suitable in accordance with IEC 61508/61511
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	Programming	
• Installation category	I	Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Pollution degree	4	• Approvals for handheld programmer	IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C T _A = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _A = +50 °C IECEX SIR 09.0073
Medium conditions		Handheld communicator	HART communicator 375/475
Dielectric constant ϵ_r	≥ 3 (1.6 in stillpipe)	PC	<ul style="list-style-type: none"> SIMATIC PDM Emerson AMS SITRANS DTM (for connection into FDT, such as PACTware or Fieldcare)
Process temperature	-40 ... +80 °C (-40 ... +176 °F) at process connection (Is suitable for CIP at 120 °C for 1/2 hr max.)	Display (local)	Graphic local user interface including quick start wizard and echo profile displays
Process pressure	Up to 5 bar g (72 psi g) temperature dependent. See Pressure/Temperature curves for more information	Power supply	
Design		4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
Enclosure		PROFIBUS PA	<ul style="list-style-type: none"> 15 mA per IEC 61158-2
• Material	Aluminum, polyester powder-coated	FOUNDATION Fieldbus	<ul style="list-style-type: none"> 20.0 mA per IEC 61158-2
• Cable inlet	2 x M20 x 1.5 or 2 x 1/2" NPT		
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68		
Weight	Approximately 3.3 kg (7.27 lb)		
Display (local)	Graphic local user interface including quick start wizard and echo profile display		
Antenna			
• Material	PVDF (Polyvinylidene fluoride)		
• Dimensions (nominal sizes)	2 inch (48 mm)		
Process connections			
• Process connection	2" NPT [(Taper), ASME B1.20.1] 2" [(BSPT), EN 10226] 2" [(BSPP), EN ISO 228-1]		

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 threaded PVDF antenna

Selection and Ordering data	Article No.
SITRANS LR250 threaded PVDF antenna 7ML5431- 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including corrosives or aggressive materials, to a range of 10 m (32.8 ft) or 20m (66ft) when used in a stilling pipe. Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process Connection and Antenna Material Threaded PVDF antenna 4	
Process Connection Type Threaded connections PVDF 2" NPT (ASME B1.20.1) (tapered thread) PA R 2" [(BSPT), EN 10226-1] (tapered thread) PB G 2" [(BSPP), EN ISO 228-1] (parallel thread) PC	
Communication/Output PROFIBUS PA 1 4 ... 20 mA, HART, start-up at < 3.6 mA 2 FOUNDATION Fieldbus 3	
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x 1/2" NPT 0 2 x M20 x 1.5 1	
Antenna 2 inch(50 mm) threaded PVDF antenna R	
Approvals General Purpose, CE, CSA, FM, FCC, R&TTE, RCM A Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 FCC, Industry Canada B Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM C Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada D Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, R&TTE, RCM E Increased Safety: IECEx/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ¹⁾ F Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ¹⁾ G Explosion proof: CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada ¹⁾ H Non Sparking: NEPSI Ex nA IIC T4 Gc K Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C L Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C ¹⁾ M Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C ¹⁾ N	
Pressure rating Rating per Pressure/Temperature curves in manual 2	

¹⁾ Applicable to Communication option 2 only

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Plug M12 with mating Connector ¹⁾²⁾³⁾ A50	
Plug 7/8" with mating Connector ²⁾³⁾⁴⁾ A55	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text Y15	
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 C11	
Material inspection Certificate Type 3.1 per EN 10204 C12	
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ⁵⁾⁶⁾ C20	
Namur NE43 compliant, device preset to failsafe < 3.6 mA ⁵⁾ N07	
Compact Operating Instructions for HART/ mA device	Article No.
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish A5E33469191	
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian A5E33469171	
English, Portuguese (Brazil), Chinese A5E34046583	
Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Compact Operating Instructions for PROFIBUS PA device	
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish A5E33469239	
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian A5E33472685	
English, Portuguese (Brazil), Chinese A5E34046624	
Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.	

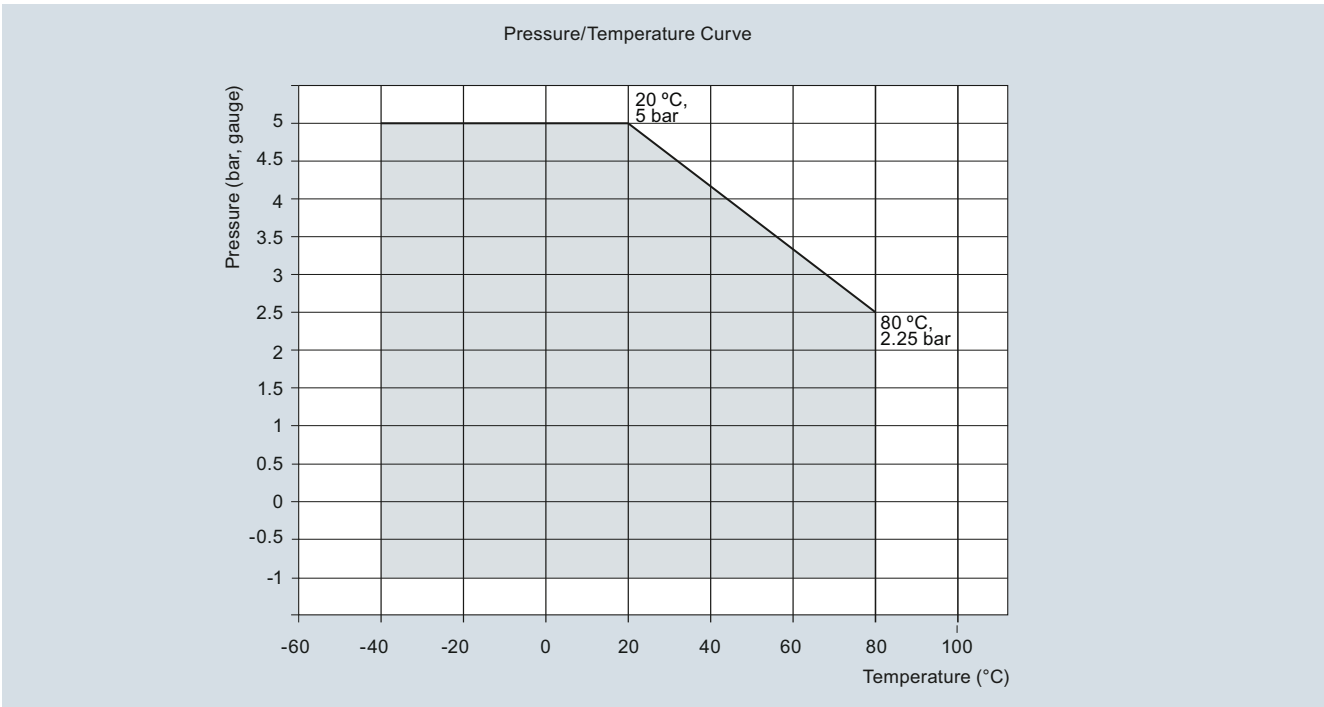
Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 threaded PVDF antenna

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
Compact Operating Instructions for FOUNDATION Fieldbus device		Accessories	
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33472700	Handheld programmer, Intrinsically safe, EEx ia	7ML1930-1BK
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33472738	HART modem/USB (for use with a PC and SIMATIC PDM)	7MF4997-1DB
English, Portuguese (Brazil), Chinese	A5E34046626	One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART	7ML1930-1AP
Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus ²⁾	7ML1930-1AQ
Other Operating Instructions		FDA approved FKM o-ring for 2" G (BSPP) process connections -28 ... +80 °C (-28 ... +176 °F)	7ML1830-3AN
SITRANS LR250 Functional Safety manual, English	A5E32286471	SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
		SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
		SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
		For applicable back up point level switch - see point level measurement section	
		¹⁾ Available with Enclosure option 1 only ²⁾ To be used with Communication options 1 and 3 only. Connector has IP67 rating. ³⁾ Available with Approval options A and B. Available with approval option C for use on intrinsically safe applications only. Not rated for dust Ex. ⁴⁾ Available with Enclosure option 0 only ⁵⁾ Available with communication option 2 only ⁶⁾ Available with approval options A, B, C, D, E, K, and L only	

Characteristic curves



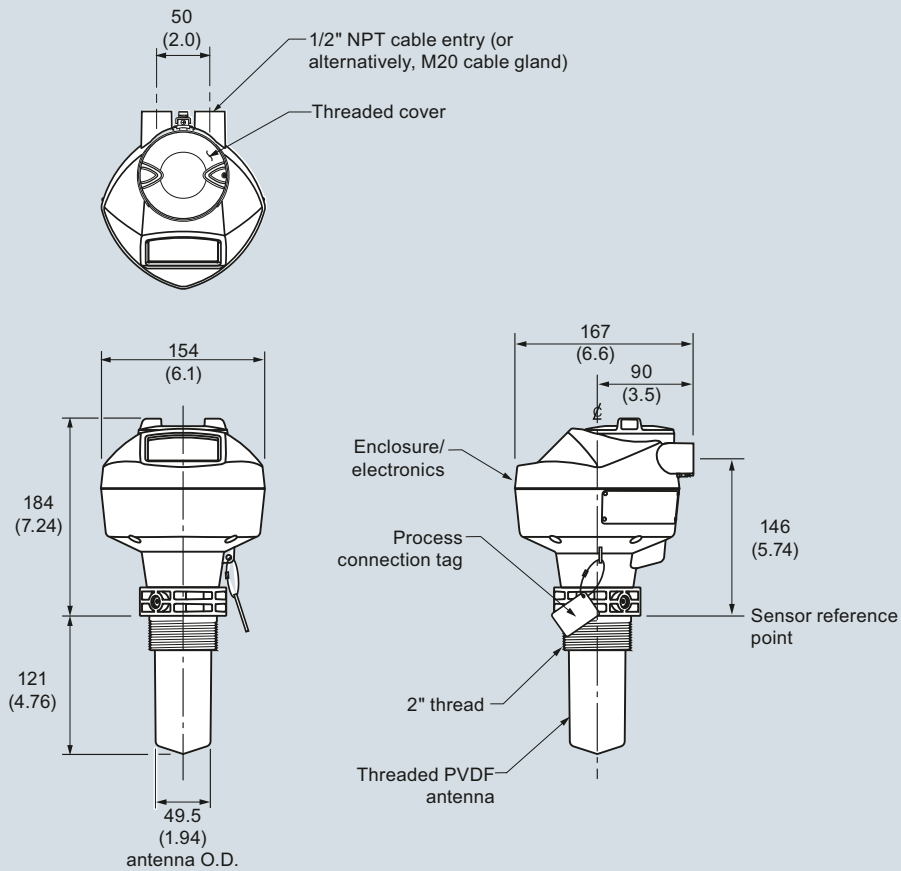
SITRANS LR250 PVDF Antenna pressure/temperature curve

Level Measurement

Continuous level measurement - Radar transmitters

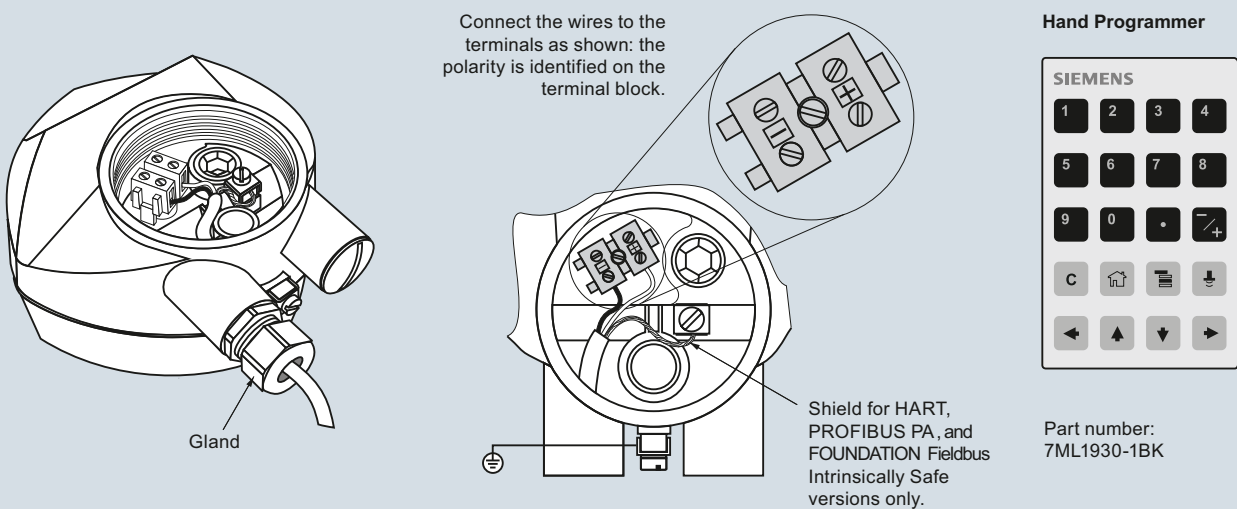
SITRANS LR250 threaded PVDF antenna

Dimensional drawings



SITRANS LR250 PVDF Antenna, dimensions in mm (inch)

Schematics



Notes:

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

Selection and ordering data

SITRANS LR250 threaded PVDF Specials

	Article No.
SITRANS LR250 threaded PVDF antenna version enclosures (PROFIBUS PA models)	
SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E03588171
SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E03588253
SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option B, with PROFIBUS PA communication, no process connection	A5E03588512
SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	A5E03589260
SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option D, with PROFIBUS PA communication, no process connection	A5E03589262
SITRANS LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection	A5E03589264
SITRANS LR250 threaded PVDF antenna version enclosures (FOUNDATION Fieldbus models)	
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E03589266
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E03589275
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection	A5E03589277
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	A5E03589280
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection	A5E03589281
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection	A5E03589283

SITRANS LR250 threaded PVDF Specials

	Article No.
SITRANS LR250 threaded PVDF antenna version enclosures (< 3.6 mA start-up HART models)	
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E03569747
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E03586807
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection	A5E03586854
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection	A5E03586887
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection	A5E03586961
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection	A5E03587012
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection	A5E03587132
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection	A5E03587223
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection	A5E03588125
SITRANS LR250 threaded PVDF antenna kits	
Antenna kit 2" NPT threaded PVDF	A5E03528941
Antenna kit 2" R (BSPT) threaded PVDF	A5E03528943
Antenna kit 2" G (BSPP) threaded PVDF	A5E03528947
Kit of hardware parts for LR250 threaded PVDF antenna: consists of O-rings, screws, wavewasher, and loctite	A5E03528948

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Overview



SITRANS LR250 with flanged encapsulated antenna is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including corrosives or aggressive materials, to a range of 20 m (66 ft) (antenna dependent).

SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 20 m (66 ft) on materials with $dk > 1.6$.

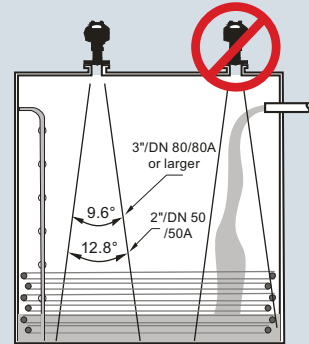
- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, temperatures to 170 °C (338 °F), corrosive and aggressive materials and applications where ease of cleaning is required such as food or fine chemicals

Configuration

Installation

Note:

- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



Benefits

- Fully encapsulated horn antenna design with FDA approved TFM 1600 PTFE lens for use in chemical and sanitary environments where aggressive and corrosive materials are used
- Cost effective replacement for transmitters made of exotic materials
- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency and 50 mm (2 inch) process connection/antenna allow for easy mounting
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Short blanking distance for improved minimum measuring range to 50 mm (2 inch) from the end of the antenna
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools such as PACTware or Fieldcare via SITRANS DTM
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511
- Suitable for API 2350

Application

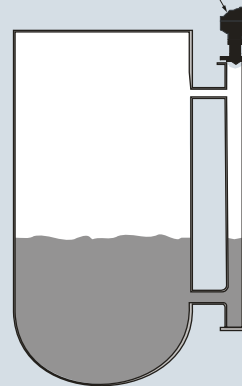
SITRANS LR250 includes a graphical local user interface (LUI) that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using Quick Start Wizard with a few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

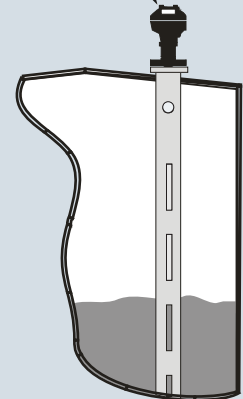
Mounting on bypass

Orient front or back of device toward vent.

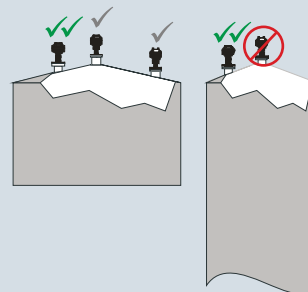


Mounting on stilling well

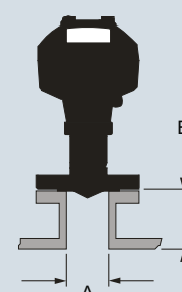
Orient front or back of device toward stillpipe slots.



Mounting on vessel



Mounting on a nozzle



A	B*
ø 50 (2)	500 (20) max.
ø 80 (3)	500 (20) max.
ø 100 (4)	500 (20) max.
ø 150 (6)	500 (20) max.

*Reference conditions

SITRANS LR250 Flanged Encapsulated Antenna installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Technical specifications

Mode of operation		Process connections	
Measuring principle	Radar level measurement	Flanged connection	Raised Face
Frequency	K-band (25.0 GHz)		<ul style="list-style-type: none"> • 2, 3, 4, 6" Class 150 ASME B16.5 • 50A, 80A, 100A, 150A 10K JIS B 2220 • DN 50, DN 80, DN 100 & DN 150 PN 10/16 EN 1092-1 type B1
Minimum measuring range	50 mm (2 inch) from end of antenna		
Maximum measuring range	20 m (66 ft)		
Output		Power supply	
HART	Version 5.1	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
<ul style="list-style-type: none"> • Analog output • Accuracy • Fail-safe 	4 ... 20 mA ± 0.02 mA <ul style="list-style-type: none"> • Programmable as high low or hold (loss of echo) • NE 43 programmable 	PROFIBUS PA	<ul style="list-style-type: none"> • 15 mA • Per IEC 61158-2
PROFIBUS PA	Profile 3.01	FOUNDATION Fieldbus	<ul style="list-style-type: none"> • 20.0 mA • Per IEC 61158-2
<ul style="list-style-type: none"> • Function blocks 	2 Analog Input (AI)		
FOUNDATION Fieldbus	H1	Certificates and approvals	
<ul style="list-style-type: none"> • Functionality • Version • Function blocks 	Basic or LAS ITK 5.2.0 2 Analog Input (AI)	General	CSA _{US/CA} , CE, FM, NE 21, RCM
Performance (according to reference conditions IEC60770-1)		Radio	FCC, Industry Canada, and Europe ETSI EN 302-372, RCM
Maximum measured error	<ul style="list-style-type: none"> • > 500 mm from sensor reference point: 3 mm (0.118 inch) • < 500 mm from sensor reference point: 25 mm (1 inch) 	Hazardous	
Influence of ambient temperature	< 0.003 %/K	<ul style="list-style-type: none"> • Explosion Proof (Brazil) 	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Rated operating conditions		<ul style="list-style-type: none"> • Increased Safety (Brazil) 	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Installation conditions		<ul style="list-style-type: none"> • Intrinsically Safe (Brazil) 	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
<ul style="list-style-type: none"> • Location 	Indoor/outdoor	<ul style="list-style-type: none"> • Explosion Proof (Canada/USA) 	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Ambient conditions (enclosure)		<ul style="list-style-type: none"> • Intrinsically Safe (Canada/USA) 	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
<ul style="list-style-type: none"> • Ambient temperature 	-40 ... +80 °C (-40 ... +176 °F)	<ul style="list-style-type: none"> • Non-incendive (Canada/USA) 	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
<ul style="list-style-type: none"> • Installation category 	I	<ul style="list-style-type: none"> • Flame Proof/Increased Safety (China) 	NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C
<ul style="list-style-type: none"> • Pollution degree 	4	<ul style="list-style-type: none"> • Intrinsically Safe (China) 	NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C
Medium conditions		<ul style="list-style-type: none"> • Non-sparking/Energy Limited (China) 	NEPSI Ex nA IIC T4 Gc
Dielectric constant ϵ_r	≥ 1.6 (antenna dependent)	<ul style="list-style-type: none"> • Intrinsically Safe (Europe) 	ATEX II 1G Ex ia IIC T4 Ga
Process temperature	-40 ... +170 °C (-40 ... +338 °F) at process connection	<ul style="list-style-type: none"> • Non-sparking/Energy Limited (Europe) 	ATEX II 1D Ex ia ta IIIC T100 °C Da
Process pressure	See Pressure/Temperature curves for more information (page 4/228)	<ul style="list-style-type: none"> • Flame Proof (International/Europe) 	ATEX II 3G Ex nA IIC T4 Gc
Design		<ul style="list-style-type: none"> • Increased Safety (International/Europe) 	IECEX/ATEX II 1/2 GD, 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da
Enclosure		<ul style="list-style-type: none"> • Intrinsically Safe (International) 	IECEX/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIIC T100 °C Da
<ul style="list-style-type: none"> • Material • Cable inlet 	Aluminum, polyester powder-coated 2 x M20 x 1.5 or 2 x 1/2" NPT	<ul style="list-style-type: none"> • Explosion Proof (Russia/Kazakhstan) • Increased Safety (Russia/Kazakhstan) • Intrinsically Safe (Russia/Kazakhstan) • Marine 	EAC Ex d
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68	<ul style="list-style-type: none"> • Functional Safety 	EAC Ex e
Weight (dependent on process connection)	<ul style="list-style-type: none"> • Approx. 7 kg (15.43 lb) for 2" Class 150 ASME B16.5 raised face flange (smallest size) • Approx. 17.7 kg (39.02 lb) for 6" Class 150 ASME B16.5 raised face flange (largest size) 		EAC Ex ia
Display (local)	Graphic local user interface including quick start wizard and echo profile display		<ul style="list-style-type: none"> • Lloyd's Register of Shipping • ABS Type Approval • Bureau Veritas
Antenna			SIL-2 suitable in accordance with IEC 61508/61511
<ul style="list-style-type: none"> • Material 	Stainless Steel 316L (1.4435 or 1.4404) and TFM 1600 PTFE Lens (lens is the only wetted part)		
<ul style="list-style-type: none"> • Dimensions (nominal sizes) 	48 mm (2 inch), 80 mm (3 inch), 100 mm (4 inch), 150 mm (6 inch)		

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Programming

Intrinsically Safe Siemens handheld programmer

- Approvals for handheld-programmer

Handheld communicator

PC

Display (local)

Infrared receiver


IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C
 T_a = -20... +50 °C CSA/FM Class I, II, III, Div. 1,
 Groups A, B, C, D, E, F, G, T6
 T_a = 50 °C IECEx SIR 09.0073


HART communicator 375/475

- SIMATIC PDM
- Emerson AMS
- SITRANS DTM (for connection into FDT such as PACTware or Field-care)

Graphic local user interface including quick start wizard and echo profile displays

Selection and Ordering data

SITRANS LR250 flanged encapsulated antenna  **7ML5432-**
 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft) (antenna dependant). Ideal for corrosive, aggressive and low dielectric media.













 Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Process Connection Material




Stainless steel 1.4404/1.4435

Process Connection Type




Flanged Process Connection Types
 (stainless steel 1.4404/1.4435)

- 2" Class 150 ASME B16.5 raised face¹⁾  **BF**
- 3" Class 150 ASME B16.5 raised face  **BG**
- 4" Class 150 ASME B16.5 raised face  **BH**
- 6" Class 150 ASME B16.5 raised face  **BJ**
- 50A 10K JIS B 2220 raised face¹⁾  **FD**
- 80A 10K JIS B 2220 raised face  **FE**
- 100A 10K JIS B 2220 raised face  **FF**
- 150A 10K JIS B 2220 raised face  **FG**
- DN 50 PN 10/16 EN 1092-1 type B1 raised face¹⁾  **GA**
- DN 80 PN 10/16 EN 1092-1 type B1 raised face  **GB**
- DN 100 PN 10/16 EN 1092-1 type B1 raised face  **GC**
- DN 150 PN 10/16 EN 1092-1 type B1 raised face  **GD**

Communication/Output

- PROFIBUS PA  **1**
- 4 ... 20 mA, HART, start-up at < 3.6 mA  **2**
- FOUNDATION Fieldbus  **3**













Enclosure/Cable inlet

- Aluminum, Epoxy painted  **0**
- 2 x 1/2" NPT  **1**
- 2 x M20 x 1.5  **1**

Antenna lens material

- TFM 1600 PTFE Flush Lens  **A**



Approvals

- General Purpose, CE, CSA, FM, FCC, R&TTE, RCM  **A**
- Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 FCC, Industry Canada  **B**
- Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM  **C**
- Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada  **D**
- Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, R&TTE, RCM  **E**
- Increased Safety: IECEx/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM²⁾  **F**
- Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM²⁾  **G**
- Explosion proof: CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada²⁾  **H**
- Non Sparking: NEPSI Ex nA IIC T4 Gc  **K**
- Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C  **L**
- Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C²⁾  **M**
- Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C²⁾  **N**

Pressure rating

- Rating per Pressure/Temperature curves in instruction manual  **0**

- 1) Maximum range 10 m (32.8 ft), dk > 3 [20 m (66 ft)] and dk > 1.6 when mounted in stillpipe]
- 2) Applicable with communication option 2 only

 We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs Please add *-Z to Article No. and specify Order code(s).			
Plug M12 with mating Connector ¹⁾²⁾³⁾	◆ A50	Compact Operating Instructions for FOUNDATION Fieldbus device English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian English, Portuguese (Brazil), Chinese Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	A5E33472700 A5E33472738 A5E34046626
Plug 7/8" with mating Connector ²⁾³⁾⁴⁾	◆ A55		
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	◆ Y15		
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	◆ C11	Other Operating Instructions SITRANS LR250 Functional Safety manual, English Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	A5E32286471
Material inspection Certificate Type 3.1 per EN 10204	◆ C12		
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ⁵⁾⁶⁾	◆ C20		
Namur NE43 compliant, device preset to failsafe < 3.6 mA ⁵⁾	◆ N07		
Compact Operating Instructions for HART/ mA device English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian English, Portuguese (Brazil), Chinese Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		Article No	
	A5E33469191		
	A5E33469171		
	A5E34046583		
Compact Operating Instructions for PROFIBUS PA device English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian English, Portuguese (Brazil), Chinese Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation			
	A5E33469239		
	A5E33472685		
	A5E34046624		
		Accessories Handheld programmer, Intrinsically safe, EEx ia HART modem/USB (for use with a PC and SIMATIC PDM) One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (2 are required) ⁶⁾ One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (2 are required) ²⁾ SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 For applicable back up point level switch - see point level measurement section	7ML1930-1BK 7MF4997-1DB 7ML1930-1AP 7ML1930-1AQ 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...
		¹⁾ Available with enclosure option 1 only ²⁾ Available with communication options 1 and 3 only ³⁾ Available with approval options A, B, C, and L only ⁴⁾ Available with enclosure option 0 only ⁵⁾ Applicable with communication option 2 only ⁶⁾ Available with approval options A, B, C, D, E, K, and L only	
		◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.	

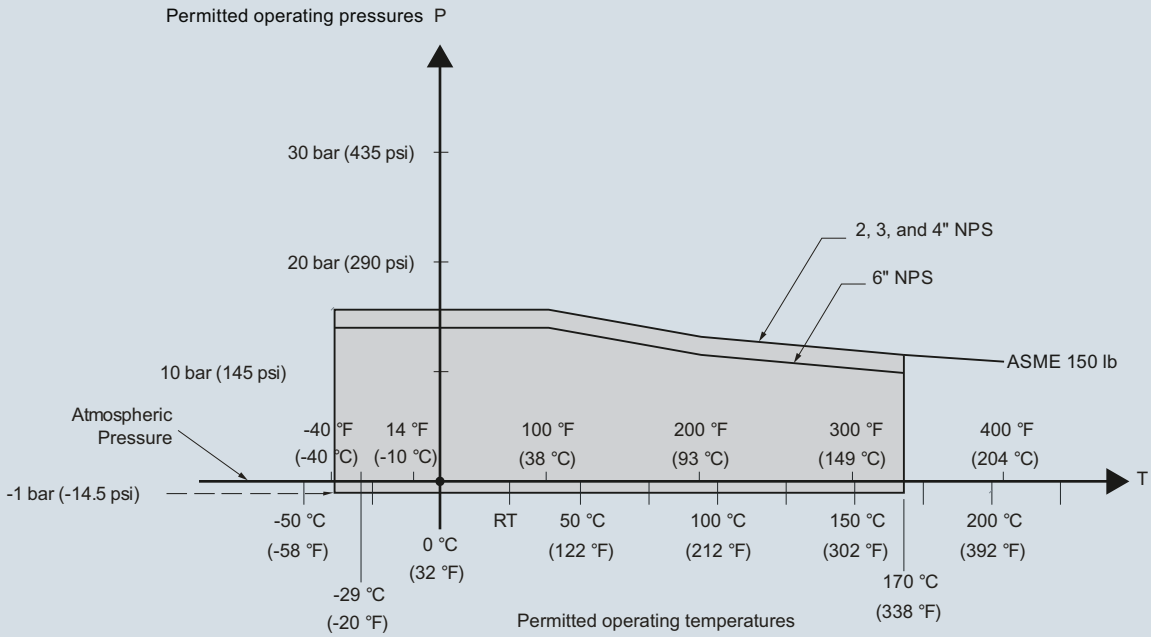
Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

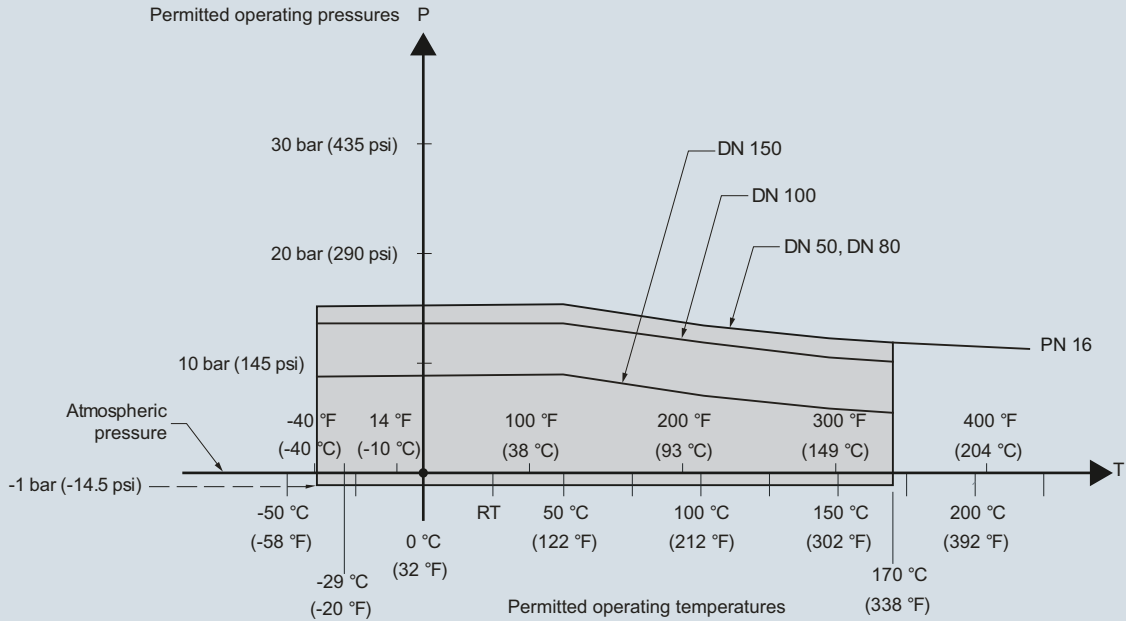
Characteristic curves

Pressure/ temperature curve
 LR250 Flanged Encapsulated Antenna
 ASME flanged process connections
 (7ML5432)



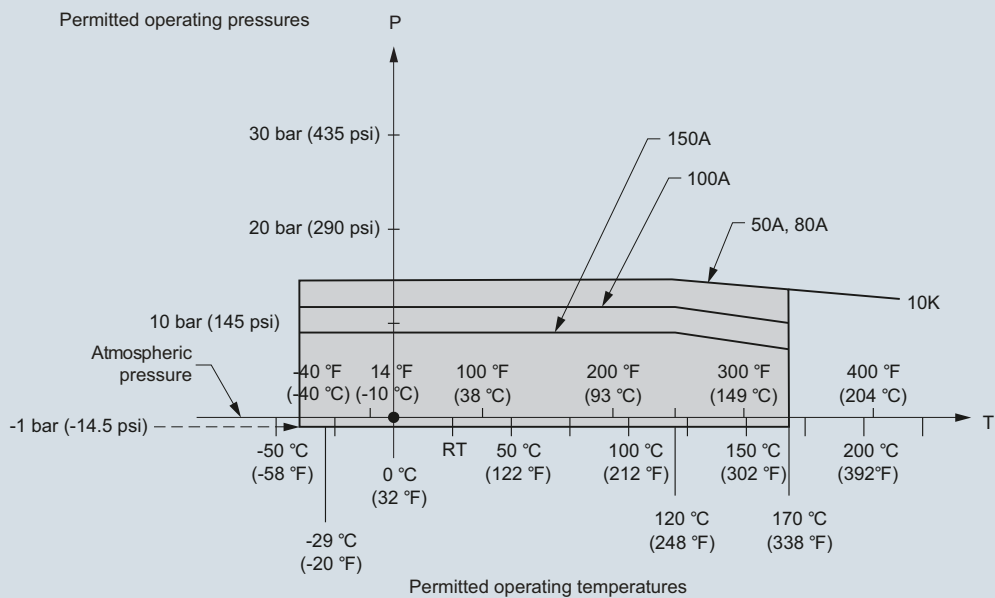
SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
EN 1092-1 flanged process connections
(7ML5432)



SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
JIS B 2220 flanged process connections
(7ML5432)



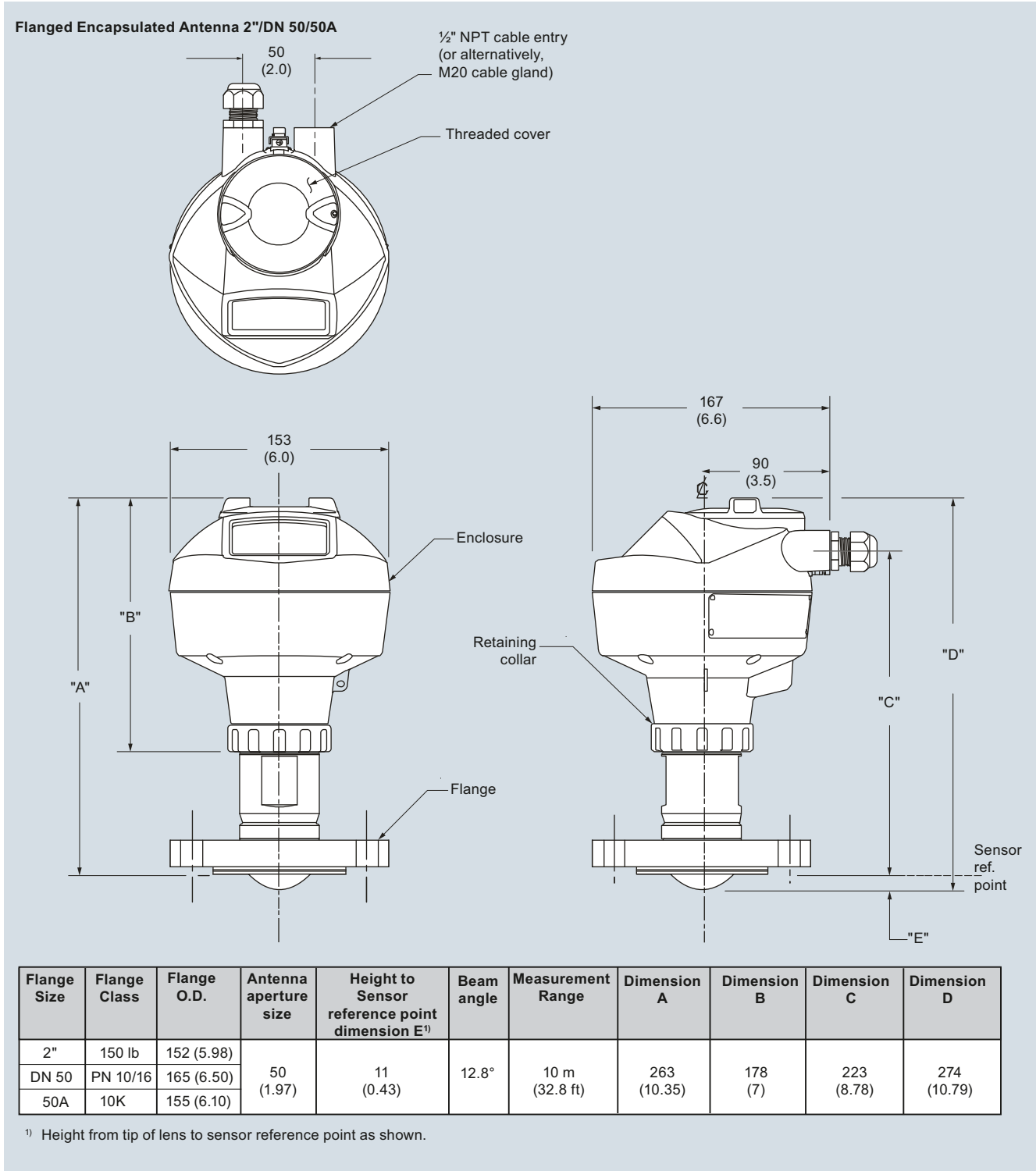
SITRANS LR250 Flanged Encapsulated Antenna pressure/temperature curve

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Dimensional drawings



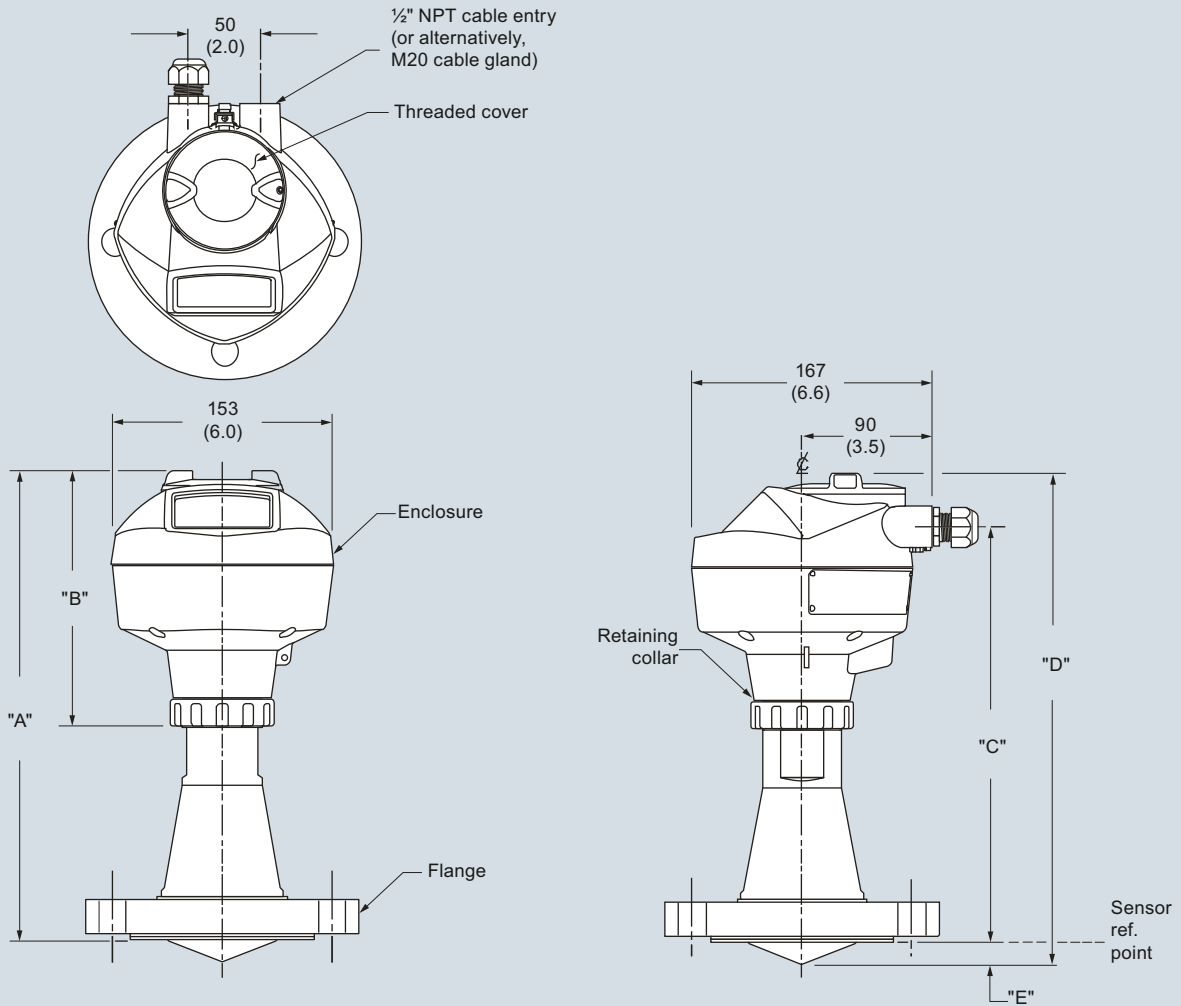
SITRANS LR250 Flanged Encapsulated Antenna, dimensions in mm (inch)

4

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Flanged Encapsulated Antenna 3"/DN 50/80A or greater



Flange Size	Flange Class	Flange O.D.	Antenna aperture size	Height to Sensor reference point dimension E ¹⁾	Beam angle	Measurement Range	Dimension A	Dimension B	Dimension C	Dimension D
3"	150 lb	190 (7.48)	75 (2.95)	15 (0.59)	9.6°	20 m (65.6 ft)	328 (12.91)	178 (7)	288 (11.34)	343 (13.54)
DN 80	PN 10/16	200 (7.87)								
80A	10K	185 (7.28)								
4"	150 lb	230 (9.06)	75 (2.95)	13 (0.51)	9.6°	20 m (65.6 ft)	328 (12.91)	178 (7)	288 (11.34)	343 (13.50)
DN 100	PN 10/16	220 (8.66)								
100A	10K	210 (8.27)								
6"	150 lb	280 (11.02)	75 (2.95)	15 (0.59)	9.6°	20 m (65.6 ft)	333 (13.11)	178 (7)	293 (11.54)	348 (13.70)
DN 150	PN 10/16	285 (11.25)								
150A	10K	280 (11.02)								

¹⁾ Height from tip of lens to sensor reference point as shown.

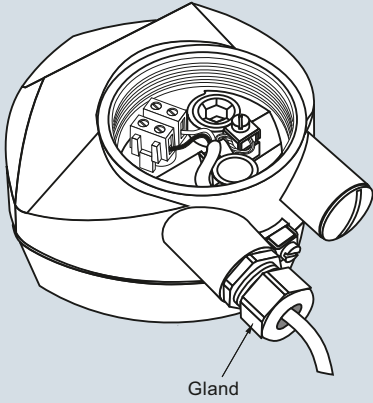
SITRANS LR250 Flanged Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

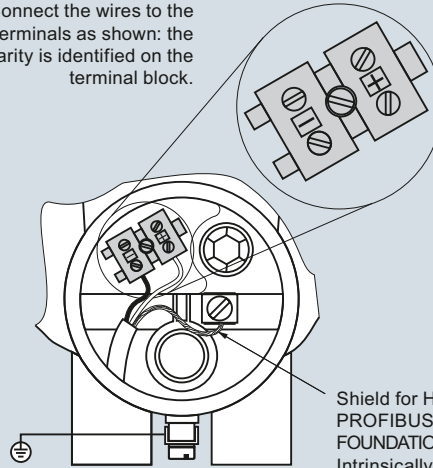
Continuous level measurement - Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

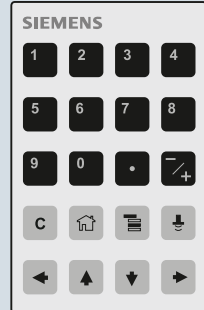
Schematics



Connect the wires to the terminals as shown: the polarity is identified on the terminal block.



Hand Programmer



Part number:
7ML1930-1BK

Notes:

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Flanged Encapsulated Specials

Selection and ordering data

SITRANS LR250 Flanged Encapsulated Specials

	Article No.
SITRANS LR250 flanged encapsulated antenna version enclosures (PROFIBUS PA models)	
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E32462853
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E32462854
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection	A5E32462855
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	A5E32462856
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection	A5E32462857
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection	A5E32462858
SITRANS LR250 flanged encapsulated antenna version enclosures (FOUNDATION Fieldbus models)	
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E32462859
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E32462860
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection	A5E32462861
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	A5E32462862
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection	A5E32462863
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection	A5E32462864
SITRANS LR250 flanged encapsulated antenna version enclosures (< 3.6 mA start-up HART models)	
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E32462865

SITRANS LR250 Flanged Encapsulated Specials

	Article No.
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E32462866
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection	A5E32462867
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection	A5E32462868
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection	A5E32462869
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection	A5E32462830
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection	A5E32462831
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection	A5E32462832
SITRANS LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection	A5E32462833
SITRANS LR250 flanged encapsulated antenna lens kits	
Replacement TFM 1600 Lens and Spring Washer Kit for 2" Class 150 ASME B16.5 raised face	A5E32462817
Replacement TFM 1600 Lens and Spring Washer Kit for 3" Class 150 ASME B16.5 raised face	A5E32462819
Replacement TFM 1600 Lens and Spring Washer Kit for 4" Class 150 ASME B16.5 raised face	A5E32462820
Replacement TFM 1600 Lens and Spring Washer Kit for 6" Class 150 ASME B16.5 raised face	A5E32462821
Replacement TFM 1600 Lens and Spring Washer Kit for 50A 10K JIS B 2220 raised face	A5E32462822
Replacement TFM 1600 Lens and Spring Washer Kit for 80A 10K JIS B 2220 raised face	A5E32462823
Replacement TFM 1600 Lens and Spring Washer Kit for 100A 10K JIS B 2220 raised face	A5E32462824
Replacement TFM 1600 Lens and Spring Washer Kit for 150A 10K JIS B 2220 raised face	A5E32462825
Replacement TFM 1600 Lens and Spring Washer Kit for DN 50 PN 10/16 EN 1092-1 type B1 raised face	A5E32462826
Replacement TFM 1600 Lens and Spring Washer Kit for DN 80 PN 10/16 EN 1092-1 type B1 raised face	A5E32462827
Replacement TFM 1600 Lens and Spring Washer Kit for DN 100 PN 10/16 EN 1092-1 type B1 raised face	A5E32462828
Replacement TFM 1600 Lens and Spring Washer Kit for DN 150 PN 10/16 EN 1092-1 type B1 raised face	A5E32462829

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Overview



The SITRANS LR250 Hygienic Encapsulated Antenna is a 2-wire 25 GHz pulse radar level transmitter with sanitary and hygienic approvals for continuous monitoring of liquids, slurries, and pastes within the food, beverage, chemical, and pharmaceutical industries to a range of 20 m (66 ft) (antenna dependent).

Picture shown with accessories sold separately.

Benefits

- Fully encapsulated horn antenna design with FDA approved and USP Class VI compliant, TFM 1600 PTFE lens
- $< 0.8 \mu$ Ra surface finish for maximum cleanability and hygiene requirements commonly required in sanitary environments
- Chemically resistant TFM 1600 PTFE lens is also suitable for aggressive or corrosive materials
- Approved device in accordance with 3-A, EHEDG EL Class I and/or EHEDG EL Aseptic Class I
- Cost effective replacement for transmitters made of exotic materials
- Graphical local user interface (LUI) makes operation simple with plug-and-play set-up using the intuitive Quick Start Wizard
- Industry standard process connections including ISO 2852, DIN 11851, DIN 11864-1, DIN 11864-2, DIN 11864-3, and Tuchenhagen Varivent Type F and N
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency and 2 inch (50 mm) process connection/antenna allow for easy mounting
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsicly Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools, such as PACTware or Fieldcare via SITRANS DTM.
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511

Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves set-up and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using the Quick Start wizard with few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsicly Safe handheld programmer without having to open the instrument's lid.

SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 20 m (66 ft) on materials with $dk > 1.6$.

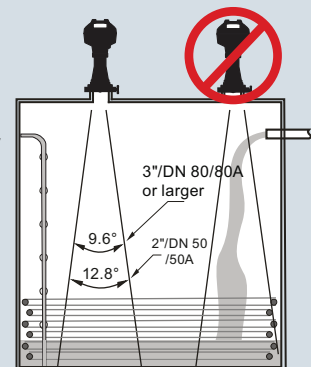
- Key Applications: applications within the food, beverage, chemical and pharmaceutical industries where sanitary, aseptic, or hygienic approvals are required or easy install/clean flush antennas are preferable, such as ice cream, fruit juice, milk, beer, and pharmaceutical or chemical additives and ingredients.

Configuration

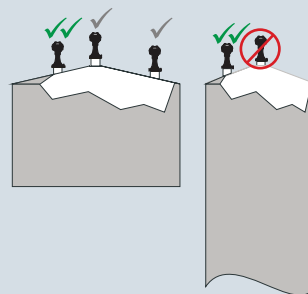
Installation

Note:

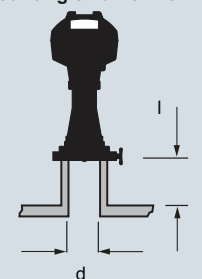
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



Mounting on vessel



Mounting on a nozzle



Nozzles should be maximum l/d ratio 1:1 (Eg. 50 mm length, 50 mm diameter)

LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Technical specifications

Mode of Operation		Process connections	
Measuring principle	Radar level measurement	Hygienic/Sanitary connections	<ul style="list-style-type: none"> • 2", 3" & 4" Sanitary Clamp according to ISO 2852 • DN 50, DN 80 & DN 100 Aseptic/Hygienic threaded to DIN 11864-1 [Form A] • DN 50, DN 80 & DN 100 Aseptic/Hygienic flanged to DIN 11864-2 [Form A] • DN 50, DN 80 & DN 100 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A] • DN 50, DN 80 & DN 100 Hygienic Union according to DIN 11851 • Type F (50 mm) & Type N (68 mm) Tuchenhausen Varivent
Frequency	K-band (25.0 GHz)		
Minimum measuring range	50 mm (2 inch) from end of antenna		
Maximum measuring range	20 m (66 ft)		
Output		Power supply	
HART	Version 5.1	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
• Analog output	4 ... 20 mA	PROFIBUS PA	<ul style="list-style-type: none"> • 15 mA • Per IEC 61158-2
• Accuracy	± 0.02 mA	FOUNDATION Fieldbus	<ul style="list-style-type: none"> • 20.0 mA • Per IEC 61158-2
• Fail-safe	<ul style="list-style-type: none"> • Programmable as high low or hold (loss of echo) • NE 43 programmable 		
PROFIBUS PA	Profile 3.01		
• Function blocks	2 Analog Input (AI)		
FOUNDATION Fieldbus	H1		
• Functionality	Basic or LAS		
• Version	ITK 5.2.0		
• Function blocks	2 Analog Input (AI)		
Performance (according to reference conditions IEC60770-1)		Certificates and approvals	
Maximum measured error	<ul style="list-style-type: none"> • > 500 mm from sensor reference point: 3 mm (0.118 inch) • < 500 mm from sensor reference point: 25 mm (1 inch) 	General	CSA _{US/C} , CE, FM, NE 21, RCM
Influence of ambient temperature	< 0.003 %/K	Radio	FCC, Industry Canada and Europe ETSI EN 302-372, RCM
Rated operating conditions		Hazardous	
Installation conditions		• Explosion Proof (Brazil)	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Location	Indoor/outdoor	• Increased Safety (Brazil)	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Ambient conditions (enclosure)		• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	• Explosion Proof (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Installation category	I	• Intrinsically Safe (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Pollution degree	4	• Non-incendive (Canada/USA)	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
Medium conditions		• Flame Proof/Increased Safety (China)	NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex ia d tD A20 IP67 T100 °C
Dielectric constant ϵ_r	≥ 1.6 (antenna dependent)	• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex ia d tD A20 IP67 T100 °C
Process temperature	-40 ... +170 °C (-40 ... +338 °F) at process connection	• Non-sparking (China)	NEPSI Ex nA IIC T4 Gc
Process pressure	See Pressure/Temperature curves for more information	• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia ta IIIC T100 °C Da
Design		• Non-sparking (Europe)	ATEX II 3G Ex nA IIC T4 Gc
Enclosure		• Flame Proof (International/Europe)	IECEX/ATEX II 1/2 GD, 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da
• Material	Aluminum, polyester powder coated	• Increased Safety (International/Europe)	IECEX/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Cable inlet	2 x M20 x 1.5 or 2 x 1/2" NPT	• Intrinsically Safe (International)	IECEX/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIIC T100 °C Da
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68	• Explosion Proof (Russia/Kazakhstan)	EAC Ex d
Weight (dependent on process connection)	<ul style="list-style-type: none"> • Approx. 4.7 kg (10.4 lb) for 2" ISO 2852 (smallest size) • Approx. 7.9 kg (17.4 lb) for DN 100 DIN 11864-2 (largest size) 	• Increased Safety (Russia/Kazakhstan)	EAC Ex e
Display (local)	Graphic local user interface including quick start wizard and echo profile display	• Intrinsically Safe (Russia/Kazakhstan)	EAC Ex ia
Antenna		Hygienic/Sanitary	EHEDG EL Class I EHEDG EL Aseptic Class I
• Material	Stainless steel 316L (1.4435 or 1.4404) and TFM 1600 PTFE Lens (lens is the only wetted part)		
• Lens surface finish (R_a)	0.8 μm		

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Programming

Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld programmer	IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C Ta = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = 50 °C IECEX SIR 09.0073
Handheld communicator	HART communicator 375/475
PC	<ul style="list-style-type: none"> • SIMATIC PDM • Emerson AMS • SITRANS DTM (for connection into FDT, such as PACTware or Field-care)
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Selection and Ordering data	Article No.
SITRANS LR250 hygienic encapsulated antenna	7ML5433-
2-wire, 25 Ghz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, up to a range of 20 m (66 ft) (Antenna dependant). Ideal for Hygienic applications including small vessels and low dielectric media.	0 - A
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Hygienic/Sanitary Approvals	
EHEDG EL Class I ¹⁾	1
EHEDG EL Aseptic Class I ¹⁾	2
3-A (Tuchenhagen connections only - FC ... FF) ²⁾³⁾	3
EHEDG EL Class I & 3-A (excludes Tuchenhagen connections) ²⁾⁴⁾	4
Process Connection Types (all types have TFM1600 PTFE lens)	
<u>316L st/st [1.4435 or 1.4404]</u>	
2" Sanitary Clamp according to ISO 2852 ⁵⁾	AA
3" Sanitary Clamp according to ISO 2852	AB
4" Sanitary Clamp according to ISO 2852	AC
<u>316L st/st (1.4435 or 1.4404) & 304L st/st (1.4301)</u>	
DN 50 Aseptic/Hygienic nozzle/ slotted nut (instrument side) to DIN 11864-1 [Form A] ⁵⁾	BA
DN 80 Aseptic/Hygienic nozzle/ slotted nut (instrument side) to DIN 11864-1 [Form A]	BB
DN 100 Aseptic/Hygienic nozzle/ slotted nut (instrument side) to DIN 11864-1 [Form A]	BC
<u>316L st/st [1.4435 or 1.4404]</u>	
DN 50 Aseptic/Hygienic flanged to DIN 11864-2 [Form A] ⁵⁾	CA
DN 80 Aseptic/Hygienic flanged to DIN 11864-2 [Form A]	CB
DN 100 Aseptic/Hygienic flanged to DIN 11864-2 [Form A]	CC
<u>316L st/st [1.4435 or 1.4404]</u>	
DN 50 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A] ⁵⁾	DA
DN 80 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A]	DB
DN 100 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A]	DC
<u>316L st/st (1.4435 or 1.4404) & 304L st/st (1.4301)</u>	
DN 50 Hygienic nozzle/ slotted nut (instrument side) to DIN 11851 ⁵⁾	EA
DN 80 Hygienic nozzle/ slotted nut (instrument side) to DIN 11851	EB
DN 100 Hygienic nozzle/ slotted nut (instrument side) to DIN 11851	EC
<u>316L st/st [1.4435 or 1.4404]</u>	
Type F (50 mm) Tuchenhagen Varivent (EHEDG only) ⁵⁾	FA
Type N (68 mm) Tuchenhagen Varivent (EHEDG only) ⁵⁾	FB
Type F (50 mm) Tuchenhagen Varivent [3-A only & EPDM process seal -40 ... 120 °C (-40 ... 248 °F)] ⁵⁾	FC
Type N (68 mm) Tuchenhagen Varivent [3-A only & EPDM process seal -40 ... 120 °C (-40 ... 248 °F)] ⁵⁾	FD
Type F (50 mm) Tuchenhagen Varivent [3-A only & FKM process seal -20 ... 170 °C (-4 ... 338 °F)] ⁵⁾	FE
Type N (68 mm) Tuchenhagen Varivent [3-A only & FKM process seal -20 ... 170 °C (-4 ... 338 °F)] ⁵⁾	FF
EXCLUDE Process Connection - Electronics Head assembly spare only (select all other options as normal)	YY

Selection and Ordering data	Article No.
SITRANS LR250 hygienic encapsulated antenna	7ML5433-
2-wire, 25 Ghz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, up to a range of 20 m (66 ft) (Antenna dependant). Ideal for Hygienic applications including small vessels and low dielectric media.	0 - A
Communication	
PROFIBUS PA	1
4 ... 20 mA HART, start-up at < 3.6 mA	2
FOUNDATION Fieldbus	3
Enclosure (with Cable Inlets)	
Aluminum, Epoxy paint, 2 X 1/2" NPT	0
Aluminum, Epoxy paint, 2 X M20 x 1.5	1
Approvals	
General Purpose, CE, CSA, FM, FCC, R&TTE, RCM	A
Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 FCC, Industry Canada	B
Intrinsically Safe: IECEx/ATEX II 1 GD Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM	C
Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada	D
Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, R&TTE, RCM	E
Increased Safety: IECEx/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ⁶⁾	F
Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ⁶⁾	G
Explosion proof: CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada ⁶⁾	H
Non Sparking: NEPSI Ex nA IIC T4 Gc	K
Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD tD A20 IP67 T100 °C	L
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C ⁶⁾	M
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD tD A20 IP67 T100 °C ⁶⁾	N
Pressure Rating	
Rating per pressure/temperature curves in instruction manual	0

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.

Level Measurement

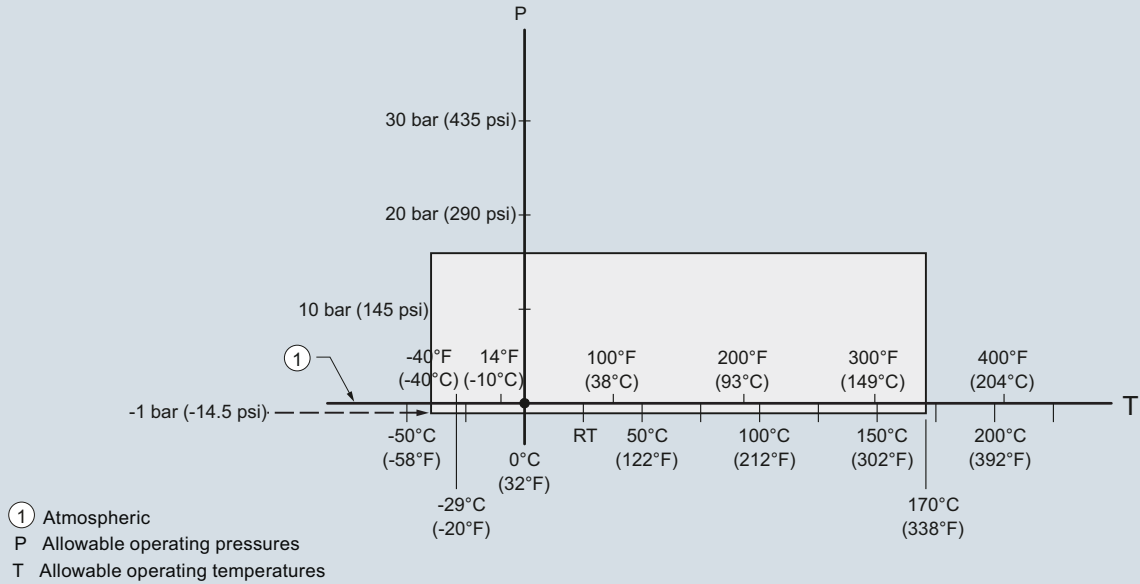
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs		Compact Operating Instructions for FOUNDATION Fieldbus device	
Please add "-Z" to Article No. and specify Order code(s).		English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33472700
Electrical Connection cable entry:		English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33472738
Plug M12 (IP 67 rating) with mating connector ²⁾⁷⁾⁸⁾	A50	English, Portuguese (Brazil), Chinese	A5E34046626
Plug 7/8" (IP 67 rating) with mating Connector ²⁾⁸⁾⁹⁾	A55	Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Test Certificates		Other Operating Instructions	
Manufacturer's Test Certificate M to DIN 55350, Part 18 and to ISO 9000	C11	SITRANS LR250 Functional Safety manual, English	A5E32286471
Material inspection Certificate 3.1 of EN 10204	C12	Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Functional Safety		Accessories	
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ⁶⁾¹⁰⁾	C20	Handheld programmer, Intrinsically safe, EEx ia (LUI enabled)	7ML1930-1BK
Namur		HART modem/USB (for use with a PC and SIMATIC PDM)	7MF4997-1DB
Namur NE43 compliant, device preset to failsafe < 3.6 mA ⁶⁾	N07	One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required) ⁶⁾	7ML1930-1AP
Tagging		One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (two are required) ⁸⁾	7ML1930-1AQ
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]	Y15	SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
Measuring-point number / identification (max. 27 characters) specify in plain text		SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
Compact Operating Instructions for HART/ mA device	Article No.	SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33469191	SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33469171	For applicable back up point level switch - see point level measurement section	
English, Portuguese (Brazil), Chinese	A5E34046583	◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.	
Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		1) Available with process connection options AA ... FB & YY only	
Compact Operating Instructions for PROFIBUS PA device		2) Available with Approval options A, B, C, L only	
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33469239	3) Available with Process connections FC ... FF only	
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33472685	4) Available with process connection options AA ... EC & YY only	
English, Portuguese (Brazil), Chinese	A5E34046624	5) Max. range 10 m (32.8 ft), dk > 3 [20 m (66 ft) and dk > 1.6 if installed in a stillpipe]	
Note: The Operating Instructions should be ordered as a separate line item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		6) Applicable with Communication option 2 only	
		7) Available with Enclosure option 1 only	
		8) Available with Communication options 1 and 3 only	
		9) Available with Enclosure option 0 only	
		10) Available with Approval options A, B, C, D, E, K, L only	

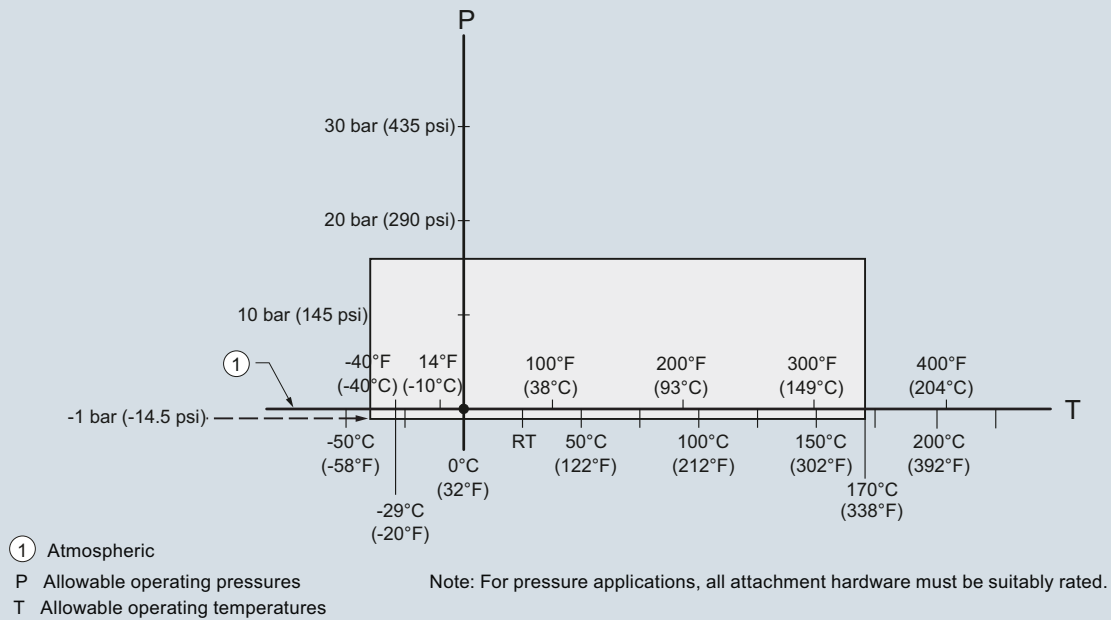
Characteristic curves

DIN 11851 Sanitary/Hygienic nozzle/slotted nut: DN 50, DN 80, and DN 100
 DIN 11864-1 Aseptic/Hygienic nozzle/slotted nut: DN 50, DN 80, and DN 100



SITRANS LR250 Hygienic Encapsulated Antenna, allowable operating temperatures and pressures, DIN 11851 Sanitary/Hygienic nozzle/slotted nut: DN 50, DN 80, and DN 100

DIN 11864-2 Aseptic/Hygienic flanged: DN 50, DN 80, and DN 100



SITRANS LR250, Hygienic Encapsulated Antenna, allowable pressures and temperatures, DIN 11864-2 Aseptic/Hygienic flanged: DN 50, DN 80, and DN 100

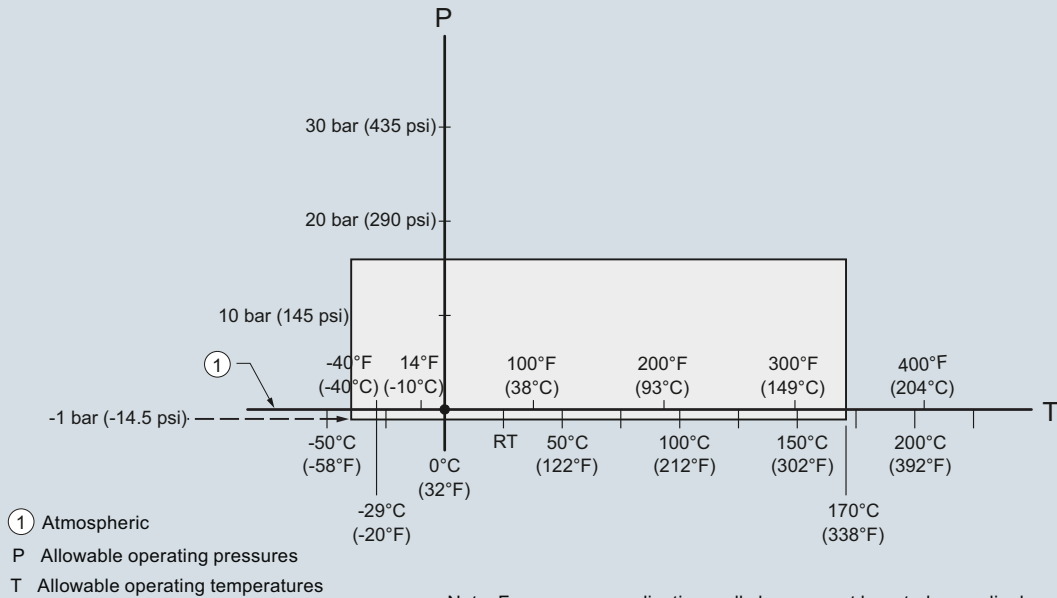
Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

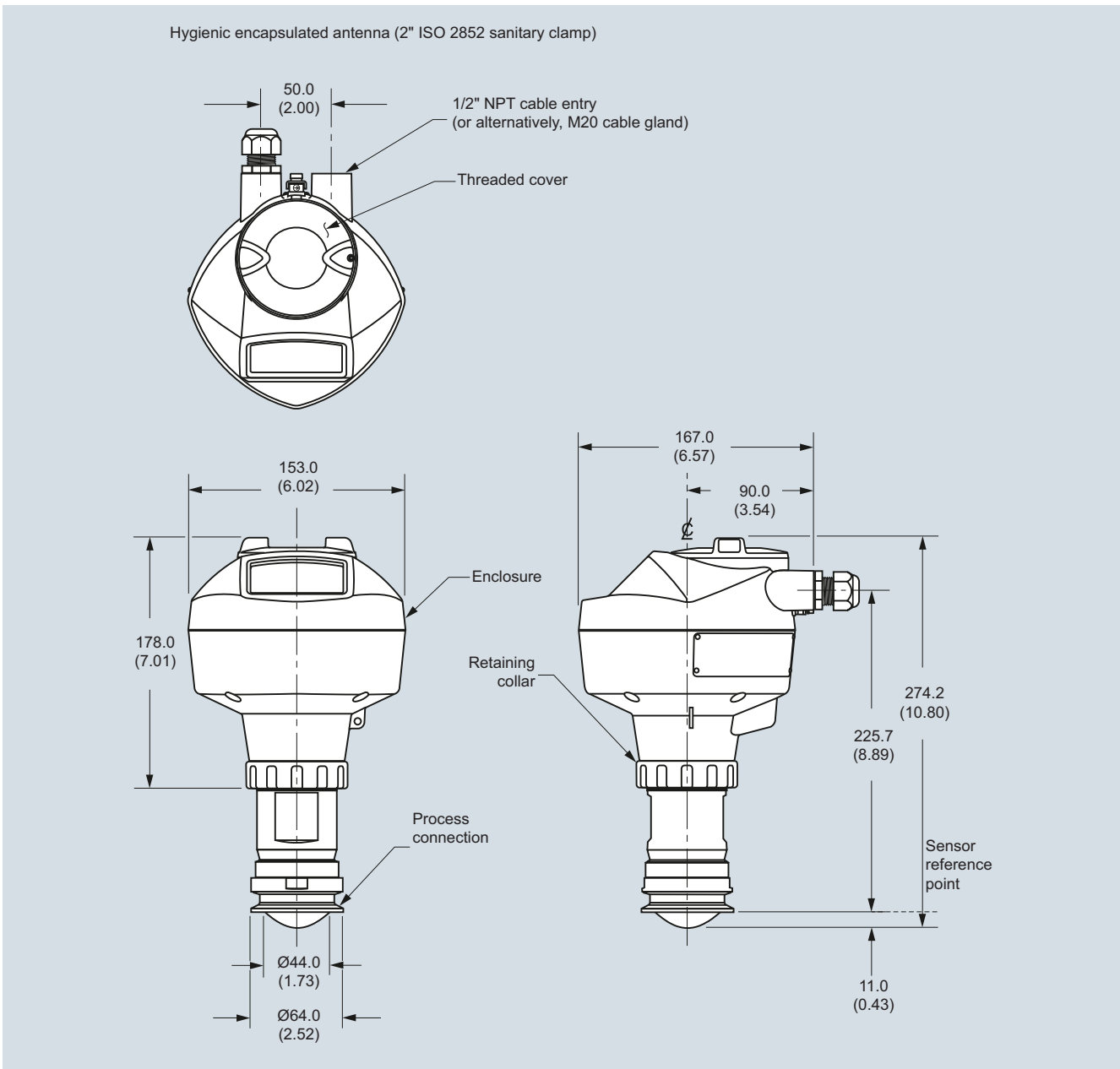
DIN 11864-3 Aseptic/Hygienic clamp: DN 50, DN 80, and DN 100
 ISO 2852 Sanitary/Hygienic clamp: 2", 3", and 4"
 Tuohenhagen Varivent face seal clamp: Type N (68 mm) and Type F (50 mm)

4



SITRANS LR250 Hygienic Encapsulated Antenna, allowable pressures and temperatures, DIN 11864-3 Aseptic/Hygienic clamp: DN 50, DN 80, and DN 100

Dimensional drawings



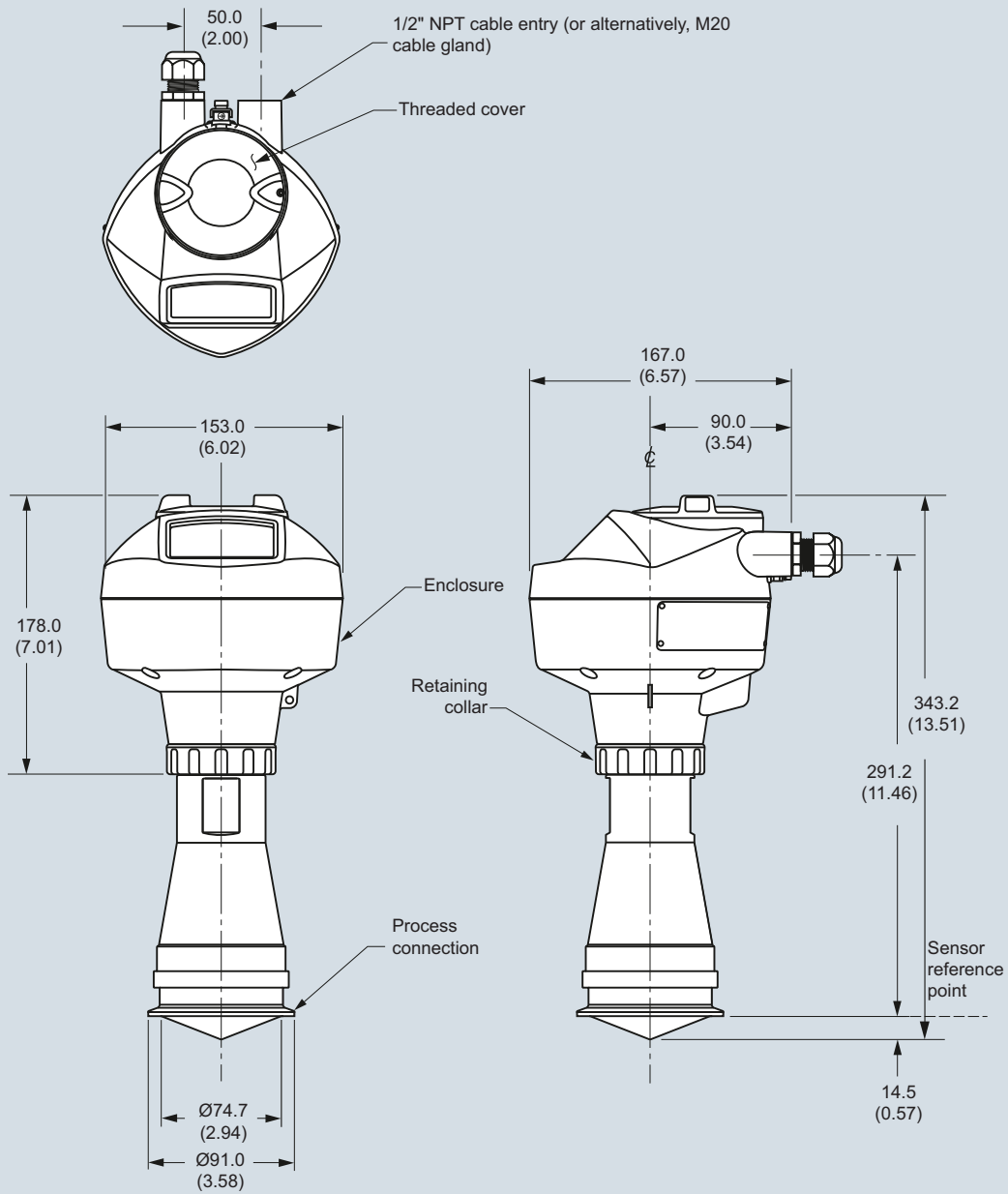
SITRANS LR250 Hygienic Encapsulated Antenna (2" ISO 2852 sanitary clamp), dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (3" ISO 2852 sanitary clamp)

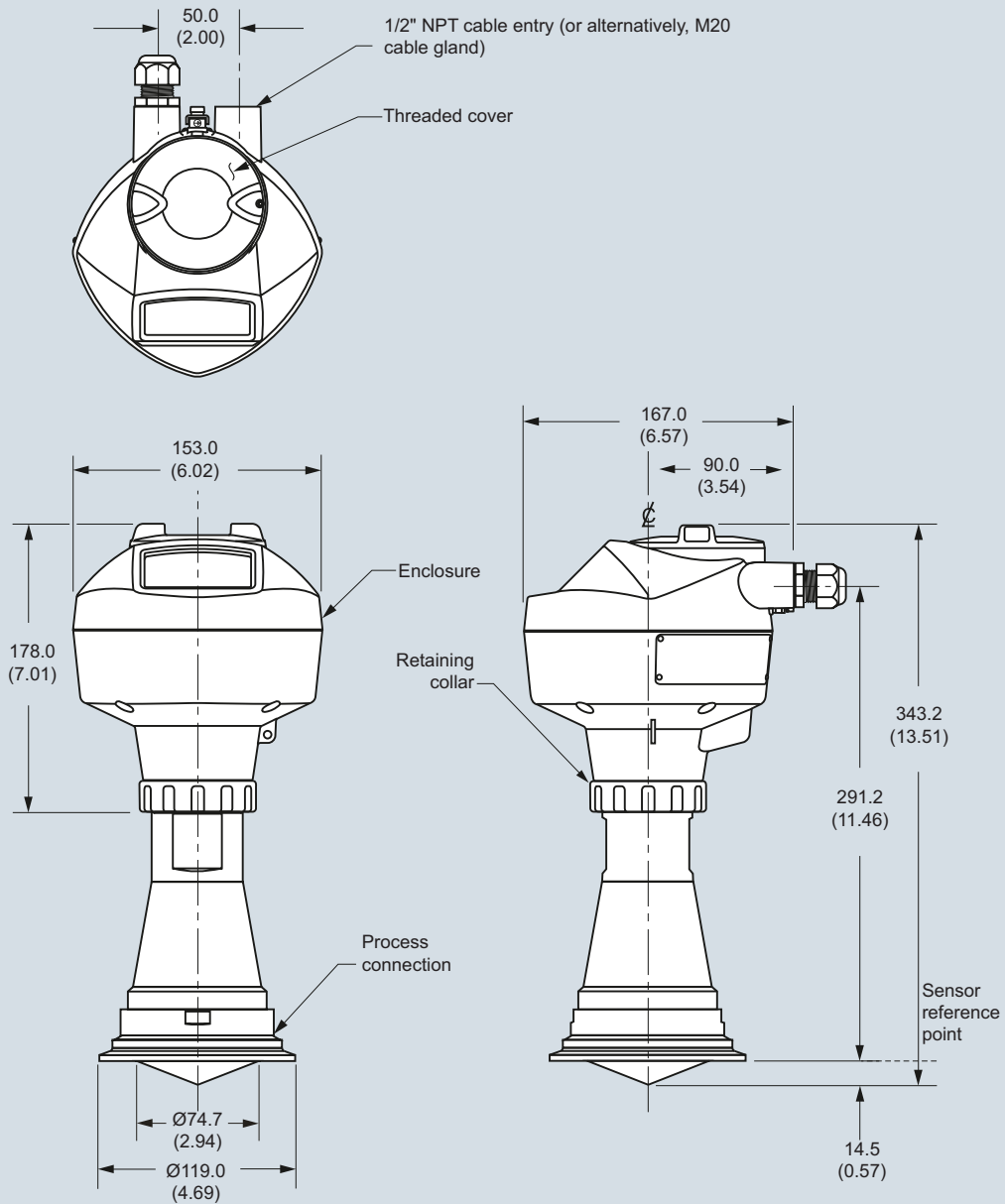


SITRANS LR250 Hygienic Encapsulated Antenna (3" ISO 2852 sanitary clamp), dimensions in mm (inch)

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (4" ISO 2852 sanitary clamp)



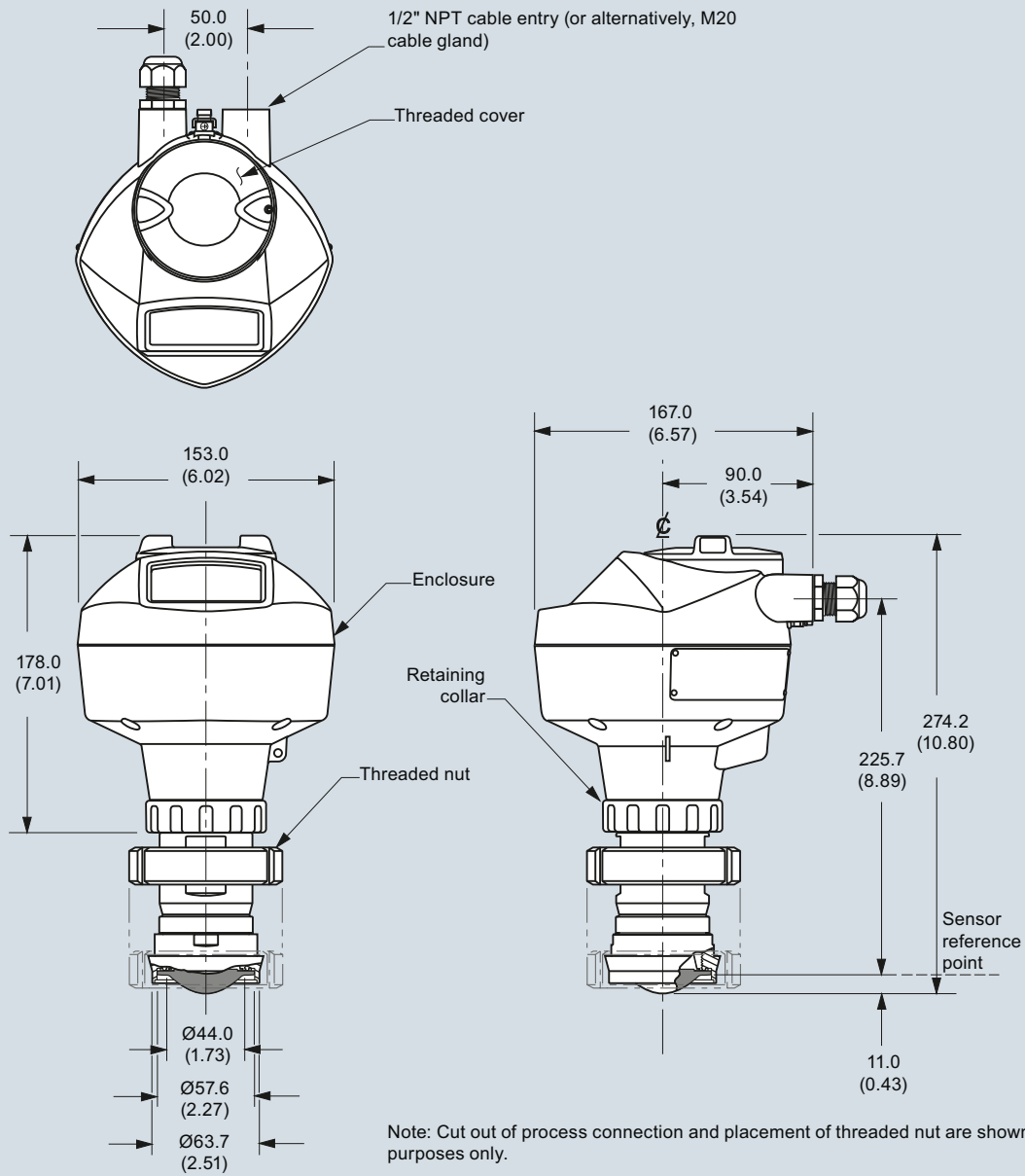
SITRANS LR250 Hygienic Encapsulated Antenna (4" ISO 2852 sanitary clamp), dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 50 nozzle/slotted nut to DIN 11851)

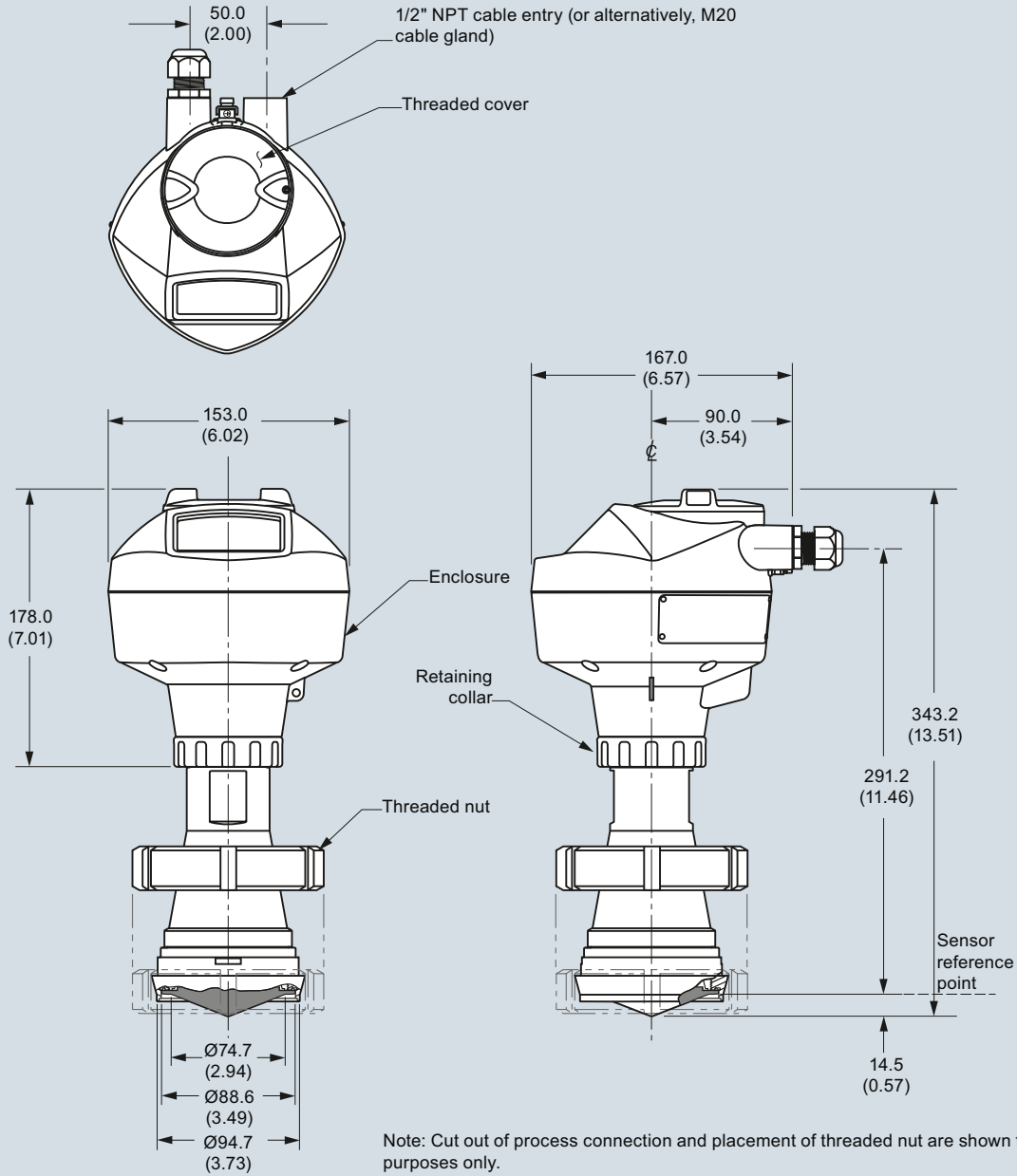


SITRANS LR250 Hygienic Encapsulated Antenna (DN 50 nozzle/slotted nut to DIN 11851), dimensions in mm (inch)

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 80 nozzle/slotted nut to DIN 11851)



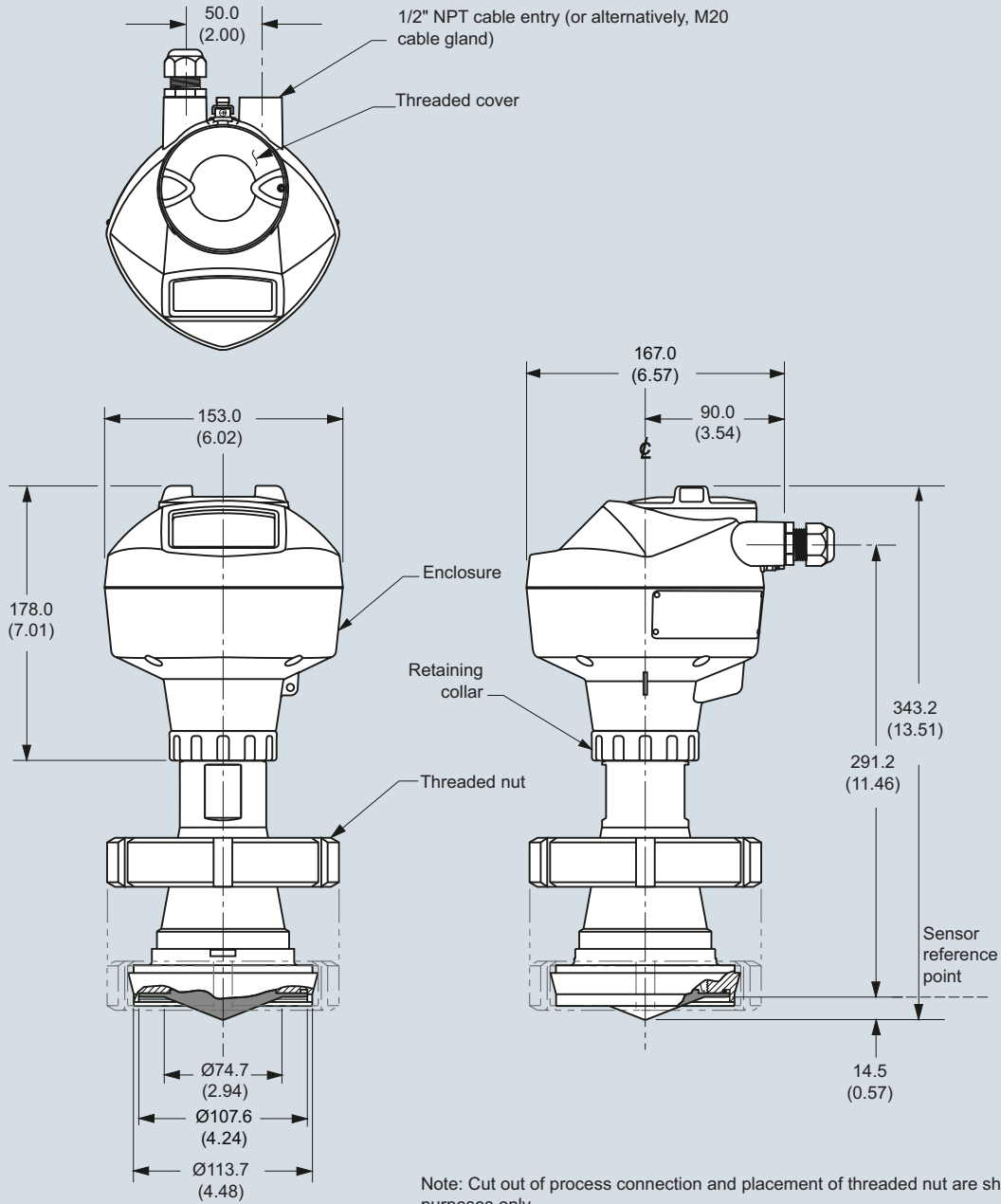
SITRANS LR250 Hygienic Encapsulated Antenna (DN 80 nozzle/slotted nut to DIN 11851), dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 100 nozzle/slotted nut to DIN 11851)

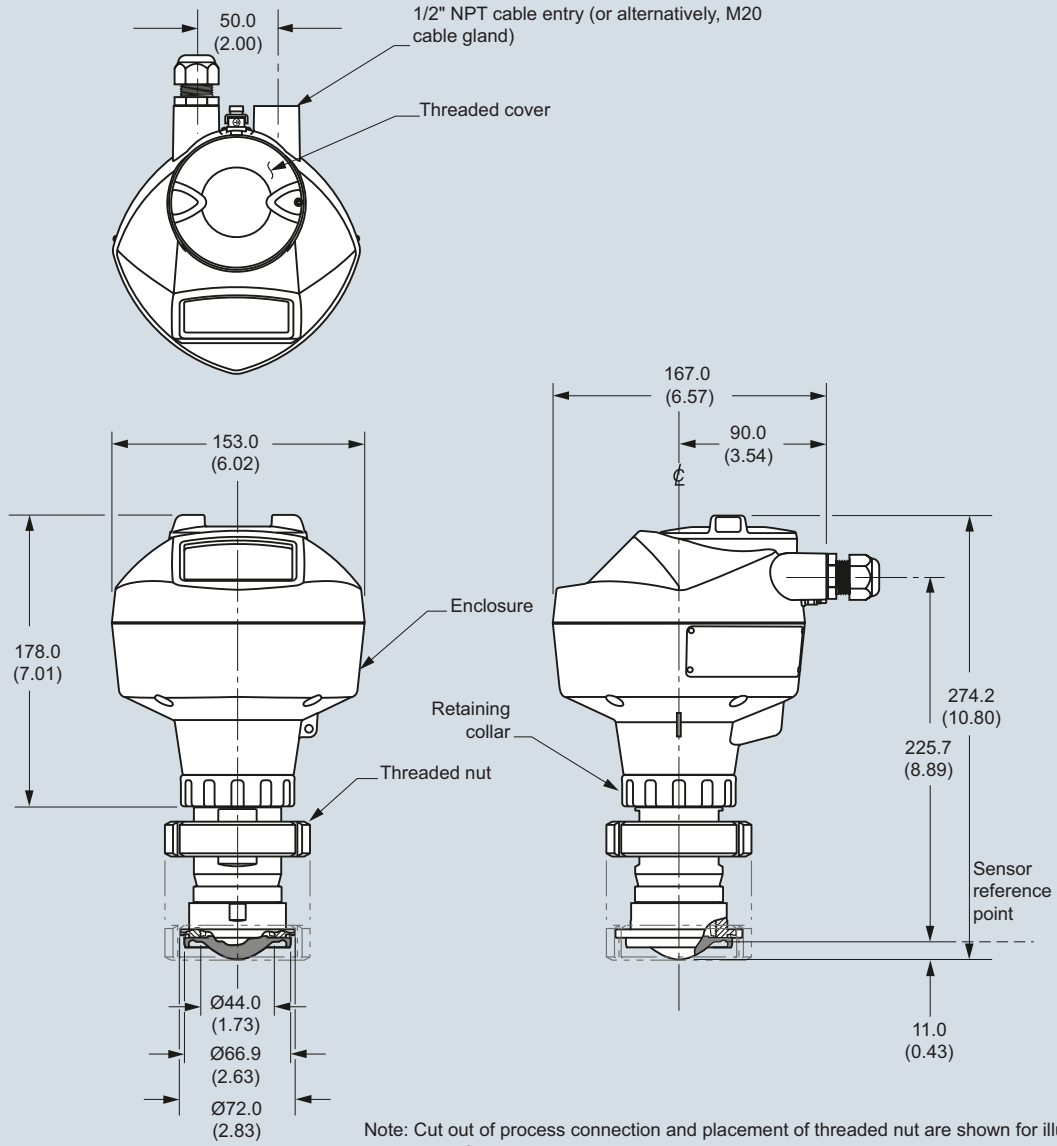


SITRANS LR250 Hygienic Encapsulated Antenna (DN 100 nozzle/slotted nut to DIN 11851), dimensions in mm (inch)

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 50 aseptic clamp to DIN 11864-1)



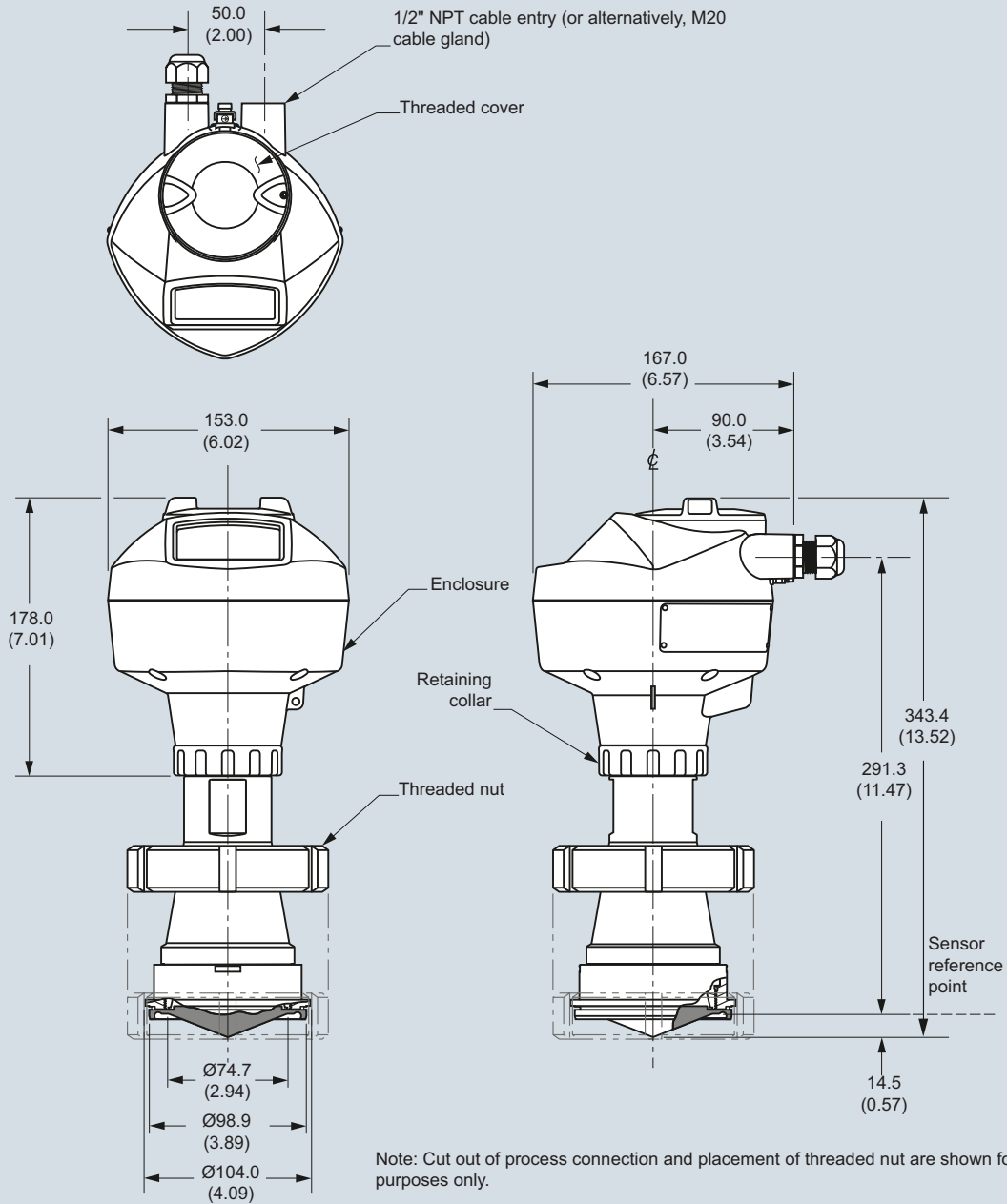
SITRANS LR250 Hygienic Encapsulated Antenna (DN 50 aseptic clamp to DIN 11864-1), dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 80 aseptic clamp to DIN 11864-1)

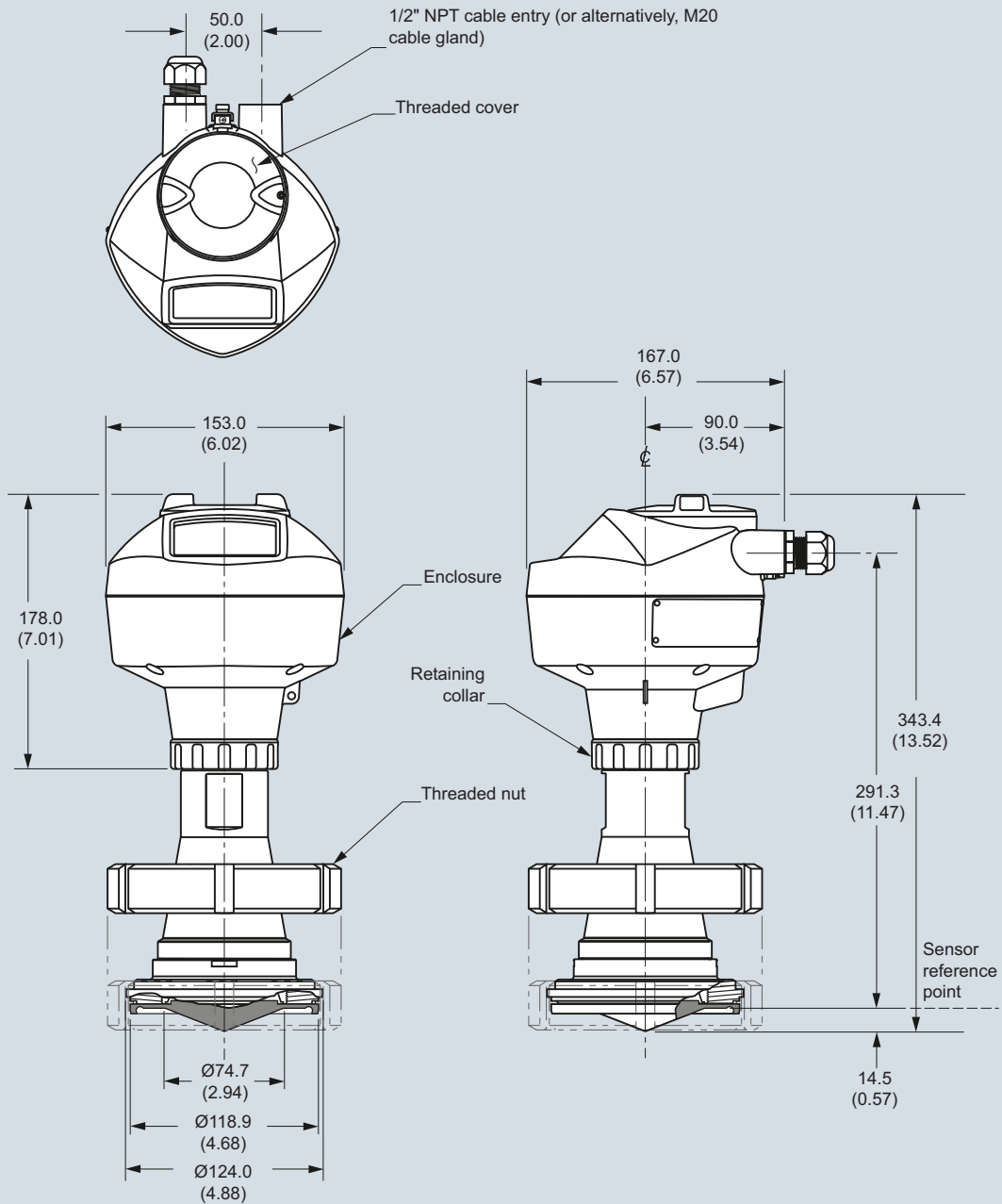


SITRANS LR250 Hygienic Encapsulated Antenna (DN 80 aseptic clamp to DIN 11864-1), dimensions in mm (inch)

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 100 aseptic clamp to DIN 11864-1)



Note: Cut out of process connection and placement of threaded nut are shown for illustration purposes only.

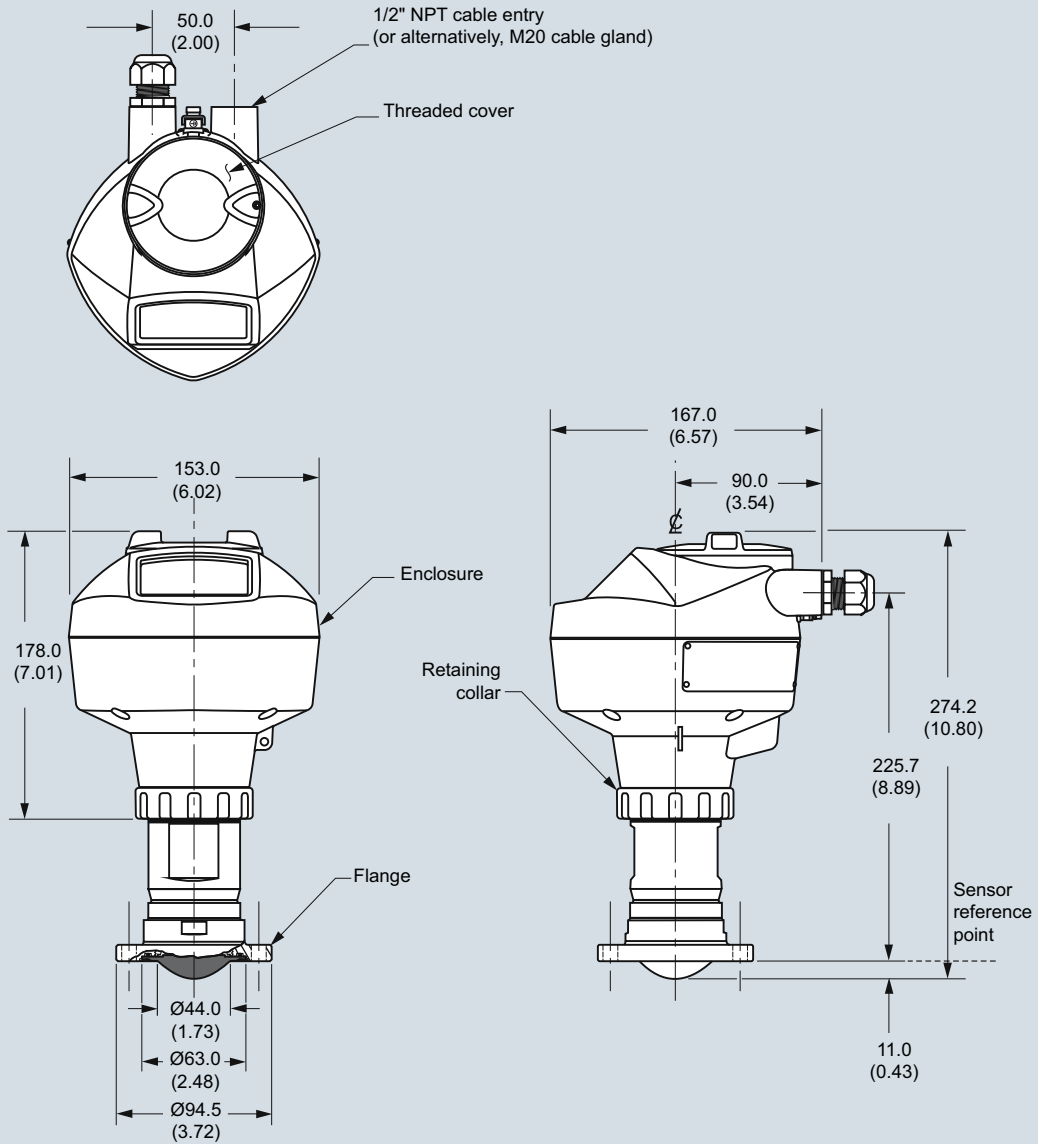
SITRANS LR250 Hygienic Encapsulated Antenna (DN 100 aseptic clamp to DIN 11864-1), dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 50 aseptic flange to DIN 11864-2)



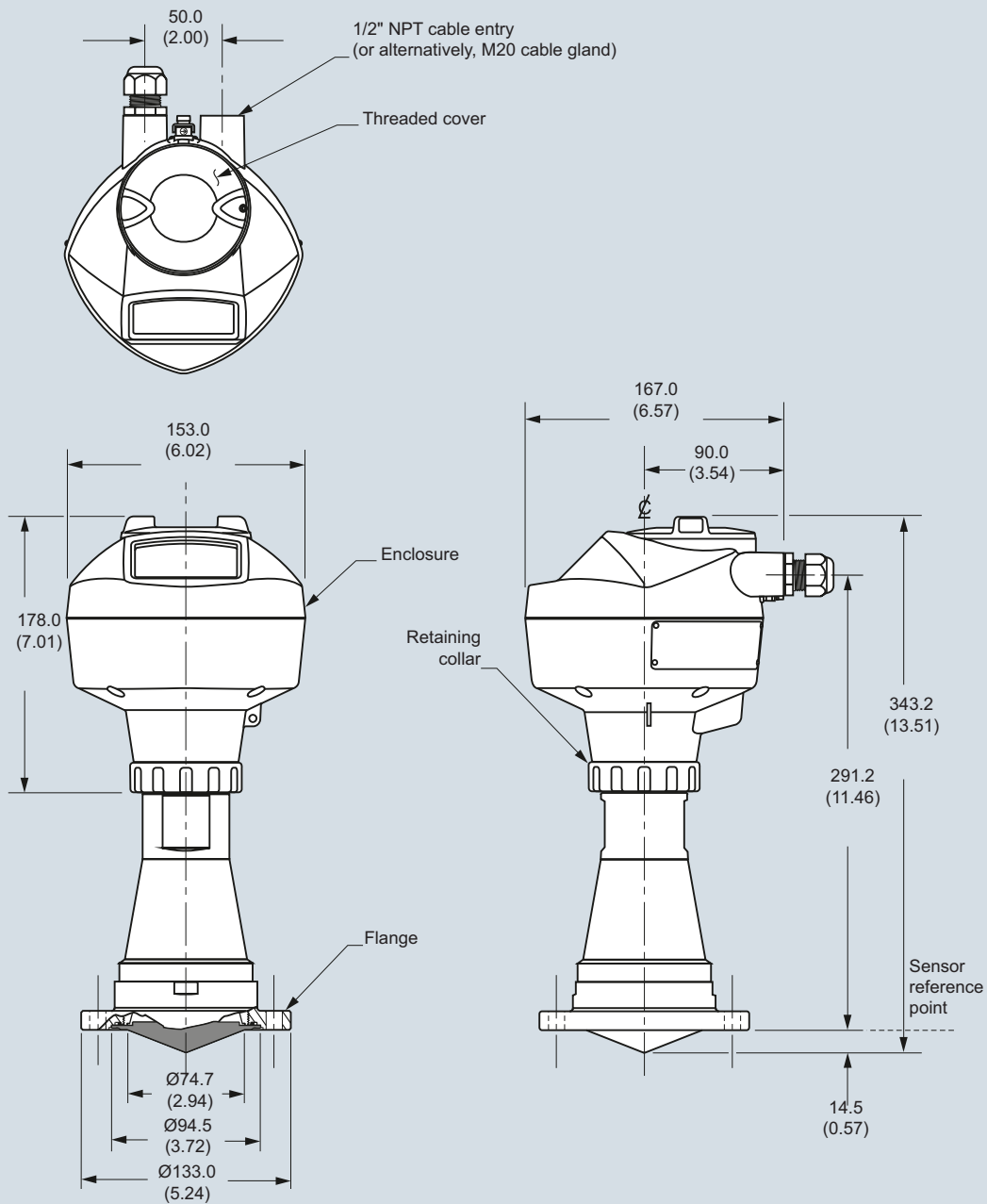
Note: Cut out of process connection and flange are shown for illustration purposes only.

SITRANS LR250 Hygienic Encapsulated Antenna (DN 50 aseptic flange to DIN 11864-2), dimensions in mm (inch)

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 80 aseptic flange to DIN 11864-2)



Note: Cut out of process connection and flange are shown for illustration purposes only.

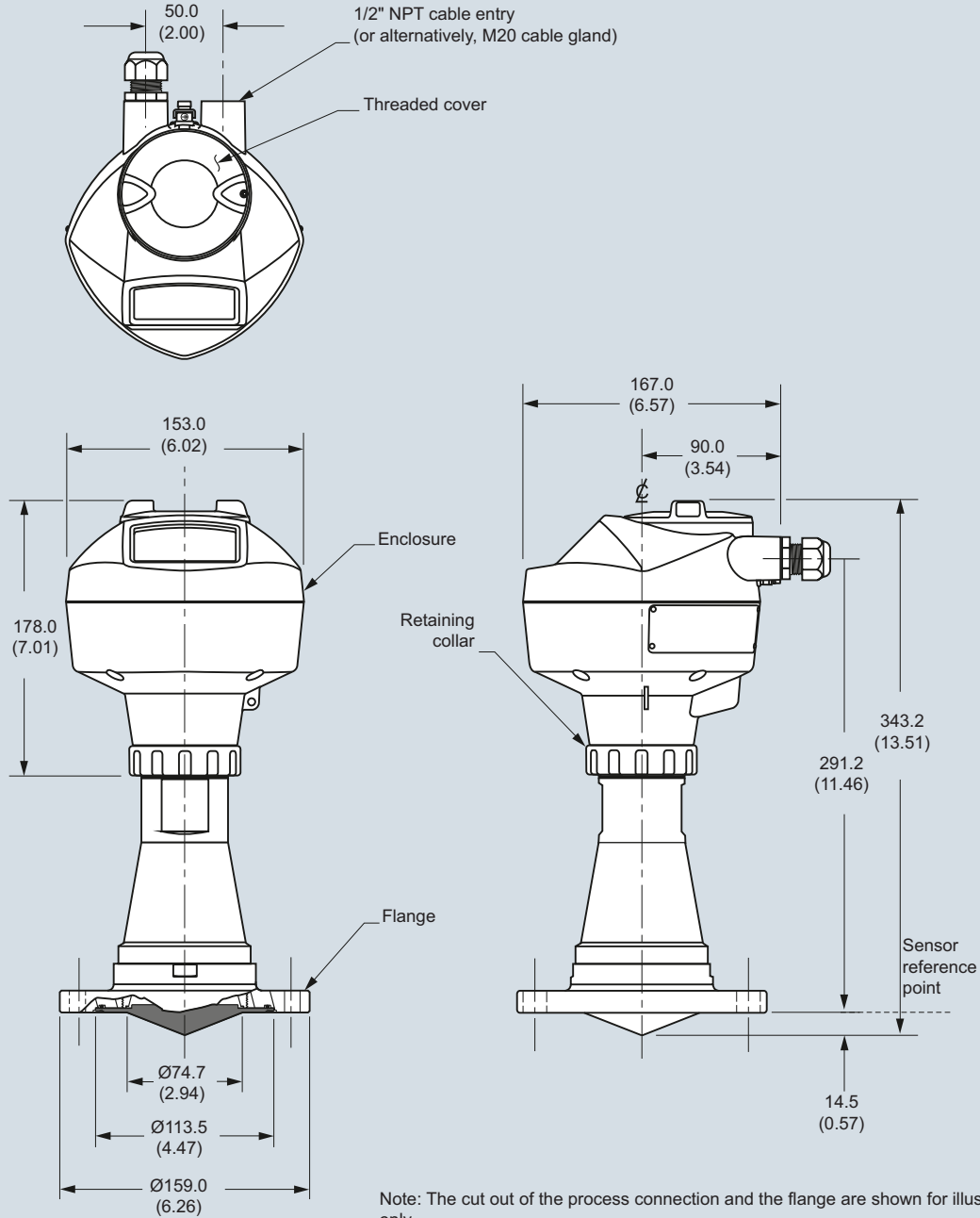
SITRANS LR250 Hygienic Encapsulated Antenna (DN 80 aseptic flange to DIN 11864-2), dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 100 aseptic flange to DIN 11864-2)

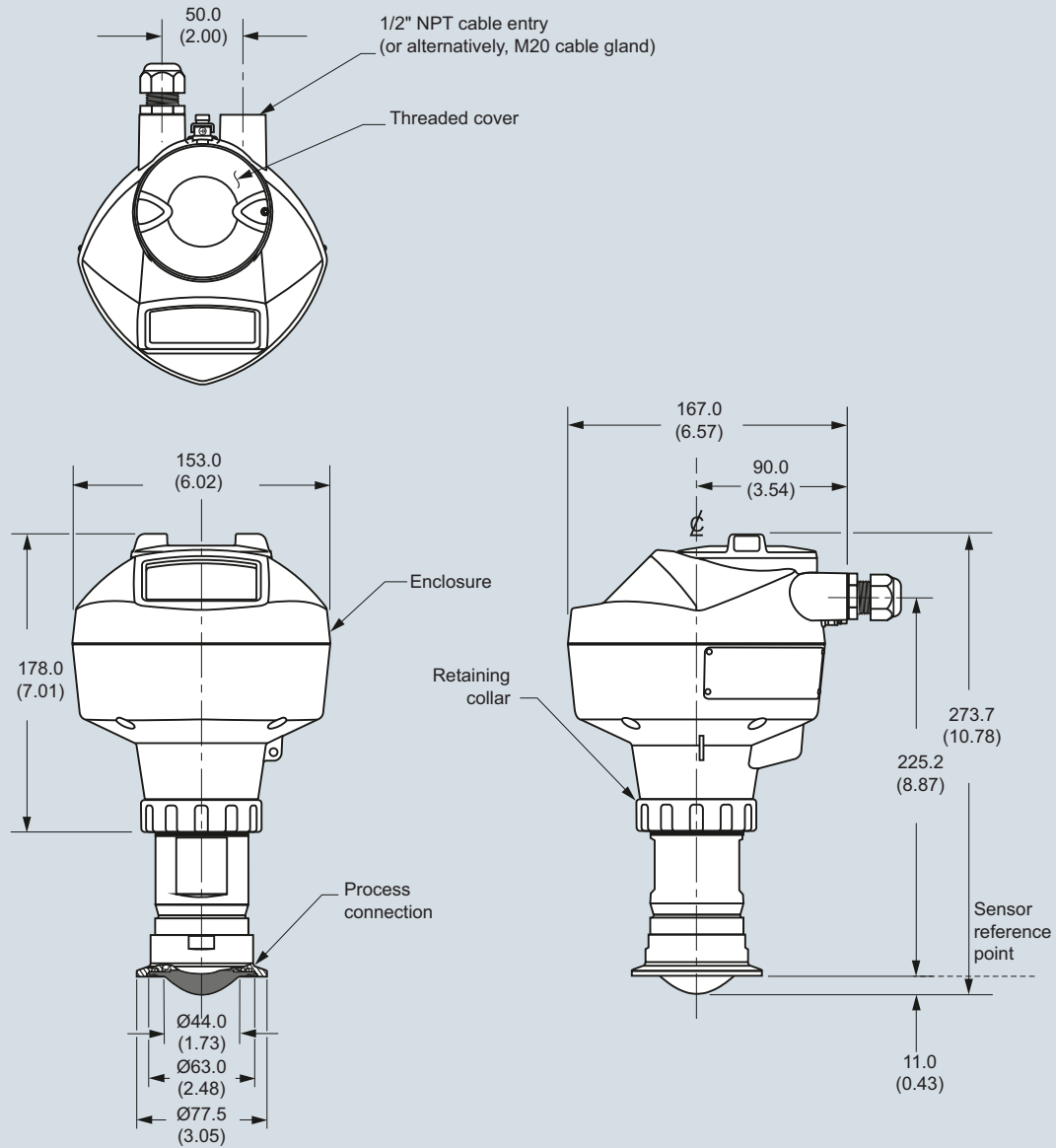


SITRANS LR250 Hygienic Encapsulated Antenna (DN 100 aseptic flange to DIN 11864-2), dimensions in mm (inch)

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 50 aseptic clamp to DIN 11864-3)



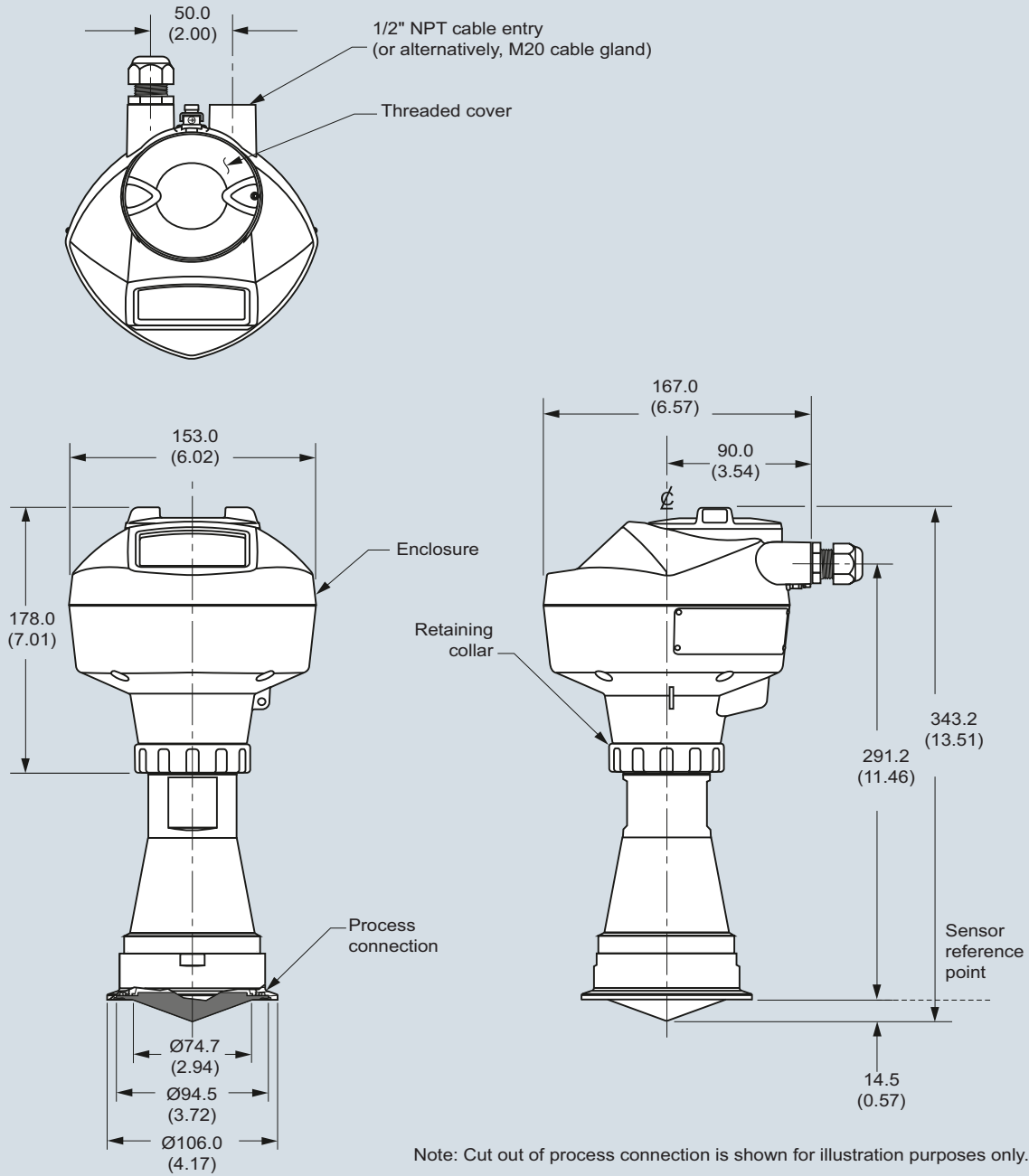
SITRANS LR250 Hygienic Encapsulated Antenna (DN 50 aseptic clamp to DIN 11864-3), dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 80 aseptic clamp to DIN 11864-3)

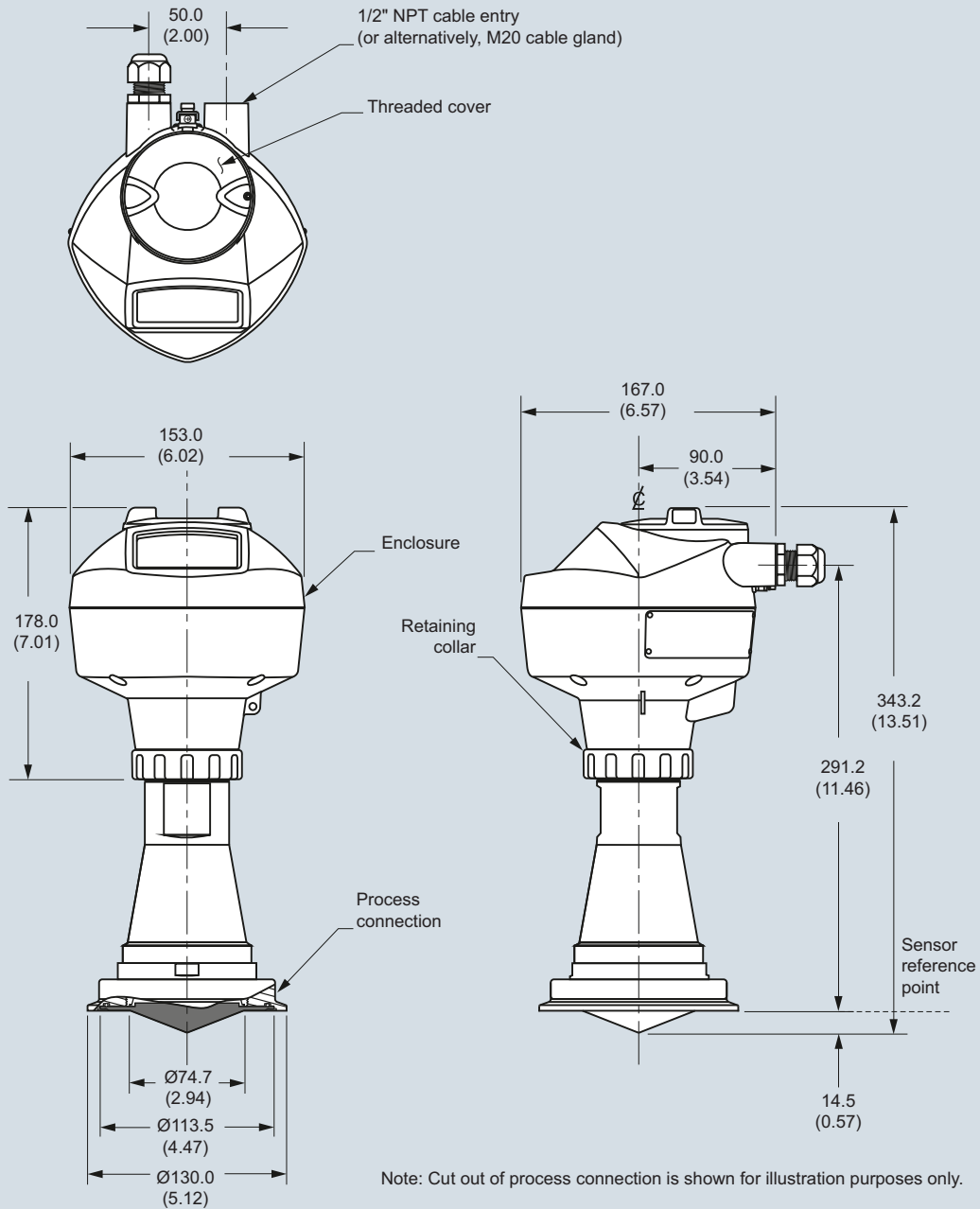


SITRANS LR250 Hygienic Encapsulated Antenna (DN 80 aseptic clamp to DIN 11864-3), dimensions in mm (inch)

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 100 aseptic clamp to DIN 11864-3)



SITRANS LR250 Hygienic Encapsulated Antenna (DN 100 aseptic clamp to DIN 11864-3), dimensions in mm (inch)

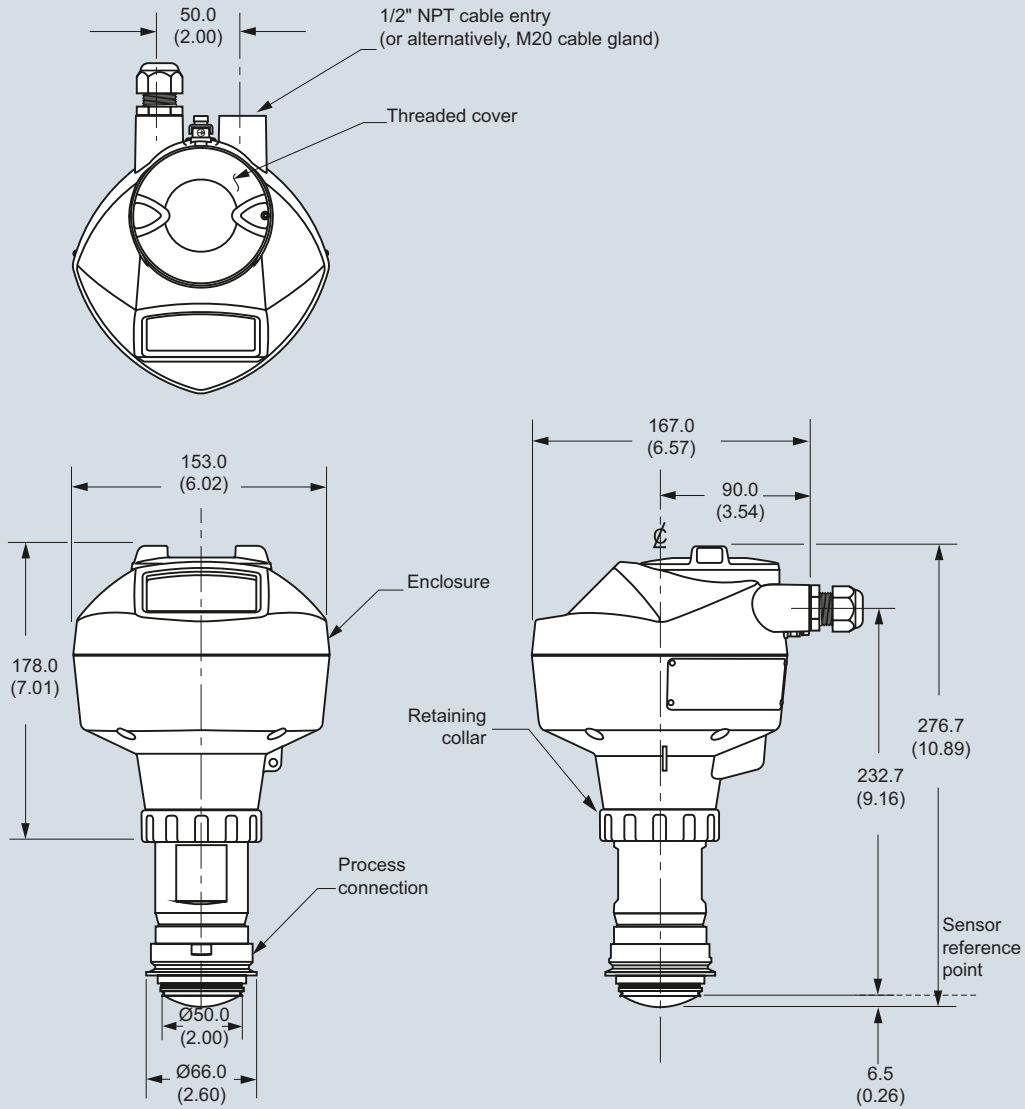
Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

4

Hygienic encapsulated antenna (Tuchenhagen Type F, 50 mm)

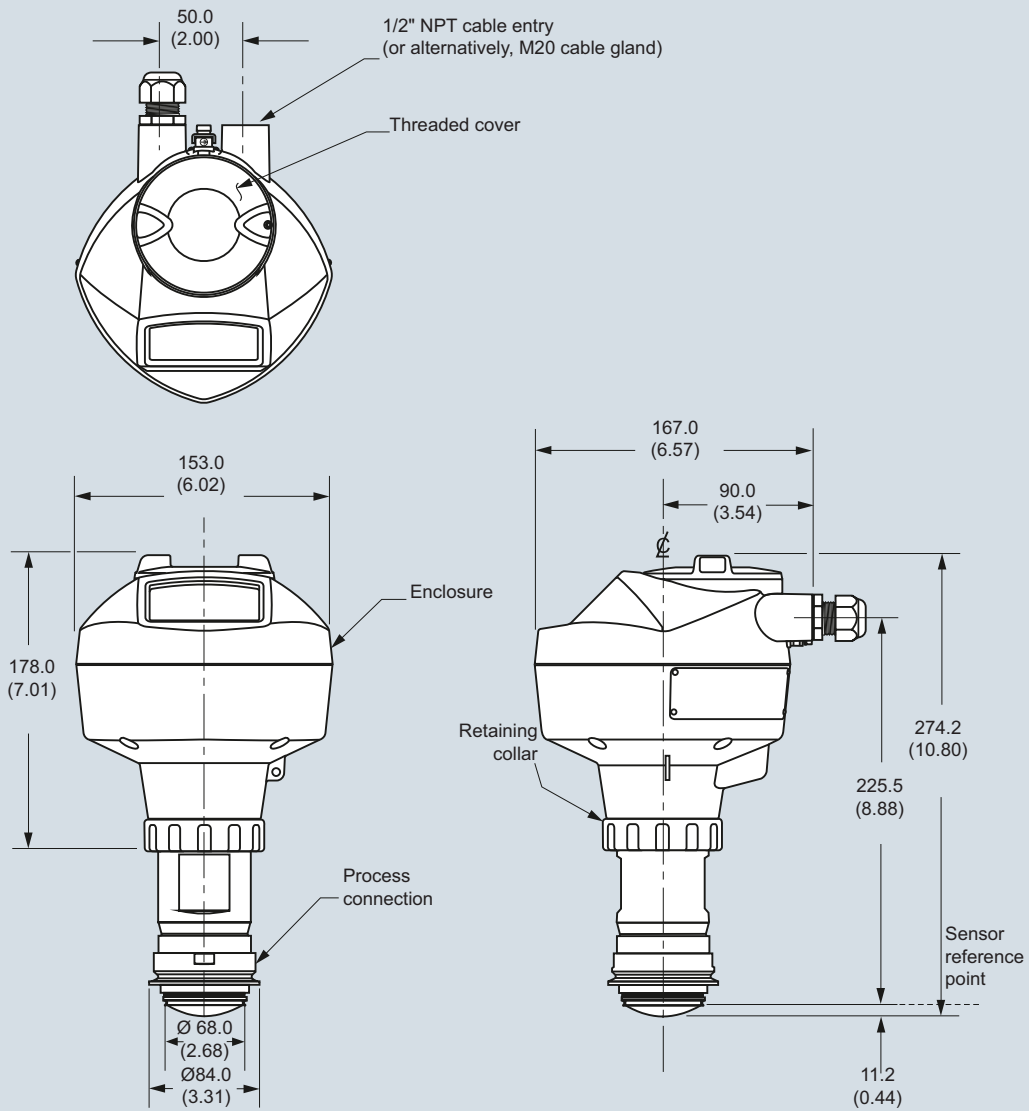


SITRANS LR250 Hygienic Encapsulated Antenna (Tuchenhagen Type F), dimensions in mm (inch)

Level Measurement
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (Tuchenhagen Type N, 68 mm)



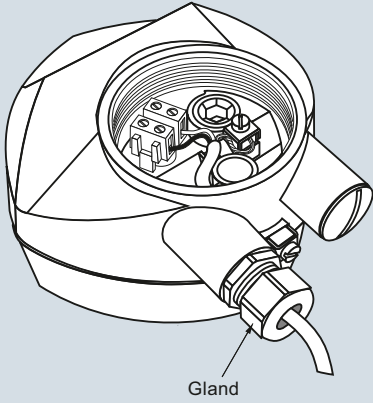
SITRANS LR250 Hygienic Encapsulated Antenna (Tuchenhagen Type N), dimensions in mm (inch)

Level Measurement

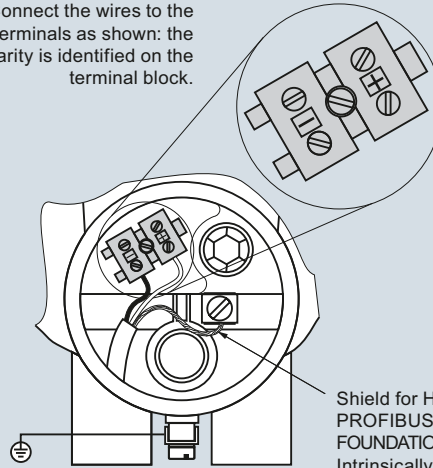
Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

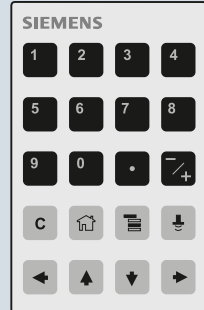
Schematics



Connect the wires to the terminals as shown: the polarity is identified on the terminal block.



Hand Programmer



Part number:
7ML1930-1BK

Notes:

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna Specials

Selection and ordering data

SITRANS LR250 Hygienic Encapsulated Specials

	Article No.
<p>For "Electronics Head only" follow the standard configuration and choose YY option on positions 9 and 10 of the full part number.</p> <p>For example: 7ML5433-1YY20-1AA0 will order an electronics head for the following:</p> <p>EHEDG EL Class 1 approval, 4 ... 20 mA HART, M20 cable entries, General purpose Haz Loc approval, pressure rating as per manual.</p>	
Spare Lens Kits (Lens and O-ring)	
Kit, 2 inch, ISO 2852, HEA, Lens, silicone secondary O-ring	A5E32572731
Kit, 3 inch, ISO 2852, HEA, Lens, silicone secondary O-ring	A5E32572745
Kit, 4 inch, ISO 2852, HEA, Lens, silicone secondary O-ring	A5E32572747
Kit, DN 50, DIN 11851, HEA, Lens, silicone secondary O-ring	A5E32572758
Kit, DN 80, DIN 11851, HEA, Lens, silicone secondary O-ring	A5E32572770
Kit, DN 100, DIN 11851, HEA, Lens, silicone secondary O-ring	A5E32572772
Kit, DN 50, DIN 11864-1, HEA, Lens, silicone secondary O-ring	A5E32572773
Kit, DN 80, DIN 11864-1, HEA, Lens, silicone secondary O-ring	A5E32572779
Kit, DN 100, DIN 11864-1, HEA, Lens, silicone secondary O-ring	A5E32572782
Kit, DN 50, DIN 11864-2/3, HEA, Lens, silicone secondary O-ring	A5E32572785
Kit, DN 80, DIN 11864-2/3, HEA, Lens, silicone secondary O-ring	A5E32572790
Kit, DN 100, DIN 11864-2/3, HEA, Lens, silicone secondary O-ring	A5E32572791
Kit, Tuchenhagen, Type F, HEA, Lens, silicone secondary O-ring	A5E32572794
Kit, Tuchenhagen, Type N, HEA, Lens, silicone secondary O-ring	A5E32572795
Accessories (customer side process connection and FKM and EPDM seal for each size and type)	
Kit DN50 DIN11864-1 GS Form A tank connection, EPDM Seal Class II	A5E32910638
Kit, DN80 DIN11864-1 GS Form A tank connection, EPDM Seal Class II	A5E32910649
Kit, DN100 DIN11864-1 GS Form A tank connection, EPDM Seal Class II	A5E32910657
Kit DN50 DIN11864-1 GS Form A tank connection, FKM Seal Class I	A5E32910658
Kit, DN80 DIN11864-1 GS Form A tank connection, FKM Seal Class I	A5E32910671
Kit, DN100 DIN11864-1 GS Form A tank connection, FKM Seal Class I	A5E32910681
Kit 2" ISO2852 tank connection, Clamp, Cleanable EPDM Seal Class II	A5E32910686

SITRANS LR250 Hygienic Encapsulated Specials

	Article No.
Kit 3" ISO2852 tank connection, Clamp, Cleanable EPDM Seal Class II	A5E32910697
Kit 4" ISO2852 tank connection, Clamp, Cleanable EPDM Seal Class II	A5E32910708
Kit 2" ISO2852 tank connection, Clamp, Cleanable FKM Seal	A5E32910718
Kit 3" ISO2852 tank connection, Clamp, Cleanable FKM Seal	A5E32910723
Kit 4" ISO2852 tank connection, Clamp, Cleanable FKM Seal	A5E32910734
Kit DN50 DIN11851 SC Tank connection, EPDM Seal Class II ¹¹⁾	A5E32910746
Kit DN80 DIN11851 SC Tank connection, EPDM Seal Class II ¹¹⁾	A5E32910771
Kit DN100 DIN11851 SC Tank connection, EPDM Seal Class II ¹¹⁾	A5E32910780
Kit DN50 DIN11851 SC Tank connection, FKM Seal Class II	A5E32910784
Kit DN80 DIN11851 SC Tank connection, FKM Seal Class II	A5E32910789
Kit DN100 DIN11851 SC Tank connection, FKM Seal Class II	A5E32910790
Kit DN50 DIN11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), EPDM Seal Class II	A5E32910791
Kit DN80 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II	A5E32910793
Kit DN100 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II	A5E32910799
Kit DN50 DIN11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), FKM Seal Class I	A5E32910805
Kit DN80 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I	A5E32910809
Kit DN100 DIN11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I	A5E32910812
Kit DN50 DIN11864-3 Form A tank connection, Clamp, EPDM Seal Class II	A5E32910813
Kit DN80 DIN11864-3 Form A tank connection, Clamp, EPDM Seal Class II	A5E32910814
Kit DN100 DIN11864-3 Form A tank connection, Clamp, EPDM Seal Class II	A5E32910815
Kit DN50 DIN11864-3 Form A tank connection, Clamp, FKM Seal Class I	A5E32910816
Kit DN80 DIN11864-3 Form A tank connection, Clamp, FKM Seal Class I	A5E32910817
Kit DN100 DIN11864-3 Form A tank connection, Clamp, FKM Seal Class I	A5E32910818
Kit Type F, Tuchenhagen, Clamp, EPDM Seal Class II (EHEDG only) - no tank connection	A5E33489537
Kit Type N, Tuchenhagen, Clamp, EPDM Seal Class II (EHEDG only) - no tank connection	A5E33489543
Kit Type F, Tuchenhagen, Clamp, FKM Seal Class I (EHEDG only) - no tank connection	A5E33489828
Kit Type N, Tuchenhagen, Clamp, FKM Seal Class I (EHEDG only) - no tank connection	A5E33489830

¹¹⁾ Class II for low fat applications when EPDM seal used on DIN11851

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR260

Overview



SITRANS LR260 is a 2-wire 25 GHz pulse radar level transmitter for continuous monitoring of solids and liquids in storage vessels including extreme levels of dust and high temperatures, to a range of 30 m (98.4 ft).

Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency allows for small horn antennas mounted easily in nozzles
- Communication using HART or PROFIBUS PA
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or SIMATIC PDM

Application

SITRANS LR260 includes a graphical local user interface (LUI) that improves setup and operation using an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

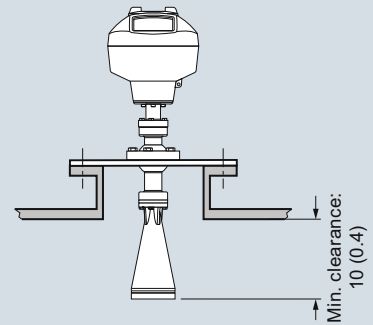
SITRANS LR260's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR260 measures virtually any solids material to a range of 30 m (98.4 ft).

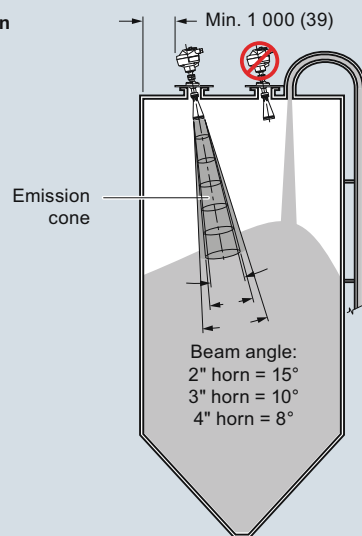
- Key Applications: cement powder, plastic powder/pellets, grain, flour, coal, solids and liquids bulk storage vessels, and other applications

Configuration

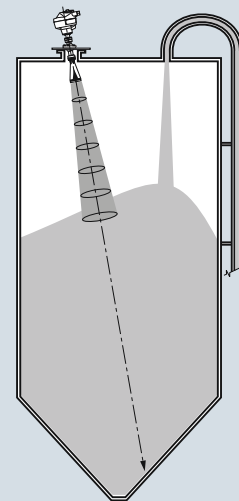
Mounting on a nozzle



Installation



Positioning with easy Aimer



SITRANS LR260 installation, dimensions in mm (inch)

Technical specifications

Mode of operation

Measuring principle	Pulse radar level measurement
Frequency	K-band (25.0 GHz)
Minimum detectable distance	0.05 m (2 inch) from end of horn
Maximum measuring range ¹⁾	
Solids	<ul style="list-style-type: none"> • 2" horn: 10 m (32.8 ft) • 3" horn: 20 m (65.6 ft) • 4" horn: 30 m (98.4 ft)
Liquids	<ul style="list-style-type: none"> • 2" horn: 20 m (65.6 ft) • 3" horn: 30 m (98.4 ft) • 4" horn: 30 m (98.4 ft)

Output - HART

Power	4 ... 20 mA (± 0.02 mA accuracy)
Fail signal	Nominal 24 V DC (max. 30 V DC)
Load	3.6 mA ... 23 mA; or last value 230 ... 600 Ω

Output - PROFIBUS PA

- Per IEC 61158-2
- 15.0 mA
- Profile version 3.01, Class B

Performance (according to reference conditions IEC60770-1)

Maximum measured error (including hysteresis and non-repeatability)	<ul style="list-style-type: none"> • 25 mm (1 inch) from minimum detectable distance to 300 mm (11.8 inch) • Remainder of range = 6 mm (0.23 inch) or 0.05 % of spa (whichever is greater)
---	--

Rated operating conditions

Installation conditions	
Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4

Medium conditions

Dielectric constant ϵ_r	$\epsilon_r > 1.6$, antenna and application dependent
Process temperature	-40 ... +200 °C (-40 ... +392 °F)
Process pressure	<ul style="list-style-type: none"> • 0.5 bar g (7.25 psi g) maximum • 3 bar g (43.5 psi g) optional with 80 °C (176 °F) temperature max

Design

Enclosure	
• Construction	Aluminum, polyester powder-coated
• Conduit entry	2 x M20 x 1.5 or 2 x 1/2" NPT
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
Weight	< 8.14 kg (17.9 lb) including 4" flange and standard Easy Aimer with 4" horn antenna
Display (local)	Graphic LCD, with bar graph representing level
Flange and horn (easy aimer model)	
• Material	304 stainless steel
• Horn antenna	2" horn 3" horn 4" horn
Process connections	
• Universal flanges ²⁾	2 inch/50 mm, 3 inch/80 mm, 4 inch/100 mm, 6 inch/150 mm
Mechanical (Threaded Connection model)	
• Threaded connection	2" NPT (ASME B1.20.1), R (BSPT, EN 10226-1), or G (BSPP, EN ISO 228-1)
• Materials	316L/1.4404 or 316L/1.4435 stainless steel PTFE emitter

Certificates and approvals

General	CSA _{US/C} , CE, FM
Radio	Europe (R&TTE), FCC, Industry Canada, RCM
Hazardous	CSA/FM Class II, Div. 1, Groups E, F, G, Class III ATEX II 1D, 1/2D, 2D Ex ta IIIC T100 °C Da IECEX/ATEX II 1 GD Ex ia IIC T4 Ga, Ex ta IIIC T100 °C Da CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G SABS ARP0108 Ex ia IIC T4 Ga

Programming

Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld programmer	IS model: ATEX II 1GD Ex ia IIC T4 Ga Ex iaD 20 T135 °C Ta = -20 ... +50 °C CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, T6 Ta = 50 °C
Handheld communicator	HART communicator 375
PC	SIMATIC PDM
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

¹⁾ From sensor reference point

²⁾ Universal flange mates with EN 1092-1 (PN 16)/ASME B16.5 (150 lb)/JIS 2220 (10K) bolt hole pattern

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR260

Selection and Ordering data

SITRANS LR260

2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of solids to a range of 30 m (98.4 ft).

Order handheld programmer separately

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Process connection

Universal flat faced flange fits ANSI/DIN/JIS flanges, Easy Aimer with integral (Easy Aimer ball)

2 inch/50 mm
3 inch/80 mm
4 inch/100 mm
6 inch/150 mm

Threaded connection

2" NPT (ASME B1.20.1) (tapered thread)¹⁾²⁾⁵⁾
R 2" [(BSPT), EN 10226-1] (tapered thread)¹⁾²⁾⁵⁾
G 2" [(BSPT), EN ISO 228-1] (parallel thread)¹⁾²⁾⁵⁾

For custom process connections, contact a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Antenna

2" Horn antenna, fits 50 mm or 2" nozzles¹⁾
2" Horn antenna with 100 mm extension¹⁾
2" Horn antenna with 200 mm extension¹⁾
2" Horn antenna with 500 mm extension¹⁾²⁾
2" Horn antenna with 1 000 mm extension¹⁾²⁾
3" Horn antenna, fits 80 mm or 3" nozzles³⁾
3" Horn antenna with 100 mm extension³⁾
3" Horn antenna with 200 mm extension³⁾
3" Horn antenna with 500 mm extension²⁾³⁾
3" Horn antenna with 1 000 mm extension²⁾³⁾
4" Horn antenna, fits 100 mm or 4" nozzles
4" Horn antenna with 100 mm extension
4" Horn antenna with 200 mm extension
4" Horn antenna with 500 mm extension²⁾
4" Horn antenna with 1 000 mm extension²⁾

For custom antennas, contact a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Purge (self cleaning) connection

No purge connection
Purge connection

Output/communication

4 ... 20 mA, HART
PROFIBUS PA

Cable inlet

2 x M20 x 1.5
2 x 1/2" NPT

Note: Polymeric cable glands will be provided with M20 devices.

Approvals

General purpose, CSA_{US/C}, FM, Industry Canada, FCC, CE, R&TTE, RCM

CSA/FM Class II, Div. 1, Groups E, F, G, Class III, Industry Canada, FCC, RCM

ATEX II 1D, 1/2D, 2D Ex ta IIIC T100 °C Da, CE, R&TTE, RCM, INMETRO

Non-incendive, CSA/FM Class I, Div. 2, Groups A, B, C, D, Industry Canada, FCC, RCM

Intrinsically safe, IECEx/ATEX II 1 GD Ex ia IIC T4 Ga, Ex ta IIIC T100 °C Da, R&TTE, RCM

Intrinsically safe, CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada, FCC, RCM

Intrinsically safe, South Africa ARP0108 Ex ia IIC T4 Ga

Pressure rating

Rating per Pressure/Temperature curves in manual⁶⁾
0.5 bar g (7.25 psi g) maximum

Article No.

7ML5427-

0 0 0 -

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A
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1

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:
Measuring-point number/identification
(max. 27 characters); specify in plain text

Manufacturer's test certificate: M to DIN 55350,
Part 18 and to ISO 9000

Material inspection Certificate Type 3.1 per
EN 10204⁴⁾

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

One metallic cable gland M20 x 1.5,
rated -40 ... +80 °C (-40 ... +176 °F), HART

One metallic cable gland M20 x 1.5,
rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA

Handheld programmer, Infrared, Intrinsically Safe

Dust cap, PTFE, for 2 inch/50 mm horn

Dust cap, PTFE, for 3 inch/75 mm horn

Dust cap, PTFE, for 4 inch/100 mm horn

HART modem/USB
(for use with a PC and SIMATIC PDM)

SITRANS RD100, loop powered display -
see Chapter 7

SITRANS RD200, universal input display with
Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer
and linearization curve and Modbus conversion -
see Chapter 7

SITRANS RD500 web, universal remote monitoring
solution for instrumentation - see Chapter 7

For applicable back up point level switch -
see point level measurement section

Note: Products shipped with plastic cable gland,
rated to -20 °C. If -40 °C rating required,
then metallic cable gland is recommended.

¹⁾ Maximum measurement range 10 m (32.8 ft) solids or 20 m (65.6 ft) liquids

²⁾ Available with Purge option 0 only

³⁾ Maximum measurement range 20 m (65.6 ft) solids or 30 m (98.4 ft) liquids

⁴⁾ Available with pressure option 0 only

⁵⁾ Available with Antenna options A, B, F, G, L, and M only

⁶⁾ Available with pressure option 0 only

Order code

Y15

C11

C12

Article No.

7ML1930-1AP

7ML1930-1AQ

7ML1930-1BK

7ML1930-1DE

7ML1930-1BL

7ML1930-1BM

7MF4997-1DB

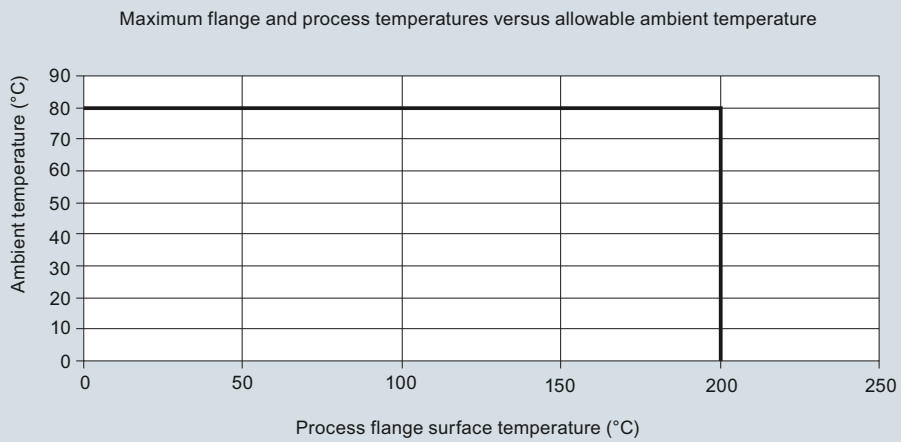
7ML5741-...

7ML5740-...

7ML5744-...

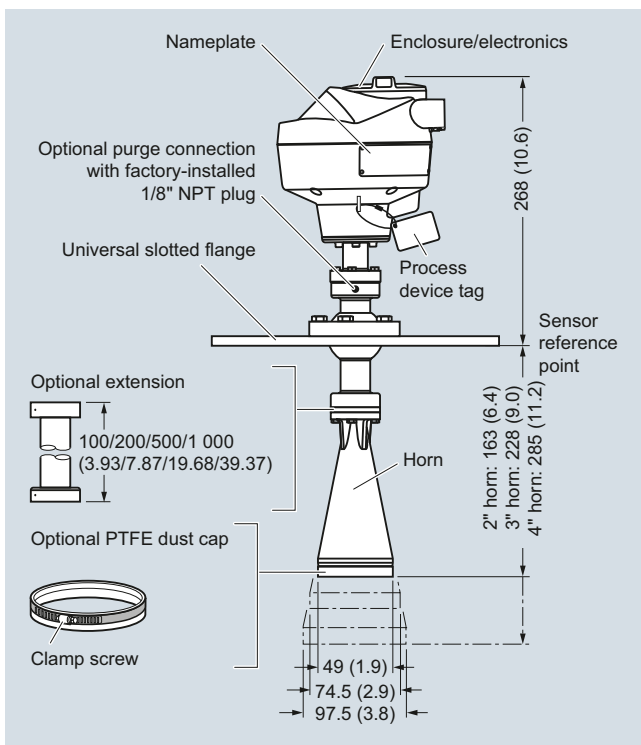
7ML5750-...

Characteristic curves



SITRANS LR260 ambient/process flange surface temperature curve

Dimensional drawings



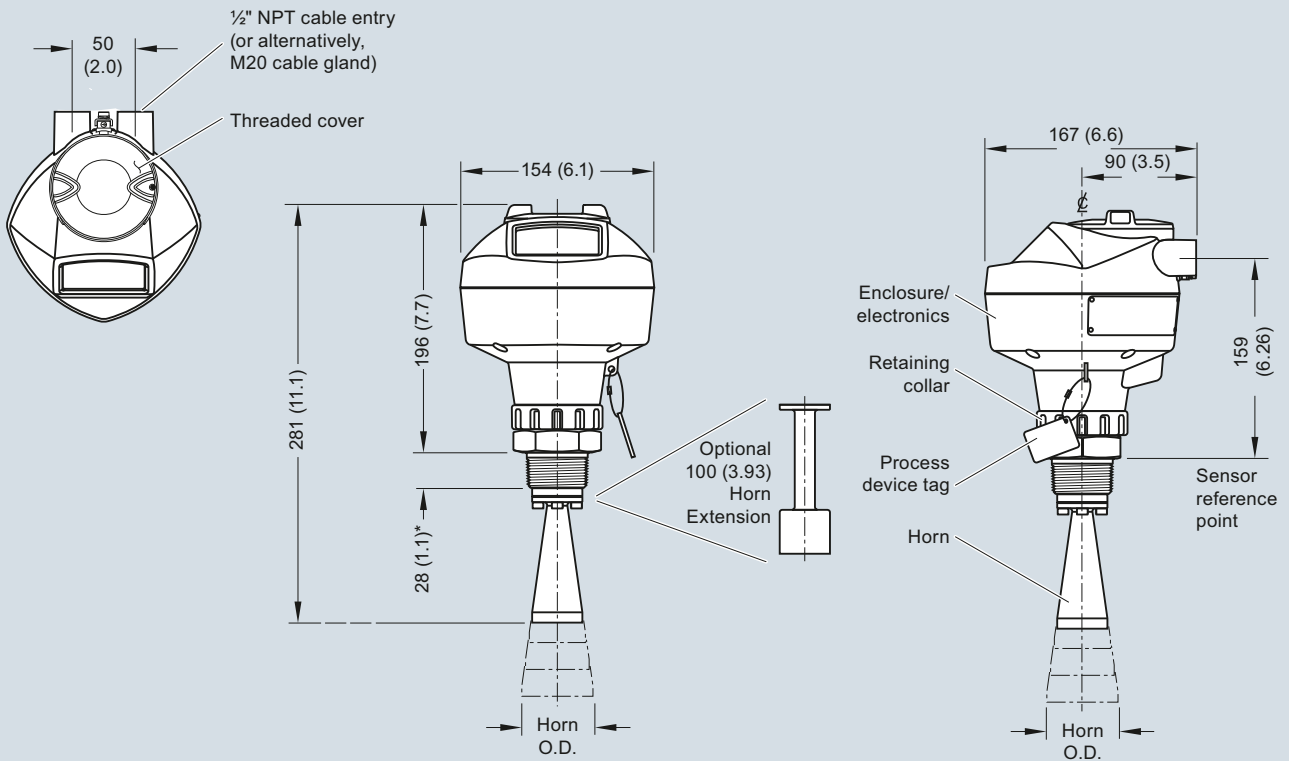
SITRANS LR260, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR260

SITRANS LR260



Antenna Type	Antenna O.D.	Height to sensor reference point			Beam angle	Measurement range
		1-1/2" threaded connection	2" threaded connection	3" threaded connection		
2" horn	47.8 (1.88)	N/A	166 (6.55)	180 (7.09)	15 degrees	20 m (65.6 ft)
3" horn	74.8 (2.94)	N/A	199 (7.85)	213 (8.39)	10 degrees	30 m (98.4 ft)
4" horn	94.8 (3.73)	N/A	254 (10)	268 (10.55)	8 degrees	30 m (98.4 ft)

SITRANS LR260, dimensions in mm (inch)

Schematics

Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

Shield for HART and PROFIBUS PA intrinsically safe versions only.

Gland

Hand programmer

SIEMENS			
1	2	3	4
5	6	7	8
9	0	.	+
C	↑	↓	↔

Part number:
7ML1930-1BK

Notes:

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR260 connections

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR460

Overview



The SITRANS LR460 is a 4-wire, 24 GHz FMCW radar level transmitter with extremely high signal-to-noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft). It is ideal for measurement in extreme dust and high temperature.

Benefits

- Process Intelligence for advanced signal processing and quick and easy adjustment
- Self-guided quick start wizard for plug and play startup
- 24 GHz provides superior reflective properties on solids surfaces
- 100 m (328 ft) range for long-range and difficult applications
- Easy Aimer optimizes signal quality on sloped surfaces
- Programming using infrared Intrinsically Safe handheld programmer or with SIMATIC PDM or HART handheld device

Application

SITRANS LR460 provides excellent results even during conditions of extreme dust. The integral Easy Aimer included on the SITRANS LR460 allows for easy positioning for optimum measurement on solids.

Process Intelligence onboard SITRANS LR460 means advanced signal processing is harnessed for reliable operation on both simple and difficult solids application.

SITRANS LR460 features a robust enclosure, flange and horn components. It is virtually unaffected by atmospheric or temperature conditions within the vessel.

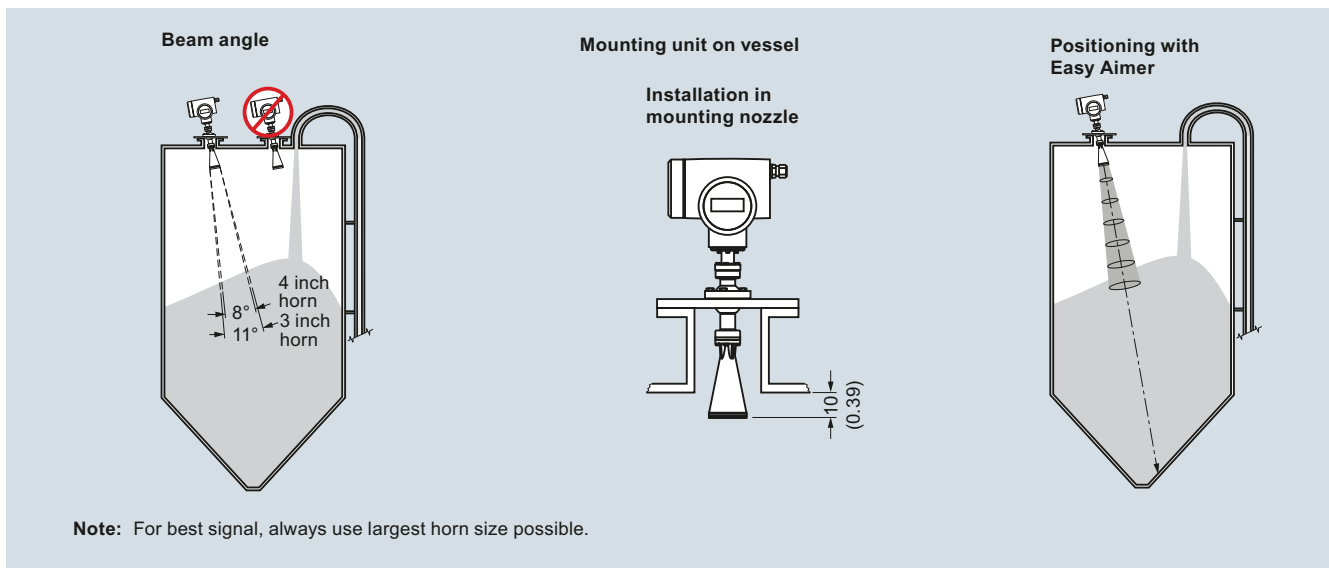
An optional dust cap is available for sticky solids. Optional air purging is also available for extremely sticky applications.

Safe on-site local programming is simple using the Intrinsically Safe handheld programmer. SIMATIC PDM can be used for easy remote programming using HART or PROFIBUS PA.

The characteristics of 24 GHz and high signal-to-noise ratio contribute to exceptional signal reflection, regardless of the dielectric value of the medium.

- Key Applications: long-range dusty applications, cement powder, fly-ash, coal, flour, grain, plastics

Configuration



SITRANS LR460 installation, dimensions in mm (inch)

Technical specifications

Mode of operation		Programming	
Measuring principle	FMCW radar level measurement	Intrinsically Safe Siemens handheld programmer (ordered separately)	Infrared receiver
Frequency	24.2 ... 25.2 GHz FMCW	• Approvals for handheld programmer	IS model: ATEX II 1G EEx ia IIC T4, CSA/FM Class I, Div. 1, Groups A, B, C, D T6 at max. ambient temperature of 40 °C (104 °F)
Measuring range	0.35 ... 100 m (1.15 ... 328.08 ft)	Handheld communicator	HART Communicator 375
Output		PC	SIMATIC PDM
Analog output (HART)		Display (local)	Alphanumeric LCD for readout and entry
• Signal range	Optically isolated	Power supply	
• Load	Max. 600 Ω	100 ... 230 V AC ± 15 % (50/60 Hz), 6 W (12 VA)	
• Fail-safe	mA signal programmable as high, low or hold (LOE)	or	
Communication	HART, optional PROFIBUS PA	24 V DC +25/-20 %, 6 W (optional)	
Digital output	Relay, NC or NO function, max. 50 V DC, max. 200 mA, rating 5 W	Certificates and approvals	
PROFIBUS PA protocol	Layer 1 and 2, Class A, Profile 3.01	General	CSA _{US/C} , CE, FM, RCM
Performance (Reference conditions according to IEC 60770-1)		Radio	European Radio (R&TTE), Industry Canada, FCC, RCM
Non-linearity	Greater of 25 mm (1 inch) or 0.25 % of span (including hysteresis and non-repeatability), over the full ambient temperature range	Hazardous Areas	CSA/FM Class II, Div. 1, Groups E, F, and G, Class III ATEX II 1D, 1/2 D, 2D T85 °C INMETRO ExtD A20 IP67 T85 °C EAC Ex DIP A20 T _a 85 °C IP67
Non-repeatability	≤ 10 mm (0.4 inch)	Optional equipment	
Rated operating conditions		Dust cap	PTFE
Amb. temperature for enclosure	-40 ... +65 °C (-40 ... +149 °F)	Air purge connection	1/8" NPT
Location	Indoor/outdoor		
Installation category	II		
Pollution degree	4		
Medium conditions			
Dielectric constant	$\epsilon_r > 1.4$		
Process temperature range	-40 ... +200 °C (-40 ... +392 °F)		
Vessel pressure	0.5 bar g (7.25 psi g) maximum		
Design			
Weight	Approx. 6.1 kg (13.4 lb) with 3 inch universal flange		
Materials			
• Enclosure	Die-cast aluminum, painted		
• Degree of protection	IP67/Type 4X/NEMA 4X/Type 6/NEMA 6		
• Cable inlet	2 x M20 x 1.5 or 1/2" NPT		
Process connections			
• Universal flanges, 304 stainless steel, flat faced, with integral Easy Aimer	3 inch/80 mm, 4 inch/100 mm, 6 inch/150 mm (mates with flange EN 1092-1, ASME B16.5, or JIS B2238 bolt pattern), 0.5 bar g (7.25 psi g) max. pressure		

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR460

Selection and Ordering data

SITRANS LR460

4-wire, 24 GHz FMCW radar level transmitter with extremely high signal-to-noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft). It is ideal for measurement in extreme dust.

Order handheld programmer separately

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Process connection

Universal, flat faced, 0.5 bar g (7.25 psi g) maximum with integral Easy Aimer ball

3 inch (80 mm)

4 inch (100 mm)

6 inch (150 mm)

Antenna

3" horn antenna, fits 80 mm (3 inch) nozzles

3" horn antenna, fits 80 mm (3 inch) nozzles with 100 mm extension

3" horn antenna, fits 80 mm (3 inch) nozzles with 200 mm extension

3" horn antenna, fits 80 mm (3 inch) nozzles with 500 mm extension¹⁾

3" horn antenna, fits 80 mm (3 inch) nozzles with 1 000 mm extension¹⁾

4" horn antenna, fits 100 mm (4 inch) nozzles

4" horn antenna, fits 100 mm (4 inch) nozzles with 100 mm extension

4" horn antenna, fits 100 mm (4 inch) nozzles with 200 mm extension

4" horn antenna, fits 100 mm (4 inch) nozzles with 500 mm extension¹⁾

4" horn antenna, fits 100 mm (4 inch) nozzles with 1 000 mm extension¹⁾

Purge (self-cleaning) connection

No purge connection

Purge connection

Output/Communication

4 ... 20 mA, HART

PROFIBUS PA

Power supply/cable inlet

100 ... 230 V AC

• 2 x M20 x 1.5

• 2 x 1/2" NPT

24 V DC

• 2 x M20 x 1.5

• 2 x 1/2" NPT

Approvals

General Purpose, CSAUs/c, Industry Canada, FM, FCC, CE and R&TTE, RCM

CSA/FM Class II, Div. 1, Groups E, F, and G, Class III

ATEX II 1/2 D T6, CE, R&TTE

¹⁾ Available with Purge option 0 only

Article No.

7ML5426-	
0	0
A	
B	
C	
A	
B	
C	
D	
E	
F	
G	
H	
J	
K	
0	
1	
0	
1	
A	
B	
C	
D	
A	
B	
C	

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters); specify in plain text

Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

Handheld programmer, Infra-red, Intrinsically Safe, EEx ia

Dust cap, PTFE, for 3 inch/80 mm horn

Dust cap, PTFE, for 4 inch/100 mm horn

HART modem/USB (for use with a PC and SIMATIC PDM)

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART¹⁾

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA¹⁾

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

For applicable back up point level switch - see point level measurement section

¹⁾ Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

Order code

Y15

C11

Article No.

7ML5830-2AJ

7ML1930-1BL

7ML1930-1BM

7MF4997-1DB

7ML1930-1AP

7ML1930-1AQ

7ML5741-...

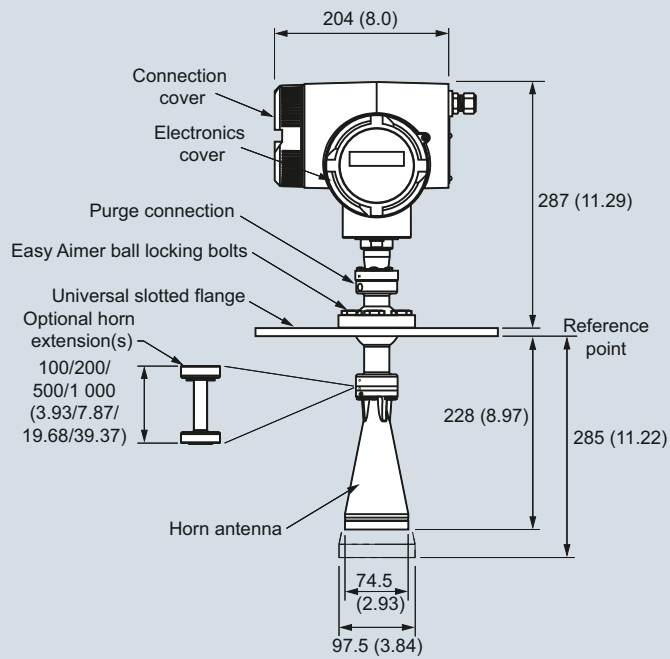
7ML5740-...

7ML5744-...

7ML5750-...

Dimensional drawings

SITRANS LR460 (7ML5426)



SITRANS LR460, dimensions in mm (inch)

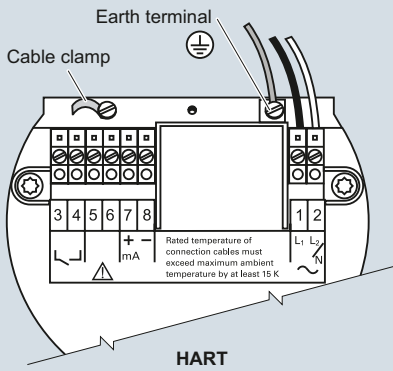
Level Measurement

Continuous level measurement - Radar transmitters

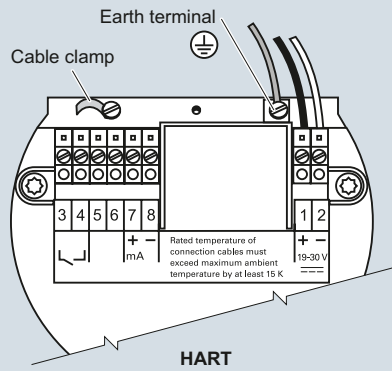
SITRANS LR460

Schematics

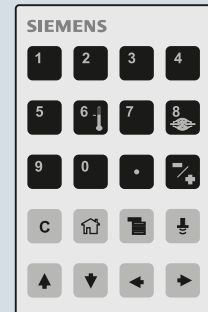
AC version



DC version

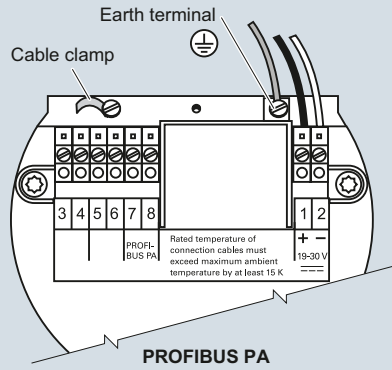
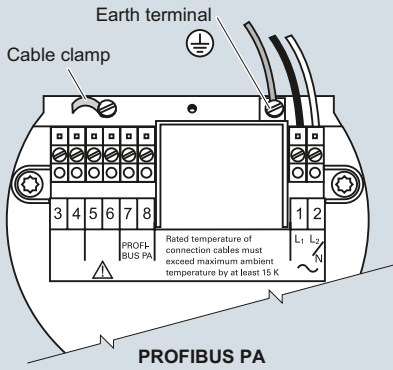


Hand programmer



SITRANS LR460

Part number:
7ML5830-2AJ




Notes

- Recommended torque on terminal clamping screws, 0.5 ... 0.6 Nm
- 4 ... 20 mA, PROFIBUS PA, DC input circuits, 14 ... 20 AWG, shielded copper wire
- AC input circuit, min. 14 AWG copper wire
- All field wiring must have insulation suitable for at least 250 V
- The equipment must be protected by a 15 A fuse or circuit breaker in the building installation

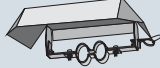
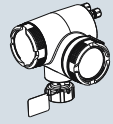
SITRANS LR460 connections

Selection and ordering data

SITRANS LR260/LR460 Specials

	Article No.
Process connection part kits - non-pressure-rated	
SITRANS LR260/LR460, 100 mm extension for horn antenna, no purge ¹⁾	A5E01087872
SITRANS LR260/LR460, 200 mm extension for horn antenna, no purge ¹⁾	A5E01091262
SITRANS LR260/LR460, 100 mm extension for horn antenna with purge ¹⁾	A5E01261979
SITRANS LR260/LR460, 200 mm extension for horn antenna with purge ¹⁾	A5E01261981
SITRANS LR260/LR460, horn 2", no purge, no emitter ¹⁾	A5E02083905
SITRANS LR260/LR460, horn 3", no purge, no emitter ¹⁾	A5E01623511
SITRANS LR260/LR460, horn 4", no purge, no emitter ¹⁾	A5E01623512
SITRANS LR260/LR460, horn 2", with purge, no emitter ¹⁾	A5E02083906
SITRANS LR260/LR460, horn 3", with purge, no emitter ¹⁾	A5E01623513
SITRANS LR260/LR460, horn 4", with purge, no emitter ¹⁾	A5E01623514
SITRANS LR260/LR460, 3" universal flat faced flange ¹⁾	A5E02303897
SITRANS LR260/LR460, 4" universal flat faced flange ¹⁾	A5E01259467
SITRANS LR260/LR460, 6" universal flat faced flange ¹⁾	A5E01261834
SITRANS LR260/LR460 O-rings for Easy Aimer ¹⁾⁾	A5E01261836
Kit, Emitter for LR260/LR460 ¹⁾	A5E02360694
SITRANS LR260 lid with O-ring	A5E02465410
Purge conversion kit – non-pressure-rated (no flange or extension included)	
SITRANS LR260/LR460 purge conversion, 2" horn ¹⁾	A5E02083914
SITRANS LR260/LR460 purge conversion, 3" horn ¹⁾	A5E02083915
SITRANS LR260/LR460 purge conversion, 4" horn ¹⁾	A5E02083916
Enclosure with electronics (LR260)	
	
SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option A, no process connection	A5E02203605
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option A, no process connection	A5E02213423
SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option A, no process connection	A5E02165924
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, NPT cable inlet, approval option A, no process connection	A5E02213428

SITRANS LR260/LR460 Specials

	Article No.
SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option D, no process connection	A5E03934184
SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option E, no process connection	A5E03934187
SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option F, no process connection	A5E03934191
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option E, no process connection	A5E37217558
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, 1/2" NPT cable inlet, approval option F, no process connection	A5E31820689
Sun shield for SITRANS LR260 enclosure, stainless steel	
	A5E39142556
Enclosure with electronics (LR460)	
	
SITRANS LR460 enclosure with board stack, HART communication, AC power, M20 cable inlet, approval option A, no process connection	A5E02182085
SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, AC power, M20 cable inlet, approval option A, no process connection	A5E02212422
SITRANS LR460 enclosure with board stack, HART communication, AC power, NPT cable inlet, approval option A, no process connection	A5E02212423
SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, AC power, NPT cable inlet, approval option A, no process connection	A5E02212424
SITRANS LR460 enclosure with board stack, HART communication, DC power, M20 cable inlet, approval option A, no process connection	A5E02212425
SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, DC power, M20 cable inlet, approval option A, no process connection	A5E02212426
SITRANS LR460 enclosure with board stack, HART communication, DC power, NPT cable inlet, approval option A, no process connection	A5E02212428
SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, DC power, NPT cable inlet, approval option A, no process connection	A5E02212429

¹⁾ Available with no pressure rating, 0.5 bar g maximum.

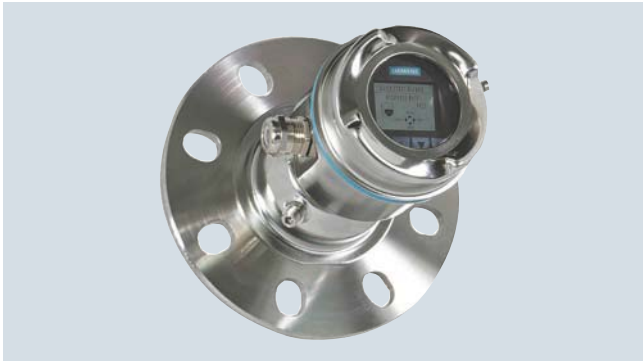
Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR560

Overview



SITRANS LR560 2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids and liquids to a range of 100 m (329 ft).

Benefits

- Rugged stainless steel design for industrial applications
- 78 GHz high frequency provides very narrow beam, virtually no mounting nozzle noise, and optimal reflection from sloped solids
- Aimer option to direct beam to area of interest, such as draw point of cone
- Lens antenna is highly resistant to product buildup
- Air purge connection is included for self-cleaning of extremely sticky solids
- Local display interface (LDI) allows local programming and diagnostics

Application

SITRANS LR560's plug and play performance is ideal for most solids applications and long range liquid applications, including those with extreme dust and high temperatures to 200 °C (392 °F). Unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR560 includes an optional graphical local display interface (LDI) that improves setup and operation using an intuitive Quick Start Wizard, and echo profile display for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

SITRANS LR560 measures practically any solids material to a range of 100 m (328 ft).

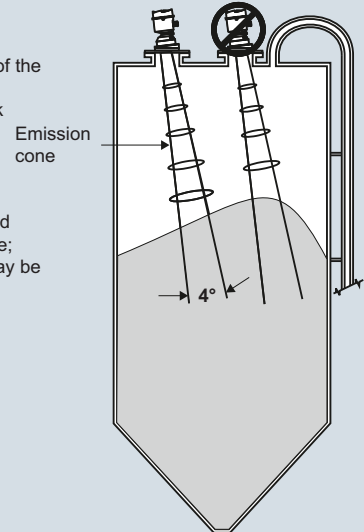
- Key Applications: cement powder, plastic powder/pellets, grain, coal, wood powder, fly ash

Configuration

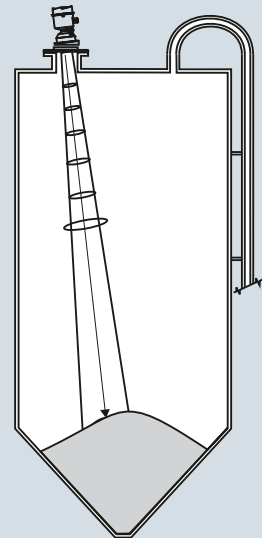
Installation

Note:

- Beam angle is the width of the cone where the energy density is half of the peak energy density
- The peak energy density is directly in front of and in line with the antenna
- There is signal transmitted outside of the beam angle; therefore false targets may be detected



Aiming will assist in measuring material in the cone



SITRANS LR560 installation, dimensions in mm (inch)

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	78 GHz FMCW
Minimum detectable distance	400 mm (15.75 inch) from sensor reference point
Maximum measuring range ¹⁾	<ul style="list-style-type: none"> • 40 m (131 ft) version • 100 m (328 ft) version
Output	
Analog output	4 ... 20 mA
Communications	<ul style="list-style-type: none"> • HART • Optional: PROFIBUS PA • Optional: FOUNDATION Fieldbus
Fail-safe	<ul style="list-style-type: none"> • Programmable as high, low or hold (Loss of Echo) • NE43 programmable
Performance (according to reference conditions IEC60770-1)	
Maximum measured error (including hysteresis and non-repeatability) ²⁾	5 mm (0.2 inch)
Rated operating conditions (according to reference conditions IEC60770-1)	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ϵ_r	> 1.6
Process temperature and pressure	See chart below
Design	
Enclosure	
• Construction	316L/1.4404 stainless steel
• Conduit entry	M20 x 1.5, or 1/2" NPT via adapter
• Purge inlet	1/8" NPT, 30 cfm at max. 100 psi
• Lens material	<ul style="list-style-type: none"> • 40 m version: PEI • 100 m version: PEEK
	Damage to lens could result from continuous purging/cleaning (due to abrasive solids). Recommended to purge/clean only a few seconds every hour.
• Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP68
• Weight	3.15 kg (6.94 lb) including 3 inch flange
• Optional local display interface	Graphic LCD, with bar graph representing level
Process connections	
• Universal flat-faced flanges ³⁾	<ul style="list-style-type: none"> • 3, 4, 6 inch/80, 100, 150 mm, 304 stainless steel • 3, 4, 6 inch/80, 100, 150 mm, 316L/1.4404 or 316L/1.4435 stainless steel
• Universal stamped flange ³⁾	3, 4, 6 inch/80, 100, 150 mm, 304 stainless steel
• Aimer flanges ³⁾	3, 4, 6 inch/80, 100, 150 mm, polyurethane powder-coated cast aluminum

Power supply	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
PROFIBUS PA/FOUNDATION Fieldbus	13.5 mA 9 ... 32 V DC, per IEC 61158-2
Certificates and approvals	
General	CSA _{US/C} , CE, FM
Radio	Europe (R&TTE), FCC, Industry Canada, RCM
Hazardous	
• Europe/International	IECEx SIR 09.0149X ATEX II 1D, 1/2D, 2D Ex ta IIIC T139 °C Da ATEX II 3G Ex nA II T4 Gc Ex nL IIC T4 Gc
• US/Canada	FM/CSA Class II, Div. 1, Groups E, F, G Class III T4 FM/CSA Class I, Div. 2, Groups A, B, C, D, T4
• China	NEPSI Ex nA II T4 Ex nL IIC T4 DIP A20 TA, T139 °C
• Brazil	INMETRO Ex na IIC T4 Gc Ex ta IIIC T139 °C Da
Programming	
Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld programmer	IS model: ATEX II 1GD Ex ia IIC T4 Ga Ex iaD 20 T135 °C $T_a = -20 \dots +50 \text{ °C}$ CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, T6 $T_a = 50 \text{ °C}$
Handheld communicator	HART communicator 375/475
PC	SIMATIC PDM, AMS, PACTware
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

¹⁾ From sensor reference point

²⁾ Under severe EMI/EMC environments per IEC61326-1 or NAMUR NE21, the device error may increase to a maximum of 25 mm (1 inch)

³⁾ Universal flange mates with EN 1092-1 (PN16)/ASME B16.5 (150 lb)/JIS 2220 (10K) bolt hole pattern.

Process temperature and pressure

Version	Stainless steel	Aimer flange: -1 ... 0.5 bar	Aimer flange: -1 ... 3.0 bar
40 m	-40 ... +100 °C (-40 ... +212 °F)	-40 ... +100 °C (-40 ... +212 °F)	-40 ... +100 °C (-40 ... +212 °F)
100 m	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +120 °C (-40 ... +248 °F)

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR560

Selection and Ordering data	Article No.
SITRANS LR560	7ML5440-
2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids and liquids to a range of 100 m (329 ft).	00 -
Order handheld programmer separately	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Measurement and process temperature range	
40 m (131 ft) max range, -40 ... +100 °C	0
100 m (329 ft) max range, -40 ... +200 °C	1
Process connection	
Universal flat-faced flange fits ANSI/DIN/JIS flanges	
80 mm/3 inch, 304 stainless steel	A
100 mm/4 inch, 304 stainless steel	B
150 mm/6 inch, 304 stainless steel	C
80 mm/3 inch, 316L stainless steel	D
100 mm/4 inch, 316L stainless steel	E
150 mm/6 inch, 316L stainless steel	F
80 mm/3 inch, painted aluminum, with integral aimer ¹⁾	G
100 mm/4 inch, painted aluminum, with integral aimer ¹⁾	H
150 mm/6 inch, painted aluminum, with integral aimer ¹⁾	J
Universal stamped flange fits ANSI/DIN/JIS flanges	
80 mm/3 inch, 304 stainless steel ²⁾	K
100 mm/4 inch, 304 stainless steel ²⁾	L
150 mm/6 inch, 304 stainless steel ²⁾	M
Enclosure (with cable inlet)	
Stainless steel, 1 X 1/2" NPT	A
Stainless steel, 1 X M20 x 1.5 (plastic gland included)	B
Pressure rating	
0.5 bar g (7.5 psi g) maximum	0
3 bar g (40 psi g) maximum	1
Output/communication	
4 ... 20 mA, HART	A
PROFIBUS PA	B
FOUNDATION Fieldbus	C
Approvals	
General Purpose, FM, CSA _{US/C} , Industry Canada, FCC, CE, R&TTE, RCM	A
CSA/FM Class I, Div. 2, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III, Industry Canada, FCC	B
ATEX II 3G Ex nA/nL, 1D, 1/2D, 2D Ex ta, INMETRO CE, R&TTE, RCM	C
Local display interface	
Without	1
With	2

1) Rated to 120 °C max. when used with Pressure rating option 1
 2) Available with Pressure Rating option 0 only

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 10/11 in the appendix

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Plug M12 with mating connector ¹⁾²⁾³⁾	◆ A50
Plug 7/8" with mating connector ¹⁾³⁾⁷⁾	◆ A55
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters); specify in plain text	◆ Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	◆ C11
Material inspection Certificate Type 3.1 per EN 10204 ⁴⁾	◆ C12
NAMUR NE43 compliant, device preset to failsafe < 3.6 mA ⁵⁾	◆ N07
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	Article No.
Hand Programmer, Intrinsically safe	7ML1930-1BK
Local display interface	7ML1930-1FJ
Sun Shield Cover, 304 stainless steel	7ML1930-1FK
Housing lid with window	7ML1930-1FL
One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART ⁶⁾	7ML1930-1AP
One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA ⁶⁾	7ML1930-1AQ
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	
1) Available with Approval option A only	
2) Available with Enclosure option B only	
3) Available with Output/communication options B and C only	
4) Available with Pressure rating option 1 only	
5) Available with Output/communication option A only	
6) Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended	
7) Only available with enclosure option A (NPT thread)	
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 10/11 in the appendix	

Options

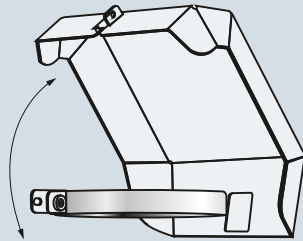
Handheld programmer

Article number:
7ML1930-1BK



Sun shield cover
(304 stainless steel)

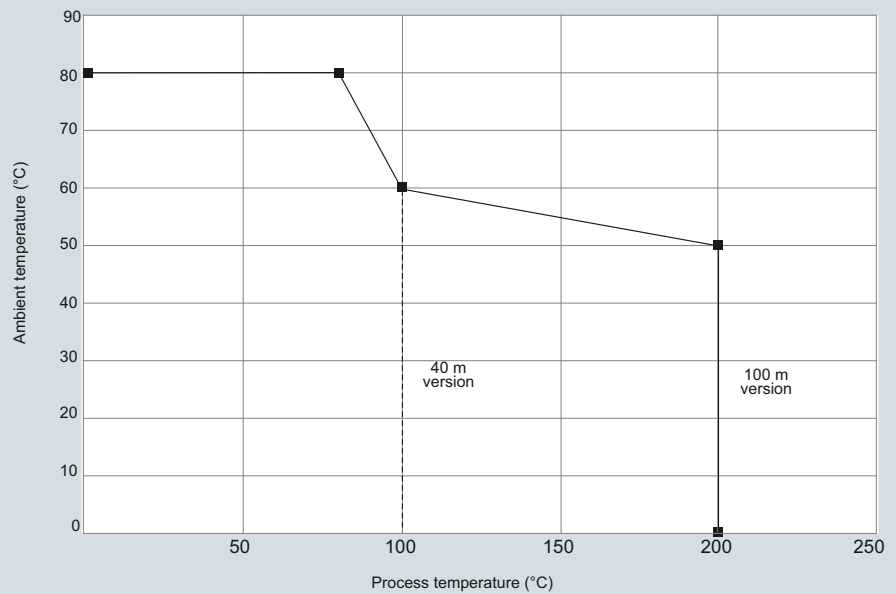
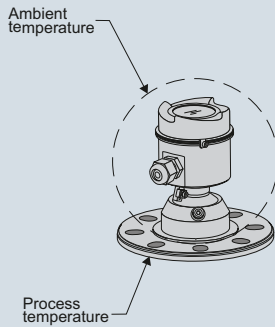
Article number:
7ML1930-1FK



SITRANS LR560 handheld programmer and sun shield cover

Characteristic curves

Temperature derating curve



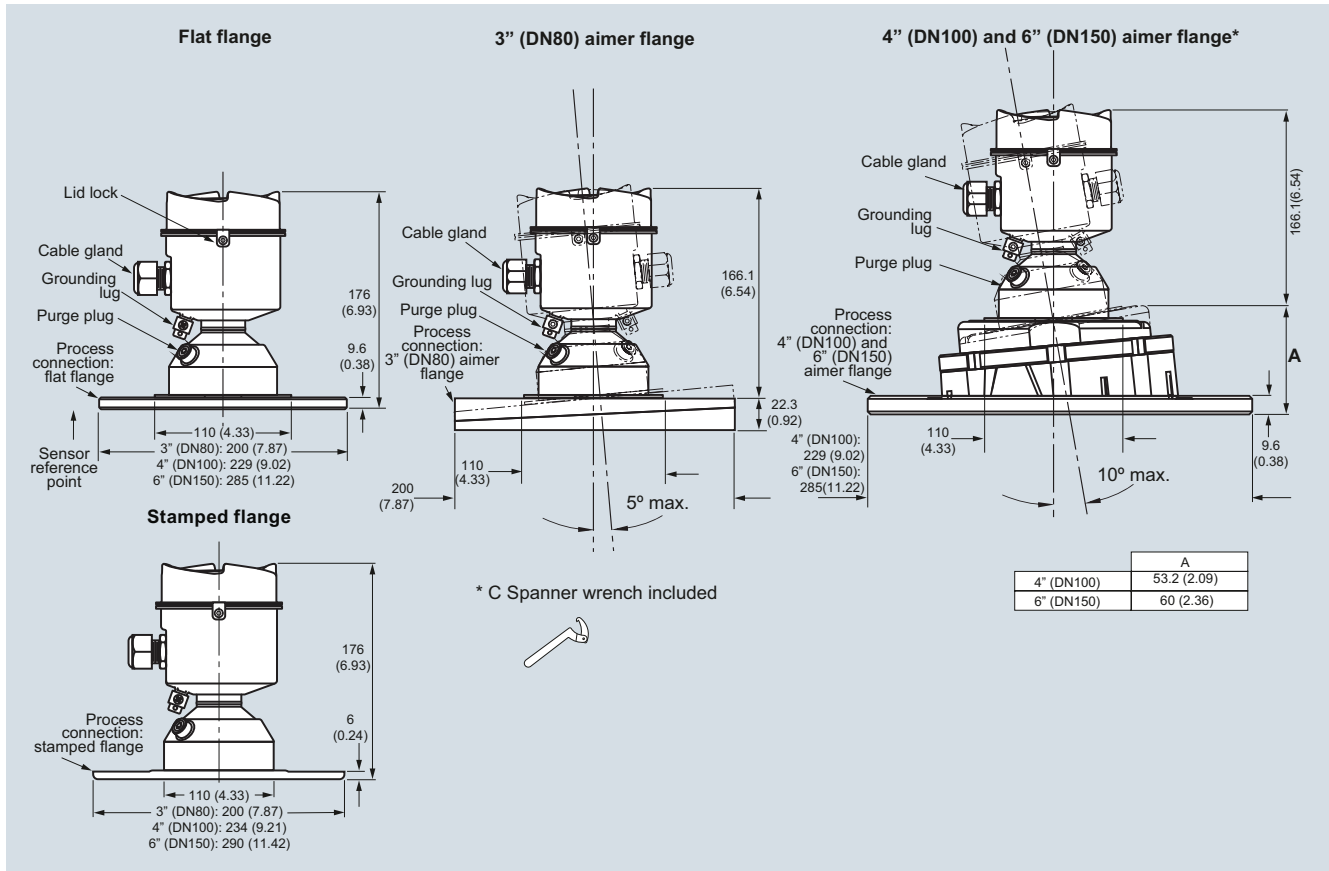
SITRANS LR560 temperature derating curve

Level Measurement

Continuous level measurement - Radar transmitters

SITRANS LR560

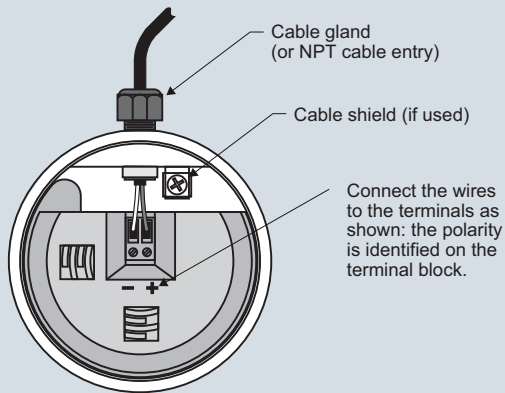
Dimensional drawings



SITRANS LR560, dimensions in mm (inch)

4

Schematics



Notes:

1. Depending on the approval rating, glands and plugs may be supplied with your instrument.
2. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
3. All field wiring must have insulation suitable for rated input voltages.
4. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
5. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR560 connections

Selection and ordering data

SITRANS LR560 Specials

	Article No.
SITRANS LR560 Electronics Modules	
SITRANS LR560 Electronics Module, HART, 100 m range, compatible with 7ML5440-1..00-.A..., no enclosure or process connection included.	7ML1830-3AC
SITRANS LR560 Electronics Module, PROFIBUS PA, 100 m range, compatible with 7ML5440-1..00-.B..., no enclosure or process connection included.	7ML1830-3AH
SITRANS LR560 Electronics Module, FOUNDATION Fieldbus, 100 m range, compatible with 7ML5440-1..00-.C..., no enclosure or process connection included.	7ML1830-3AJ
SITRANS LR560 Electronics Module, HART, 40 m range, compatible with 7ML5440-0..00-.A..., no enclosure or process connection included.	7ML1830-3AK
SITRANS LR560 Electronics Module, PROFIBUS PA, 40 m range, compatible with 7ML5440-0..00-.B..., no enclosure or process connection included.	7ML1830-3AL
SITRANS LR560 Electronics Module, FOUNDATION Fieldbus, 40 m range, compatible with 7ML5440-0..00-.C..., no enclosure or process connection included.	7ML1830-3AM
SITRANS LR560 Miscellaneous Spare Kits	
Kit, lid gasket, EPDM	7ML1830-3AA
Kit, wrench for 4" and 6" Aimers	7ML1830-3AB
Kit, O-rings for 3" Aimer	7ML1830-3AD
Kit, O-rings for 4" Aimer	7ML1830-3AE
Kit, O-rings for 6" Aimer	7ML1830-3AF
Kit, lid screw and purge plug set with hex keys	7ML1830-3AG
Kit, lid, no window	7ML1830-3AP

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Level Measurement

Continuous level measurement - Guided wave radar transmitters

Guided wave radar transmitters

Overview

Introduction

Guided Wave Radar transmitters use TDR (time domain reflectometry).

Time Domain Reflectometry (TDR)

TDR uses pulses of electromagnetic (EM) energy to measure distances or levels. When a pulse reaches a dielectric discontinuity (created by media surface), part of the energy is reflected. The greater the dielectric difference, the greater the amplitude (strength) of the reflection.

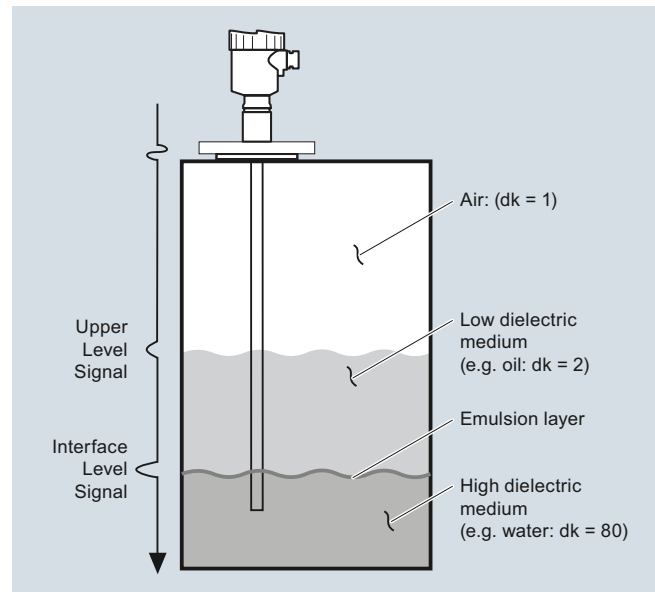
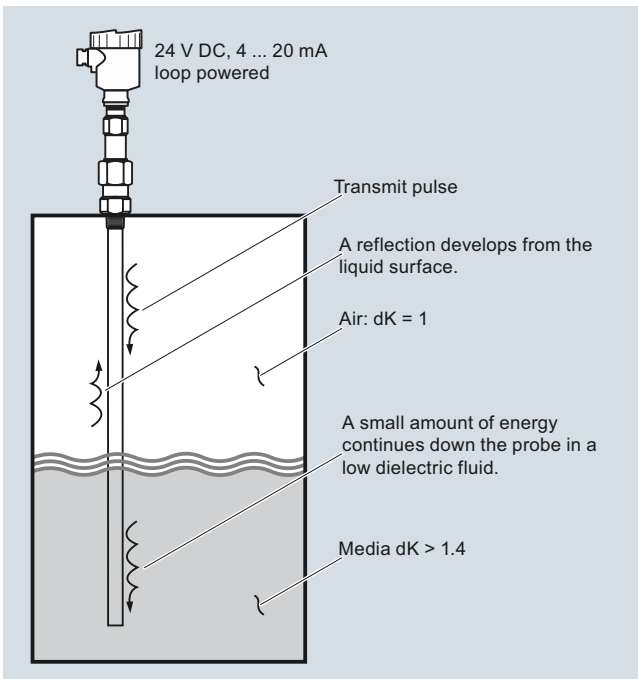
The SITRANS LG includes a transmitter and waveguide that has a characteristic impedance in air and is used as a probe. When part of the probe is immersed in a material other than air, there is lower impedance due to the increase in the dielectric. When an EM pulse is sent down the probe and meets the dielectric discontinuity, a reflection is generated.

Mode of operation

Interface Detection

The SITRANS LG, is a transmitter capable of measuring both an upper level and an interface level. The upper liquid must have a dielectric constant between 1.6 and 10 and the two liquids have a difference in dielectric constants greater than 10. A typical application would be oil over water, with the upper layer of oil being non-conductive with a dielectric constant of approximately 2 and the lower layer of water being very conductive with a dielectric constant of approximately 80. This interface measurement can only be accomplished when the dielectric constant of the upper medium is lower than the dielectric constant of the lower medium.

4



Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Overview



The Siemens SITRANS LG series are guided wave radar transmitters for level, level/interface, and volume measurement of liquids and solids. The SITRANS LG product line can handle changes in process conditions, high temperatures and pressures, and steam.

Benefits

- High accuracy to +/- 2 mm
- Advanced Diagnostics available for high degree of safety
- Simple menu driven display offers ease of setup
- Large range of options offers reliability in most continuous level measurement applications
- Ease of maintenance through module design and field replaceable and adjustable probe options
- Perfect solution for wide range of applications from storage to interface with options for extreme pressure and temperature conditions
- Universally applicable in liquids, interface, slurries and solids
- Highly immune to buildup using auto learn function
- Ability to measure in loss of echo situations with probe end tracking
- Suitable for API 2350
- Convenient access using USB and remote interface accessories

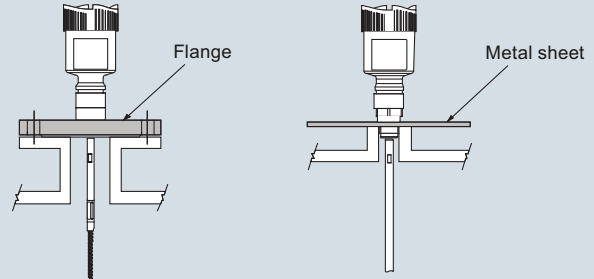
Application

The SITRANS LG series comes in four different models, depending on the applications, level of performance, and functionality required:

- SITRANS LG240 offers configuration options for your hygienic and corrosive application requirements
- SITRANS LG250 Highly flexible solution for liquid level and interface applications. Extremely versatile offering solutions for storage, separation of materials or difficult ammonia applications
- SITRANS LG260 Ideal for measuring level in medium range solids applications including: grains, plastics, and cement
- SITRANS LG270 offers configuration options for extreme conditions including high temperature and high pressure applications such as: harsh applications found in chemical, HPI and energy industries for example, LPG gas tanks, steam boilers and distillation columns

Configuration

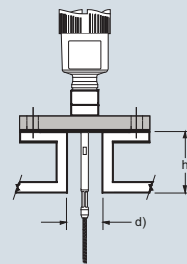
Mounting on nozzle



Installation in non-metal vessel

The guided microwave principle requires a metal surface on the process fitting. Therefore, use in plastic vessels etc. an instrument version with flange (from DN 50) or place a metal sheet, $\text{Ø} > 200$ mm (8 inch), beneath the process fitting when screwing it in. Make sure that the plate has direct contact with the process fitting

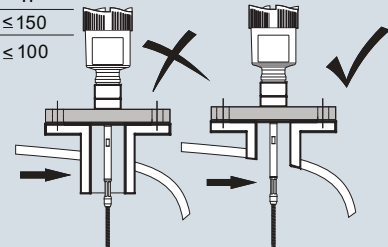
Mounting socket



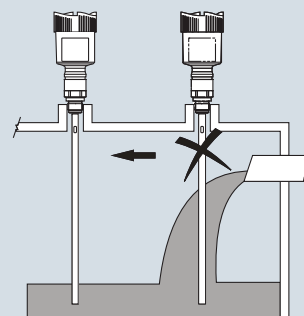
If possible, avoid sockets, mount the sensor flush with the vessel top. If this is not possible, use short sockets with small diameter. Higher sockets or sockets with a bigger diameter can generally be used. They simply increase the upper blocking distance. Check if this is relevant for your measurement. In such cases, always carry out a false signal suppression after installation.

d	h
DN 40 ... DN 150	≤ 150
> DN 150 ... DN 200	≤ 100

Socket must be installed flush



When welding the socket, make sure that the socket is flush to the vessel top. Before beginning the welding work, remove the electronics module from the sensor. By doing this, you avoid damage to the electronics through inductive coupling.



Inflowing medium

Do not mount the instruments in or above the filling stream. Make sure that you detect the product surface, not the inflowing product.

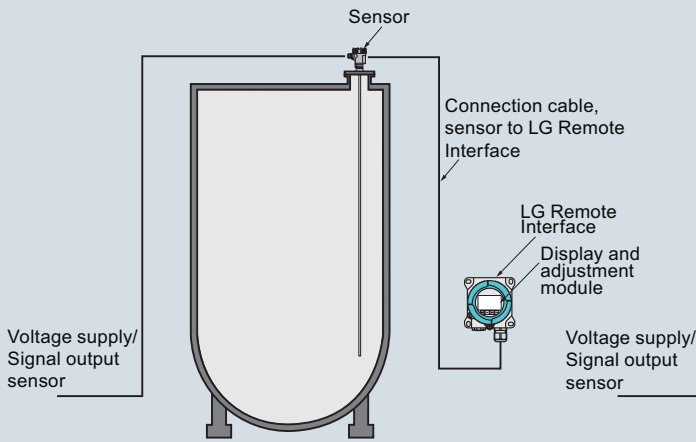
SITRANS LG Series installation

Level Measurement

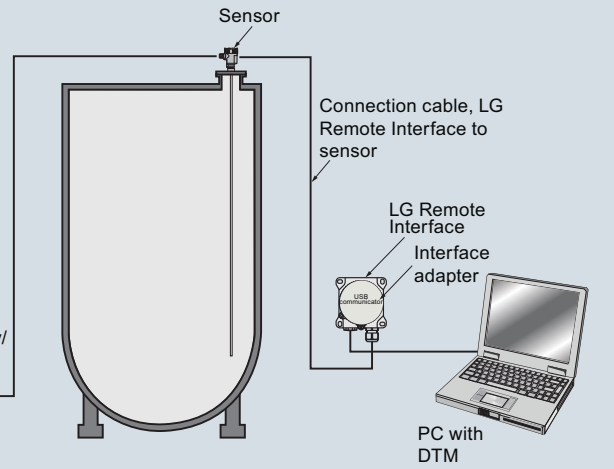
Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Connection of SITRANS LG Remote Interface to the sensor



Connection of LG Remote Interface to the sensor and the PC



SITRANS LG Remote Interface installation

4

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Technical specifications

Mode of operation		Medium conditions	
Measuring principle	Guided wave radar measurement	Dielectric constant	dK ≥ 1.4 (configuration dependent)
Measuring range	300 ... 75 000 mm (11.81 ... 2 952.75 inch)	Process temperature range	-196 ... +450 °C (-321 ... +842 °F)
Output		Vessel pressure	-1 ... +400 bar (-100 ... +40 000 kPa)
mA analog output with HART digital signal	4 ... 20 mA/HART (SIL optional)	Design	
Output range	Current: minimum 3.8 mA, maximum 20.5 mA ≤ 10 mA for 5 ms after switching on, ≤ 3.6 mA	Instrument weight (dependent on process fitting) - see manual for further details	Approx. 0.8 ... 8 kg (0.176 ... 17.64 lb)
• Analog		Materials	<ul style="list-style-type: none"> • Plastic housing plastic PBT (Polyester) • Aluminum die-casting housing, aluminum die-casting AlSi10 mg, powder-coated- basis: polyester • Stainless steel housing, precision casting 316L • Stainless steel housing, electropolished 316L
• Startup current	Diagnostic alarm	• Enclosure	
Digital communication	Failure signal current output (adjustable): last valid measured value, ≥ 21 mA, ≤ 3.6 mA	• Cable inlet	2 x M20 x 1.5 or 2 x 1/2" NPT
Modbus	HART Version 7 x and multidrop compatible	Process connections	G3/4" A, G1" A, G1 1/2" A according to DIN 3852-A
PROFIBUS PA	Modbus RTU, Modbus ASCII	• Pipe thread, cylindrical (ISO 228 T1)	
FOUNDATION Fieldbus	FOUNDATION Fieldbus protocol Physical layer according to IEC 61158-2	• American pipe thread, conical (ASME B1.20.1)	DIN from DN 25, ANSI from 1"
Performance		• Flanged	Hygienic fittings
Process reference conditions according to DIN EN 61298-1		• Hygienic	
Non-linearity	See manual for more details	Programming	
• Coaxial		Resolution and repeatability	Local
• Single rod probes	Accuracy +/- 2 mm (0.08 inch)	Handheld communicator	Hart communicator
• Interface models	+/- 2 mm (0.08 inch) +/- 5 mm (0.197 inch)	PC	SIMATIC PDM, AMS, PACTware
Resolution and repeatability		Accuracy	Power
• Coaxial/rod/cable probes	Note: Typical deviation, Interface measurement. See manual for full explanation.	2-wire Hart version	9.6 ... 35 V DC
• Interface models		4-wire versions	9.6 ... 48 V DC, 20 ... 42 V AC, 50/60 Hz, and 90 ... 253 V AC, 50/60 Hz
Electromagnetic compatibility (check if needed)	The measurement error from the process conditions is in the specified pressure and temperature range of below 1 %	Modbus	8 ... 30 V DC
• Measuring cycle time		PROFIBUS PA	9 ... 32 V DC
• Step response time	Ambient temperature for enclosure -40 ... +80 °C (-40 ... +176 °F)	FOUNDATION Fieldbus	9 ... 32 V DC
• Temperature Effects		LCD readable temperature range	-40 ... +80 °C (-40 ... +176 °F) with display heated option
Rated operating conditions		Location	Indoor/outdoor
Ambient temperature for enclosure	-40 ... +80 °C (-40 ... +176 °F)	Installation category	II
LCD readable temperature range	-40 ... +80 °C (-40 ... +176 °F) with display heated option	Pollution degree	2
Location	Indoor/outdoor	Relative Humidity	20 ... 85 %
Installation category	II	Certificates and approvals	
Pollution degree	2	Hazardous approvals:	ATEX, FM, CSA, IECex Note: other regional approvals are available
Relative Humidity	20 ... 85 %	Hygienic approvals:	EHEDG, FDA
		Overfill protection	WHG, VlareM
		Ship approval	ABS, CCS, GL, BV, LR

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Industries	SITRANS LG240 Food, Beverage and Pharmaceutical	SITRANS LG250 Chemical/HPI/Power/General	SITRANS LG260 Cement, power generation, food, processing, mineral pro- cessing, mining	SITRANS LG270 Chemical/HPI/Power/General
Applications	Hygienic and corrosive applications	Liquids, storage and process vessels with agitators, vaporous liquids, interface	Cement, fly ash, grain, coal, flour, plastics	Aggressive applications in liquids, storage and process vessels with agitators, vaporous liquids, high temperatures and pressures, low dielectric media
Range	32 m	75 m	60 m	60 m
Performance	± 2 mm	± 2 mm	± 2 mm	± 2 mm
Temperature	-40 ... +150 °C (-40 ... +302 °F)	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +200 °C (-40 ... +392 °F)	-196 ... +450 °C (-320.8 ... +842 °F)
Communications	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • Modbus: Modbus RTU, Modbus ASCII • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • Modbus: Modbus RTU, Modbus ASCII • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • Modbus: Modbus RTU, Modbus ASCII • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • Modbus: Modbus RTU, Modbus ASCII • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Article No.	Ord. Code
SITRANS LG240	7ML5880-		SITRANS LG240	7ML5880-	
Guided Wave Radar sensor for Hygienic and corrosive continuous level and interface measurement of liquids.			Guided Wave Radar sensor for Hygienic and corrosive continuous level and interface measurement of liquids.		
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Approvals			Process fitting/Material		
General purpose (CSA, FM, CE) ⁹⁾³⁰⁾	0 A		Clamp 2" PN 16 (ø 64 mm) DIN 32676, ISO2852/1.4435 (BN2) ⁴⁾	0 0	
Overfill protection (WHG; VLAREM) ²⁸⁾³⁰⁾	0 C		Clamp 2" PN 16 (ø 64 mm) DIN 32676, ISO2852/PTFE-TFM 1600	0 1	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 ⁹⁾³⁰⁾	0 E		Clamp 2 1/2" PN 10 (ø 77.5 mm) DIN 32676, ISO2852/1.4435 (BN2) ⁴⁾	0 2	
ATEX II 1G, 1/2G, 2G Ex ia IIC + Overfill (WHG;VLAREM) ⁹⁾²⁸⁾³⁰⁾	0 F		Clamp 2 1/2" PN 10 (ø 77.5 mm) DIN 32676, ISO2852/PTFE-TFM 1600	0 3	
ATEX II 1G, 1/2G 2G Ex ia IIC + ATEX II 1D, 1/2D, 2D IP6x ¹⁵⁾²⁴⁾²⁶⁾²⁷⁾	0 H		Clamp 3" PN 10 (ø 91 mm) D N 32676, ISO2852/1.4435 (BN2) ⁴⁾	0 4	
ATEX II 1/2G, 2G Ex d ia IIC T6 ¹⁾¹²⁾²⁷⁾	0 J		Clamp 3" PN 10 (ø 91 mm) DIN 32676, ISO2852/PTFE-TFM 1600	0 5	
ATEX II 1/2G, 2G Ex d ia IIC + ATEX II 1/2D, 2D IP6x ¹⁾¹²⁾¹⁵⁾²⁴⁾²⁷⁾	0 K		Clamp 4" PN 6 (ø 119 mm) DIN 32676, ISO2852/1.4435(BN2) ⁴⁾	0 6	
ATEX II 1D, 1/2D, 2D IP6x T ¹⁵⁾²⁴⁾²⁶⁾²⁷⁾	0 N		Clamp 4" PN 6 (ø 119 mm) DIN 32676, ISO2852/PTFE-TFM 1600	0 7	
IEC Ex ia IIC T6 ⁹⁾³⁰⁾	0 P		Clamp 1 1/2" PN 16 (ø 50.5 mm) DIN 32676, ISO2852/1.4435 (BN2)	4 0	
IEC Ex ia IIC T6 + IEC IP6x T tD ¹⁵⁾²⁴⁾²⁶⁾²⁷⁾	0 Q		Bolting DN 32, PN 40 DIN 11851/1.4435(BN2) ⁴⁾	0 8	
IEC Ex d ia IIC T6 ¹⁾¹²⁾²⁷⁾	0 R		Bolting DN 32, PN 40 DIN 11851/PTFE-TFM 1600	1 0	
IEC Ex d ia IIC T6 + IEC IP6x T tD ¹⁾¹²⁾¹⁵⁾²⁴⁾²⁷⁾	0 S		Bolting DN 40, PN 40 DIN 11851/1.4435 (BN2) ⁴⁾	1 1	
FM (NI) Class I, Div. 2, Groups A, B, C, D	1 A		Bolting DN 40, PN 40 DIN 11851/PTFE-TFM 1600	1 2	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ³⁰⁾	1 B		Bolting DN 50, PN 25 DIN 11851/1.4435(BN2) ⁴⁾	1 3	
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾¹²⁾	1 C		Bolting DN 50, PN 25 DIN 11851/PTFE-TFM 1600	1 4	
CSA (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G ⁹⁾¹⁵⁾²⁶⁾²⁷⁾²⁹⁾	1 E		Bolting DN 65, PN 25 DIN 11851/PTFE-TFM 1600	1 5	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ⁹⁾³⁰⁾	1 F		Flange DN 25, PN 40 Form C, DIN 2501/PTFE-TFM 1600	2 0	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾¹²⁾	1 G		Flange DN 40, PN 40 Form C, DIN 2501/PTFE-TFM 1600	2 1	
NEPSI Ex ia IIC T6 ⁹⁾³⁰⁾	2 A		Flange DN 50, PN 40 Form C, DIN 2501/PTFE-TFM 1600	2 2	
NEPSI Ex ia IIC T6 + DIP A20/21 TA T*	2 B		Flange DN 50, PN 40 Form V13, DIN 2513/PTFE-TFM 1600	2 3	
NERSI Ex d ia IIC T6	2 C		Flange DN 65, PN 40 Form C, DIN 2513/PTFE-TFM 1600	2 4	
NERSI Ex d ia IIC T6 + DIP A20/21 TA T*	2 D		Flange DN 80, PN 40 Form C, DIN 2501/PTFE-TFM 1600	2 5	
NEPSI Ex d IIC T6	2 E		Flange DN 100, PN 16 Form C, DIN 2501/PTFE-TFM 1600	2 6	
NEPSI Ex d IIC T6 + DIP A20/21 TA T*	2 F		Flange DN 80, PN 40 EN 1092-1 Form B1/PTFE-TFM 1600	2 7	
NEPSI DIP A20/21 TA T*	2 G		Flange DN 100, PN 40 EN 1092-1 Form B1/PTFE-TFM 1600	2 8	
INMETRO Ex ia IIC T6 ... T1 ⁹⁾³⁰⁾	3 A		Flange 2" 150 lb RF, ANSI B16.5/PTFE-TFM 1600	3 0	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex ia IIC T6, Ga, Ga/Gb	3 B		Flange 2" 300 lb RF, ANSI B16.5/PTFE-TFM 1600	3 1	
INMETRO Ex d ia IIC T6 ... T1	3 C		Flange 3" 150 lb RF, ANSI B16.5/PTFE-TFM 1600	3 2	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d ia IIC T6 Ga/Gb	3 D		Flange 4" 150 lb RF, ANSI B16.5/PTFE-TFM 1600	3 3	
INMETRO Ex d IIC T6 ... T1	3 E		Note: The pressure limit for all PTFE coated versions is 16 bar (per manual).		
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d IIC T6 Ga/Gb	3 F				
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db	3 G				
GOST-R/EAC 0 Ex ia IIC T1 ... T6 X ³³⁾	5 A				
GOST-R/EAC 0 Ex ia IIC T1 ... T6 X + Ex t IIIC T ... IP66 ³¹⁾³⁴⁾	5 B				
GOST-R/EAC 1 Ex d ia IIC T1 ... T6 X ³²⁾³⁵⁾	5 C				
GOST-R/EAC 1 Ex d ia IIC T1 ... T6 X + Ex t IIIC T ... IP66 ¹⁾³⁵⁾	5 D				
Probe version/Material					
Probe cable ø 4 mm (0.16 inch) with gravity weight/PFA ²⁾⁷⁾	A				
Probe exchangeable rod ø 8 mm (0.31 inch)/1.4435 (Basle standard) ³⁾⁷⁾	B				
Probe exchangeable rod ø 8 mm (0.31 inch)/1.4435 (Basle standard) can be autoclaved ³⁾⁷⁾	C				
Probe rod ø 10 mm (0.39 inch)/PFA ²⁾⁷⁾	D				
Probe exchangeable rod (ø 8 mm) /1.4435 (BN2), electropolished (Ra < 0.38 µm) ⁷⁾	E				

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Article No.	Ord. Code
SITRANS LG240	7ML5880-		SITRANS LG240	7ML5880-	
Guided Wave Radar sensor for Hygienic and corrosive continuous level and interface measurement of liquids.			Guided Wave Radar sensor for Hygienic and corrosive continuous level and interface measurement of liquids.		
Electronics			Stainless steel double chamber / IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated	S	
Two-wire 4 ... 20mA/HART		0	Remote stainless steel single chamber housing, electropolished/IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug	Z	Q2 A
Four-wire Modbus ¹⁹⁾²⁰⁾²¹⁾²²⁾		1	Remote plastic single chamber housing /IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug	Z	Q2 B
Two-wire 4 ... 20mA/HART with SIL qualification ¹⁸⁾		2			
Four-wire 4 ... 20mA/HART; 90 ... 253 V AC; 50/60 Hz ¹⁾⁸⁾¹⁰⁾		3			
Four-wire 4 ... 20mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC ¹⁾⁸⁾¹⁰⁾		4			
PROFIBUS PA ²⁵⁾		5			
FOUNDATION Fieldbus		6			
Seal/Process temperature			Lengths		
Without glass seal/-40 ... +150 °C (-40 ... +302 °F) ⁹⁾¹¹⁾		A	Rod \varnothing 8 mm (0.31 inch)/1.4435 (Basle standard 300 ... 4 000 mm)		
FFKM (Kalrez 6221)/-20 ... 150 °C (-4 ... +302 °F)		B	300 ... 1 000 mm (11.81 ... 39.37 inch) ¹⁴⁾	0	
EPDM (Freudenberg 70 EPDM 291)/-20 ... 130 °C (-4 ... +266 °F)		C	1 001 ... 2 000 mm (39.41 ... 78.74 inch) ¹⁴⁾	1	
			2 001 ... 3 000 mm (78.78 ... 118.11 inch) ¹⁴⁾	2	
			3 001 ... 4 000 mm (118.15 ... 157.48 inch) ¹⁴⁾	3	
Housing/Protection/Cable			Rod \varnothing 10 mm (0.24 inch)/PFA (300 ... 4 000 mm)		
Plastic IP66/IP67 M20 x 1.5/blind stopper		A	300 mm (11.81 inch) ¹⁴⁾	9	R1 A
Plastic IP66/IP67 1/2" NPT/blind stopper		B	500 mm (19.69 inch) ¹⁴⁾	9	R1 B
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		C	300 ... 1 000 mm (11.81 ... 39.37 inch) ¹⁴⁾	9	R1 C
Aluminum/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		D	1 001 ... 5 000 mm (39.41 ... 78.74 inch) ¹⁴⁾	9	R1 D
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		E	2 001 ... 3 000 mm (78.78 ... 118.11 inch) ¹⁴⁾	9	R1 E
Aluminum double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		F	3 001 ... 4 000 mm (118.15 ... 157.48 inch) ¹⁴⁾	9	R1 F
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		G	Cable \varnothing 4 mm (0.16 inch)/PFA (500 ... 32 000 mm)		
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		H	500 mm (9.69 inch)	9	R1 G
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		J	501 ... 1 000 mm (19.72 ... 39.37 inch)	9	R1 H
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		K	1 001 ... 2 000 mm (39.41 ... 78.74 inch)	9	R1 J
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		L	2 001 ... 4 000 mm (78.78 ... 118.11 inch)	9	R1 K
Stainless steel double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		M	4 001 ... 5 000 mm (157.52 ... 196.85 inch)	9	R1 L
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		N	5 001 ... 10 000 mm (196.89 ... 393.70 inch)	9	R1 M
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		P	10 001 ... 15 000 mm (393.74 ... 590.55 inch)	9	R1 N
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		Q	15 001 ... 20 000 mm (590.59 ... 787.40 inch)	9	R1 P
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		R	20 001 ... 25 000 mm (787.44 ... 984.25 inch)	9	R1 Q
Aluminum single chamber / IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		W	25 001 ... 32 000 mm (984.29 ... 1 259.52 inch)	9	R1 R
Aluminum double chamber / IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		X	Exchange rod \varnothing 8 mm (0.31 inch)/1.4435 (BN2), electropolished (Ra < 0.38 μ m)		
Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated		Y	300 ... 1 000 mm (11.81 ... 39.37 inch) ¹⁴⁾	9	R2 A
			1 001 ... 2 000 mm (39.41 ... 78.74 inch) ¹⁴⁾	9	R2 B
			2 001 ... 3 000 mm (78.78 ... 118.11 inch) ¹⁴⁾	9	R2 C
			3 001 ... 4 000 mm (118.15 ... 157.48 inch) ¹⁴⁾	9	R2 D

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs (mandatory)		Operating Instructions	
Please add "-Z" to Article No. and specify Order code(s).		All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Supplementary electronics		Accessories	
Without	A00	SITRANS LG, GWR sensor Display Module	A5E34143449
Additional current output 4 ... 20 mA ¹⁾²³⁾	A01	SITRANS LG, two-wire 4 ... 20 mA/HART electronic	A5E35637821
Indicating/adjustment module		SITRANS LG, USB communicator	A5E35192015
Without	E00	SITRANS LG, Mounting eye M12 x 20	PBD:51041448
Mounted	E01	SITRANS LG, Mounting spring	PBD:51041449
Laterally mounted ¹⁾	E02	Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia	7NG4124-0AA00
Language of display		SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
German	L00	SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
English	L01	SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
French	L02	SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
Dutch	L03		
Italian	L04		
Spanish	L05		
Portuguese	L06		
Russian	L07		
Chinese	L08		
Japanese	L09		
Operating instructions			
German	M00		
English	M01		
French	M02		
Spanish	M03		
Further designs (optional)			
Please add "-Z" to Article No. and specify Order code(s).			
Enter the total insertion length in plain text description	Y01		
Enter the total length of rigid part (cable version only) range from 100 ... 1 000 mm	Y02		
Cleaning included certificate: oil, grease and silicone free	W01		
Identification label (measurement loop) stainless steel, 40 characters max, add in plain text. To add more than one line use a coma ",", for line break.	Y17		
Identification Label (measurement loop) foil, 40 characters max, add in plain text. To add more than one line use a coma ",", for line break.	Y18		
3.1-Inspection Certificate for instrument (EN 10204) ¹⁶⁾	C12		
3.1-Inspection Certificate for material (EN 10204 NACE MR 0175) ¹⁶⁾	D07		
3.1-Inspection Certificate for instrument with test data (EN 10204) ¹⁶⁾	C25		
2.2-Factory certificate for material (EN 10204) ¹⁶⁾	C15		
Quality and test plan ¹⁶⁾	C26		
Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN10204) ¹⁶⁾	C13		
X-ray test + 3.1 certificate/instrument ¹⁶⁾	C14		
Positive material identification test + 3.1 certificate/instrument ¹⁶⁾	C16		
Roughness test + 3.1 certificate/instrument ¹⁶⁾	C18		
Pressure test + 3.1 certificate/instrument ¹⁶⁾	C31		
Helium leak test + 3.1 certificate/instrument ¹⁶⁾	C32		
Ferrite measuring accuracy to DIN 32514-1 + 3.1 certificate/instrument ¹⁶⁾	C60		
Pressure test according to Norsok + 3.1 certificate/instrument ¹⁶⁾	C61		
5 point calibration certificate (min. length 1 000 mm) ¹⁶⁾	C62		
		For applicable back up point level switch - see point level measurement section	
		1) Available with Housing/Protection/Cable options E, F, L, M only	
		2) Available only with Process fitting/Material options 01, 03, 05, 07, 10, 12, 14 ... 33 (PTFE-TFM 1600 options)	
		3) Available only with Process Fitting/Material options 00, 02, 04, 06, 08, 11, and 13 [1.4435 (BN2) options]	
		4) Available with Length options 0, 1, 2, 3 only (Rod ø 8 mm 1.4435 options)	
		5) Available with Length options R1A ... R1R only (Rod ø 10 mm/PFA and Cable ø 4 mm/PFA options)	
		7) Available only with the same rod or cable diameter in Length options	
		8) Available with Supplementary electronic option A00 and Indicating/adjustment module options E00, E01	
		9) Available with Supplementary electronics A01, Intrinsically safe approval options (excluding FM) 0A, 0E, 0F, 0P, 1E, 1F, 2A, and 3A	
		10) Available with Approval options 0A, 0J, 0K, 0N, 0R, 0S, 1A, 1C, 1E, 1G, 2C, 2D, 2G, 3C, 3D, 3G	
		12) Available with Indicating/adjustment module options E00 and E01	
		14) Not available with Y02	
		15) Available with Housing/Protection/Cable options C, D, E, F, G, H, L, M	
		16) Listed Certificates are not available with all configurations, please contact factory for more information	
		18) Available with Supplementary electronic option A00, SIL electronics	
		19) Only available with Approval options 0A, 0J, 0K, 0R, 0S, 1A, 1C, 1E, and 1G	
		20) Available with Housing/Protection/Cable options E, F, L, M, and P	
		21) Available with Supplementary Electronic option A00	
		22) Available with Indicating/adjustment module options E00, E01	
		23) Not available with Indicating/adjustment module option E02	
		24) Available with Housing/Protection/Cable options D, F, H, M, X, and S	
		25) Not available with Supplementary Electronic option A01	
		26) Available with Housing/Protection/Cable options W and Y	
		27) Available with Housing/Protection/Cable options X and S	
		28) Available with Electronics options 0, 2, and 5	
		29) Not available with Housing/Protection/Cable options A and B	
		30) Available with Housing/Protection/Cable options Q2A and Q2B (Approval option 0A excluding CSA)	
		31) Only available with Housing/Protection/Cable options C, D, E, F, G, H, L, M, W, X, Y, S	
		32) Only available with Housing/Protection/Cable options E, F, L, M, X, S	
		33) Only available with Electronics options 0, 2, 5, 6	
		34) Only available with Electronics options 0 and 2	
		35) Only available with Electronics options 0 ... 4	
		Note: Please consult manual for further details	

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Article No.	Ord. Code
SITRANS LG250	7ML5881-		SITRANS LG250	7ML5881-	
A guided wave radar sensor for continuous level and interface measurement of liquids.			A guided wave radar sensor for continuous level and interface measurement of liquids.		
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Approvals			Probe version/Material		
General purpose (CSA, FM, CE) ¹⁶⁾⁵⁰⁾⁵³⁾	0 A		Probe exchangeable cable ø 2 mm (0.08 inch) with gravity weight/316L ⁸⁾⁹⁾¹¹⁾²⁶⁾	A	
Shipping approval ¹⁹⁾²⁸⁾²⁹⁾⁵²⁾⁵⁴⁾	0 B		Probe exchangeable cable ø 2 mm (0.08 inch) center weight/316L ⁸⁾⁹⁾¹²⁾²⁶⁾	B	
Overfill protection (WHG; VLAREM) ⁴⁶⁾⁵⁰⁾⁵³⁾	0 C		Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/316L ⁸⁾⁹⁾¹¹⁾²⁶⁾	C	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 ¹⁶⁾⁵⁰⁾⁵³⁾	0 E		Probe exchangeable cable ø 4 mm (0.16 inch) with center weight/316L ⁸⁾⁹⁾¹²⁾²⁶⁾	D	
ATEX II 1G, 1/2G, 2G Ex ia IIC + Overfill (WHG; VLAREM) ¹⁶⁾⁴⁶⁾⁵⁰⁾⁵³⁾	0 F		Probe exchangeable rod ø 8 mm (0.31 inch)/316L ²⁾⁸⁾¹⁰⁾¹¹⁾²⁶⁾	E	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 + shipping approval ¹⁹⁾²⁸⁾²⁹⁾⁵²⁾⁵⁴⁾	0 G		Probe exchangeable rod ø 12 mm (0.47 inch)/316L ³⁾⁸⁾¹⁰⁾¹¹⁾²⁶⁾	F	
ATEX II 1G, 1/2G 2G Ex ia IIC + ATEX II 1D, 1/2D, 2D IP6x ²³⁾⁴⁰⁾⁴⁴⁾⁴⁵⁾	0 H		Probe coax version ø 21.3 mm (0.84 inch) with single hole/316L ⁸⁾⁹⁾¹¹⁾²⁶⁾²⁷⁾	G	
ATEX II 1/2G, 2G Ex d ia IIC T6 ¹⁾²¹⁾²³⁾⁴⁵⁾	0 J		Probe coax version ø 21.3 mm (0.84 inch) with multiple hole/316L ⁸⁾⁹⁾¹¹⁾²⁶⁾²⁷⁾	H	
ATEX II 1/2G, 2G Ex d ia IIC + ATEX II 1/2D, 2D IP6x ^{1) 21)23)40)45)}	0 K		Probe coax version ø 42.2 mm (1.66 inch) with multiple hole/316L ⁵⁾⁸⁾⁹⁾¹¹⁾²⁶⁾²⁷⁾	K	
ATEX II 1/2G, 2G Ex d IIC T6 ¹⁴⁾²⁰⁾	0 L		Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/Alloy C22 (2.4602) ⁸⁾	L	
ATEX II 1/2G, 2G Ex d IIC + ATEX II 1/2D, 2D IP6x ¹⁴⁾²⁰⁾²³⁾⁴⁰⁾⁴⁴⁾	0 M		Probe exchangeable cable ø 4 mm (0.16 inch) with centre weight/Alloy C22 (2.4602) ⁸⁾	M	
ATEX II 1D, 1/2D, 2D IP6x T ²⁰⁾²³⁾⁴⁰⁾⁴⁴⁾⁴⁵⁾	0 N		Probe exchangeable rod ø 8 mm (0.31 inch)/Alloy C22 (2.4602) ⁸⁾	N	
IEC Ex ia IIC T6 ¹⁶⁾⁵⁰⁾⁵³⁾	0 P		Probe exchangeable rod ø 12 mm (0.47 inch)/Alloy C22 (2.4602) ⁸⁾	P	
IEC Ex ia IIC T6 + IEC IP6x T tD ²⁰⁾²³⁾⁴⁰⁾⁴⁴⁾⁴⁵⁾	0 Q		Probe coax version ø 21.3 mm (0.84 inch) with multiple hole/Alloy C22 (2.4602) ⁸⁾	Q	
IEC Ex d ia IIC T6 ¹⁾²¹⁾²³⁾⁴⁰⁾⁴⁵⁾	0 R		Probe coax version ø 42.2 mm (1.66 inch) with multiple hole/Alloy C22 (2.4602) ⁸⁾	R	
IEC Ex d ia IIC T6 + IEC IP6x T tD ¹⁾²⁰⁾²¹⁾⁴⁰⁾⁴⁴⁾⁴⁵⁾	0 S		Probe exchangeable rod ø 8 mm (0.31 inch)/Duplex (1.4462) ⁸⁾	S	
IEC Ex d IIC T6 ¹⁴⁾²⁰⁾	0 T		Exchangeable rod ø 12 mm (0.47 inch)/Alloy 400 (2.4360) ⁸⁾	T	
IEC Ex d IIC T6 + IEC IP6x T tD ¹⁴⁾²⁰⁾²³⁾⁴⁰⁾⁴⁴⁾	0 U				
FM (NI) Class I, Div. 2, Groups A, B, C, D ²⁰⁾⁵¹⁾⁵³⁾	1 A				
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F ⁵³⁾	1 B				
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾²¹⁾²³⁾	1 C				
FM (XP) Class I, Div. 1, Groups A, B, C, D ²⁰⁾	1 D				
CSA (NI) Class I, Div. 2, Groups A, B, C, D (DIP) Class II, III, Div. 1, Groups E, F, G ¹⁶⁾⁴⁴⁾⁴⁵⁾⁵¹⁾	1 E				
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁶⁾⁵⁰⁾⁵³⁾	1 F				
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾²¹⁾²³⁾	1 G				
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁴⁾²⁰⁾	1 H				
NEPSI Ex ia IIC T6 ¹⁶⁾⁴⁶⁾⁵³⁾	2 A				
NEPSI Ex ia IIC T6 + DIP A20/21 TA T ^{*43)}	2 B				
NEPSI Ex d ia IIC T6 ⁴³⁾⁴⁷⁾	2 C				
NEPSI Ex d ia IIC T6 + DIP A20/21 TA T ^{*43)47)}	2 D				
NEPSI Ex d IIC T6 ⁴³⁾	2 E				
NEPSI Ex d IIC T6 + DIP A20/21 TA T ^{*43)}	2 F				
NEPSI DIP A20/21 TA T ^{*43)48)}	2 G				
INMETRO Ex ia IIC T6 ... T1 ¹⁶⁾⁴⁶⁾⁵³⁾	3 A				
INMETRO Ex t IIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex ia IIC T6, Ga, Ga/Gb ⁴³⁾	3 B				
INMETRO Ex d ia IIC T6 ... T1 ⁴³⁾⁴⁷⁾	3 C				
INMETRO Ex t IIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d ia IIC T6 Ga/Gb ⁴³⁾⁴⁷⁾	3 D				
INMETRO Ex d IIC T6 ... T1 ⁴³⁾⁴⁶⁾	3 E				
INMETRO Ex t IIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d IIC T6 Ga/Gb ⁴³⁾	3 F				
INMETRO Ex t IIC T* IP6X, Da, Da/Db, Da/Dc, Db ⁴³⁾⁴⁸⁾	3 G				
KOSHA Ex d IIC T6 ... T1 - KE ¹⁴⁾²⁰⁾⁵²⁾	4 A				
GOST-R/EAC 0 Ex ia IIC T1 ... T6 X ⁶⁰⁾	5 A				
GOST-R/EAC 0 Ex ia IIC T1 ... T6 X + Ex t IIC T ... IP66 ⁵⁶⁾⁵²⁾	5 B				
GOST-R/EAC 1 Ex d ia IIC T1 ... T6 X ⁵⁷⁾⁶¹⁾	5 C				
GOST-R/EAC 1 Ex d ia IIC T1 ... T6 X + Ex t IIC T ... IP66 ⁵⁸⁾⁶¹⁾	5 D				
GOST-R/EAC 1 Ex d IIC T1 ... T6 X ⁵⁹⁾⁵²⁾	5 E				
GOST-R/EAC 0 Ex d IIC T1 ... T6 X + Ex t IIC T ... IP66 ¹⁴⁾⁵²⁾	5 F				
GOST-R/EAC Ex t IIC T ... IP66 ⁵⁶⁾⁶¹⁾	5 G				

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Article No.	Ord. Code
SITRANS LG250	7ML5881-		SITRANS LG250	7ML5881-	
A guided wave radar sensor for continuous level and interface measurement of liquids.			A guided wave radar sensor for continuous level and interface measurement of liquids.		
Process fitting/Material					
Thread G 3/4" (DIN 3852-A) PN 6/316L	00		Flange DN 100 PN 40 Form V13, DIN 2513/316L	31	
Thread 3/4" NPT (ASME B1.20.1) PN 6/316L	01		Flange DN 150 PN 16 Form C, DIN 2501/316L	32	
Thread G 3/4" (DIN 3852-A) PN 40/316L	02		Flange DN 50 PN 40 EN 1092-1 Form B1/316L	33	
Thread 3/4" NPT (ASME B1.20.1) PN 40/316L	03		Flange DN 80 PN 40 EN 1092-1 Form B1/316L	34	
Thread G 3/4" (DIN 3852-A) PN 100 / 316L ⁴²⁾	04		Flange 1" 150 lb RF, ANSI B16.5/316L	35	
Thread 3/4" NPT (ASME B1.20.1) PN 100/316L ⁴²⁾	05		Flange 1 1/2" 150 lb RF, ANSI B16.5/316L	36	
Thread G 1" (DIN 3852-A) PN 40/316L	06		Flange 2" 150 lb RF, ANSI B16.5/316L	37	
Thread 1" NPT (ASME B1.20.1) PN 40/316L	07		Flange 2" 300 lb RF, ANSI B16.5/316L	38	
Thread G 1" (DIN 3852-A) PN 100/316L ⁴²⁾	08		Flange 3" 150 lb RF, ANSI B16.5/316L	40	
Thread 1" NPT (ASME B1.20.1) PN 100/316L ⁴²⁾	10		Flange 3" 300 lb RF, ANSI B16.5/316L	41	
Thread G 1 1/2" (DIN 3852-A) PN 40/316L	11		Flange 4" 150 lb RF, ANSI B16.5/316L	42	
Thread 1 1/2" NPT (ASME B1.20.1) PN 40/316L	12		Flange 4" 300 lb RF, ANSI B16.5/316L	43	
Thread G 1 1/2" (DIN 3852-A) PN 100/316L ⁴²⁾	13		Flange 6" 150 lb RF, ANSI B16.5/316L	44	
Thread 1 1/2" NPT (ASME B1.20.1) PN 100/316L ⁴²⁾	14		Flange 6" 300 lb RF, ANSI B16.5/316L	45	
Thread 2 NPT PN 40, ASME B1.20.1/316L ³⁷⁾³⁸⁾	15		Thread G 3/4" PN 40, DIN3852-A / Alloy C22 (2.4602)	46	
Flange DN 25 PN 40 Form C, DIN 2501/316L	20		Thread G 1" PN 40, DIN 3852-A/ Alloy C22 (2.4602)	47	
Flange DN 25 PN 40 Form F, DIN 2501/316L	21		Thread G 1 1/2" PN 40, DIN 3852-A/ Alloy C22 (2.4602)	48	
Flange DN 40 PN 40 Form C, DIN 2501/316L	22		Thread 1 1/2" NPT PN 40, ASME B1.20.1/ Alloy C22 (2.4602)	50	
Flange DN 50 PN 40 Form C, DIN 2501/316L	23		Flange DN 50 PN 40 Form C, DIN 2501/ 316L with Alloy C22 (2.4602) coating	51	
Flange DN 50 PN 40 form V13, DIN 2513/316L	24		Flange DN 50 PN 40 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating	52	
Flange DN 80 PN 40 Form C, DIN 2501/316L	25		Flange DN 80 PN 40 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating	53	
Flange DN 80 PN 40 Form V13, DIN 2501/316L	26		Flange DN 100 PN 40 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating	54	
Flange DN 100 PN 16 Form C, DIN 2501/316L	27		Flange DN 150 PN 16 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating	55	
Flange DN 100 PN 16 Form C, DIN 2501/ 316L	28		Flange DN 200 PN 16 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating	56	
Flange DN 100 PN 40 Form C, DIN 2501 /316L	30		Flange 2" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	57	
			Flange 2" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	58	
			Flange 3" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	60	
			Flange 4" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	61	
			Flange 4" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	62	
			Flange 6" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	63	
			Flange 6" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	64	
			Thread G 3/4" (DIN 3852-A) PN 40/Duplex 1.4462	65	
			Flange DN 80 PN 40 Form F, DIN 2501/Duplex (1.4462)	66	
			Flange DN 50 PN 40 Form B1, EN 1092-1/ Duplex (1.4462)	67	
			Flange 1" 150 lb RF, ASME16.5/Duplex (1.4462)	68	
			Flange 1 1/2" 150 lb RF, ASME B16.5/Duplex (1.4462)	70	
			Flange 2" 150 lb RF, ASME B16.5/Duplex (1.4462)	71	
			Flange 2" 300 lb RF, ASME B16.5/Duplex (1.4462)	72	
			Flange 2" 600 lb RF, ASME B16.5/Duplex (1.4462)	73	
			Flange 3" 150 lb RF, ASME B16.5/Duplex (1.4462)	74	
			Flange 3" 300 lb RF, ASME B16.5/Duplex (1.4462)	75	

Level Measurement

Continuous level measurement - Guided wave radar transmitters



SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Article No.	Ord. Code
SITRANS LG250	7ML5881-		SITRANS LG250	7ML5881-	
A guided wave radar sensor for continuous level and interface measurement of liquids.			A guided wave radar sensor for continuous level and interface measurement of liquids.		
Flange 4" 150 lb RF, ANSI B16.5/Duplex (1.4462)	7 6		Electronics		
Flange 4" 150 lb FF, ANSI B16.5/Duplex (1.4462)	7 7		Two-wire 4 ... 20 mA/HART	0	
Flange 4" 300 lb RF, ASME B16.5/Duplex (1.4462)	7 8		Four-wire Modbus ³³⁾³⁵⁾³⁶⁾⁴⁹⁾	1	
Flange 4" 600 lb RF, ASME B16.5/Duplex (1.4462)	8 0		Two-wire 4 ... 20 mA/HART with SIL qualification ²⁴⁾³²⁾	2	
Thread 1 1/2" NPT PN 40, ASME B1.20.1/ Alloy 400 (2.4360)	8 1		Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60Hz ¹⁾¹⁵⁾¹⁷⁾⁴⁹⁾	3	
Flange 2" 150 lb RF, ASME B16.5/Alloy 400 (2.4360)	8 2		Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC ¹⁾¹⁵⁾¹⁷⁾⁴⁹⁾	4	
Flange 2" 300 lb RF, ASME B16.5/Alloy 400 (2.4360) solid	8 3		PROFIBUS PA ⁴³⁾⁴⁹⁾	5	
Flange 3" 150 lb RF, ASME B16.5/Alloy 400 (2.4360)	8 4		FOUNDATION Fieldbus ⁴⁹⁾	6	
Flange 3" 300 lb RF, ASME B16.5/Alloy 400 (2.4360)	8 5		Seal/Second line of defense/ Process temperature		
Flange 3" 300 lb RJF, ASME B16.5/Alloy 400 (2.4360)	8 6		FKM (SHS FPM 70C3 GLT)/without glass seal/-40 ... +80 °C (-40 ... +176 °F) ⁶⁾	A	
Flange 4" 150 lb RF, ASME B16.5/Alloy 400 (2.4360)	8 7		FKM (SHS FPM 70C3 GLT)/without glass seal/-40 ... +150 °C (-40 ... +302 °F)	B	
Flange 4" 300 lb RF, ASME B16.5/Alloy 400 (2.4360)	8 8		FKM (SHS FPM 70C3 GLT)/with glass seal/-40 ... +150 °C (-40 ... +302 °F)	C	
Flange DN 25 PN 40 Form C, DIN 2501/ Alloy C22 (2.4602) solid	9 0	L 1 A	EPDM (A+P 75.5/KW75F)/without glass seal/-40 ... +80 °C (-40 ... +176 °F)	D	
Flange DN 25 PN 40 Form B1, EN 1092-1/ Alloy C22 (2.4602) solid	9 0	L 1 B	EPDM (A+P 75.5/KW75F)/with glass seal/-40 ... +150 °C (-40 ... +302 °F)	E	
Flange DN 80 PN 40 Form B1, EN 1092-1/ Alloy C22 (2.4602) solid	9 0	L 1 C	FFKM (Kalrez 6375)/with glass seal/-20 ... +200 °C (-4 ... +392 °F)	F	
Flange 1" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 D	EPDM (A+P 75.5/KW75F)/without glass seal/-40 ... +80 °C (-40 ... +176 °F) ⁶⁾	G	
Flange 1 1/2" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 E	EPDM (A+P 75.5/KW75F)/without glass seal/-40 ... +150 °C (-40 ... +302 °F)	H	
Flange 1 1/2" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 F	EPDM (A+P 75.5/KW75F)/with glass seal/-40 ... +150 °C (-40 ... +302 °F)	J	
Flange 2" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 G	Silicone FEP coated (A+P FEP-O-SEAL)/ without glass seal/-40 ... +80 °C (-40 ... +176 °F) ⁶⁾	K	
Flange 2" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 H	Silicone FEP coated (A+P FEP-O-SEAL)/ without glass seal/-40 ... +150 °C (-40 ... +302 °F)	L	
Flange 2" 600 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 J	Silicone FEP coated (A+P FEP-O-SEAL)/with glass seal/-40 ... +150 °C (-40 ... +302 °F)	M	
Flange 2" 1 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 K	With borosilicate glass lead through/with glass seal/-60 ... +150 °C (-76 ... +302 °F)	N	
Flange 3" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 L	FFKM (Kalrez 6375)/without glass seal/-20 ... +200 °C (-4 ... +392 °F)	P	
Flange 3" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 M	FKM (SHS FPM 70C3 GLT)/with glass seal/-40 ... 80 °C (-40 ... +176 °F) ⁶⁾	Q	
Flange 3" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	9 0	L 1 N	Housing/Protection/Cable		
Flange 4" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 P	Plastic IP66/IP67 M20 x 1.5/blind stopper	A	
Flange 4" 150 lb FF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 Q	Plastic IP66/IP67 1/2" NPT/blind stopper	B	
Flange 4" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 R	Plastic 2-chamber/IP66/IP67/M20 x 1.5/blind stopper	G	
Flange 4" 300 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 S	Plastic 2-chamber/IP66/IP67 /1/2" NPT/blind stopper	H	
Flange 4" 300 lb LT, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 T	Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/ Blind stopper	C	
Flange 4" 600 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 U	Aluminum/IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper	D	
Flange 6" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 V	Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5 / Blind stopper	E	
Flange 2 1/2" 600 lb RF, Masoneilan/ Alloy C22 (2.4602) solid	9 0	L 1 W	Aluminum double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper	F	
Flange 3" 600 lb RF, ASME B16.5/316/316L ⁵⁵⁾	9 0	L 1 Y	Stainless Steel (precision casting) 316L/ IP66/IP68 (0.2 bar) M20 x 1.5/Blind stopper	L	
			Stainless Steel (precision casting) 316L/ IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper	M	

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Article No.	Ord. Code
SITRANS LG250	7ML5881-		SITRANS LG250	7ML5881-	
A guided wave radar sensor for continuous level and interface measurement of liquids.			A guided wave radar sensor for continuous level and interface measurement of liquids.		
Stainless Steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/Blind stopper		N	<u>Rod ø 12 mm/316L</u>		
Stainless Steel (electropolished) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper		P	300 ... 1 000 mm (11.81 ... 39.37 inch) ²²⁾	9 R 2 A	
Stainless Steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/Blind stopper		Q	1 001 ... 2 000 mm (39.41 ... 78.74) ²²⁾	9 R 2 B	
Stainless Steel double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/Blind stopper		R	2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²²⁾	9 R 2 C	
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/ Cable gland stainless steel		S	3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²²⁾	9 R 2 D	
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/Cable gland stainless steel		T	<u>Cable lengths ø 2 or 4 mm/316L</u>		
Stainless Steel (precision casting) 316L/ IP66/IP68 (0.2 bar) M20 x 1.5/Cable gland stainless steel		U	501 ... 1 000 mm (19.72 ... 39.37 inch)	9 R 2 E	
Stainless Steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/Cable gland stainless steel		V	1 000 ... 5 000 mm (39.37 ... 196.85 inch)	9 R 2 F	
Stainless steel single chamber (precision casting)/IP66/IP68 (0.2 bar) M20 x 1.5/ Cable gland brass nickel-plated		W	5 001 ... 10 000 mm (196.89 ... 393.70 inch)	9 R 2 G	
Aluminum single chamber/IP66/IP68 (0.2 bar) M20 x 1.5/Cable gland brass nickel-plated		X	10 001 ... 15 000 mm (393.74 ... 590.55 inch)	9 R 2 H	
Stainless steel single chamber (precision casting)/IP66/IP68 (0.2 bar) M20 x 1.5/ Cable gland brass nickel-plated		Y	15 001 ... 20 000 mm (590.59 ... 787.40 inch)	9 R 2 J	
Stainless steel double chamber / IP66/ IP68 (0.2 bar) M20 x 1.5 / Cable gland brass nickel-plated		J	20 001 ... 25 000 mm (787.44 ... 984.25 inch)	9 R 2 K	
Aluminum single chamber/IP66/IP68 (0.2 bar) with M20 x 1.5/Plug connector Harting HAN 7D (straight)		Z	25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	9 R 2 L	
Aluminum single chamber/IP66/IP68 (0.2 bar) with M20 x 1.5/Special HARTING plug (bent) according to Tier One (ZB7555)		Z	30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	9 R 2 M	
Remote stainless steel single chamber housing, electropolished/IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug		Z	35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	9 R 2 N	
Remote plastic single chamber housing /IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug		Z	40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	9 R 2 P	
		Z	45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	9 R 2 Q	
		Z	50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	9 R 2 R	
		Z	55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)	9 R 2 S	
		Z	60 001 ... 65 000 mm (2 362.24 ... 2 559.06 inch)	9 R 2 T	
		Z	65 001 ... 70 000 mm (2 559.09 ... 2 755.91 inch)	9 R 2 U	
		Z	70 001 ... 75 000 mm (2 755.94 ... 2 952.76 inch)	9 R 2 V	
		Z	<u>Cable Lengths ø 2 mm or ø 4 mm/C22</u>		
		Z	501 ... 1 000 mm (19.72 ... 39.37 inch)	9 R 4 A	
		Z	1 001 ... 5 000 mm (39.41 ... 196.85 inch)	9 R 4 B	
		Z	5 001 ... 10 000 mm (196.89 ... 393.70 inch)	9 R 4 C	
		Z	10 001 ... 15 000 mm (393.74 ... 590.55 inch)	9 R 4 D	
		Z	15 001 ... 20 000 mm (590.59 ... 787.40 inch)	9 R 4 E	
		Z	20 001 ... 25 000 mm (787.44 ... 984.25 inch)	9 R 4 F	
		Z	25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	9 R 4 G	
		Z	30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	9 R 4 H	
		Z	35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	9 R 4 J	
		Z	40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	9 R 4 K	
		Z	45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	9 R 4 L	
		Z	50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	9 R 4 M	
		Z	55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)	9 R 4 N	
		Z	60 001 ... 65 000 mm (2 362.24 ... 2 559.06 inch)	9 R 4 P	
		Z	65 001 ... 70 000 mm (2 559.09 ... 2 755.91 inch)	9 R 4 Q	
		Z	70 001 ... 75 000 mm (2 755.94 ... 2 952.76 inch)	9 R 4 R	
Lengths					
<u>Rod ø 8 mm/316L</u>					
300 ... 1 000 mm (11.81 ... 39.37 inch) ²²⁾		0			
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ²²⁾		1			
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²²⁾		2			
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²²⁾		3			
4 001 ... 5 000 mm (157.52 ... 196.85 inch) ²²⁾		4			
5 001 ... 6 000 mm (196.89 ... 236.22 inch) ²²⁾		5			
<u>Rod ø 8 mm/Duplex</u>					
300 ... 1 000 mm (11.81 ... 39.37 inch) ²²⁾	9	R 1 A			
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ²²⁾	9	R 1 B			
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²²⁾	9	R 1 C			
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²²⁾	9	R 1 D			
4 001 ... 5 000 mm (157.52 ... 196.85 inch) ²²⁾	9	R 1 E			
5 001 ... 6 000 mm (196.89 ... 236.22 inch) ²²⁾	9	R 1 F			
<u>Rod ø 8 mm or ø 12 mm / C22</u>					
300 ... 1 000 mm (11.81 ... 39.37 inch) ²²⁾	9	R 1 J			
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ²²⁾	9	R 1 K			
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²²⁾	9	R 1 L			
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²²⁾	9	R 1 M			
4 001 ... 5 000 mm (157.52 ... 196.85 inch) ²²⁾	9	R 1 N			
5 001 ... 6 000 mm (196.89 ... 236.22 inch) ²²⁾	9	R 1 P			

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Order code
SITRANS LG250	7ML5881-		Further designs (mandatory)	
A guided wave radar sensor for continuous level and interface measurement of liquids.			Please add "-Z" to Article No. and specify Order code(s).	
<u>Coax ø 21.3 mm/316L</u>			Supplementary electronics	
300 ... 1 000 mm (11.81 ... 39.37 inch) ²²⁾		9 R 3 A	Without	A00
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ²²⁾		9 R 3 B	Additional current output 4 ... 20 mA ¹⁾³⁹⁾	A01
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²²⁾		9 R 3 C		
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²²⁾		9 R 3 D	Dimensions centering weight (diameter/height)	
4 001 ... 5 000 mm (157.52 ... 196.85 inch) ²²⁾		9 R 3 E	Without	B00
5 001 ... 6 000 mm (196.89 ... 236.22 inch) ²²⁾		9 R 3 F	ø 40/30 mm	B01
			ø 45/30 mm (for 2 inch tubes)	B02
			ø 75/30 mm (for 3 inch tubes)	B03
			ø 95/30 mm (for 4 inch tubes)	B04
			ø 40 mm/30 mm	B05
<u>Coax ø 21.3 mm/C22</u>			ø 1.57/1.18 inch (for 2 inch Schedule 160)	B06
300 ... 1 000 mm (11.81 ... 39.37 inch) ²²⁾		9 R 5 A	ø 45 mm/30 mm (for 2 inch tubes)	B07
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ²²⁾		9 R 5 B	ø 1.77/1.18 inch (for 2 inch Schedule 40/80)	B08
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²²⁾		9 R 5 C	ø 75 mm/30 mm (for 3 inch tubes)	
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²²⁾		9 R 5 D	ø 2.95/1.18 inch (for 3 inch Schedule 10/40)	
4 001 ... 5 000 mm (157.52 ... 196.85 inch) ²²⁾		9 R 5 E	ø 95 mm/30 mm (for 4 inch tubes)	
5 001 ... 6 000 mm (196.89 ... 236.22 inch) ²²⁾		9 R 5 F	ø 3.74/1.18 inch (for 4 inch Schedule 80)	
<u>Coax ø 42.2 mm/316L</u>			Rod mounted	
300 ... 1 000 mm (11.81 ... 39.37 inch) ²²⁾		9 R 3 G	Without Rod, applicable for coax or cable probe types only	C00
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ²²⁾		9 R 3 H	Mounted	C01
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²²⁾		9 R 3 J	Not mounted	C02
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²²⁾		9 R 3 K		
4 001 ... 5 000 mm (157.52 ... 196.85 inch) ²²⁾		9 R 3 L	Indicating/adjustment module	
5 001 ... 6 000 mm (196.89 ... 236.22 inch) ²²⁾		9 R 3 M	Without	E00
			Mounted	E01
<u>Coax ø 42.2 mm/C22</u>			Laterally mounted ¹⁾	E02
300 ... 1 000 mm (11.81 ... 39.37 inch) ²²⁾		9 R 5 G		
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ²²⁾		9 R 5 H	Language of display	
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²²⁾		9 R 5 J	German	L00
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²²⁾		9 R 5 K	English	L01
4 001 ... 5 000 mm (157.52 ... 196.85 inch) ²²⁾		9 R 5 L	French	L02
5 001 ... 6 000 mm (196.89 ... 236.22 inch) ²²⁾		9 R 5 M	French	L02
			Dutch	L03
			Italian	L04
			Spanish	L05
			Portuguese	L06
			Russian	L07
			Chinese	L08
			Japanese	L09
			Operating instructions	
			German	M00
			English	M01
			French	M02
			Spanish	M03
			Further designs (optional)	
			Please add "-Z" to Article No. and specify Order code(s).	
			Enter the total insertion length in plain text description	Y01
			Enter the total length of rigid part (cable version only) range from 100 ... 1 000 mm	Y02
			Remote electronic cable lengths: 2 m (6.6 ft). Only available with housing options Q2A and Q2B	Y10
			Remote electronic cable lengths: 5 m (16.4 ft). Only available with housing options Q2A and Q2B	Y11
			Remote electronic cable lengths: 10 m (32.8 ft). Only available with housing options Q2A and Q2B	Y12
			Identification Label (measurement loop) stainless steel, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	Y17
			Identification Label (measurement loop) foil, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	Y18
			3.1-Inspection Certificate for instrument (EN 10204) ³⁰⁾	C12

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data

Order code

Further designs (optional), continued

Please add ***-Z** to Article No. and specify Order code(s).

3.1-Inspection Certificate for material (EN 10204 NACE MR 0175)³⁰⁾

D07

3.1-Inspection Certificate for instrument with test data (EN 10204)³⁰⁾

C25

2.2-Factory certificate for material (EN 10204)³⁰⁾
Quality and test plan³⁰⁾

C15

Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN10204)³⁰⁾

C26

X-ray test + 3.1 certificate/instrument³⁰⁾

C13

Positive material identification test + 3.1 certificate/instrument³⁰⁾

C14

Roughness test + 3.1 certificate/instrument³⁰⁾

C16

Pressure test + 3.1 certificate/instrument³⁰⁾

C18

Helium leak test + 3.1 certificate/instrument³⁰⁾

C31

Pressure test according to Norsok + 3.1 certificate/instrument³⁰⁾

C32

5 point calibration certificate (min. length 1 000 mm)³⁰⁾⁴¹⁾

C61

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

SITRANS LG, GWR sensor Display Module

Article No.

A5E34143449

SITRANS LG, two-wire 4 ... 20 mA/HART electronic

A5E35637821

SITRANS LG, USB communicator

A5E35192015

SITRANS LG, Mounting eye M12 x 20

PBD:51041448

SITRANS LG, Mounting spring

PBD:51041449

Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia

7NG4124-0AA00

SITRANS RD100, loop powered display - see Chapter 7

7ML5741-...

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

7ML5740-...

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

7ML5744-...

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

7ML5750-...

For applicable back up point level switch - see point level measurement section

- 1) Available with Housing/Protection cable options E, F, G, H, Q, R, and T (double chamber only)
- 2) Not available with Process fitting/Material options 04, 05, 08, 10, 13, 14
- 3) Available only with Process Fitting/Material options 11, 12, 23 ... 34, and 37 ... 45 (Not available with threaded connections less than 1.5 inch and flanges < DN 50/2 inch)
- 4) Available with Seal option N only
- 5) Not available with Process fitting/Material options 00 ... 10, 11, 12, 23 ... 34 and 37 ... 45. (Not available with threaded connections less than 1.5 inch and flanges < DN 50/2 inch)
- 6) Available only with Process fitting/Material options [00 and 01 options with max temp of 80 °C (176 °F) only available with PN 6 rated threaded connections]
- 7) Available with Version/Material option J only
- 8) Available only with the same diameter probe lengths
- 9) Available with Rod mounted option C00 only (Coax and cable version only)
- 10) Available with Rod mounted options C01, C02 only (rod versions only)

- 11) Available only with Centering weight option B00 (no centering weight option)
 - 12) Available with Centering weight options B01 ... B08 only
 - 13) Available only with Housing/Protection/Cable options E, F, G, H, Q, R, T (double chamber options only)
 - 14) Available only with Housing/Protection/Cable options C, D, L, M
 - 15) Available with Supplementary electronic option A00 and Indicating/adjustment module options E00, E01
 - 16) Available with Supplementary electronics A01, Intrinsically safe approval options (excluding FM) 0A, 0E, 0F, 0P, 1E, 1F, 2A, and 3A
 - 17) Not Available with Approval options 0B ... 0H 0P, 0Q, and 1B (not available with Intrinsically Safe and shipping approvals)
 - 19) Not available with Length options 3, 4, 5, R2C, and R2D
 - 20) Available only with Seal options C, E, F, J, M, N, and Q [second line of defense (with glass seal) for all explosion proof options]
 - 21) Available with Indicating/adjustment module options E00 and E01
 - 22) Not available with Y02
 - 23) Available with Housing/Protection options C, D, E, F, L, M, Q, R (dust approvals)
 - 25) Available with Process Fitting/Material options 04, 05, 08, 10, 13 ... 45
 - 26) Not available with Process fitting /Material options 04, 05, 08, 10, 13, 14
 - 27) Not available with Process Fitting/Material options 00 and 01
 - 28) Available with Housing/Protection/Cable options A, B, C, D, E, F, L, M, R, S, T, and U
 - 29) Available with Electronic option 0 only
 - 30) Listed Certificates are not available with all configurations, please contact factory for more information
 - 31) Not available with Process fitting/Material options 02, 03, 06, 07, 11, and 12 or threaded options below PN 100
 - 32) Available with supplementary electronic option A00, SIL electronics
 - 33) Available with Approvals options 0A, 0J, 0K, 0R, 0S, 1A, 1C, 1E, and 1G
 - 35) Available with supplementary electronic option A00
 - 36) Available with Indicating/adjustment module options E00, E01
 - 37) Not available with Version/Material option K
 - 38) Not available with Seal/Process temperature options A, G, K, and Q
 - 39) Not available with Indicating/adjustment module option E02
 - 40) Available with Housing/Protection/Cable options D, F, M, R (dust approvals)
 - 41) Available with Version/Material A, B, C, D, E, and F
 - 42) Only available with Seal/Process temperature N
 - 43) Not available with Supplementary electronic option A01
 - 44) Available with Housing/Protection/Cable options W and Y
 - 45) Available with Housing/Protection/Cable options J and X
 - 46) Available with Electronics options 0, 2, and 5
 - 47) Available with Electronics options 0, 1, 3, 4
 - 48) Available with Electronics options 0,1, 2, 3, 4
 - 49) Not available with Electronics options 1, 3, 4, 5, 6 and Housing/Protection/Cable option Q1A
 - 50) Available with Housing/Protection/Cable options Q1A
 - 51) Not available with Housing options A, B, G, and H
 - 52) Available with Electronics options 0 and 2 only
 - 53) Available with Housing/Protection/Cable options Q2A and Q2B
 - 54) Available with Housing/Protection/Cable option Q2B
 - 55) Only available with Version/Material options A ... K
 - 56) Only available with Housing/Protection/Cable options C, D, E, F, L, M, Q, R, W, X, Y, J
 - 57) Only available with Housing/Protection/Cable options E, F, Q, R, X, J
 - 58) Only available with Housing/Protection/Cable options E, F, Q, R
 - 59) Only available with Housing/Protection/Cable options C, D, L, M, W, Y
 - 60) Only available with Electronics options 0, 2, 5, 6
 - 61) Only available with Electronics options 0 ... 4
- Note: Please consult manual for further details.

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code
SITRANS LG260	7ML5882-	
A guided wave radar sensor for level measurement of solids.		
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Approvals		
General purpose (CSA, FM, CE) ⁴⁾¹²⁾¹⁴⁾²¹⁾²²⁾³¹⁾	0 A	
Shipping approval ⁹⁾¹⁰⁾²¹⁾³²⁾	0 B	
Overfill protection (WHG; VLAREM) ²⁶⁾³¹⁾	0 C	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 ⁴⁾¹²⁾²¹⁾²²⁾³¹⁾	0 E	
ATEX II 1G, 1/2G, 2G Ex ia IIC + Overfill (WHG; VLAREM) ⁴⁾¹²⁾²¹⁾²²⁾²⁶⁾³¹⁾	0 F	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 + shipping approval ⁹⁾²¹⁾³²⁾	0 G	
ATEX II 1G, 1/2G, 2G Ex ia IIC + II 1D, 1/2D, 1/3D, 2D IP66 ⁸⁾¹⁰⁾¹²⁾²¹⁾²³⁾²⁴⁾	0 H	
ATEX II 1/2G, 2G Ex d ia IIC T6 ¹⁾⁷⁾¹²⁾¹⁴⁾	0 J	
ATEX II 1/2G, 2G Ex d ia IIC + shipping approval ¹⁾⁷⁾⁹⁾¹⁰⁾	0 L	
ATEX II 1/2G, 2G Ex d ia IIC + II 1D, 1/2D, 1/3D, 2D IP66 ⁷⁾⁸⁾¹²⁾²⁴⁾	0 M	
ATEX II 1/2G, 2G Ex d IIC T6 ⁸⁾¹¹⁾¹²⁾²¹⁾²⁵⁾²⁷⁾	0 N	
ATEX II 1/2G, 2G Ex d IIC + shipping approval ⁸⁾⁹⁾¹⁰⁾¹¹⁾²¹⁾²⁵⁾²⁷⁾	0 Q	
ATEX II 1/2G, 2G Ex d IIC + II 1D, 1/2D, 1/3D, 2D IP66 ⁸⁾¹¹⁾¹²⁾²¹⁾²³⁾²⁵⁾²⁷⁾	0 R	
ATEX II 1D, 1/2D, 2D IP6x T ⁸⁾¹¹⁾¹²⁾¹⁴⁾²¹⁾²³⁾²⁴⁾²⁵⁾	0 S	
IEC Ex ia IIC T6 ⁴⁾¹²⁾²¹⁾²²⁾³¹⁾	0 T	
IEC Ex ia IIC T6 + IEC IP6x T tD ⁸⁾¹¹⁾¹²⁾²¹⁾²⁵⁾²⁷⁾	0 U	
IEC Ex d ia IIC T6 ¹⁾⁷⁾¹²⁾¹⁴⁾	1 A	
IEC Ex d ia IIC T6 + IEC IP6x T tD ⁷⁾⁸⁾¹²⁾²¹⁾	1 B	
IEC Ex d IIC T6 ⁸⁾¹¹⁾¹²⁾²¹⁾²⁵⁾²⁷⁾	1 C	
IEC Ex d IIC T6 + IEC IP6x T tD ⁸⁾¹¹⁾¹²⁾²¹⁾²³⁾²⁵⁾²⁷⁾	1 D	
FM (NI) Class I, Div. 2, Groups A, B, C, D ¹²⁾²¹⁾²⁹⁾³¹⁾¹⁴⁾	1 F	
FM (NI) Class I, Div. 2, Groups A, B, C, D + Ship approval ⁹⁾¹⁰⁾²¹⁾³²⁾	1 G	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F ¹²⁾²¹⁾³¹⁾	1 H	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + shipping approval ⁹⁾¹⁰⁾²¹⁾	1 J	
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾⁷⁾¹²⁾¹⁴⁾	1 K	
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + shipping approval ¹⁾⁷⁾⁹⁾¹⁰⁾	1 L	
FM (XP) Class I, Div. 1, Groups A, B, C, D ⁸⁾¹¹⁾¹²⁾²¹⁾²⁵⁾²⁷⁾	1 M	
CSA (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G ⁴⁾⁸⁾¹²⁾¹⁴⁾²¹⁾²²⁾²³⁾²⁴⁾	1 N	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ⁴⁾¹²⁾²¹⁾²²⁾³¹⁾	1 P	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾⁷⁾¹²⁾¹⁴⁾	1 Q	
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ⁸⁾¹¹⁾¹²⁾²¹⁾²⁵⁾²⁷⁾	1 R	
NEPSI Ex ia IIC T6 ⁴⁾³¹⁾	2 A	
NEPSI Ex ia IIC T6 + DIP A20/21 TA T* ¹⁴⁾	2 B	
NEPSI Ex d ia IIC T6 ¹⁴⁾	2 C	
NEPSI Ex d ia IIC T6 + DIP A20/21 TA T* ¹⁴⁾	2 D	
NEPSI Ex d IIC T6 ²⁷⁾	2 E	
NEPSI Ex d IIC T6 + DIP A20/21 TA T* ²⁷⁾	2 F	
NEPSI DIP A20/21 TA T* ¹⁴⁾	2 G	
INMETRO Ex ia IIC T6 ... T10 ⁴⁾³¹⁾	3 A	

Selection and Ordering data	Article No.	Ord. Code
SITRANS LG260	7ML5882-	
A guided wave radar sensor for level measurement of solids.		
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex ia IIC T6, Ga, Ga/Gb	3 B	
INMETRO Ex d ia IIC T6 ... T1 ¹⁴⁾	3 C	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d ia IIC T6 Ga/Gb ¹⁴⁾	3 D	
INMETRO Ex d IIC T6 ... T1 ²⁷⁾	3 E	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d IIC T6 Ga/Gb ²⁷⁾	3 F	
INMETRO Ex t IIIC T* IP6X, Da, Da/Db, Da/Dc, Db ¹⁴⁾	3 G	
KOSHA Ex d IIC T6 ... T1 – KE ³⁰⁾	4 A	
GOST-R/EAC 0 Ex ia IIC T1 ... T6 X ³³⁾³⁶⁾	5 A	
GOST-R/EAC 0 Ex ia IIC T1 ... T6 X + Ex t IIIC T ... IP66 ³⁴⁾³⁰⁾	5 B	
GOST-R/EAC 1 Ex d ia IIC T1 ... T6 X ³⁵⁾³⁷⁾	5 C	
GOST-R/EAC 1 Ex d ia IIC T1 ... T6 X + Ex t IIIC T ... IP66 ³⁵⁾³⁷⁾	5 D	
GOST-R/EAC 1 Ex d IIC T1 ... T6 X ²⁵⁾³⁰⁾	5 E	
GOST-R/EAC 0 Ex d IIC T1 ... T6 X + Ex t IIIC T ... IP66 ²⁵⁾³⁰⁾	5 F	
GOST-R/EAC Ex t IIIC T ... IP66 ³⁷⁾³⁸⁾	5 G	
Probe version/Material		
Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/316 ²⁸⁾	A	
Probe exchangeable cable ø 6 mm (0.24 inch) with gravity weight/316 ²⁸⁾	B	
Probe exchangeable cable ø 6 mm (0.24 inch) with gravity weight/PA coated	C	
Probe exchangeable cable ø 11 mm (0.43 inch) with gravity weight/PA coated	D	
Probe exchangeable rod ø 16 mm (0.63 inch)/316L ²⁾⁶⁾²⁸⁾	E	
Process fitting/Material		
Thread G 3/4" (DIN 3852-A) PN 40/316L	0 0	
Thread 3/4" NPT (ASME B1.20.1) PN 40/316L	0 1	
Thread G 1" (DIN 3852-A) PN 40/316L	0 2	
Thread 1" NPT (ASME B1.20.1) PN 40/316L	0 3	
Thread G 1 1/2" (DIN 3852-A) PN 40/316L	0 4	
Thread 1 1/2" NPT (ASME B1.20.1) PN 40/316L	0 5	
Thread G 2" (DIN 3852-A) PN 40/316L	0 6	
Flange DN 50 PN 40 Form C, DIN 2501/316L	1 0	
Flange DN 80 PN 40 Form C, DIN 2501/316L	1 2	
Flange DN 100 PN 16 Form C, DIN 2501/316L	1 3	
Flange DN 100 PN 40 Form C, DIN 2501/316L	1 4	
Flange DN 150 PN 16 Form C, DIN 2501/316L	1 5	
Flange DN 50 PN 40 EN 1092-1 Form B1/316L	1 6	
Flange DN 80 PN 40 EN 1092-1 Form B1/316L	1 7	
Flange DN 100 PN 16 EN 1092-1 Form B1/316L	1 8	
Flange 2" 150 lb RF, ANSI B16.5/316L	3 0	
Flange 2" 300 lb RF, ANSI B16.5/316L	3 2	
Flange 3" 150 lb RF, ANSI B16.5/316L	3 3	
Flange 3" 300 lb RF, ANSI B16.5/316L	3 4	
Flange 4" 150 lb RF, ANSI B16.5/316L	3 5	
Flange 4" 300 lb RF, ANSI B16.5/316L	3 6	
Flange 6" 150 lb RF, ANSI B16.5/316L	3 7	

Level Measurement
Continuous level measurement - Guided wave radar transmitters


SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Article No.	Ord. Code
SITRANS LG260	7ML5882-		SITRANS LG260	7ML5882-	
A guided wave radar sensor for level measurement of solids.			A guided wave radar sensor for level measurement of solids.		
Electronics			Aluminum single chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated	W	
Two-wire 4 ... 20 mA/HART		0	Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated	X	
Four-wire Modbus ¹⁶⁾¹⁷⁾¹⁸⁾¹⁹⁾		1	Stainless steel single chamber (precision casting)/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated	Y	
Two-wire 4 ... 20 mA/HART with SIL qualification ¹⁵⁾		2	Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated	U	
Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz ¹⁾³⁾⁵⁾		3	Remote stainless steel single chamber housing, electropolished/IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug	Z	Q 2 A
Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC ¹⁾³⁾⁵⁾		4	Remote plastic single chamber housing /IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug	Z	Q 2 B
PROFIBUS PA ²²⁾		5			
FOUNDATION Fieldbus		6			
Seal/Process temperature			Lengths		
FKM (SHS FPM 70C3 GLT)/-40 ... +80 °C (-40 ... +176 °F)		A	<u>Rod ø 16 mm/316L</u>		
FKM (SHS FPM 70C3 GLT)/-40 ... +150 °C (-40 ... +302 °F)		B	500 mm (19.69 inch)	0	
FFKM (Kalrez 6375)/-20 ... +200 °C (-4 ... +392 °F)		C	501 ... 1 000 mm (19.72 ... 39.37 inch)	1	
EPDM (A+P 75.5/KW75F)/without/ -40 ... +80 °C (-40 ... +176 °F)		D	1 001 ... 2 000 mm (39.41 ... 78.74 inch)	2	
EPDM (A+P 75.5/KW75F)/without/ -40 ... +150 °C (-40 ... +392 °F)		E	2 001 ... 3 000 mm (78.78 ... 118.11 inch)	3	
Housing/Protection/Cable			3 001 ... 4 000 mm (118.15 ... 157.48 inch)	4	
Plastic IP66/IP67 M20 x 1.5/blind stopper		A	4 001 ... 5 000 mm (157.52 ... 196.85 inch)	5	
Plastic IP66/IP67 1/2" NPT/blind stopper		B	5 001 ... 6 000 mm (196.89 ... 236.22 inch)	6	
Plastic 2-chamber/IP66/IP67/M20 x 1.5/blind stopper		C	<u>Cable lengths ø 4 mm/316</u>		
Plastic 2-chamber/IP66/IP67/ 1/2" NPT/blind stopper		D	501 ... 1 000 mm (19.72 ... 39.37 inch)	9	R 2 E
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		E	1 001 ... 5 000 mm (39.41 ... 196.85 inch)	9	R 2 F
Aluminum/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		F	5 001 ... 10 000 mm (196.89 ... 393.70 inch)	9	R 2 G
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		G	10 001 ... 15 000 mm (393.74 ... 590.55 inch)	9	R 2 H
Aluminum double chamber/IP66/ IP68 (0.2 bar) 1/2" NPT/blind stopper		H	15 001 ... 20 000 mm (590.59 ... 787.40 inch)	9	R 2 J
Stainless Steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		J	20 001 ... 25 000 mm (787.44 ... 984.25 inch)	9	R 2 K
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		K	25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	9	R 2 L
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		L	30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	9	R 2 M
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		M	35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	9	R 2 N
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper		N	40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	9	R 2 P
Stainless steel double chamber/IP66/ IP68 (0.2 bar) 1/2" NPT/blind stopper		P	45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	9	R 2 Q
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		Q	50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	9	R 2 R
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		R	55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)	9	R 2 S
Stainless steel (precision casting) 316L/ IP66/ IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		S	<u>Cable lengths ø 6 mm/316L</u>		
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel		T	500 mm (19.69 inch)	9	R 4 A
			501 ... 1 000 mm (19.72 ... 39.37 inch)	9	R 4 B
			1 001 ... 5 000 mm (39.41 ... 196.85 inch)	9	R 4 C
			5 001 ... 10 000 mm (196.89 ... 393.70 inch)	9	R 4 D
			10 001 ... 15 000 mm (393.74 ... 590.55 inch)	9	R 4 E
			15 001 ... 20 000 mm (590.59 ... 787.40 inch)	9	R 4 F
			20 001 ... 25 000 mm (787.44 ... 984.25 inch)	9	R 4 G
			25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	9	R 4 H
			30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	9	R 4 J

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Order code
SITRANS LG260	7ML5882-		Further designs (mandatory)	
A guided wave radar sensor for level measurement of solids.			Please add "-Z" to Article No. and specify Order code(s).	
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)		9 R 4 K	Supplementary electronics	
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)		9 R 4 L	Without	A00
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)		9 R 4 M	Additional current output 4 ... 20 mA ¹⁾²⁰⁾	A01
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)		9 R 4 N	Rod mounted	
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)		9 R 4 P	Without Rod, applicable for coax or cable probe types only	C00
<u>Cable lengths ø 6 mm or ø 11 mm/PA coated</u>			Mounted	C01
501 ... 1 000 mm (19.72 ... 39.37 inch)		9 R 6 A	Not mounted	C02
1 001 ... 5 000 mm (39.41 ... 196.85 inch)		9 R 6 B	Indicating/adjustment module	
5 001 ... 10 000 mm (196.89 ... 393.70 inch)		9 R 6 C	Without	E00
10 001 ... 15 000 mm (393.74 ... 590.55 inch)		9 R 6 D	Mounted	E01
15 001 ... 20 000 mm (590.59 ... 787.40 inch)		9 R 6 E	Laterally mounted ¹⁾	E02
20 001 ... 25 000 mm (787.44 ... 984.25 inch)		9 R 6 F	Language of display	
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)		9 R 6 G	German	L00
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)		9 R 6 H	English	L01
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)		9 R 6 J	French	L02
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)		9 R 6 K	Dutch	L03
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)		9 R 6 L	Italian	L04
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)		9 R 6 M	Spanish	L05
55 001 ... 65 000 mm (2 165.39 ... 2 559.06 inch)		9 R 6 N	Portuguese	L06
			Russian	L07
			Chinese	L08
			Japanese	L09
			Operating instructions	
			German	M00
			English	M01
			French	M02
			Spanish	M03

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs (optional)		Accessories	
Please add "-Z" to Article No. and specify Order code(s).		SITRANS LG, GWR sensor Display Module	A5E34143449
Enter the total insertion length in plain text description	Y01	SITRANS LG, two-wire 4 ... 20 mA/HART electronic	A5E35637821
Identification Label (measurement loop) stainless steel, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	Y17	SITRANS LG, USB communicator	A5E35192015
Identification Label (measurement loop) foil, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.	Y18	SITRANS LG, Mounting eye M12 x 20	PBD:51041448
3.1-Inspection Certificate for instrument (EN 10204) ¹³⁾	C12	SITRANS LG, Mounting spring	PBD:51041449
3.1-Inspection Certificate for material (EN 10204 NACE MR 0175) ¹³⁾	D07	Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia	7NG4124-0AA00
3.1-Inspection Certificate for instrument with test data (EN 10204) ¹³⁾	C25	SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
2.2-Factory certificate for material (EN 10204) ¹³⁾	C15	SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
Quality and test plan ¹³⁾	C26	SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN10204) ¹³⁾	C13	SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
X-ray test + 3.1 certificate/instrument ¹³⁾	C14	For applicable back up point level switch - see point level measurement section	
Positive material identification test + 3.1 certificate/instrument ¹³⁾	C16		
Roughness test + 3.1 certificate/instrument ¹³⁾	C18	1) Available only with Housing/Protection/Cable options C, D, G, H, N, P	
Pressure test + 3.1 certificate/instrument ¹³⁾	C31	2) Not available with Process/Fitting/Material options 00, 01, 02, and 03	
Helium leak test + 3.1 certificate/instrument ¹³⁾	C32	3) Available with Supplementary electronic option A00 and Indicating/adjustment module options E00, E01	
Pressure test according to Norsok + 3.1 certificate/instrument ¹³⁾	C61	4) Available with Supplementary electronics A01, Intrinsically safe approval options (excluding FM) 0A, 0E, 0F, 0T, 1N, 1P, 2A, and 3A	
5 point calibration certificate (min. length 1 000 mm) ¹³⁾	C62	5) Not available with Approval options 0B ... 0H, 0L, 0Q, 1B, 1F, 1G, 1J, 1L (not available with Intrinsically Safe and shipping approvals)	
Operating Instructions		6) Available with Rod Mounted options C01 and C02	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		7) Available with Indicating/adjustment module options E00 and E01	
		8) Available with Housing Protection options C,D E, F, G, H, J, K, N, P	
		9) Not available with Housing/ Protection/ Cable options L, M, and T	
		10) Available with Electronic option 0 only	
		11) Available with Seal/ Process temperature option C only	
		12) Available with Version/ Material option E only	
		13) Listed Certificates are not available with all configurations, please contact factory for more information	
		14) Available with Electronics options 3 and 4	
		15) Available with Supplementary electronic option A00, SIL electronics	
		16) Available with Approvals options 0A, 0J, 0K, 0R, 0S,1A,1C,1E, and 1G	
		17) Available with Housings/ Protection/ Cable options E, F, L, M, and P	
		18) Available with Supplementary Electronic option A00	
		19) Available with Indicating/Adjustment module options E00, E01	
		20) Not available with Indicating/Adjustment module option E02	
		21) Available with Housing/Protection/Cable options F, H, P, and K	
		22) Not available with Supplementary Electronic option A01	
		23) Available with Housing/Protection/Cable options W and Y	
		24) Available with Housing/Protection/Cable options X and U	
		25) Available with Housing/Protection/Cable options E, F, J, K, W, Y only	
		26) Available with Electronics options 0, 2, and 5	
		27) Available with Seal/ Process option C	
		28) Probe options A, B, and E cannot be paired with seal options A and D	
		29) Not available with Housing options A and B	
		30) Available with Electronic options 0 and 2 only	
		31) Available with Housing/Protection/Cable options Q2A and Q2B	
		32) Available with Housing/Protection/Cable option Q2B	
		33) Not available with Housing/Protection/Cable options W, X, Y, U	
		34) Not available with Housing/Protection/Cable options A, B, C, D, L, M, Q, R, S, T, Q2A, and Q2B	
		35) Available only with Housing/Protection/Cable options G, H, N, P	
		36) Available only with Electronics options 0, 2, 5, and 6	
		37) Available only with Electronics options 0 ... 4	
		38) Available only with Housing/Protection/Cable options D, F, M, R, W, X, Y, and J	
		Note: Please consult manual for further details.	

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code
SITRANS LG270	7ML5883-	
A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications		
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Approvals		
General purpose (CSA, FM, CE) ³⁾⁴⁴⁾	0 A	
Shipping approval ¹⁷⁾¹⁸⁾¹⁹⁾⁴⁵⁾	0 B	
Overfill protection (WHG; VLAREM) ³⁾⁴⁴⁾	0 C	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 ³⁾⁴⁴⁾	0 E	
ATEX II 1G, 1/2G, 2G Ex ia IIC + Overfill (WHG; VLAREM) ³⁾³⁴⁾⁴⁴⁾	0 F	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 + shipping approval ¹⁷⁾¹⁸⁾¹⁹⁾⁴⁵⁾	0 G	
ATEX II 1G, 1/2G, 2G Ex ia IIC + ATEX II 1D, 1/2D, 2D IP6x ¹⁶⁾²⁸⁾³²⁾³³⁾	0 H	
ATEX II 1/2G, 2G Ex d ia IIC T6 ¹⁾¹⁰⁾¹⁴⁾³³⁾	0 J	
ATEX II 1/2G, 2G Ex d ia IIC + shipping approval ¹⁾¹⁰⁾¹⁴⁾¹⁷⁾¹⁸⁾¹⁹⁾	0 L	
ATEX II 1/2G, 2G Ex d ia IIC + ATEX II 1/2D, 2D IP6x ¹⁰⁾¹⁴⁾¹⁶⁾²⁸⁾³³⁾	0 M	
ATEX II 1/2G, 2G Ex d IIC T6 ¹¹⁾	0 N	
ATEX II 1/2G, 2G Ex d IIC + ship approval ¹⁷⁾¹⁸⁾¹⁹⁾	0 Q	
ATEX II 1/2G, 2G Ex d IIC + ATEX II 1/2D, 2D IP6x ¹¹⁾¹⁶⁾²⁸⁾³²⁾	0 R	
ATEX II 1D, 1/2D, 2D IP6x T ¹⁶⁾²⁸⁾³²⁾³³⁾⁴⁹⁾	0 S	
IEC Ex ia IIC T6 ³⁾⁴⁴⁾	0 T	
IEC Ex ia IIC T6 + IEC IP6x T d ¹⁶⁾²⁸⁾³²⁾³³⁾	0 U	
IEC Ex d ia IIC T6 ¹⁾¹⁰⁾¹⁴⁾³³⁾	1 A	
IEC Ex d ia IIC T6 + IEC IP6x T d ¹⁰⁾¹⁴⁾¹⁶⁾²⁸⁾³³⁾	1 B	
IEC Ex d IIC T6 ¹¹⁾	1 C	
IEC Ex d IIC T6 + IEC IP6x T d ¹¹⁾¹⁶⁾²⁸⁾³²⁾	1 D	
FM (NI) Class I, Div. 2, Groups A, B, C, D ³⁷⁾⁴⁴⁾	1 F	
FM (NI) Class I, Div. 2, Groups A, B, C, D + ship approval ¹⁷⁾¹⁸⁾¹⁹⁾³⁷⁾	1 G	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F ⁴⁴⁾	1 H	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + ship approval ¹⁷⁾¹⁸⁾¹⁹⁾	1 J	
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾¹⁰⁾¹⁴⁾	1 K	
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + shipping approval ¹⁾¹⁰⁾¹⁷⁾¹⁸⁾¹⁹⁾	1 L	
FM (XP) Class I, Div. 1, Groups A, B, C, D	1 M	
CSA (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G ³⁾¹⁶⁾³²⁾³³⁾	1 N	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ³⁾⁴⁴⁾	1 P	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾¹⁰⁾¹⁴⁾	1 Q	
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹¹⁾	1 R	
NEPSI Ex ia IIC T6 ³⁾⁴⁴⁾	2 A	
NEPSI Ex ia IIC T6 + DIP A20/21 TA T*	2 B	
NERSI Ex d ia IIC T6	2 C	
NEPSI Ex d ia IIC T6 + DIP A20/21 TA T*	2 D	
NEPSI Ex d IIC T6	2 E	
NEPSI Ex d IIC T6 + DIP A20/21 TA T*	2 F	
NEPSI DIP A20/21 TA T*	2 G	
INMETRO Ex ia IIC T6 ... T1 ³⁾⁴⁴⁾	3 A	
INMETRO Ex t IIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex ia IIC T6, Ga, Ga/Gb	3 B	
INMETRO Ex d ia IIC T6 ... T1	3 C	

Selection and Ordering data	Article No.	Ord. Code
SITRANS LG270	7ML5883-	
A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications		
INMETRO Ex t IIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d ia IIC T6 Ga/Gb	3 D	
INMETRO Ex d IIC T6 ... T1	3 E	
INMETRO Ex t IIC T* IP6X, Da, Da/Db, Da/Dc, Db + Ex d IIC T6 Ga/Gb	3 F	
INMETRO Ex t IIC T* IP6X, Da, Da/Db, Da/Dc, Db	3 G	
KOSHA Ex d IIC T6 ... T1 – KE	4 A	
GOST-R/EAC 0 Ex ia IIC T1 ... T6 X ⁴⁶⁾⁵⁰⁾	5 A	
GOST-R/EAC 0 Ex ia IIC T1 ... T6 X + Ex t IIC T ... IP66 ⁴⁷⁾⁵¹⁾	5 B	
GOST-R/EAC 1 Ex d ia IIC T1 ... T6 X ⁴⁸⁾⁵²⁾	5 C	
GOST-R/EAC 1 Ex d ia IIC T1 ... T6 X + Ex t IIC T ... IP66 ¹⁴⁾⁵²⁾	5 D	
GOST-R/EAC 1 Ex d IIC T1 ... T6 X ¹¹⁾⁵¹⁾	5 E	
GOST-R/EAC 0 Ex d IIC T1 ... T6 X + Ex t IIC T ... IP66 ¹¹⁾⁵¹⁾	5 F	
GOST-R/EAC Ex t IIC T ... IP66 ⁴⁹⁾⁵²⁾	5 G	
Version/Material		
Probe exchangeable cable ø 2 mm (0.08 inch) with gravity weight/316L ⁴⁾⁷⁾	A	
Probe exchangeable cable ø 2 mm (0.08 inch) center weight/316L ⁵⁾⁷⁾	B	
Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/316L ⁴⁾⁷⁾	C	
Probe exchangeable cable ø 4 mm (0.16 inch) with center weight/316L ⁵⁾⁷⁾	D	
Probe exchangeable rod ø 16 mm (0.63 inch)/316L ⁴⁾⁷⁾⁹⁾	E	
Probe coax version ø 42.2 mm (1.66 inch) with multiple hole/316L ⁴⁾⁷⁾	F	
Probe coax version ø 42.2 mm (1.66 inch); multiple hole; reference distances/316L ⁴⁾⁷⁾¹³⁾³⁰⁾³⁶⁾	G	
Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/ Alloy C22 (2.4602) ⁷⁾	H	
Probe exchangeable rod ø 16 mm (0.63 inch)/Alloy C22 (2.4602) ⁷⁾	J	
Coax version ø 42.2 mm (1.66 inch) with multiple hole/Alloy C22 (2.4602) ⁷⁾	K	
Exchangeable rod, diameter 8 mm /316L (0.32 inch) ⁴²⁾⁴³⁾	L	
Process fitting/Material		
Thread G 1 1/2" (DIN 3852-A) PN 400/316L ⁴⁰⁾	0 0	
Thread 1 1/2" NPT (ASME B1.20.1) PN 400/316L ⁴⁰⁾	0 1	
Thread G1 1/2" PN 400, DIN 3852-A/ Alloy C22 (2.4602)	0 2	
Thread 1 1/2" NPT PN 400, ASME B1.20.1/ Alloy C22 (2.4602)	0 3	
Flange DN 50 PN 40 Form C, DIN 2501/ 316L with Alloy C22 (2.4602) coating	0 4	
Flange DN 80 PN 40 Form C, DIN 2501/ 316L with Alloy C22 (2.4602) coating	0 5	
Flange DN 100 PN 16 Form C, DIN 2501/ 316L with Alloy C22 (2.4602) coating	0 6	
Flange DN 50 PN 40 Form B1, EN 1092-1/ 316L with Alloy C22 (2.4602) coating	0 7	
Flange DN 50 PN 63 Form B1, EN 1092-1/ 316L with Hastelloy C22	0 8	

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Article No.	Ord. Code
SITRANS LG270	7ML5883-		SITRANS LG270	7ML5883-	
A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications			A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications		
Flange DN 50 PN 40 Form C, DIN 2501/316L	1 0		Flange 6" 300 lb RF, ANSI B16.5/316L	4 5	
Flange DN 50 PN 40 form V13, DIN 2513/316L	1 1		Flange 6" 600 lb RF, ANSI B16.5/316L	4 6	
Flange DN 65 PN 64 Form V13, DIN 2501/316L	1 2		Flange 2" 150 lb Fisher special return/316L	4 7	
Flange DN 80 PN 40 Form C, DIN 2501/316L	1 3		Flange 3" 900 lb RJF, ASME B16.5/ Alloy C22 (2.4602)	4 8	
Flange DN 80 PN 40 Form V13, DIN 2501/316L	1 4		Flange 2" 900 lb RF, ANSI B16.5/316L	5 0	
Flange DN 80 PN 100 Form L, DIN 2501/316L ⁴⁰⁾	1 5		Flange 3" 1 500 lb RF, ANSI B16.5/316L	5 1	
Flange DN 100 PN 16 Form C, DIN 2501/316L	1 6		Flange 4" 900 lb RF, ANSI B16.5/316L	5 2	
Flange DN 100 PN 16 Form V13, DIN 2501/316L	1 7		Flange 4" 1 500 lb RF, ANSI B16.5/316L	5 3	
Flange DN 100 PN 40 Form C, DIN 2501/316L	1 8		Flange 4" 2 500 lb RJF, ANSI B16.5/316L ⁴⁰⁾	5 4	
Flange DN 100 PN 40 Form V13, DIN 2513/316L	2 0		Flange 4" 1500 lb RJF, ASME B16.5/316L ⁴⁰⁾	5 5	
Flange DN 150 PN 16 Form C, DIN 2501/316L	2 1		Flange 3" 600 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	5 6	
Flange DN 50 PN 40 EN 1092-1 Form B1/316L	2 2		Flange 4" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	5 7	
Flange DN 100 PN 160 GOST 12815-80.7/316L ⁴⁰⁾	2 3		Flange 4" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	5 8	
Flange 2" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	2 4		Flange 6" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	7 0	
Flange 2" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	2 5		Flange DN 50 PN 40 Form C, DIN 2501/ Alloy C22 (2.4602) solid	7 1	
Flange 2" 600 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	2 6		Flange DN 100 PN 16 Form C, DIN 2501/C22 solid	7 2	
Flange 3" 150 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	2 7		Flange DN 100 PN 40 Form N, DIN 2501/ Alloy C22 (2.4602) solid	7 3	
Flange 3" 300 lb RF, ASME B16.5/316L with Alloy C22 (2.4602) coating	2 8		Flange DN 50 PN 40 Form B1, EN 1092-1/ Alloy C22 (2.4602) solid	7 4	
Flange DN 80 PN 160 Form C, DIN 2501/316L ⁴⁰⁾	6 0		Flange 2" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	7 5	
Flange DN 80 PN 250 Form L, DIN 2501/316L ⁴⁰⁾	6 1		Flange 2" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	7 6	
Flange DN 50 PN 160, EN 1092-1 Form B1/316L ⁴⁰⁾	6 2		Flange 2" 600 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	7 7	
Flange DN 50 PN 160, EN 1092-1 Form B2/316L ⁴⁰⁾	6 3		Flange 2" 900 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	7 8	
Flange DN 50 PN 320, EN 1092-1 Form B1/316L ⁴⁰⁾	6 4		Flange 2" 1 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	8 0	
Flange DN 65 PN 250, EN 1092-1 Form B1/316L ⁴⁰⁾	6 5		Flange 3" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	8 1	
Flange DN 100 PN 160, EN 1092-1 Form B2/316L ⁴⁰⁾	6 6		Flange 3" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	8 2	
Flange DN 80 PN 63, EN 1092-1 Form B2/316L	6 7		Flange 3" 600 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	8 3	
Flange 4" 600 lb RF, ASME B16.5/ 316L with Alloy C22 (2.4602) coating	6 8		Flange 4" 150 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	8 4	
Flange 2" 150 lb RF, ANSI B16.5/316L	3 0		Flange 4" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	8 5	
Flange 2" 300 lb RF, ANSI B16.5/316L	3 1		Flange 3" 600 lb RJF for R31, ASME B16.5/ Alloy C22 (2.4602) solid	8 6	
Flange 2" 600 lb RF, ANSI B16.5/316L	3 2		Flange 2" 2 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 A
Flange 2" 1 500 lb RF, ANSI B16.5/316L	3 3		Flange 3" 1 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 B
Flange 3" 150 lb RF, ANSI B16.5/316L	3 4		Flange 3" 2 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 C
Flange 3" 300 lb RF, ANSI B16.5/316L	3 5		Flange 4" 600 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 D
Flange 3" 600 lb RF, ANSI B16.5/316L	3 6		Flange 4" 600 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 E
Flange 3" 900 lb RF, ANSI B16.5/316L	3 7		Flange 4" 900 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 F
Flange 3" 2 500 lb RF, ANSI B16.5/316L	3 8		Flange 4" 900 lb RJF, ASME B16.5/ Alloy C22 (2.4602) massiv	9 0	L 1 G
Flange 3 1/2" 600 lb RF, ANSI B16.5/316L	4 0		Flange 4" 1 500 lb RJF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 H
Flange 4" 150 lb RF, ANSI B16.5/316L	4 1		Flange 4" 2 500 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	9 0	L 1 J
Flange 4" 300 lb RF, ANSI B16.5/316L	4 2				
Flange 4" 600 lb RF, ANSI B16.5/316L	4 3				
Flange 6" 150 lb RF, ANSI B16.5/316L	4 4				

Level Measurement

Continuous level measurement - Guided wave radar transmitters


SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Article No.	Ord. Code
SITRANS LG270	7ML5883-		SITRANS LG270	7ML5883-	
A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications			A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications		
Flange 8" 300 lb RF, ASME B16.5/ Alloy C22 (2.4602) solid	90	L 1 K	Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel	T	
Flange 3½" 600 lb Fisher type 249B and 259B/Alloy C22 (2.4602) solid	90	L 1 L	Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel	U	
Flange 2½" 300 lb RF, ASME B16.5/316/316L	90	L 2 A	Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel	V	
Flange 2½" 600 lb RF, ASME B16.5/316/316L	90	L 2 B	Aluminum single chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated	W	
Flange DN 50 PN 40 Form D, EN 1092-1/316/316L ⁷⁾⁴¹⁾	90	L 2 C	Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated	X	
Flange 2½" 1 500 lb RF, ASME B16.5/316/316L ⁷⁾	90	L 2 D	Stainless steel single chamber (precision casting)/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated	Y	
Thread G 1" (DIN 3852-A) PN 100/316L	90	L 3 C	Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland brass nickel-plated	J	
Thread 1" NPT, ASME B1.20.1/PN 100/316L	90	L 3 D	Remote stainless steel single chamber housing, electropolished/IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug	Z	Q 2 A
Thread G 1½" (DIN 3852-A) PN 100/316L	90	L 3 E	Remote plastic single chamber housing /IP66/IP67 with cable outlet IP68 (electronics separated by cable); M20 x 1.5/blind plug	Z	Q 2 B
Thread 1½" NPT, ASME B1.20.1/PN 100/316L	90	L 3 F			
Thread 2" NPT, ASME B1.20.1/PN 100/316L	90	L 3 G			
Electronics			Lengths		
Two-wire 4 ... 20 mA/HART	0		<u>Rod ø 16 mm/316L</u>		
Four-wire Modbus ²³⁾²⁴⁾²⁵⁾²⁶⁾	1		300 mm (11.81 inch) ¹⁵⁾		0
Two-wire 4 ... 20 mA/HART with SIL qualification ²²⁾	2		500 mm (19.69 inch) ¹⁵⁾		1
Four-wire 4 ... 20 mA/HART; 90 ... 253 V AC; 50/60 Hz ¹⁾²⁾⁶⁾	3		501 ... 1 000 mm (19.72 ... 39.37 inch) ¹⁵⁾		2
Four-wire 4 ... 20 mA/HART; 9.6 ... 48 V DC; 20 ... 42 V AC ¹⁾²⁾⁶⁾	4		1 001 ... 2 000 mm (39.41 ... 78.74 inch) ¹⁵⁾		3
PROFIBUS PA ³¹⁾	5		2 001 ... 3 000 mm (78.78 ... 118.11 inch) ¹⁵⁾		4
FOUNDATION Fieldbus	6		3 001 ... 4 000 mm (118.15 ... 157.48 inch) ¹⁵⁾		5
Seal/Second line of defense/ Process temperature			4 001 ... 5 000 mm (157.52 ... 196.85 inch) ¹⁵⁾		6
Ceramic-graphite/with glass seal/ -196 ... +280 °C (-321 ... +536 °F)	A		5 001 ... 6 000 mm (196.89 ... 236.22 inch) ¹⁵⁾		7
Ceramic-graphite/with glass seal/ -196 ... +450 °C (-321 ... +842 °F)	B		<u>Rod ø 16 mm/C22</u>		
Ceramic-graphite/with glass seal/ -196 ... +400 °C (-321 ... +752 °F)	C		501 ... 1000 mm (19.72 ... 39.37 inch) ¹⁵⁾		9 R 1 A
PEEK-FFKM (Kalrez 6375) /with glass seal/ -20...+250 °C (-4 ... +482 °F) ³⁸⁾³⁹⁾	D		1 001 ... 2 000 mm (39.41 ... 78.74 inch) ¹⁵⁾		9 R 1 B
Housing/Protection/Cable			2 001 ... 3 000 mm (78.78 ... 118.11 inch) ¹⁵⁾		9 R 1 C
Plastic IP66/IP67 M20 x 1.5/blind stopper	A		3 001 ... 4 000 mm (118.15 ... 157.48 inch) ¹⁵⁾		9 R 1 D
Plastic IP66/IP67 1/2" NPT/blind stopper	B		4 001 ... 5 000 mm (157.52 ... 196.85 inch) ¹⁵⁾		9 R 1 E
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper	C		5 001 ... 6 000 mm (196.89 ... 236.22 inch) ¹⁵⁾		9 R 1 F
Aluminum/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper	D		<u>Rod ø 8 mm/316L</u>		
Aluminum double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper	E		300 ... 1 000 mm (11.81 ... 39.37 inch)		9 R 1 H
Aluminum double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper	F		1 001 ... 2 000 mm (39.41 ... 78.74 inch)		9 R 1 J
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper	L		2 001 ... 3 000 mm (78.78 ... 118.11 inch)		9 R 1 K
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper	M		3 001 ... 4 000 mm (118.15 ... 157.48 inch)		9 R 1 L
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper	N		4 001 ... 5 000 mm (157.52 ... 196.85 inch)		9 R 1 M
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper	P		5 001 ... 6 000 mm (196.89 ... 236.22 inch)		9 R 1 N
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20 x 1.5/blind stopper	Q		<u>Cable lengths ø 2 or 4 mm/316L</u>		
Stainless steel double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper	R		501 ... 1 000 mm (19.72 ... 39.37 inch)		9 R 2 E
Aluminum/IP66/IP68 (0.2 bar) M20 x 1.5/cable gland stainless steel	S		1 000 ... 5 000 mm (39.37 ... 196.85 inch)		9 R 2 F
			5 001 ... 10 000 mm (196.89 ... 393.70 inch)		9 R 2 G

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Ord. Code	Selection and Ordering data	Order code
SITRANS LG270	7ML5883-		Further designs (mandatory)	
A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications			Please add "-Z" to Article No. and specify Order code(s).	
10 001 ... 15 000 mm (393.74 ... 590.55 inch)		9 R 2 H	Supplementary electronics	
15 001 ... 20 000 mm (590.59 ... 787.40 inch)		9 R 2 J	Without	A00
20 001 ... 25 000 mm (787.44 ... 984.25 inch)		9 R 2 K	Additional current output 4 ... 20 mA ¹⁾²⁷⁾	A01
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)		9 R 2 L	Dimensions centering weight (diameter/height)	
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)		9 R 2 M	Without	B00
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)		9 R 2 N	ø 45/30 mm (for 2 inch tubes)	B01
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)		9 R 2 P	ø 75/30 mm (for 3 inch tubes)	B02
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)		9 R 2 Q	ø 95/30 mm (for 4 inch tubes)	B03
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)		9 R 2 R	ø 40 mm/30 mm	B04
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)		9 R 2 S	ø 1.57 inch/1.18 inch (for 2 inch Schedule 160)	B05
<u>Cable lengths ø 4 mm/ C22</u>			ø 45 mm/30 mm (for 2 inch tubes)	B06
501 ... 1 000 mm (19.72 ... 39.37 inch)		9 R 4 A	ø 1.77 inch/1.18 inch (for 2 inch Schedule 40/80)	B07
1 000 ... 5 000 mm (39.37 ... 196.85 inch)		9 R 4 B	ø 75 mm/30 mm (for 3 inch tubes)	B08
5 001 ... 10 000 mm (196.89 ... 393.70 inch)		9 R 4 C	ø 2.95 inch/1.18 inch (for 3 inch Schedule 10/40)	
10 001 ... 15 000 mm (393.74 ... 590.55 inch)		9 R 4 D	ø 95 mm/30 mm (for 4 inch tubes)	
15 001 ... 20 000 mm (590.59 ... 787.40 inch)		9 R 4 E	ø 3.74 inch/1.18 inch (for 4 inch Schedule 80)	
20 001 ... 25 000 mm (787.44 ... 984.25 inch)		9 R 4 F	Rod mounted	
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)		9 R 4 G	Without Rod, applicable for coax or cable probe types only ⁸⁾	C00
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)		9 R 4 H	Mounted	C01
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)		9 R 4 J	Not mounted	C02
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)		9 R 4 K	Indicating/adjustment module	
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)		9 R 4 L	Without	E00
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)		9 R 4 M	Mounted	E01
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)		9 R 4 N	Laterally mounted ¹⁾	E02
<u>Coax ø 42.2 mm/316L</u>			Language of display	
300 ... 1 000 mm (11.81 ... 39.37 inch) ¹⁵⁾		9 R 3 G	German	L00
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ¹⁵⁾³⁰⁾		9 R 3 H	English	L01
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ¹⁵⁾		9 R 3 J	French	L02
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ¹⁵⁾		9 R 3 K	Dutch	L03
4 001 ... 5 000 mm (157.52 ... 196.85 inch) ¹⁵⁾		9 R 3 L	Italian	L04
5 001 ... 6 000 mm (196.89 ... 236.22 inch) ¹⁵⁾		9 R 3 M	Spanish	L05
<u>Coax ø 42.2 mm/ C22</u>			Portuguese	L06
300 ... 1 000 mm (11.81 ... 39.37 inch) ¹⁵⁾		9 R 3 Q	Russian	L07
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ¹⁵⁾³⁰⁾		9 R 3 R	Chinese	L08
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ¹⁵⁾		9 R 3 S	Japanese	L09
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ¹⁵⁾		9 R 3 T	Operating instructions	
4 001 ... 5 000 mm (157.52 ... 196.85 inch) ¹⁵⁾		9 R 3 U	German	M00
5 001 ... 6 000 mm (196.89 ... 236.22 inch) ¹⁵⁾		9 R 3 V	English	M01
			French	M02
			Spanish	M03
			Further designs (optional)	
			Please add "-Z" to Article No. and specify Order code(s).	
			Enter the total insertion length in plain text description	Y01
			Reference probe G length of reference distance = 260 mm/10.24 inches (note blanking 450 mm required with min. probe 1 000 mm)	Y05
			Reference probe G length of reference distance = 500 mm/19.69 inches (note blanking 690 mm required with min. probe 1 250 mm)	Y06
			Reference probe G length of reference distance = 750 mm/29.53 inches (note blanking 940 mm required with min. probe 1 500 mm)	Y07
			Y02 rigid part is 100 mm, only applicable for cable versions	Y02
			Cleaning included certificate: oil, grease and silicone free	W01

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data

Order code

Further designs (optional), continued

Please add **"-Z"** to Article No. and specify Order code(s).

Identification Label (measurement loop) stainless steel, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.

Y17

Identification Label (measurement loop) foil, 40 characters max, add in plain text. To add more than one line use a coma "," for line break.

Y18

3.1-Inspection Certificate for instrument (EN 10204)²⁰⁾

C12

3.1-Inspection Certificate for material (EN 10204 NACE MR 0175)²⁰⁾

D07

3.1-Inspection Certificate for instrument with test data (EN 10204)²⁰⁾

C25

2.2-Factory certificate for material (EN 10204)²⁰⁾

C15

Quality and test plan²⁰⁾

C26

Dye penetration test, results confirmed via a 3.1 certificate/instrument (EN10204)²⁰⁾

C13

X-ray test + 3.1 certificate/instrument²⁰⁾

C14

Positive material identification test + 3.1 certificate/instrument²⁰⁾

C16

Roughness test + 3.1 certificate/instrument²⁰⁾

C18

Pressure test + 3.1 certificate/instrument²⁰⁾

C31

Helium leak test + 3.1 certificate/instrument²⁰⁾

C32

Pressure test according to Norsok + 3.1 certificate/instrument²⁰⁾

C61

5 point calibration certificate (min. length 1 000 mm)²⁰⁾²⁹⁾

C62

Certificate: Approval for steam boiler according to EN 12952-11, EN 12953-9³⁵⁾

C70

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

Article No.

SITRANS LG, GWR sensor Display Module

A5E34143449

SITRANS LG, two-wire 4 ... 20 mA/HART electronic

A5E35637821

SITRANS LG, USB communicator

A5E35192015

SITRANS LG, Mounting eye M12 x 20

PBD:51041448

SITRANS LG, Mounting spring

PBD:51041449

Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia

7NG4124-0AA00

SITRANS RD100, loop powered display - see Chapter 7

7ML5741-...

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

7ML5740-...

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

7ML5744-...

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

7ML5750-...

For applicable back up point level switch - see point level measurement section

- 1) Available with Housing/Protection/Cable options E, F, Q, R, and T
 - 2) Available with Supplementary electronic option A00 and Indicating/adjustment module options E00, E01
 - 3) Available with Supplementary electronics A01, Intrinsically safe approval options (excluding FM) 0A, 0E, 0F, 0T, 1N, 1P, 2A, and 3A
 - 4) Available with Centering weight option B00 only
 - 5) Available with Centering weight options B01 ... B08 only
 - 6) Available with Approval options 0A, 0B, 0J, 0K, 0N, 0R, 0S, 1A, 1C, 1E, 1F, and 1G
 - 7) Available only with the same Version/Material, Process fitting/Material, and Length types
 - 8) Available with Version/Material options A, B, C, D, F, G
 - 9) Available with Rod Mounted options C01 and C02
 - 10) Available with Indicating/adjustment module options E00 and E01
 - 11) Available only with Housing/Protection/Cable options C, D, L, M
 - 12) Version/Material Hastelloy C22, temperature is limited to 400 °C (752 °F)
 - 13) Minimum probe length (Y01) is 1 250 mm (49 inch)
 - 14) Available with Housing/Protection Cable options E, F, Q, and R
 - 15) Not available with Y02
 - 16) Available with Housing/Protection/Cable options C, D, E, F, L, M, Q, and R
 - 17) Not available with Housing/Protection/Cable options N, P, and V
 - 18) Available with Electronic option 0 only
 - 19) Not available with Version/Material options E, F, and G
 - 20) Listed Certificates are not available with all configurations, please contact factory for more information
 - 22) Available with Supplementary electronic option A00, SIL electronics
 - 23) Available with Approval options 0A, 0H, 0K, 0R, 0S, 0U, 1A, 1C, 1D, 1E, 1F, 1H, 1N, 1P, and 1R
 - 24) Available with Housing/Protection/Cable options E, F, L, M and P
 - 25) Available with supplementary electronic option A00
 - 26) Available with Indicating/adjustment module options E00, E01
 - 27) Not available with Indicating/adjustment module option E02
 - 28) Available with Housing/Protection/Cable options D, F, M, and R
 - 29) Available with Version/Material A, B, C, D, and E
 - 30) Accuracy is application dependent, please consult factory
 - 31) Not available with Supplementary electronic option A01
 - 32) Available with Housing/Protection/Cable options W and Y
 - 33) Available with Housing/Protection/Cable options X and J
 - 34) Available with Electronics options 0, 2, and 5
 - 35) Available with Version/Material G and Electronics option 2
 - 36) Please pick Y05, Y06, or Y07 when you pick Probe/version material G
 - 37) Not available with Housing/Protection/Cable options A and B
 - 38) Available with Approval option 0A only
 - 39) Available with Version/Material options A, B, D, C, and L only
 - 40) Not available with Seal/Second line of defense/Process temperature option D
 - 41) Available with Seal/second line of defense/Process temperature options A, B, and C only
 - 42) Not available with Seal/second line of defense/Process temperature options A, B, C
 - 43) Only available Process fitting/material options that are 316L stainless steel
 - 44) Available with Housing/Protection/Cable options Q2A and Q2B
 - 45) Available with Housing/Protection/Cable option Q2B
 - 46) Not available with Housing/Protection/Cable options W, X, Y, J
 - 47) Not available with Housing/Protection/Cable options A, B, N, P, S, T, U, V, Q2A, and Q2B
 - 48) Available only with Housing/Protection/Cable options E, F, Q, R, X, and J
 - 49) Available only with Housing/Protection/Cable options D, F, M, R, W, X, Y, and J
 - 50) Available only with Electronics options 0, 2, 5, and 6
 - 51) Available only with Electronics options 0 and 2
 - 52) Available only with Electronics options 0 ... 4
- Note: Please consult manual for further details.

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series


Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LG Remote Interface	7ML5840-	SITRANS LG Replacement Probes	7ML5841-
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Approval		Instrument	
For Ex-free area	0 A	LG240 ⁴⁾⁵⁾	0
ATEX II 1G, 2G, Ex ia IIC T6 Ga, Gb	0 C	LG250 ⁶⁾	1
ATEX II 2G, Ex d IIC T6 Gb ¹⁾	0 E	LG260 ⁷⁾	2
IEC Ex ia IIC T6 Ga, Gb	0 F	LG270 ⁹⁾¹⁰⁾	3
IEC Ex d IIC T6 Gb ¹⁾	0 G		
CSA (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G	0 H	Probe Type	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G	0 J	Exchangeable cable ø 2 mm with gravity weight/316 ¹⁾¹¹⁾	AA
CSA (XP) Class I, Div. 1, Groups A, B, C, D ¹⁾	0 K	Exchangeable cable ø 2 mm center weight/316 ²⁾¹¹⁾	AC
INMETRO Ex ia IIC T6 Ga, Gb	0 L	Exchangeable cable ø 4 mm without weight/316 ¹⁾¹¹⁾	AD
INMETRO Ex d IIC T6 Gb ¹⁾	0 M	Exchangeable cable ø 4 mm with gravity weight/316 ¹⁾¹¹⁾	AE
Shipping Approval (DNV/GL) ⁶⁾	0 N	Exchangeable cable ø 4 mm with center weight/316 ²⁾¹¹⁾	AG
		Exchangeable cable ø 6 mm with gravity weight/316 ¹⁾⁸⁾¹¹⁾	AH
Electronics		Exchangeable rod ø 8 mm/316L ¹⁾	AP
Digital (I ² C communication)	A	Exchangeable rod ø 8 mm/1.4435 (acc. to Basle Standard) ¹⁾	AQ
Housing		Exchangeable rod ø 12 mm/316L ¹⁾	AU
Plastic ²⁾⁴⁾	0	Exchangeable rod ø 16 mm/316L ¹⁾	AW
Aluminum ³⁾⁵⁾	1		
Stainless Steel (precision casting) ³⁾⁵⁾	2	Process fitting	
Housing protection		Thread to 1 1/2 inch	0
IP66/IP67 NEMA 4X	0	Thread from 2 inch	1
IP66/IP68 NEMA 6P (0.2 bar)	1	Flange less than DN 50 or 2 inch	2
Cable entry		Flange greater or equal to DN 50 or 2 inch or hygienic fitting (not for safety ingold 25 x 46 mm)	3
M20 x 1.5/ Blind plug	3	Dimension centering weight	
1/2" NPT/ Blind plug	5	Without	0
Display		ø 40 mm/30 mm	1
Without	A	ø 45 mm/30 mm (for 2 inch tubes)	2
Mounted	B	ø 75 mm/30 mm (for 3 inch tubes)	3
Mounting		ø 95 mm/30 mm (for 4 inch tubes)	4
For wall mounting with Aluminum or stainless steel housing	A	ø 1.57 inch/1.18 inch (for 2 inch Schedule 160)	5
For carrier rail and wall mounting with plastic housing	B	ø 1.77 inch/1.18 inch (for 2 inch Schedule 40/80)	6
For carrier rail with Aluminum or stainless steel housing	C	ø 2.95 inch/1.18 inch (for 3 inch Schedule 10/40)	7
For tube mounting (29 ... 60 mm) including mounting material	D	ø 3.74 inch/1.18 inch (for 4 inch Schedule 80)	8
Certificates		Certificates	
None	0	Without	0
3.1 Certificate/Instrument with test data	1	2.2 Material certificate	1
Quality and Test plan	2	3.1 Material certificate	2


- 1) Available with Housing option 1 and 2 only
- 2) Available with Housing Protection option 0 only
- 3) Available with Housing Protection option 1 only
- 4) Available with Mounting options B and D only
- 5) Not available with Mounting option B
- 6) Shipping approval is only available with housing options plastic and aluminum 0 and 1

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.
SITRANS LG Replacement Probes	7ML5841-
	 0
Lengths	
<u>Rod ø 8 mm</u>	
300 ... 1 000 mm (11.81 ... 39.37 inch)	AA
1 001 ... 2 000 mm (39.41 ... 78.74 inch)	AB
2 001 ... 3 000 mm (78.78 ... 118.11 inch)	AC
3 001 ... 4 000 mm (118.15 ... 157.48 inch)	AD
4 001 ... 5 000 mm (157.52 ... 196.85 inch)	AE
5 001 ... 6 000 mm (196.89 ... 236.22 inch)	AF
<u>Rod ø 12 mm</u>	
300 ... 1 000 mm (11.81 ... 39.37 inch)	AG
1 001 ... 2 000 mm (39.41 ... 78.74 inch)	AH
2 001 ... 3 000 mm (78.78 ... 118.11 inch)	AJ
3 001 ... 4 000 mm (118.15 ... 157.48 inch)	AK
4 001 ... 5 000 mm (157.52 ... 196.85 inch)	AL
5 001 ... 6 000 mm (196.89 ... 236.22 inch)	AM
<u>Rod ø 16 mm</u>	
300 ... 1 000 mm (11.81 ... 39.37 inch)	AN
1 001 ... 2 000 mm (39.41 ... 78.74 inch)	AP
2 001 ... 3 000 mm (78.78 ... 118.11 inch)	AQ
3 001 ... 4 000 mm (118.15 ... 157.48 inch)	AR
4 001 ... 5 000 mm (157.52 ... 196.85 inch)	AS
5 001 ... 6 000 mm (196.89 ... 236.22 inch)	AT
<u>Cable Lengths ø 2 mm and 4 mm/316</u>	
501 ... 1 000 mm (19.72 ... 39.37 inch)	AU
1 001 ... 5 000 mm (39.41 ... 196.85 inch)	AV
5 000 ... 10 000 mm (196.85 ... 393.70 inch)	AW
10 001 ... 15 000 mm (393.74 ... 590.55 inch)	AX
15 001 ... 20 000 mm (590.59 ... 787.40 inch)	AY
20 001 ... 25 000 mm (787.44 ... 984.25 inch)	BA
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	BB
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	BC
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	BD
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	BE
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	BF
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	BG
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)	BH
60 001 ... 65 000 mm (2 362.24 ... 2 559.06 inch)	BJ
65 001 ... 70 000 mm (2 559.09 ... 2 755.91 inch)	BK
70 001 ... 75 000 mm (2 755.94 ... 2 952.76 inch)	BL

Selection and Ordering data	Article No.
SITRANS LG Replacement Probes	7ML5841-
	 0
<u>Cable Lengths ø 6 mm/316</u>	
501 ... 1 000 mm (19.72 ... 39.37 inch)	BM
1 001 ... 5 000 mm (39.41 ... 196.85 inch)	BN
5 000 ... 10 000 mm (196.89 ... 393.70 inch)	BP
10 001 ... 15 000 mm (393.74 ... 590.55 inch)	BQ
15 001 ... 20 000 mm (590.59 ... 787.40 inch)	BR
20 001 ... 25 000 mm (787.44 ... 984.25 inch)	BS
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	BT
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	BU
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	BV
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	BW
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	BX
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	BY
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)	CA
60 001 ... 65 000 mm (2 362.24 ... 2 559.06 inch)	CB
65 001 ... 70 000 mm (2 559.09 ... 2 755.91 inch)	CC
70 001 ... 75 000 mm (2 755.94 ... 2 952.76 inch)	CD

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description	Y01
Total length: Enter the total length of rigid part (range 100 ... 1 000 mm LG270 limited to 100 mm) (cable versions only)	Y02
1) Available with Dimension centering weight: Without option 0	
2) Available with Dimension centering weight: option 1 ... 8	
3) All Probe types are only available with corresponding Probe lengths	
4) Available with Probe type option AQ	
5) Available with Process fitting options 2 and 3	
6) Not available with Probe type options AQ and AW	
7) Available with Probe type options AE, AH, and AW	
8) Not available with Process fitting option 2	
9) Available with Probe type options AA, AC, AE, AG, and AW	
10) Available with Process fittings 0 and 3	
11) Not available with certificate options 1 and 2	

1) Only available with Version/Material options AA and AC

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.
SITRANS LG Spacers	7ML5842-
	000AA0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Instrument	
LG240 ¹⁾	0
LG250 ²⁾	1
LG260 ³⁾	2
LG270 ³⁾	3
Version/Material	
Cable ø 4 mm/ PFA ⁴⁾	AA
Rod ø 8 mm including fastening/ PEEK can be shortened ⁵⁾	AB
Rod ø 10 mm/ PFA ⁴⁾	AC
Rod ø 12 mm including fastening/ PEEK can be shortened ⁵⁾	AD
Rod ø 16 mm, cable with gravity weight, including fastening/ PEEK can be shortened ⁵⁾⁷⁾	AE
Cable ø 2 mm including fastening/ PEEK and 316L	AF
Rod ø 16 mm including fastening/ 1.4568 (AISI 631) flexible ⁸⁾	AG
Rod ø 8 mm including fastening/ PTFE can be shortened ⁵⁾	AH
Rod ø 12 mm including fastening/ 1.4568 (AISI 631) flexible ⁶⁾	AG
Tube diameter	
50 mm (2 inch) up to 100 mm (4 inch)	1
49.2 mm (1.9 inch) up to 56.3 mm (2.2 inch)	2
66.6 mm (2.6 inch) up to 84.9 mm (3.3 inch)	3

²⁾ Only available with Version/Material options AB, AD, AE, AH and AJ

³⁾ Only available with Version/Material options AE and AG

⁴⁾ Only available with Tube Diameter option 1 and LG240

⁵⁾ Only available with Tube Diameter options 2 and 3 and LG250

⁶⁾ Only available with Tube Diameter option 1 and LG250

⁷⁾ Only available with Tube diameter option 1 and LG260 or LG270

⁸⁾ Only available with Tube Diameter options 2 and 3 and LG260 or LG270

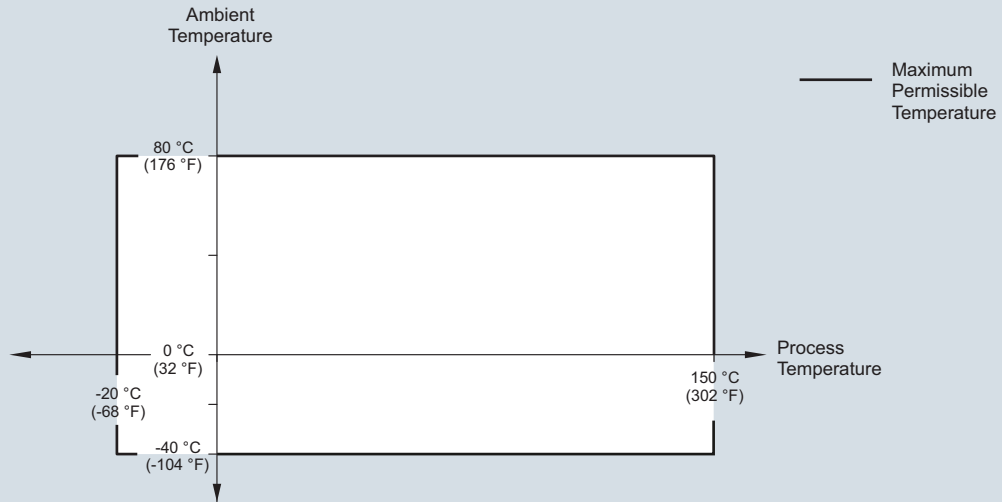
Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

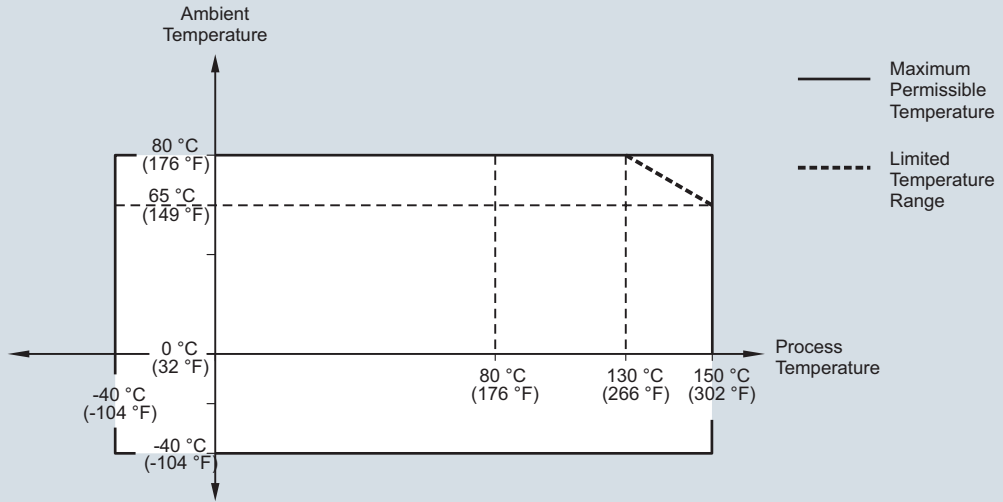
Characteristic curves

SITRANS LG240, Ambient temperature/process temperature, standard version

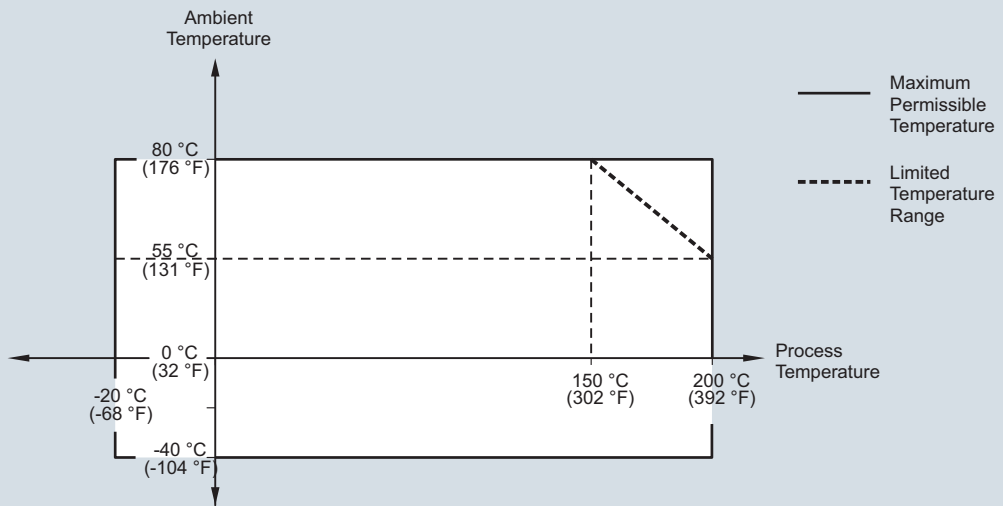


SITRANS LG240, ambient temperature/process temperature curve

SITRANS LG250, Ambient temperature/process temperature, standard version



SITRANS LG250, Ambient temperature/process temperature, temperature adapter version



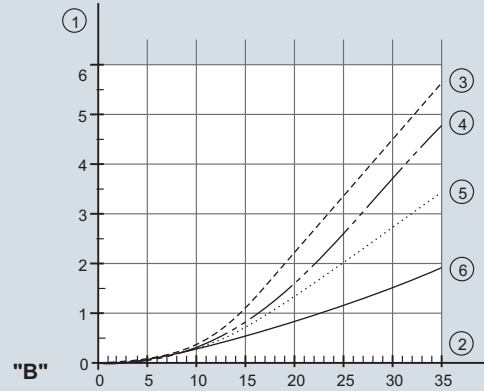
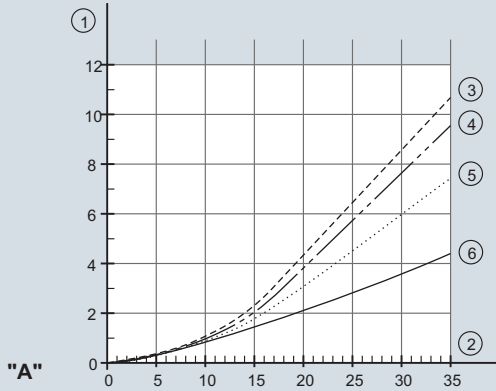
SITRANS LG250, ambient temperature/process temperature curves

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

SITRANS LG260, Maximum tensile load with cereals and plastic granules - cable: \varnothing 4 mm (0.157 inch)



A. Cereals

B. Plastic granules

1. Tensile force in kN (the determined value must be multiplied with safety factor 2)

2. Cable length in m

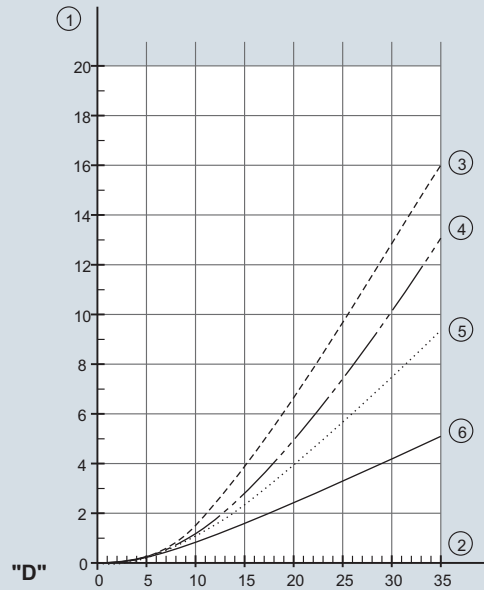
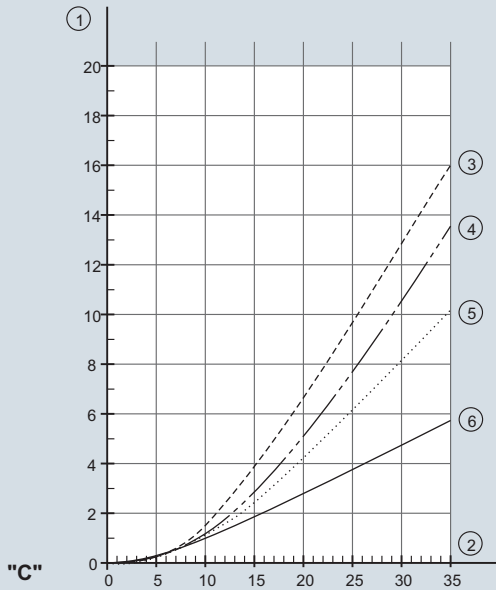
3. Vessel diameter 12 m (39.37 ft)

4. Vessel diameter 9 m (29.53 ft)

5. Vessel diameter 6 m (19.69 ft)

6. Vessel diameter 3 m (9.843 ft)

SITRANS LG260, Maximum tensile load with sand and cement - cable: \varnothing 4 mm (0.157 inch)



C. Sand

D. Cement

1. Tensile force in kN (the determined value must be multiplied with safety factor 2)

2. Cable length in m

3. Vessel diameter 12 m (39.37 ft)

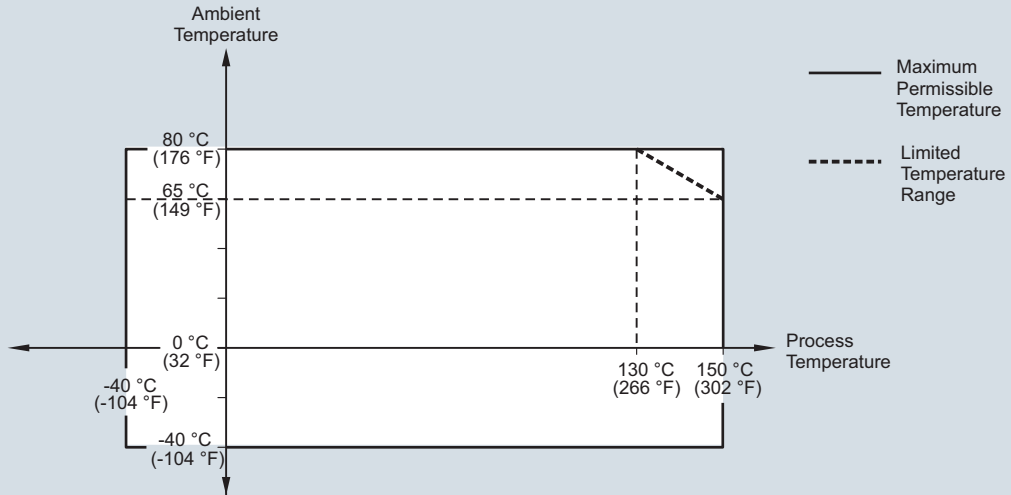
4. Vessel diameter 9 m (29.53 ft)

5. Vessel diameter 6 m (19.69 ft)

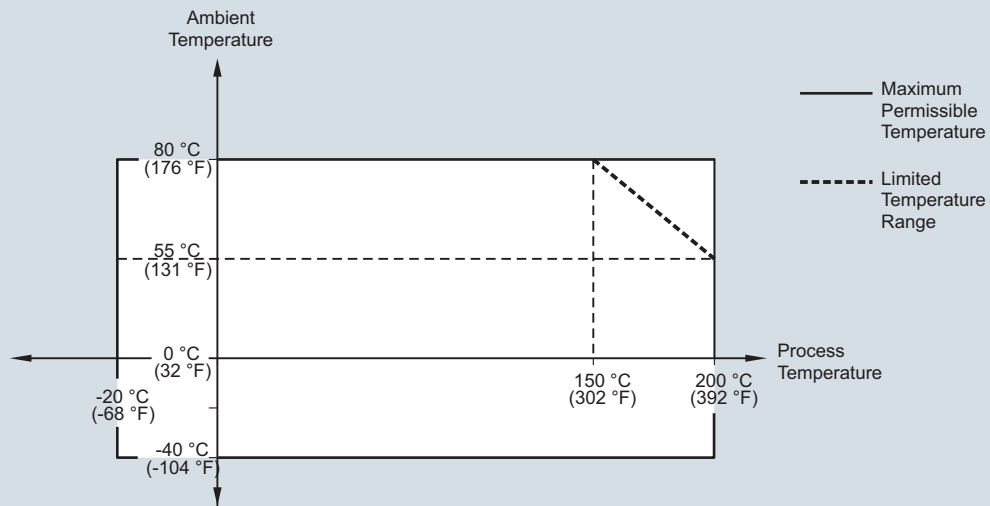
6. Vessel diameter 3 m (9.843 ft)

SITRANS LG260, maximum tensile load curves

SITRANS LG260, Ambient temperature/process temperature, standard version
 Cable version with \varnothing 4 mm (0.157 inch)
 Cable version, PA coated with \varnothing 6 mm (0.236 inch)



SITRANS LG260, Ambient temperature/process temperature, temperature adapter version
 Cable version with \varnothing 4 mm (0.157 inch)
 Cable version, PA coated with \varnothing 6 mm (0.236 inch)



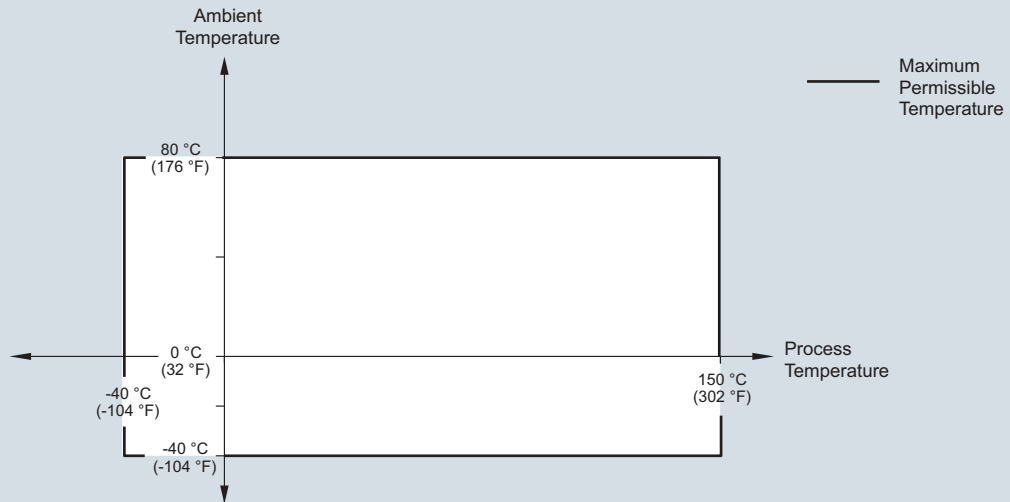
SITRANS LG260, ambient temperature/process temperature curves

Level Measurement

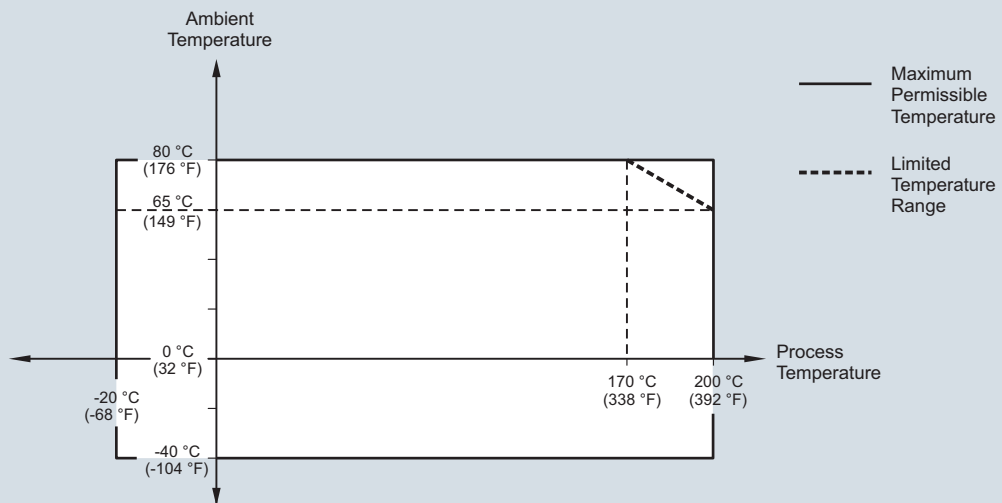
Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

SITRANS LG260, Ambient temperature/process temperature, standard version
Cable version with \varnothing 6 mm (0.236 inch)
Cable version, PA coated with \varnothing 11 mm (0.433 inch)

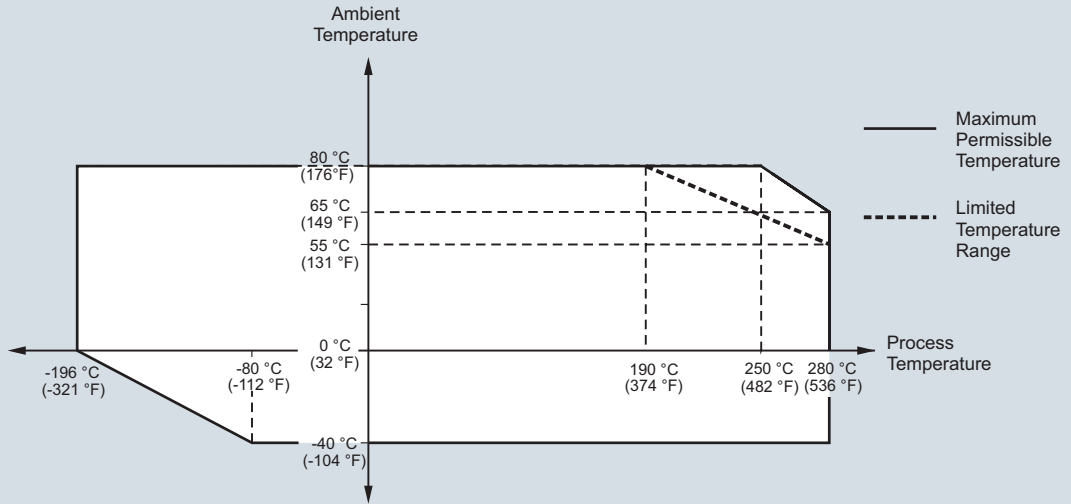


SITRANS LG260, Ambient temperature/process temperature, temperature adapter version
Cable version with \varnothing 6 mm (0.236 inch)
Cable version, PA coated with \varnothing 11 mm (0.433 inch)

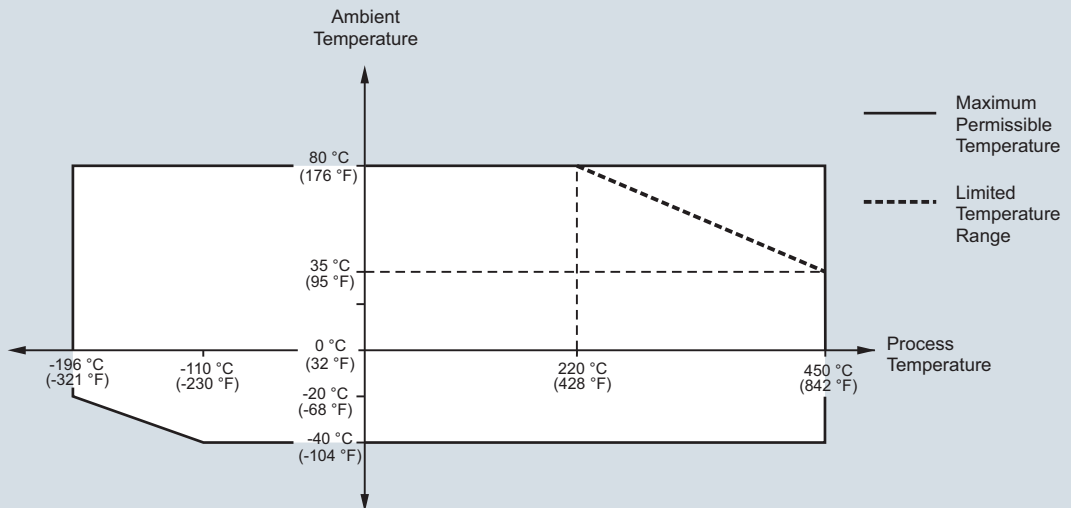


SITRANS LG260, ambient temperature/process temperature curves

SITRANS LG270, Ambient temperature/process temperature (-196 ... +280 °C/-321 ... +536 °F version)



SITRANS LG270, Ambient temperature/process temperature (-196 ... +450 °C/-321 ... +842 °F version)



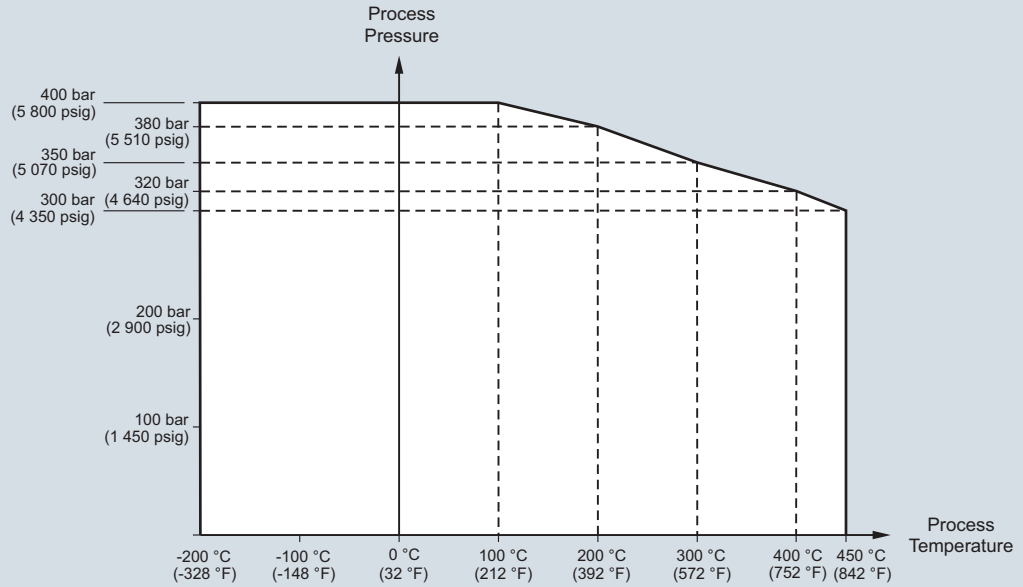
SITRANS LG270, ambient temperature/process temperature curves

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

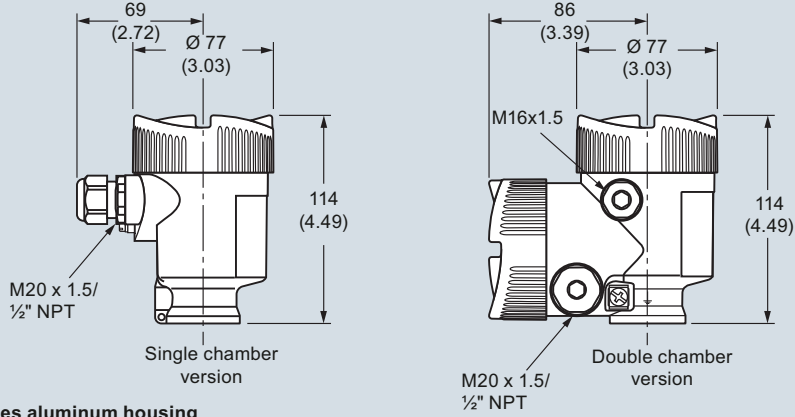
SITRANS LG270, Process pressure/process temperature (-196 ... +450 °C/-321 ... +842 °F version)



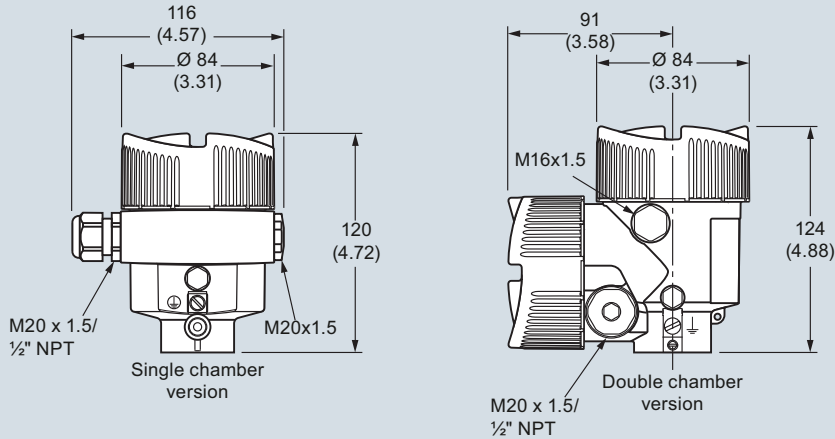
SITRANS LG270, process pressure/process temperature curve

Dimensional drawings

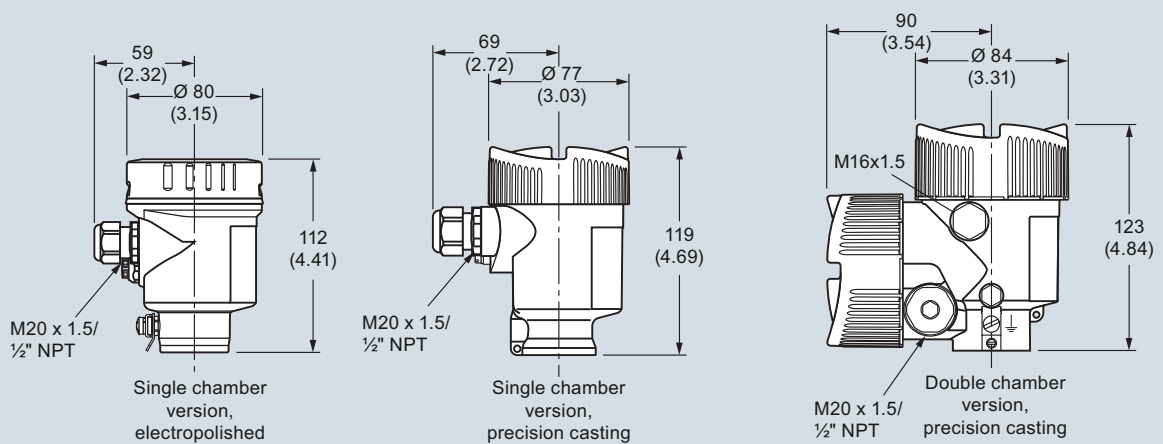
SITRANS LG Series plastic housing



SITRANS LG Series aluminum housing



SITRANS LG Series stainless steel housing



Note: For integrated display and adjustment module the housing is 9 (0.35) higher for all housing options

SITRANS LG series, dimensions in mm (inch)

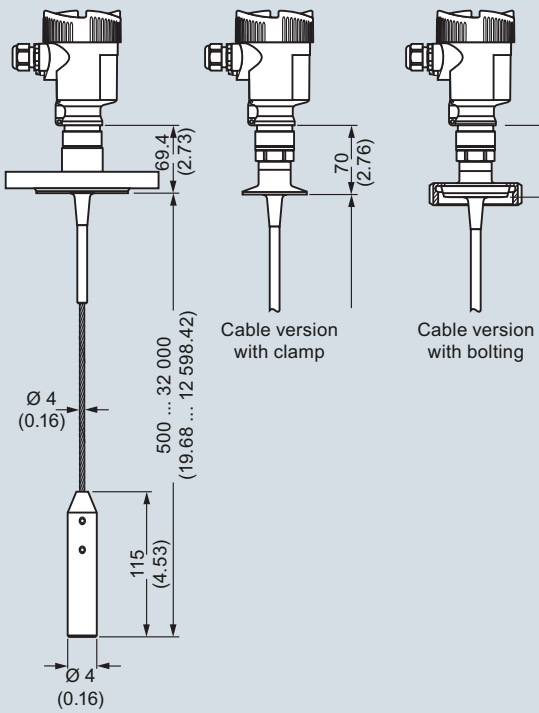
Level Measurement

Continuous level measurement - Guided wave radar transmitters

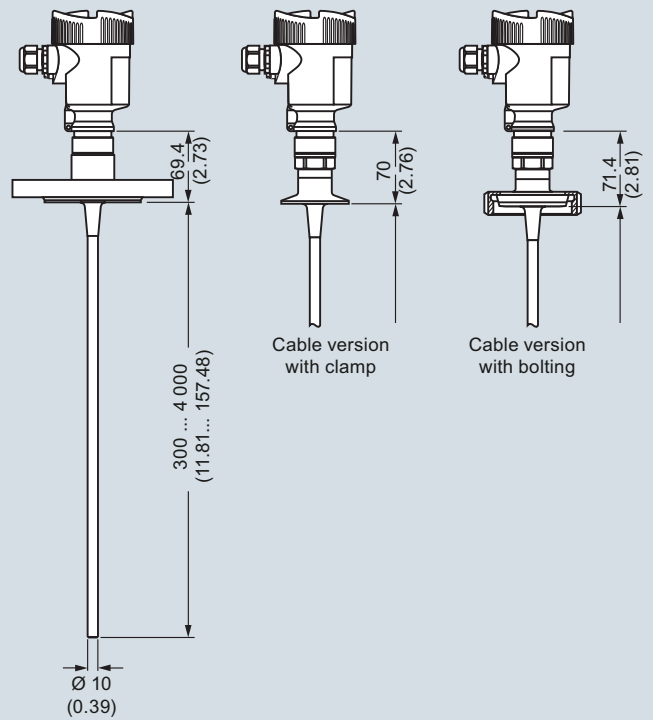
SITRANS LG series

SITRANS LG240

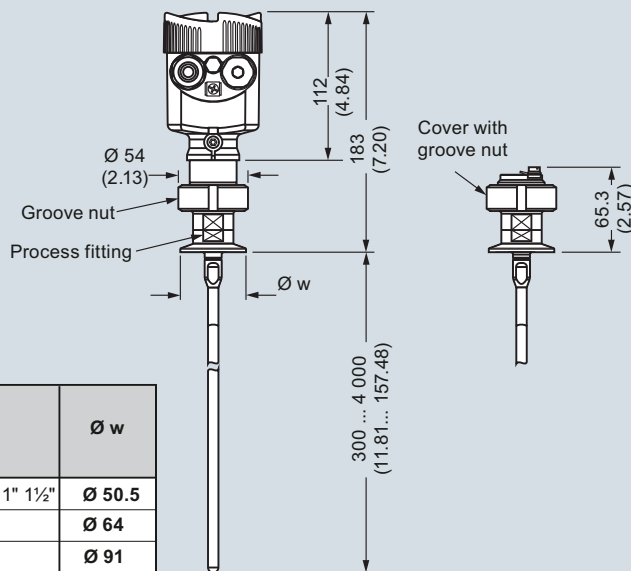
Cable version Ø 4 (0.157), PFA coated



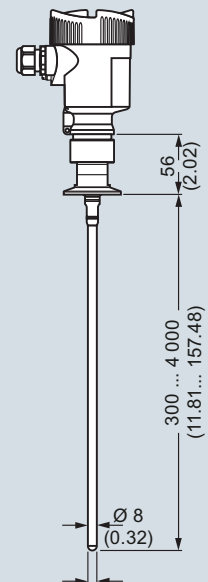
Rod version Ø 10 (0.394), PFA coated



Autoclaved version



Rod version Ø 8 (0.315), polished

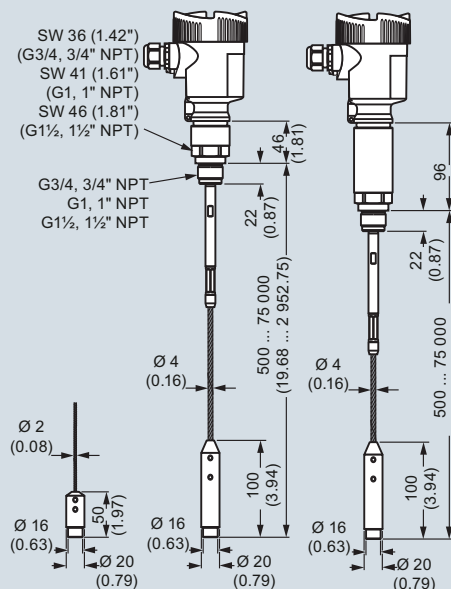


	Ø w
DIN DN 25 DN 32 DN 40/ 1" 1½"	Ø 50.5
DIN DN 50/ 2"	Ø 64
DIN DN 65/ 3"	Ø 91

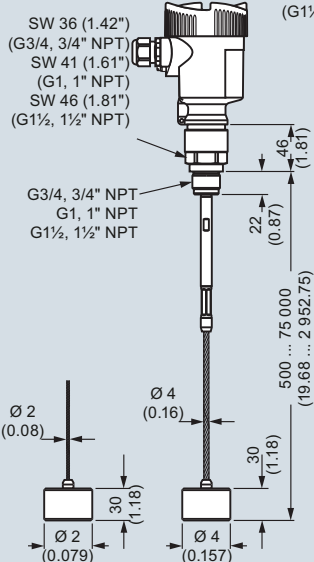
SITRANS LG240, dimensions in mm (inch)

SITRANS LG250

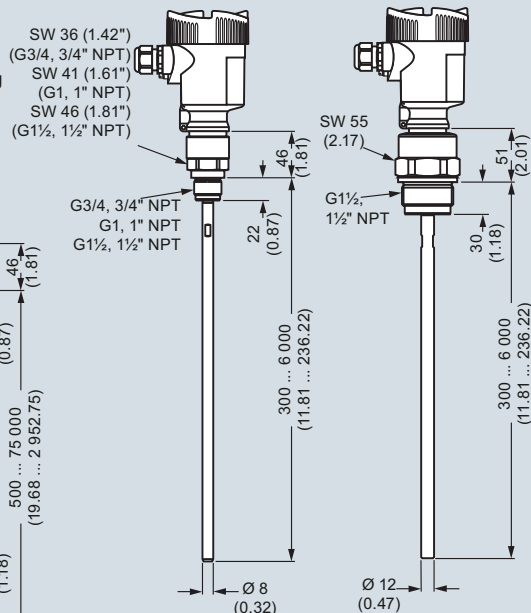
Cable version with gravity weight



Cable version with centering weight



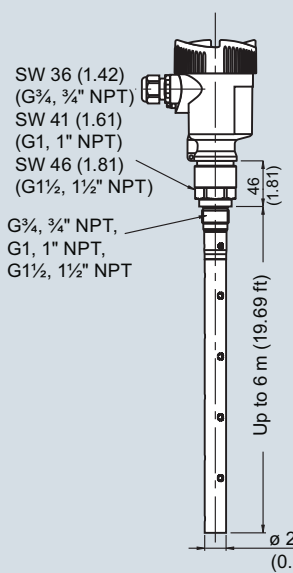
Rod version



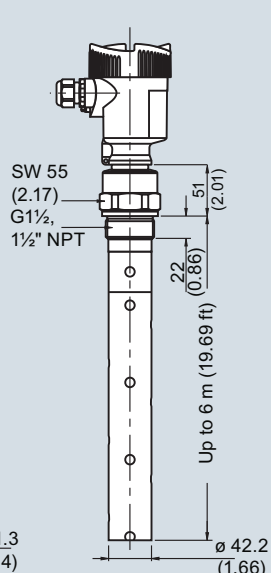
SITRANS LG250, dimensions in mm (inch)

SITRANS LG250, coax version

**Coaxial version
Ø 21.3 (0.839)**



**Coaxial version
Ø 42.2 (1.661)**



SITRANS LG250, dimensions in mm (inch)

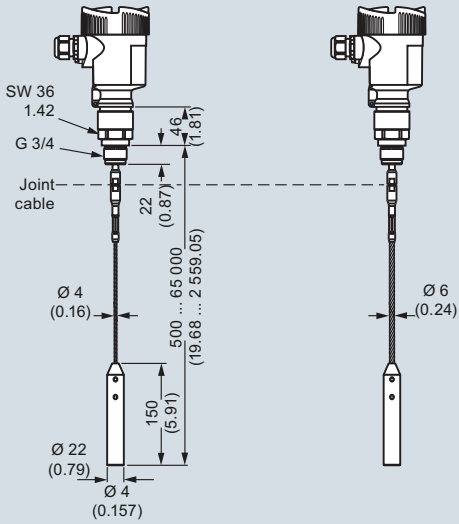
Level Measurement

Continuous level measurement - Guided wave radar transmitters

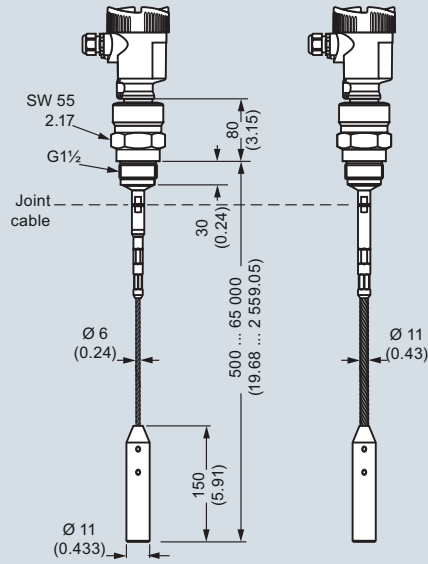
SITRANS LG series

SITRANS LG260

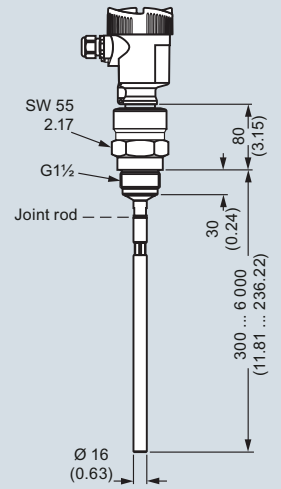
Cable version Ø 4 (0.157)/ Ø 6 (0.236)- PA coated



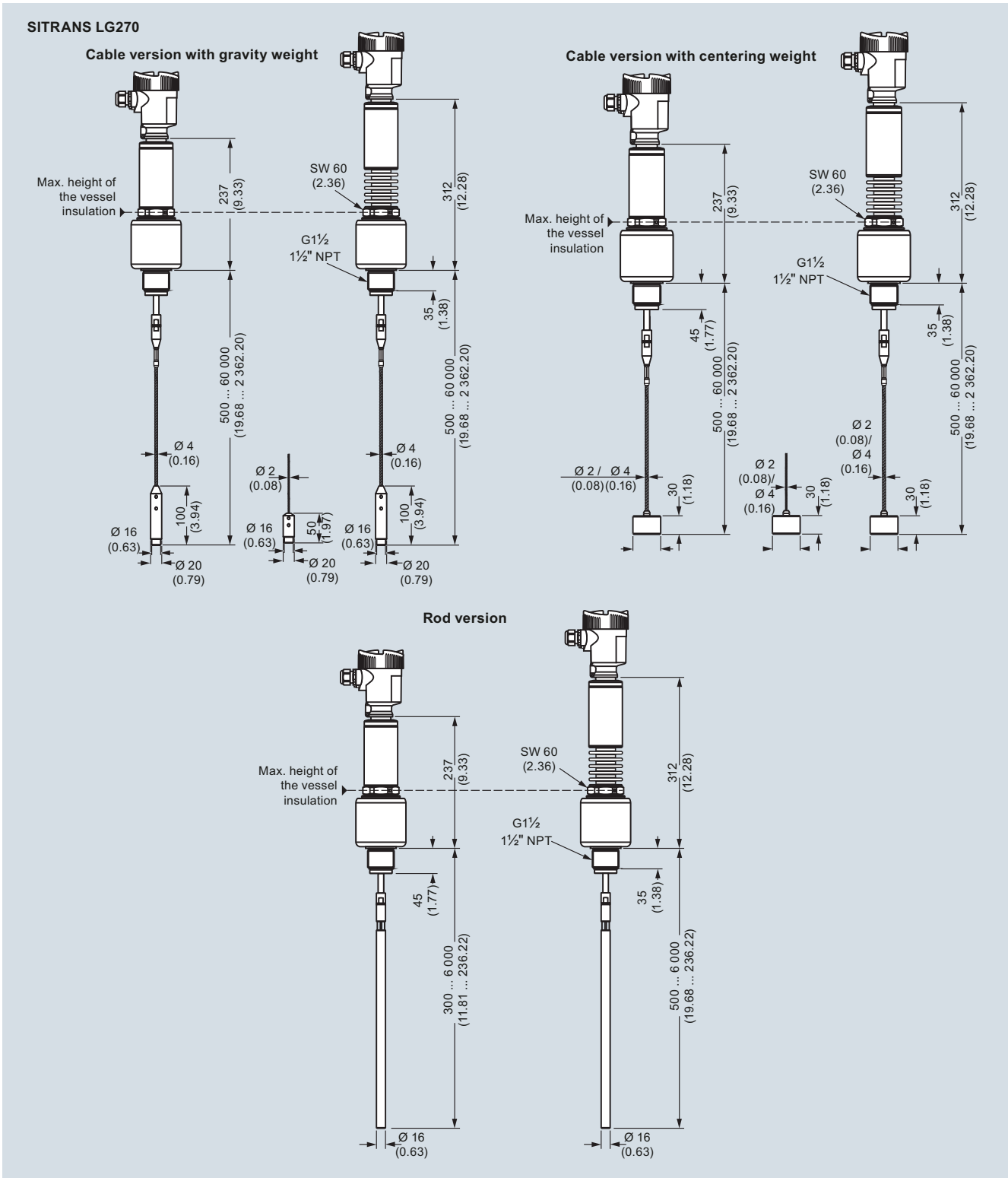
Cable version Ø 6 (0.236)/ Ø 11 (0.433)- PA coated



Rod version Ø 16 (0.63)



SITRANS LG260, dimensions in mm (inch)



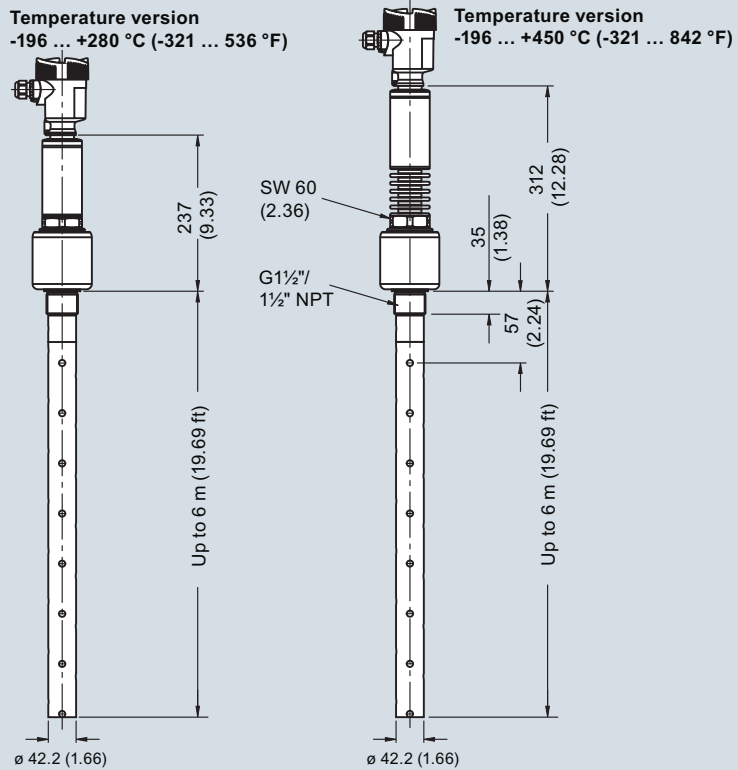
SITRANS LG270, dimensions in mm (inch)

Level Measurement

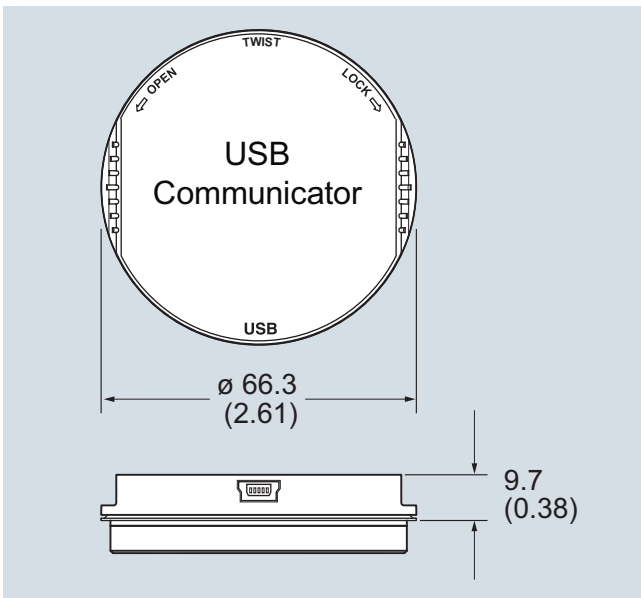
Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

SITRANS LG270, coax version

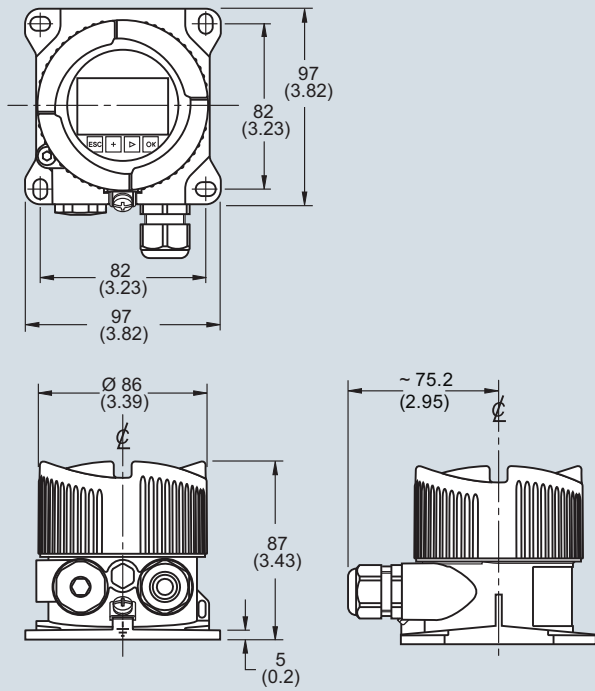


SITRANS LG270, dimensions in mm (inch)

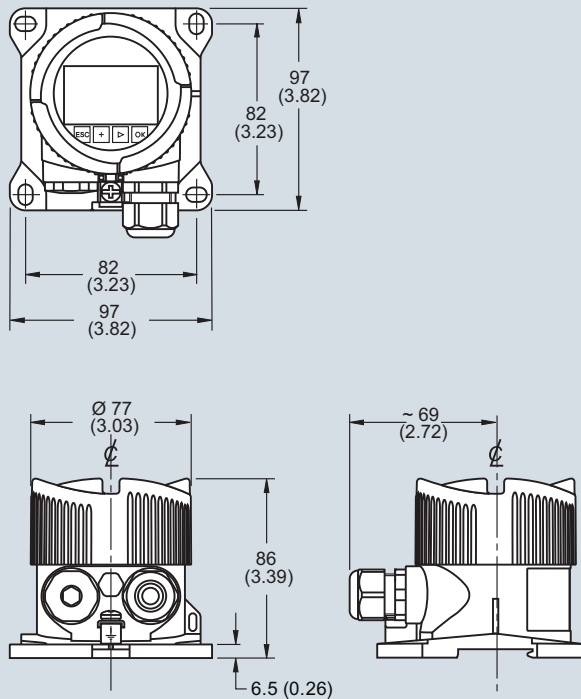


SITRANS LG USB Communicator, dimensions in mm (inch)

SITRANS LG remote interface, aluminum housing



SITRANS LG remote interface, plastic housing



SITRANS LG remote interface, dimensions in mm (inch)

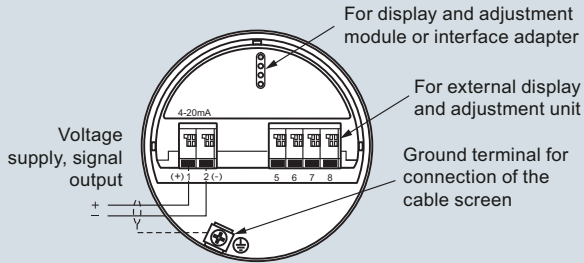
Level Measurement

Continuous level measurement - Guided wave radar transmitters

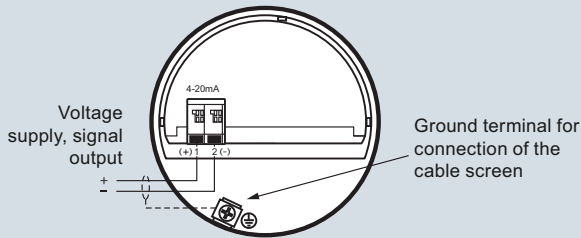
SITRANS LG series

Schematics

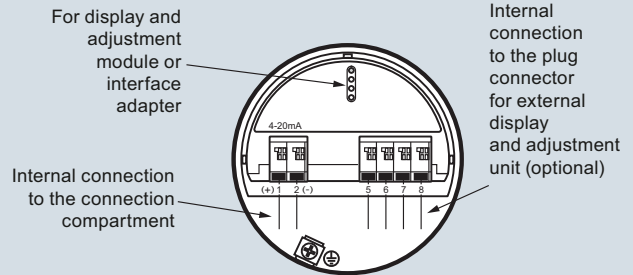
2-wire HART electronic option, electronics and connection compartment, single chamber housing



2-wire HART electronic option, connection compartment, Ex-d-ia double chamber housing



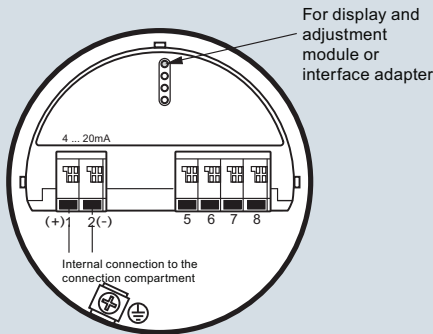
2-wire HART electronic option, electronics compartment, double chamber housing



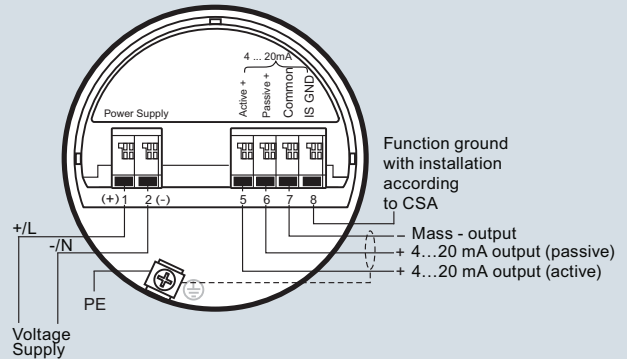
Note: All 2-wire HART connections and electronics are also available with SIL qualification.

SITRANS LG series connections

4-wire HART electronic option, electronics compartment, double chamber housing

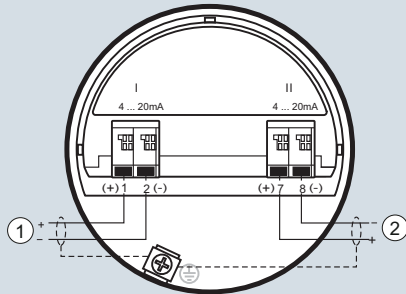


4-wire electronic option, connection compartment, double chamber housing with mains voltage



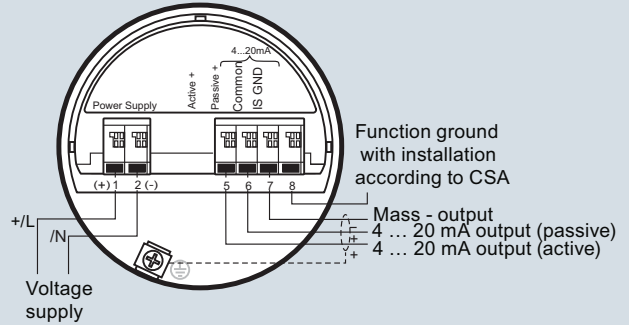
SITRANS LG series connections

Supplementary electronics



- ① First current output (I) - Voltage supply and signal output (HART)
- ② Second current output (II) - Voltage supply and signal output (without HART)

Connection compartment with low voltage

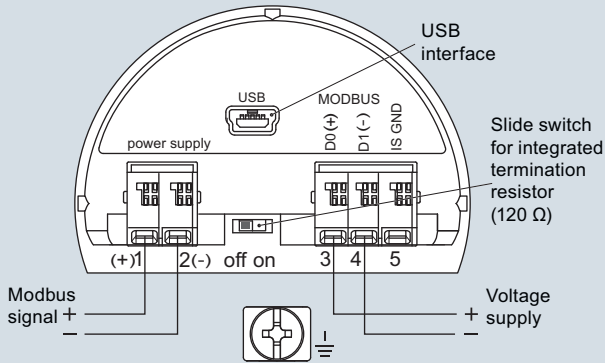


Function ground with installation according to CSA

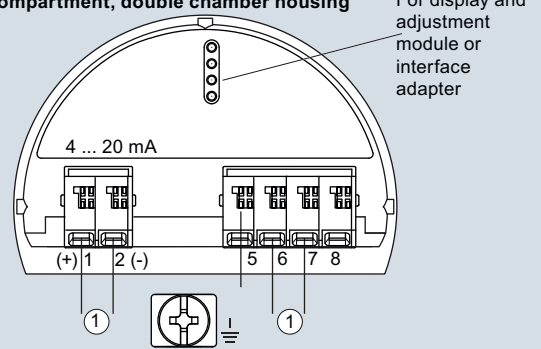
Mass - output
4 ... 20 mA output (passive)
4 ... 20 mA output (active)

SITRANS LG series connections

Modbus electronic option, connection compartment



Modbus electronic option, electronics compartment, double chamber housing

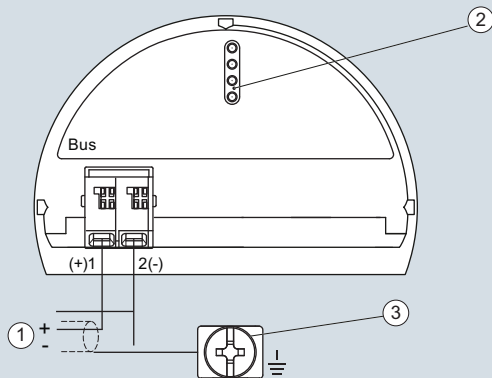


For display and adjustment module or interface adapter

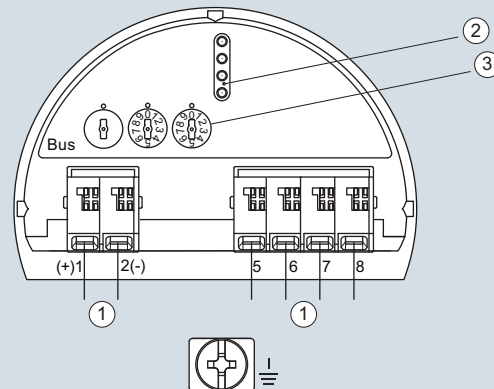
- ① Internal connection to the connection compartment

SITRANS LG series connections

PROFIBUS electronic option, connection compartment, double chamber housing



PROFIBUS electronic option, electronics compartment, double chamber housing



- ① Voltage supply, signal output
- ② For display and adjustment module or interface adapter
- ③ Ground terminal for connection of the cable screen

- ① Internal connection to the connection compartment
- ② Contact pins for the display and adjustment module or interface adapter
- ③ Selection switch for bus address

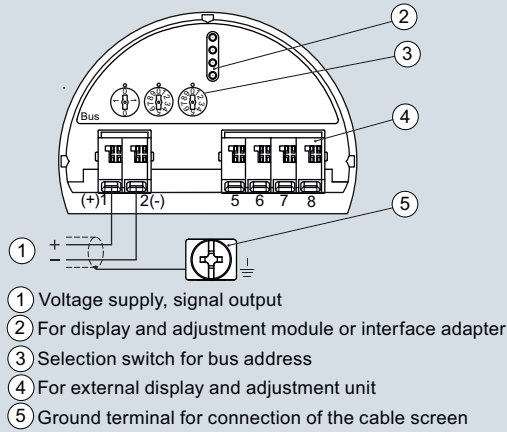
LG series connections

Level Measurement

Continuous level measurement - Guided wave radar transmitters

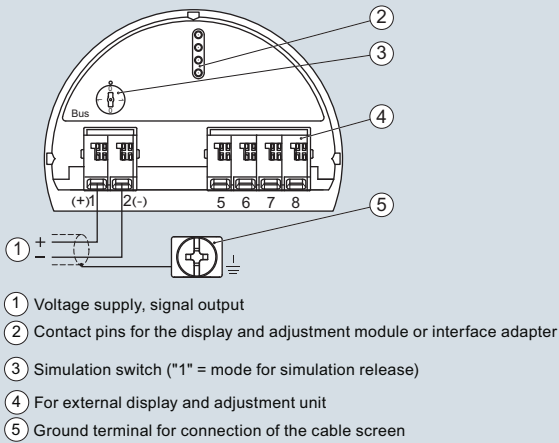
SITRANS LG series

PROFIBUS electronic option, electronics and connection compartment, single chamber housing



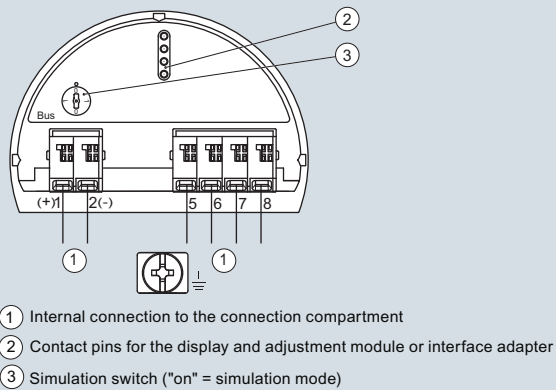
LG series connections

LG series, FOUNDATION Fieldbus electronic option, electronic and terminal compartment, single chamber housing



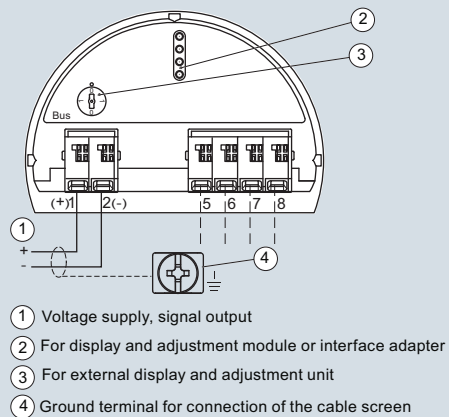
LG series connections

LG series, FOUNDATION Fieldbus electronic option, electronic compartment, double chamber housing



LG series connections

LG series, FOUNDATION Fieldbus electronic option, terminal compartment, double chamber housing



Overview



SITRANS LC300 is an inverse frequency shift capacitance continuous level transmitter for liquid, interface, and solid applications. It is ideal for standard industrial applications in chemical, hydrocarbon processing, food and beverage, water, wastewater, mining, aggregate, and cement industries.

Benefits

- Active-Shield technology so measurement is unaffected by material buildup in active shield section
- Highly accurate and reliable PFA-lined probes
- Integrated local LCD display
- 2-wire (4 to 20 mA) current loop design
- Current signaling according to NAMUR NE 43
- Push-button calibration and programming
- Stilling well (ground tube) version for low dielectric media, agitated materials, and non-metallic vessels

Application

SITRANS LC300 is a 2-wire level measurement instrument combining a sophisticated, yet easy-to-adjust microprocessor with field-proven probes. It is available in four versions: rod, rod with stilling well, cable with PFA insulation, and cable without PFA insulation.

Materials with low or high dielectric properties are accurately measured and Active-Shield technology helps in ignoring the effects of buildup or condensation near vessel nozzle.

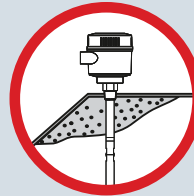
- Key Applications: conductive ($dK \geq 20$) and non-conductive ($dK < 20$) media including: liquids and solids in standard industrial processes, bulk solids applications involving dust, and chemical processes involving vapor

Probe Applications

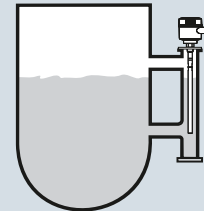
Rod version	Conductive liquids, slurries or solids
Rod version with stilling well	<ul style="list-style-type: none"> • Conductive liquids or slurries in non-conductive tanks • Non-conductive liquids in non-conductive tanks • Tanks with agitation or turbulent liquids • Liquids with a dielectric constant below 2 • Non-linear tanks, such as parabolic or spherical tanks • Interface measurements
Cable version	Non-conductive solids or liquids
PFA coated cable version	Conductive or sticky liquids, slurries or solids

Configuration

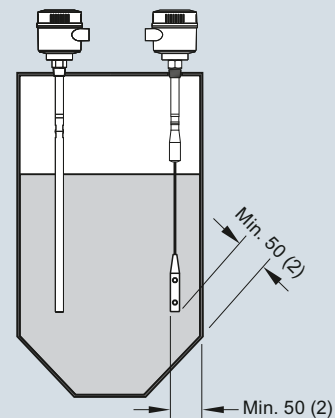
Installation



Build up of material in active shield area does not affect switch operation.



Mounting on a bypass area



Install probe at least 50 (2) from tank wall.
Note angle of repose and adjust accordingly.

SITRANS LC300 installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Capacitance transmitters

SITRANS LC300

Technical specifications

Input	
Measuring range	1.66 ... 3 300 pF
Span	Min. 3.3 pF
Output	
Loop current	Continuous signal 4 ... 20 mA/ 20 ... 4 mA according to NAMUR 43
Accuracy (transmitter)	
Temperature stability	0.25 % of actual capacitance value
Non-linearity and repeatability	< 0.4 % of full scale and actual measurement value
Accuracy	Deviation < 0.5 % of actual measurement value
Rated operating conditions¹⁾	
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F) ²⁾³⁾
• Installation category	I
• Pollution degree	4
• Ingress protection	Type 4/NEMA 4/IP65 (optional IP68)
Installation conditions	
• Location	Indoor/outdoor
• Process pressure	-1 ... +35 bar g (-14.6 ... +511 psi g)
• Process temperature	-40 ... +200 °C (-40 ... +392 °F) ⁴⁾
• Min. dielectric constant ϵ_r	1.5
• Min. difference in dielectric constant for interface measurement	5
Design	
Material	
• Enclosure	Aluminum, epoxy-coated
Probe diameter	
• Rod version	19 mm (0.75 inch) with PFA jacket
• Cable version	9 mm (0.35 inch) with PFA jacket, 6 mm (0.24 inch) without PFA jacket
Active shield length	
• Rod version	Threaded: 120 mm (4.72 inch) Flanged: 100 mm (3.94 inch)
• Cable version	Threaded: 125 mm (4.92 inch) Flanged: 105 mm (4.13 inch)
Process connection of probe	
• Threaded rod mounting	$\frac{3}{4}$ " 1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ " NPT [(Taper), ANSI/ASME B1.20.1] R $\frac{3}{4}$ ", 1", 1 $\frac{1}{2}$ " [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G $\frac{3}{4}$ ", 1", 1 $\frac{1}{2}$ " [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 1 $\frac{1}{2}$ " NPT [(Taper), ANSI/ASME B1.20.1] R 1 $\frac{1}{2}$ " [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1 $\frac{1}{2}$ " [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
• Threaded cable mounting	1 ... 4" ASME, DN 25 ... 100
• Flange mounting	1 ... 4" ASME, DN 25 ... 100
Enclosure cable inlet	2 x $\frac{1}{2}$ " NPT or 2 x M20 x 1.5

Power supply	12 ... 30 V DC any polarity, 2-wire current loop circuit
User Interface	
Display	Local LCD, 4 digit, each 0 ... 9 and limited alpha characters
Safety	
Measurement current signaling	According to NAMUR NE 43, signal 3.8 ... 20.5 mA, fault ≤ 3.6 or ≥ 21 mA (22 mA)
Certificates and approvals	
General	CE, CSA _{US/CA} , FM, RCM, KCC, EAC
Dust Ignition Proof (Intrinsically Safe probe circuit)	
• Canada/USA	FM/CSA: Class II, Div. 1, Groups E, F, G Class III T4 ATEX 1/2 D T100 °C
• Europe	ATEX II 1/2 G EEx d [ia] IIC T6 ... T1 ATEX II 1/2 D T100 °C
Flame Proof (Intrinsically Safe probe circuit)	
• Europe	Ex d [ia Ga] IIC T6 ... T4 Gb Ex tb IIIC T85 °C ... T100 °C Db IP65/IP68 EAC Ex
• Brazil	Class I, Div. 1, Groups A, B, C, D Class II, Div. 1, Groups E, F, G Class III T4
• Russia/Kazakhstan	Bureau Veritas Type Approval ABS Type Approval, Lloyds Register, BV
Explosion Proof (Intrinsically Safe probe circuit)	
• Canada/USA	AIB-Vincotte
Marine	Pattern Approval (AQSIQ, China), CRN, PED
Overfill Protection	
Other	

1) When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 4/330.

2) Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)

3) Minimum voltage of 15 V DC is required for use at -40 °C (-40 °F)



4) Not suitable for steam environments

Design: Probe			
	Rod version	Stilling well version	Cable version
Length	Min. 300 mm (12 inch), max. 5 000 mm (197 inch)	Min. 300 mm (12 inch), max. 5 000 mm (197 inch)	Min. 1 000 mm (40 inch), max. 25 000 mm (984 inch)
Sensor wetted parts	PFA, 316L stainless steel	PFA, 316L stainless steel	316L stainless steel or 316L stainless steel with PFA insulation
O-ring seal material	FKM or FFKM	FKM or FFKM	FKM or FFKM
Thermal isolator	Optional	Optional	Optional
Options	N/A	N/A	Mounting eye for PFA insulated cable version

Level Measurement

Continuous level measurement - Capacitance transmitters

SITRANS LC300

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LC300, rod version	7ML5670-	SITRANS LC300, rod version	7ML5670-
An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications.		An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications.	
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Process connection		Probe Length (from flange face or including process thread)	
Threaded, 316L stainless steel		Add Order code Y01 and plain text: "Insertion length ... mm"	
3/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 A	300 ... 1 000 mm (11.81 ... 39.37 inch)	A
1" NPT [(Taper), ANSI/ASME B1.20.1]	0 B	1 001 ... 2 000 mm (39.41 ... 78.74 inch)	B
1 1/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 C	2 001 ... 3 000 mm (78.78 ... 118.11 inch)	C
1 1/2" NPT [(Taper), ANSI/ASME B1.20.1]	0 D	3 001 ... 4 000 mm (118.15 ... 157.48 inch)	D
R 3/4" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 A	4 001 ... 5 000 mm (157.52 ... 196.85 inch)	E
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 B	Bent probes also available. Please contact a local sales person for details.	
R 1 1/2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D	For more information, please visit http://www.automation.siemens.com/aspa_app .	
G 3/4" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 A	Thermal isolator	
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 B	Without thermal isolator	0
G 1 1/2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D	With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1
Welded flange, 316L stainless steel, raised face ¹⁾		Wetted seals	
1" ASME, 150 lb	5 A	FKM	0
1" ASME, 300 lb	5 B	FFKM [for process temperatures above -20 °C (-4 °F)]	1
1" ASME, 600 lb	5 C		
1 1/2" ASME, 150 lb	5 D	Probe material	
1 1/2" ASME, 300 lb	5 E	19 mm (0.75 inch) diameter 316L stainless steel, PFA lined rod	0
1 1/2" ASME, 600 lb	5 F		
2" ASME, 150 lb	5 G	Approvals	
2" ASME, 300 lb	5 H	General Safety (CSA, FM, CE, RCM)	A
2" ASME, 600 lb	5 J	Dust Ignition Proof With IS Probe	B
3" ASME, 150 lb	5 K	CE, RCM, ATEX II 1/2 D T100 °C	C
3" ASME, 300 lb	5 L	Flame Proof Enclosure With IS Probe	D
3" ASME, 600 lb	5 M	CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C	E
4" ASME, 150 lb	5 N	Dust Ignition Proof With IS Probe	
4" ASME, 300 lb	5 P	CSA/FM Class II, Div. 1, Groups E, F, G	
4" ASME, 600 lb	5 Q	CSA/FM Class III T4	
Welded flange, 316L stainless steel, Type A flat faced ¹⁾		Explosion Proof Enclosure With IS Probe	
DN 25, PN 16	6 A	CSA/FM Class I, Div. 1, Groups A, B, C, D	
DN 25, PN 40	6 B	CSA/FM Class II, Div. 1, Groups E, F, G	
DN 40, PN 16	6 C	CSA/FM Class III T4	
DN 40, PN 40	6 D	Enclosure	
DN 50, PN 16	6 E	Aluminum epoxy coated 2 x 1/2" NPT via adapter - cable inlet, IP65	A
DN 50, PN 40	6 F	Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65	B
DN 80, PN 16	6 G	Aluminum epoxy coated 2 x 1/2" NPT via adapter - cable inlet, IP68	C
DN 80, PN 40	6 H	Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68	D
DN 100, PN 16	6 J	Stainless steel, contact local sales person for details.	
DN 100, PN 40	6 K	For more information, please visit http://www.automation.siemens.com/aspa_app .	
Sanitary, hastelloy, duplex or other custom process connections available. Please contact a local sales person for details.			
For more information, please visit http://www.automation.siemens.com/aspa_app .			

¹⁾ Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.

Level Measurement

Continuous level measurement - Capacitance transmitters

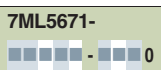
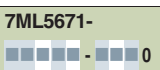
SITRANS LC300

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Material inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/ processinstrumentation/documentation	
Accessories	
Electronic transmitter kit (includes transmitter and driver)	Article No. 7ML1830-1KN
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

Level Measurement

Continuous level measurement - Capacitance transmitters

SITRANS LC300

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LC300, stilling well version An inverse frequency shift capacitance continuous level transmitter for liquid applications. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5671- 	SITRANS LC300, stilling well version An inverse frequency shift capacitance continuous level transmitter for liquid applications.	7ML5671- 
Process connection Threaded, 316L stainless steel 1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] <u>Welded flange, 316L stainless steel, raised face¹⁾</u> 1½" ASME, 150 lb 1½" ASME, 300 lb 1½" ASME, 600 lb 2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb 4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb <u>Welded flange, 316L stainless steel, Type A flat faced¹⁾</u> DN 40, PN 16 DN 40, PN 40 DN 50, PN 16 DN 50, PN 40 DN 80, PN 16 DN 80, PN 40 DN 100, PN 16 DN 100, PN 40 Sanitary, hastelloy, duplex or other custom process connections available. Please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app .	0 D 1 D 3 D 5 D 5 E 5 F 5 G 5 H 5 J 5 K 5 L 5 M 5 N 5 P 5 Q 6 C 6 D 6 E 6 F 6 G 6 H 6 J 6 K A B C D E	Dust Ignition Proof With IS Probe CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Explosion Proof Enclosure With IS Probe CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Enclosure Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65 Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65 Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68 Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68 Stainless steel, please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app . ¹⁾ Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.	D E A B C D
Probe Length (from flange face or including process thread) Add Order code Y01 and plain text: "Insertion length ... mm" 300 ... 1 000 mm (11.81 ... 39.37 inch) 1 001 ... 2 000 mm (39.41 ... 78.74 inch) 2 001 ... 3 000 mm (78.78 ... 118.11 inch) 3 001 ... 4 000 mm (118.15 ... 157.48 inch) 4 001 ... 5 000 mm (157.52 ... 196.85 inch)	A B C D E	Selection and Ordering data	Order code
Thermal isolator Without thermal isolator With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	0 1	Further designs Please add "-Z" to Article No. and specify Order code(s). Insertion length, specify in plain text: Y01: ... mm Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters) specify in plain text Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000 Material inspection Certificate Type 3.1 per EN 10204	Y01 Y15 C11 C12
Wetted seals FKM FFKM [for process temperatures above -20 °C (-4 °F)]	0 1	Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Probe material 35 mm (1.38 inch) diameter stilling well, with 19 mm (0.75 inch) diameter 316L stainless steel, PFA lined rod with PTFE spacers	1	Accessories Electronic transmitter kit (includes transmitter and driver) SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 For applicable back up point level switch - see point level measurement section	Article No. 7ML1830-1KN 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...
Approvals General Safety (CSA, FM, CE, RCM) Dust Ignition Proof With IS Probe CE, RCM, ATEX II 1/2 D T100 °C Flame Proof Enclosure With IS Probe CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C	A B C		

Level Measurement

Continuous level measurement - Capacitance transmitters

SITRANS LC300

Selection and Ordering data	Article No.
SITRANS LC300, cable version	7ML5672-
An inverse frequency shift capacitance continuous level transmitter for non-conductive liquids and solids applications.	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection	
Threaded, 316L stainless steel	
1½" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
Welded flange, 316L stainless steel, raised face ¹⁾	
1½" ASME, 150 lb	5 D
1½" ASME, 300 lb	5 E
1½" ASME, 600 lb	5 F
2" ASME, 150 lb	5 G
2" ASME, 300 lb	5 H
2" ASME, 600 lb	5 J
3" ASME, 150 lb	5 K
3" ASME, 300 lb	5 L
3" ASME, 600 lb	5 M
4" ASME, 150 lb	5 N
4" ASME, 300 lb	5 P
4" ASME, 600 lb	5 Q
Welded flange, 316L stainless steel, Type A flat faced ¹⁾	
DN 40, PN 16	6 C
DN 40, PN 40	6 D
DN 50, PN 16	6 E
DN 50, PN 40	6 F
DN 80, PN 16	6 G
DN 80, PN 40	6 H
DN 100, PN 16	6 J
DN 100, PN 40	6 K
Sanitary, hastelloy, duplex or other custom process connections available.	
Please contact a local sales person for details.	
For more information, please visit http://www.automation.siemens.com/aspa_app .	
Probe Length (from flange face or including process thread)	
Add Order code Y01 and plain text: "Insertion length ... mm"	
1 000 ... 2 000 mm (39.37 ... 78.74 inch)	A
2 001 ... 4 000 mm (78.78 ... 157.48 inch)	B
4 001 ... 6 000 mm (157.52 ... 236.22 inch)	C
6 001 ... 8 000 mm (236.26 ... 314.96 inch)	D
8 001 ... 10 000 mm (315.00 ... 393.70 inch)	E
10 001 ... 12 000 mm (393.74 ... 472.44 inch)	F
12 001 ... 14 000 mm (472.48 ... 551.18 inch)	G
14 001 ... 16 000 mm (551.22 ... 629.92 inch) ²⁾	H
16 001 ... 18 000 mm (629.96 ... 708.66 inch) ²⁾	J
18 001 ... 20 000 mm (708.70 ... 787.40 inch) ²⁾	K
20 001 ... 22 000 mm (787.44 ... 866.14 inch) ²⁾	L
22 001 ... 24 000 mm (866.18 ... 944.88 inch) ²⁾	M
24 001 ... 25 000 mm (944.92 ... 984.25 inch) ²⁾	N
Thermal isolator	
Without thermal isolator	0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1
Wetted seals	
FKM	0
FFKM [for process temperatures above -20 °C (-4 °F)]	1

Selection and Ordering data	Article No.
SITRANS LC300, cable version	7ML5672-
An inverse frequency shift capacitance continuous level transmitter for non-conductive liquids and solids applications.	
Probe material	
Bare 316L stainless steel cable and 316L stainless steel cable weight, tinned copper crimp, PTFE backing ring, PEEK isolator and PFA lined active shield	0
Approvals	
General Safety (CSA, FM, CE, RCM)	A
Dust Ignition Proof With IS Probe CE, RCM, ATEX II 1/2 D T100 °C	B
Flame Proof Enclosure With IS Probe CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C	C
Dust Ignition Proof With IS Probe CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	D
Explosion Proof Enclosure With IS Probe CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	E
Enclosure	
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65	A
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65	B
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68	C
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68	D
Stainless steel, please contact a local sales person for details.	
For more information, please visit http://www.automation.siemens.com/aspa_app .	

- Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.
- Cable lengths from 15 000 mm (590.55 inch) to 25 000 mm (984.25 inch) can be used in non-conductive media. Contact Factory for assistance.

Selection and Ordering data	Order code
Further designs	
Please add *-Z to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Material inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/ processinstrumentation/documentation	
Accessories	
Electronic transmitter kit (includes transmitter and driver)	Article No. 7ML1830-1KN
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

Level Measurement

Continuous level measurement - Capacitance transmitters

SITRANS LC300

4

Selection and Ordering data	Article No.
SITRANS LC300, PFA coated cable version ↗	7ML5673-
An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications.	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection	
<u>Threaded, 316L stainless steel</u>	
1½" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
<u>Welded flange, 316L stainless steel, raised face¹⁾</u>	
1½" ASME, 150 lb	5 D
1½" ASME, 300 lb	5 E
1½" ASME, 600 lb	5 F
2" ASME, 150 lb	5 G
2" ASME, 300 lb	5 H
2" ASME, 600 lb	5 J
3" ASME, 150 lb	5 K
3" ASME, 300 lb	5 L
3" ASME, 600 lb	5 M
4" ASME, 150 lb	5 N
4" ASME, 300 lb	5 P
4" ASME, 600 lb	5 Q
<u>Welded flange, 316L stainless steel, Type A flat faced¹⁾</u>	
DN 40, PN 16	6 C
DN 40, PN 40	6 D
DN 50, PN 16	6 E
DN 50, PN 40	6 F
DN 80, PN 16	6 G
DN 80, PN 40	6 H
DN 100, PN 16	6 J
DN 100, PN 40	6 K
Sanitary, hastelloy, duplex or other custom process connections available. Please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app .	
Probe Length (from flange face or including process thread)	
Add Order code Y01 and plain text: "Insertion length ... mm"	
1 000 ... 2 000 mm (39.37 ... 78.74 inch)	A
2 001 ... 4 000 mm (78.78 ... 157.48 inch)	B
4 001 ... 6 000 mm (157.52 ... 236.22 inch)	C
6 001 ... 8 000 mm (236.26 ... 314.96 inch)	D
8 001 ... 10 000 mm (315.00 ... 393.70 inch)	E
10 001 ... 12 000 mm (393.74 ... 472.44 inch)	F
12 001 ... 14 000 mm (472.48 ... 551.18 inch)	G
14 001 ... 16 000 mm (551.22 ... 629.92 inch) ²⁾	H
16 001 ... 18 000 mm (629.96 ... 708.66 inch) ²⁾	J
18 001 ... 20 000 mm (708.70 ... 787.40 inch) ²⁾	K
20 001 ... 22 000 mm (787.44 ... 866.14 inch) ²⁾	L
22 001 ... 24 000 mm (866.18 ... 944.88 inch) ²⁾	M
24 001 ... 25 000 mm (944.92 ... 984.25 inch) ²⁾	N
Thermal isolator	
Without thermal isolator	0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1
Wetted seals	
FKM	0
FFKM [for process temperatures above -20 °C (-4 °F)]	1

Selection and Ordering data	Article No.
SITRANS LC300, PFA coated cable version	7ML5673-
An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications.	
Probe material	
PFA coated cable and 316L stainless steel cable weight, PEEK isolator and PFA lined active shield	1
Approvals	
General Safety (CSA, FM, CE, RCM)	A
Dust Ignition Proof With IS Probe CE, RCM, ATEX II 1/2 D T100 °C	B
Flame Proof Enclosure With IS Probe CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C	C
Dust Ignition Proof With IS Probe CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	D
Explosion Proof Enclosure With IS Probe CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	E
Enclosure	
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65	A
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65	B
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68	C
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68	D
Stainless steel, please contact a local sales person for details. For more information, please visit http://www.automation.siemens.com/aspa_app .	
Mounting eye	
Without Mounting eye	0
With mounting eye	1
¹⁾ Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.	
²⁾ Cable lengths from 15 000 mm (590.55 inch) to 25 000 mm (984.25 inch) can be used in non-conductive media. Contact Factory for assistance.	

Selection and Ordering data	Order code
Further designs	
Please add *-Z to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Material inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/ processinstrumentation/documentation	
Accessories	
Electronic transmitter kit (includes transmitter and driver)	Article No. 7ML1830-1KN
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

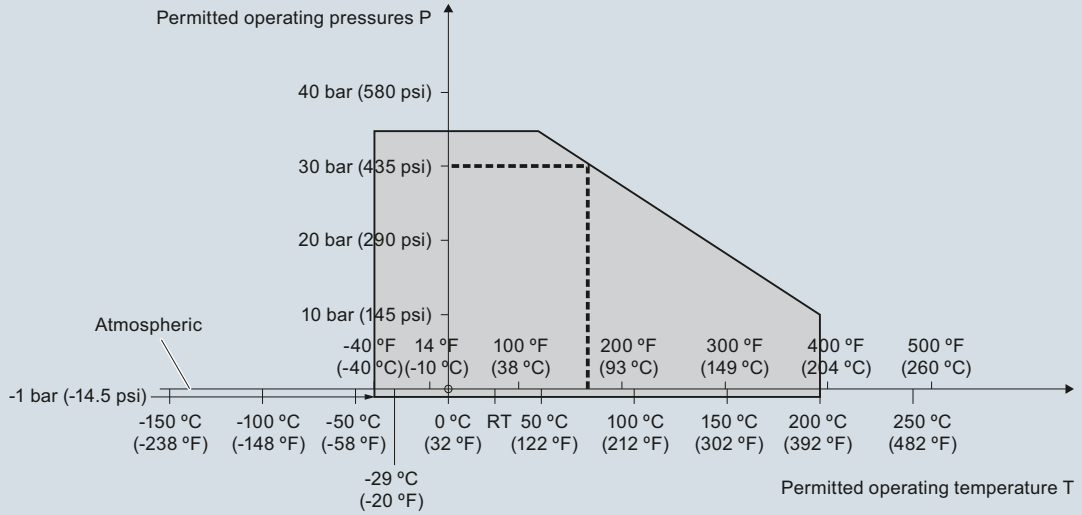
Level Measurement

Continuous level measurement - Capacitance transmitters

SITRANS LC300

Characteristic curves

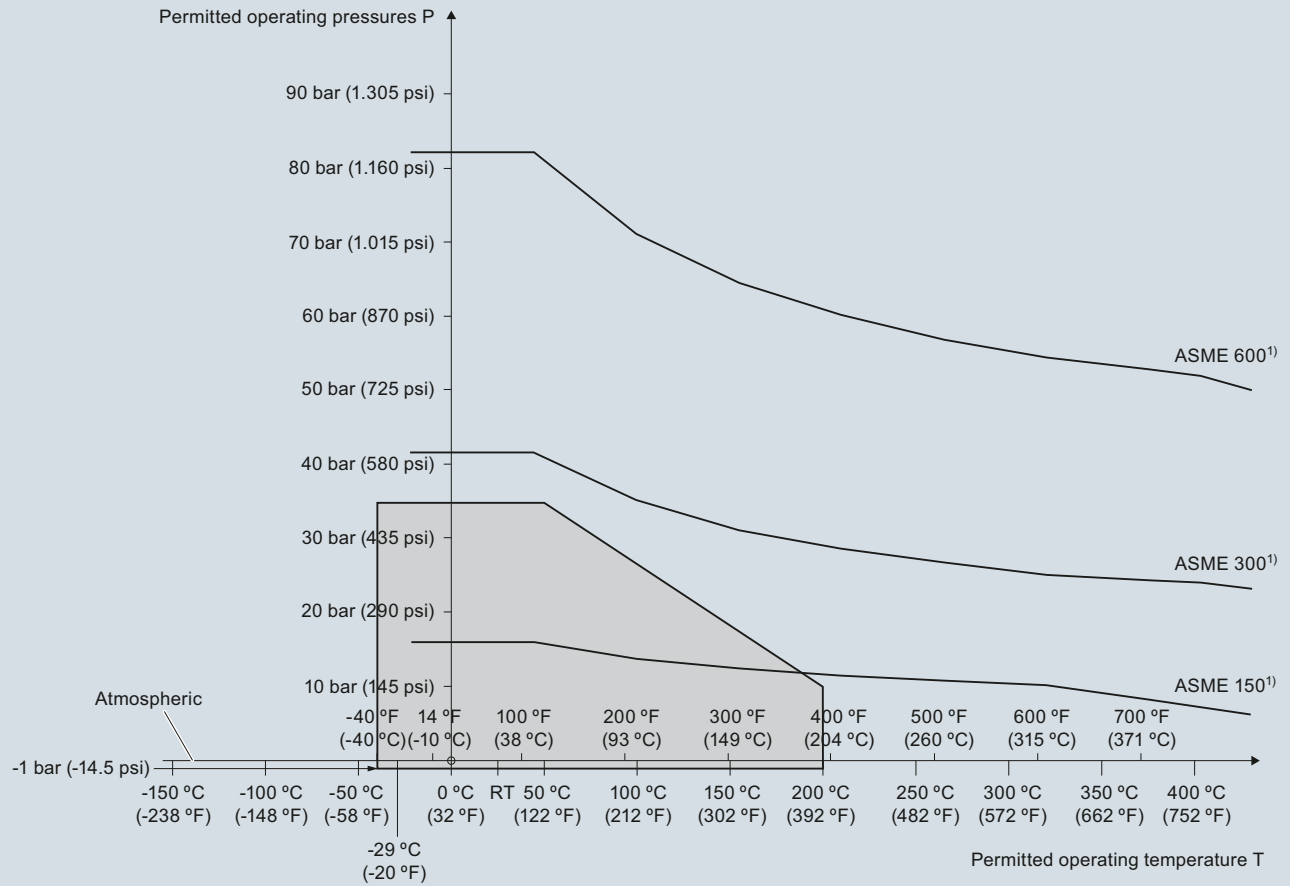
Pressure/temperature curve
 LC300 standard, extended rod and cable probes
 Threaded process connections
 (7ML5670, 7ML5671, 7ML5672 and 7ML5673)



--- Example:
 Permitted operating pressure = 30 bar (435 psi) at 75 °C

SITRANS LC300 process pressure/temperature derating curves (7ML5670, 7ML5671, 7ML5672, and 7ML5673)

Pressure/temperature curve
LC300 standard, extended rod and cable probes
ASME flanged process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

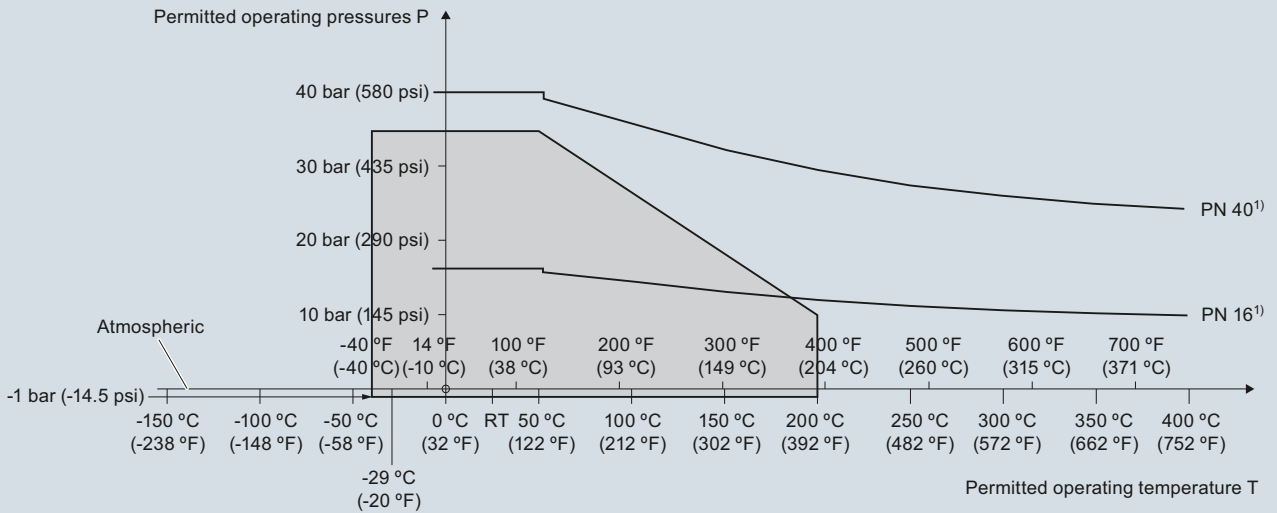
SITRANS LC300 process pressure/temperature derating curves (7ML5670, 7ML5671, 7ML5672, and 7ML5673)

Level Measurement

Continuous level measurement - Capacitance transmitters

SITRANS LC300

Pressure/temperature curve
LC300 standard, extended rod and cable probes
EN flanged process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)

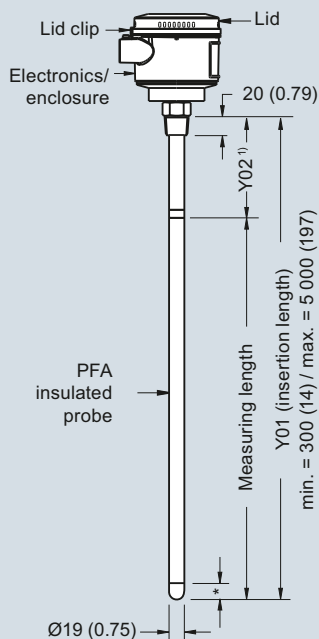


¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC300 process pressure/temperature derating curves (7ML5670, 7ML5671, 7ML5672, and 7ML5673)

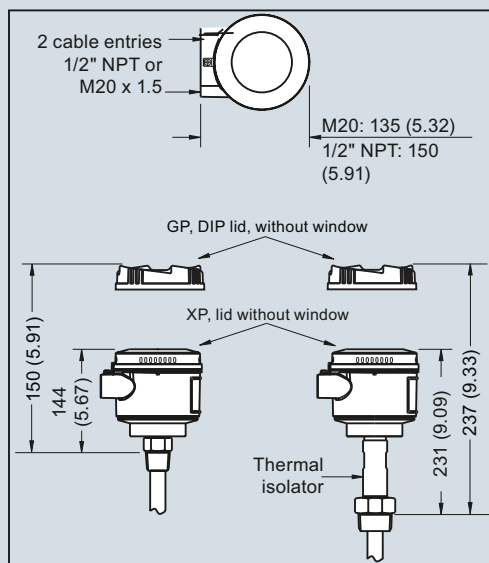
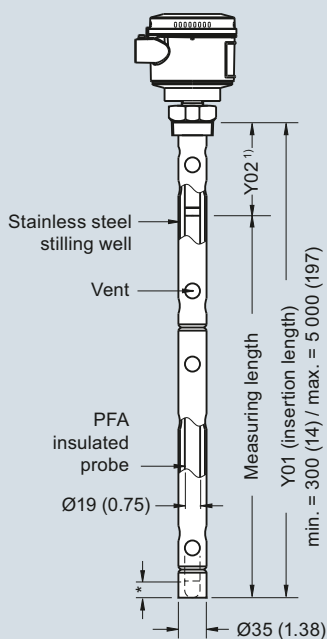
Dimensional drawings

Threaded (7ML5670)



* = 30 (1.18) Inactive tip

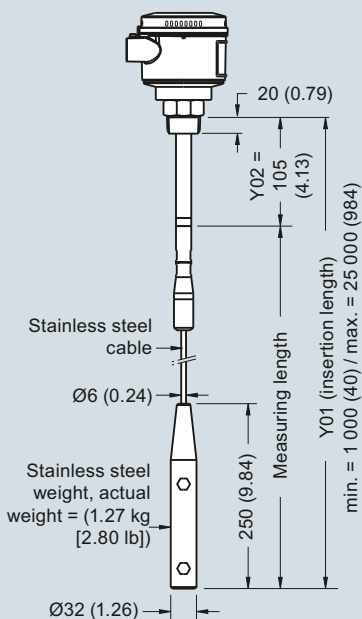
Threaded (7ML5671)



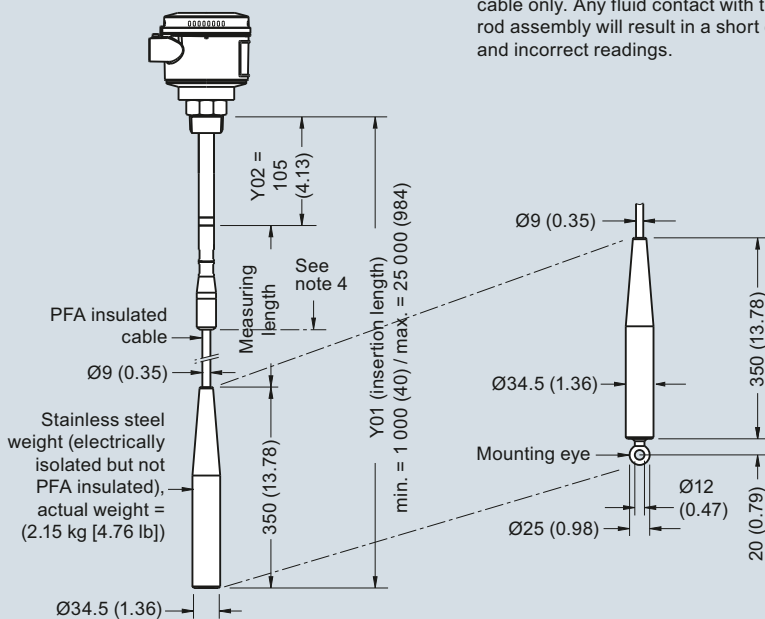
Note:

- 1) Rod version, threaded Y02 (including process connection): shield length = 120 (4.7).
- 2) For non-conductive applications only. Non-insulated cable can be shortened on site. Weight is included in measuring length.
- 3) For liquid and solid applications. Insulated cable cannot be shortened. Weight is **not** included in measuring length.
- 4) For conductive materials, the measuring length includes the exposed PFA insulated cable only. Any fluid contact with the upper rod assembly will result in a short circuit and incorrect readings.

**Cable version, non-insulated²⁾
Threaded (7ML5672)**



**Cable version, insulated³⁾
Threaded (7ML5673)**



SITRANS LC300 threaded process connections, dimensions in mm (inch)

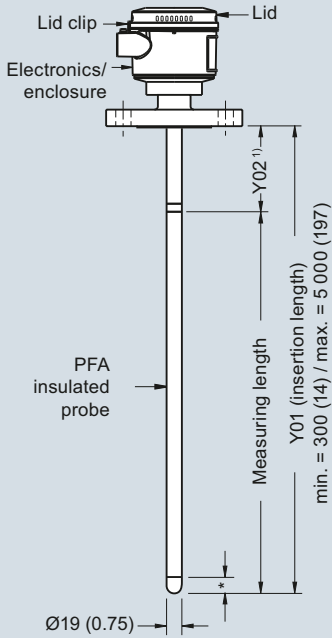
Level Measurement

Continuous level measurement - Capacitance transmitters

SITRANS LC300

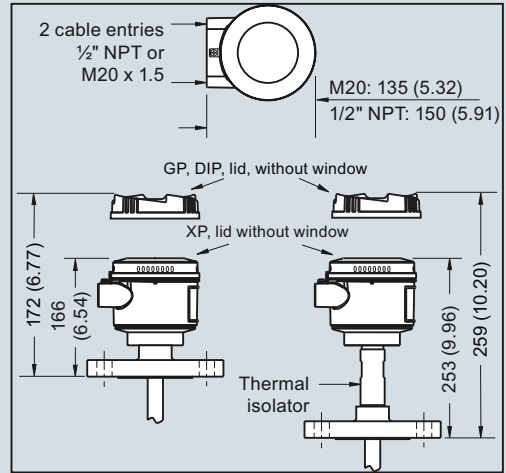
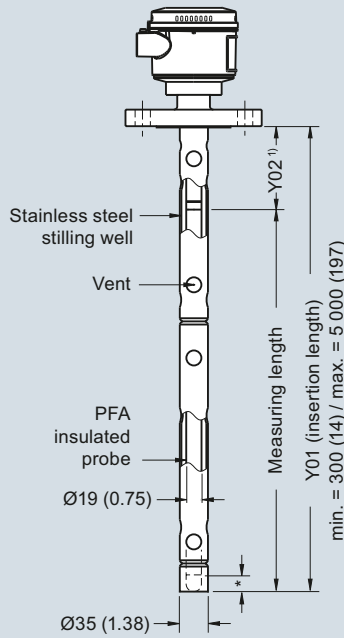
4

Welded Flange (7ML5670)



* = 30 (1.18) inactive tip

Welded Flange (7ML5671)



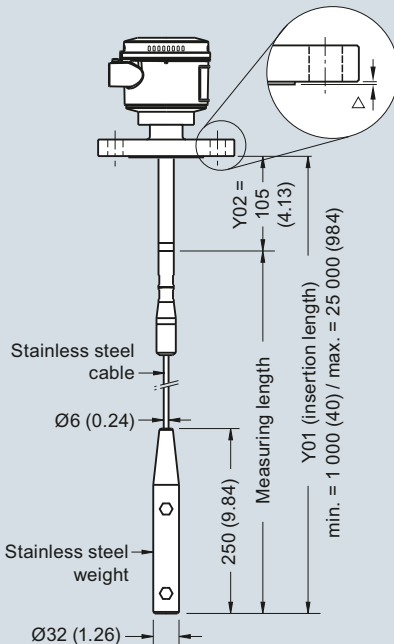
Flange Facing (raised face)

Flange Class	Facing thickness
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

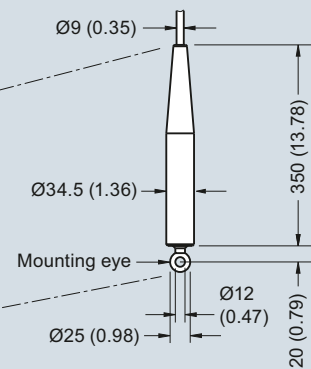
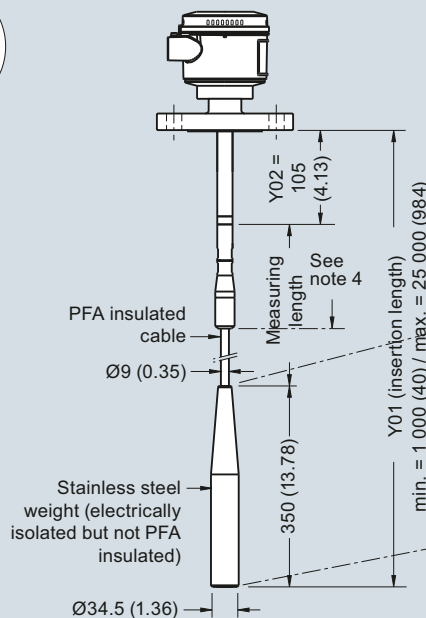
Notes:

- 1) Rod version, welded flange Y02: shield length = 100 (3.9).
- 2) For non-conductive applications only. Non-insulated cable can be shortened on site. Weight is included in measuring length.
- 3) For liquid and solid applications. Insulated cable cannot be shortened. Weight is **not** included in measuring length.
- 4) For conductive materials, the measuring length includes the exposed PFA insulated cable only. Any fluid contact with the upper rod assembly will result in a short circuit and incorrect readings.

Cable version, non-insulated ²⁾ Welded Flange (7ML5672)



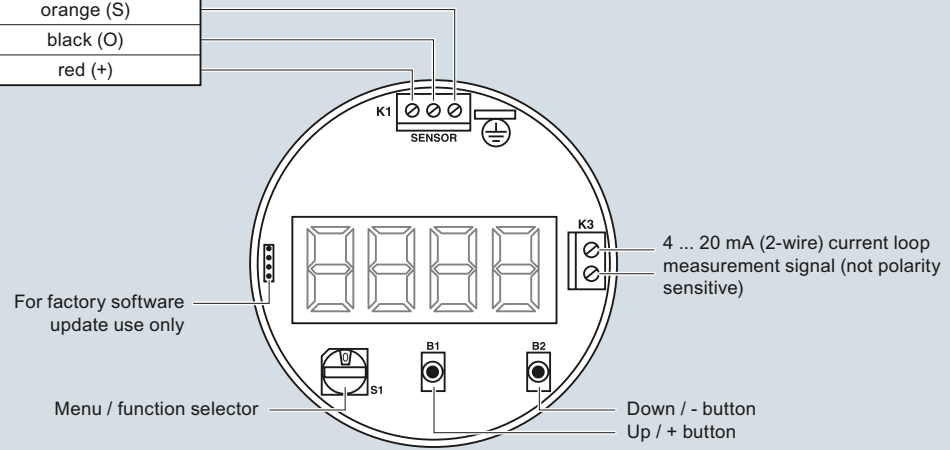
Cable version, insulated ³⁾ Welded Flange (7ML5673)



SITRANS LC300 flanged process connections, dimensions in mm (inch)

Schematics

With safety barrier	Without safety barrier
white (S)	orange (S)
black (O)	black (O)
red (+)	red (+)



SITRANS LC300 connections



Level Measurement

Continuous level measurement - Capacitance transmitters


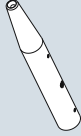
SITRANS LC300 Specials

Selection and ordering data

LC300 Specials¹⁾

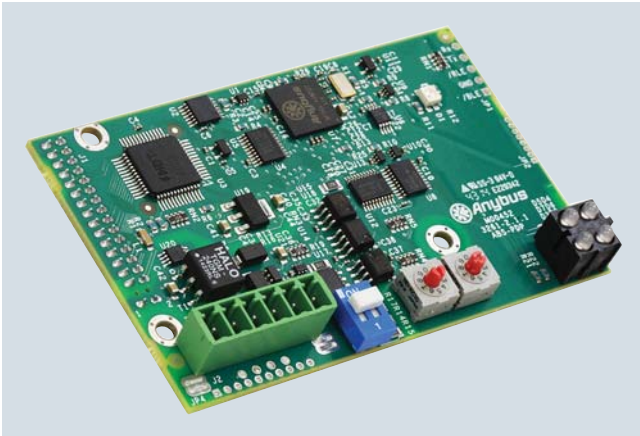
	Article No.
LC300 Cable Extensions, 316L stainless steel	
Kit, stainless steel cable extension, 1 m, adjustable by customer	A5E01163688
Kit, stainless steel cable extension, 3 m, adjustable by customer	A5E01163689
Kit, stainless steel cable extension, 5 m, adjustable by customer	A5E01163690
Kit, stainless steel cable extension, 10 m, adjustable by customer	A5E01163691
Kit, stainless steel cable extension, 15 m, adjustable by customer	A5E01163693
Kit, stainless steel cable extension, 20 m, adjustable by customer	A5E01163695
LC300 Cable Extensions, 316 stainless steel with PFA coating	
Kit, PFA cable extension, 1 m	A5E01163709
Kit, PFA cable extension, 3 m	A5E01163710
Kit, PFA cable extension, 5 m	A5E01163711
Kit, PFA cable extension, 10 m	A5E01163712
Kit, PFA cable extension, 15 m	A5E01163713
Kit, PFA cable extension, 20 m	A5E01163714

LC300 Specials¹⁾

	Article No.
LC300 Mounting Eye	
Spare mounting eye (LC300 PFA versions only)	A5E01163717
LC300 Weight Kit, 316L stainless steel	
Kit, Spare stainless steel weight. To be used in any cable version of CLS300, or stainless steel cable version of LC300.	A5E01163727

¹⁾ Special flange sizes and facings are available. Please contact a local sales person for details.

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

Overview

SmartLinX modules provide direct digital connection to popular industrial communications buses with true plug-and-play compatibility with products manufactured by Siemens.

Benefits

- Fast, easy installation
- Direct connection: no additional installation required
- Scalable application layer allows for optimized network bandwidth and memory requirements (for PROFIBUS DPV0 and DeviceNet only)
- Modules available for PROFIBUS DPV0, PROFIBUS DPV1, DeviceNet

Application

With the addition of a SmartLinX module, Siemens instruments can be connected to a variety of industrial communications networks.

They're fast and easy to install, and can be added at any time. The module simply plugs into the socket on any SmartLinX enabled product. They require no secondary private buses or gateways and no separate wiring. There are no extra boxes to connect to your network so there's a minimum load on engineering and maintenance staff.

SmartLinX provides all data from the instrument, including measurement and status, and allows changes to operation parameters to be done over the bus or telemetry link. The user can select which data in the application layer to transfer over the bus. This selection saves bandwidth and memory and optimizes data throughput and speeds up the network, enabling you to connect more instruments to your network.

Selecting a communications module: PROFIBUS DPV0 versus PROFIBUS DPV1

The PROFIBUS DPV1 card was added to MultiRanger 200 HMI and HydroRanger 200 HMI to provide acyclic communication and SIMATIC PDM support over PROFIBUS. For backward compatibility, the PROFIBUS DPV0 card can also be used with MultiRanger 200 HMI and HydroRanger 200 HMI.

MultiRanger 100/200 and HydroRanger 200 are compatible only with the PROFIBUS DPV0 module.

Technical specifications

Module type	PROFIBUS DPV0
Interface	RS 485 (PROFIBUS standard)
Transmission rate	All valid PROFIBUS DP rates from 9 600 Kbps ... 12 Mbps
Slave address	0 ... 99
Connection	Slave
SmartLinX module compatibility	<ul style="list-style-type: none"> • MultiRanger 200 HMI • MultiRanger 100/200 • HydroRanger 200 HMI • HydroRanger 200

Module type	PROFIBUS DPV1
Interface	RS 485 (PROFIBUS standard)
Transmission rate	All valid PROFIBUS DP rates from 9 600 Kbps ... 12 Mbps
Slave address	0 ... 99
Connection	Slave
SmartLinX module compatibility	<ul style="list-style-type: none"> • MultiRanger 200 HMI • HydroRanger 200 HMI

Module type	DeviceNet
Interface	DeviceNet physical layer
Transmission rate in kbps	125, 250, 500
MAC address	0 ... 63
Connection	Slave (group 2)
SmartLinX module compatibility	<ul style="list-style-type: none"> • MultiRanger 200 HMI • MultiRanger 100/200 • HydroRanger 200 HMI • HydroRanger 200

Selection and Ordering data	Article No.
SmartLinX module for: MultiRanger 200 HMI, MultiRanger 100/200, HydroRanger 200 HMI, and HydroRanger 200	
PROFIBUS DPV0 module	7ML1830-1HR
PROFIBUS DPV1 module	A5E35778741
DeviceNet module	7ML1830-1HT
Operating Instructions	
PROFIBUS DPV1 communications module	
• English	A5E36197302
• German	A5E36197305
Note: The Operating Instructions should be ordered as a separate line item on the order.	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

Level Measurement Communication

Dolphin Plus Software

Overview



Dolphin Plus is instrument configuration software that allows you to quickly and easily configure, monitor, tune and diagnose several Siemens level devices remotely (see list below). Remote access is available using your desktop PC or connected directly in the field using a laptop.

Benefits

- Real-time monitoring and adjustment of parameters
- On-screen visualization of process values
- Saving and visualization of echo profiles for a wide range of Siemens level meters
- Copying of data for programming several devices
- Quick setup and commissioning of device
- Generation of configuration reports within seconds

Note:

The Dolphin Plus software is only available in English.

Application

Dolphin Plus is easy to install and use. Just load the software from the CD. In minutes, you're ready to set up or modify complete parameter configurations for one or more devices.

Following configuration, you can alter parameters, upload and download parameter sets to and from disk, and use parameter sets saved from other instruments. Reading of echo profiles permits fine tuning without the need for special instruments. Built-in quick start wizards and help functions guide you through the entire process.

Compatibility

Dolphin Plus is compatible with Microsoft Windows 95/98/NT4/Me/2000/XP and works with a wide range of Siemens products, including:

- SITRANS LU10
- SITRANS LU02
- SITRANS LU01

Connection to a Siemens instrument may be a direct RS 232 serial connection or via an RS 485 converter or Siemens infrared ComVerter, depending on the instrument being configured.

Meets VDE 2187 user interface requirements.

Most other Siemens level devices use Simatic PDM configuration software.

Selection and Ordering data	Article No.
Dolphin Plus	7ML1841-
Instrument configuration software to quickly and easily configure, monitor, tune and diagnose most Siemens devices remotely, from your desktop PC or connected directly in the field using a laptop. Dolphin Plus Software includes a software DVD, and a nine pin adapter with a 2.1 m (82.7 inch) cable for connection to a PC serial port.	AA 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
RS 485 to RS 232 converter	
No	0
Yes	1
ComVerter	
No	0
Yes	1

Selection and Ordering data	Article No.
Operating Instructions	
Connection manual, English: Included on Dolphin Plus DVD and available at www.siemens.com/processautomation	
Spare parts	
Converter, RS 485 to RS 232 (D-Sub)	7ML1830-1HA
Kit containing one 9-pin D-Sub to RJ11 Adapter and one 2.1 meter telephone cable with two male jacks	7ML1830-1MC
ComVerter, Infrared link	7ML1830-1MM

Positioners





5/2	Product Overview
	SIPART PS2
5/3	Technical description Technical specifications
5/8	- all versions
5/9	- SIPART PS2 with and without HART
5/11	- SIPART PS2 with PROFIBUS PA/ with FOUNDATION Fieldbus
5/13	- Option modules Selection and Ordering data
5/17	- SIPART PS2
5/19	- SIPART PS2 for flameproof enclosure
5/22	- Accessories/Spare parts
5/24	Dimensional drawings
5/26	Schematics
5/27	Mounting kit
	Software
Sec. 8	SIMATIC PDM, for parametrize HART and PROFIBUS PA devices

You can download all instructions, catalogs and certificates for positioners free of charge at the following Internet address:
www.siemens.com/positioners

Positioners

Product Overview

Overview

	Application	Description	Catalog page	Software for parameterization
Positioners				
	Position control of pneumatic linear or part-turn actuators, also for intrinsically safe operation	SIPART PS2 Universal device for positioning pneumatic actuators <ul style="list-style-type: none"> • Connection: 4 to 20 mA • HART, PROFIBUS PA or FOUNDATION Fieldbus • Local manual operation • Binary inputs and outputs • Diagnostic function • Blocking function • Automatic startup 	5/3	SIMATIC PDM
	As above, but in flameproof enclosure for explosion-proof application	SIPART PS2 As above, but in flameproof aluminum and stainless steel enclosure	5/3	SIMATIC PDM

Product documentation on DVD and Safety Note



Siemens products for process instrumentation will be delivered with a multi-language **Safety note** and a **Mini DVD - Process Instrumentation and Weighing Systems**.

On the DVD, customers can find many important operating instructions and certificates of our Siemens portfolio for process instrumentation and weighing systems.

Additionally, product or order-specific print material might be part of the delivery.

For further information see appendix page 10/11.

Overview



Electropneumatic positioner SIPART PS2 in the aluminum enclosure



SIPART PS2 electropneumatic positioner in flameproof aluminum enclosure with manometers



SIPART PS2 in stainless steel enclosure with manometers

The SIPART PS2 electropneumatic positioner is used to control the final control element of pneumatic linear or part-turn actuators. The electropneumatic positioner moves the actuator to a valve position corresponding to the setpoint. Additional function inputs can be used to block the valve or to set a safety position. A binary input is present as standard in the basic device for this purpose.

Benefits

SIPART PS2 positioners offer decisive advantages:

- Simple installation and automatic commissioning (self-adjustment of zero and span)
- Simple operation with
 - Local operation (manual operation) and configuration of the device using three buttons and a user-friendly two-line display
 - Parameterization via SIMATIC PDM
- Very high-quality control thanks to an online adaptation procedure
- Negligible air consumption in stationary operation
- "Tight closing" function (ensures maximum positioning pressure on the valve seat)
- "Fail in place" function: Current position is retained on failure of auxiliary electrical power and/or pneumatic failure (does not apply in conjunction with SIL).

Example: For an actuator with a volume of 8 liters, the typical position stability of a SIPART PS2 with "Fail in Place" is 0.3 % per hour.
- Numerous functions can be activated by simple configuring (e. g. characteristic curves and limits)
- Extensive diagnostic functions for valve and actuator
- Only one device version for linear and part-turn actuators
- Few moving parts, hence insensitive to vibrations
- External non contacting sensor as option for extreme ambient conditions
- "Intelligent solenoid valve": Partial Stroke Test and solenoid valve function in one device
- Partial Stroke Test e. g. for safety valves
- Full Stroke Test, Multi Step Response Test, Valve Performance Test for performance and maintenance evaluation of the valve
- Can also be operated with purified natural gas, carbon dioxide, nitrogen or noble gases
- SIL (Safety Integrity Level) 2

Application

The SIPART PS2 positioner is used, for example, in the following industries:

- Chemical/petrochemical
- Power stations
- Paper and glass
- Water, waste water
- Food and pharmaceuticals
- Offshore plants

The SIPART PS2 positioner can be used with all pneumatic actuators and is available for delivery:

- In various enclosure designs and various materials (polycarbonate, aluminum, and stainless steel)
- For non-hazardous applications
- For hazardous applications in the versions
 - Intrinsic safety type of protection
 - Flameproof enclosure type of protection
 - Non-sparking type of protection
 - Dust protection by enclosure type of protection

and in the versions:

- With 0/4 ... 20 mA control with/without communication through HART signal
- With PROFIBUS PA communication interface
- With FOUNDATION Fieldbus (FF) communications interface

Positioners

SIPART PS2

Technical description

Explosion-proof versions

- Device with protection type "intrinsic safety" for use in Zone 1, 2, 21, 22 or Class I, II, III/Division 1/Groups A-G
- Device with protection type "dust protection with enclosure" for use in Zone 21, 22 or Class II, III/Division 1/Groups E-G
- Device with protection type "non-sparking" for use in Zone 2 or Class I, Division 2, Groups A-D
- Device with protection type "flameproof enclosure" for use in Zone 1 or Class I, Division 1, Groups A-D

Stainless steel enclosure for extreme ambient conditions

The SIPART PS2 is available in a stainless steel enclosure (with no window in the cover) for use in particularly aggressive environments (e.g. offshore operation, chlorine plants etc.). The device functions are the same as for the basic version.

Design

The SIPART PS2 positioner is a digital field device with a highly-integrated microcontroller.

The positioner consists of the following components:

- Enclosure and cover
- PCB with corresponding electronics with or without communication through HART 7 or with electronics for communication in accordance with - PROFIBUS PA specification, IEC 61158-2; bus-supplied device, or - FOUNDATION Fieldbus (FF) specification, IEC 61158-2, bus-supplied device
- Position detection system
- Terminal housing with screw terminals
- Pneumatic block with piezoelectric valve precontrol.

The pneumatic block is located in the housing, the pneumatic connections for the inlet air and the positioning pressure on the right-hand side. A pressure gauge block and/or a safety solenoid valve can be connected there as options. The SIPART PS2 positioner is fitted to the linear or part-turn actuator using an appropriate mounting kit. The circuit board container in the casing provides slots for separately ordered boards with the following functions:

Position feedback module

- Position feedback as a two-wire signal 4 to 20 mA

Alarm module (3 outputs, 1 input)

- Signaling of two limits of the travel or angle by binary signals. The two limits can be set independently as maximum or minimum values.
- Output of an alarm if the setpoint position of the final control element is not reached in automatic mode or if a device fault occurs.
- Second binary input for alarm signals of for triggering safety reactions, e. g. blocking function or safety position.

Limit signaling through slot-type initiators (SIA module)

Two limits can be signaled redundantly as NAMUR signals (EN 60947-5-6) by slot-type initiators. An alarm output is also integrated in the module (see "Alarm Module").

Limit value signal via mechanical contacts (mechanical limit switch module)

Two limits can be signaled redundantly by switching contacts. An alarm output is also integrated in the module (see "Alarm Module").

Valid for all modules described above:

All signals are electrically isolated from one another and from the basic unit. The outputs indicate self-signaling faults. The modules are easy to retrofit.

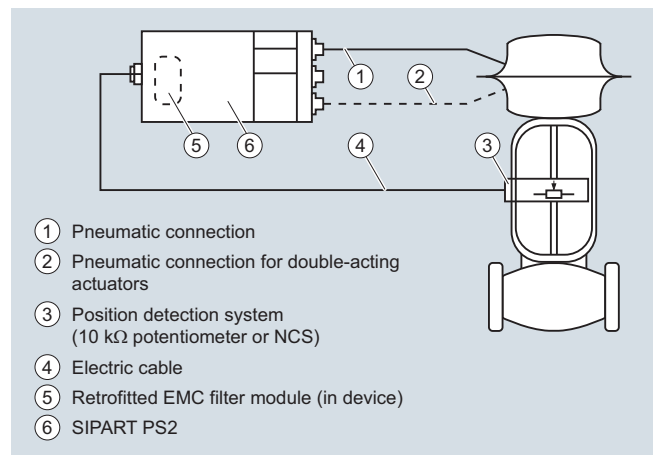
Separate mounting of position detection system and controller unit

The position detection system and controller unit can be connected separately for all casing versions of the SIPART PS2 (except flameproof design). Measurement of the travel or angle is carried out directly on the actuator. The controller unit can then be fitted a certain distance away, e. g. on a mounting pipe or similar, and is connected to the position detection system by an electric cable and to the actuator by one or two pneumatic lines. Such a split design is frequently advantageous if the ambient conditions at the fitting exceed the specified values for the positioner (e. g. strong vibrations).

The following can be used for measuring the travel or angle:

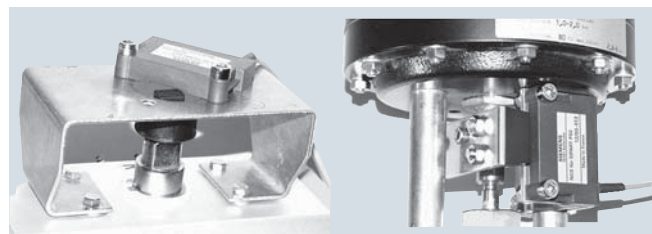
- NCS sensor
- External position detection system C73451-A430-D78
- A commercially available potentiometer (10 k Ω resistance), e. g. for higher application temperatures or customer-specific applications

The use of potentiometers is recommended for very small linear actuators with a short valve travel since, on the one hand, the space required by the potentiometer is very small and, on the other, the transmission characteristic is optimum for a small travel.



Separate mounting of position detection system and controller unit

Non contacting sensor (NCS)



NCS for part-turn actuator (6DR4004-N.10) mounted with mounting console (left) and NCS for linear actuator \leq 14 mm (0.55 inch) (6DR4004-N.20) mounted with actuator-specific mounting solution (right)



NCS (6DR4004-.N.30) for travels > 14 mm (0.55 inch) mounted using mounting kit for NAMUR linear actuator

The NCS sensor consists of a non-contacting position sensor. All coupling elements are omitted such as coupling wheel and driver pin with part-turn actuators or lever and pick-up bracket with linear actuators for up to 14 mm travel.

This results in:

- Even greater resistance to vibration and shock
- No wear of sensor
- Problem-free mounting on very small actuators
- Negligible hysteresis with very small travels.

The sensor does not require an additional power supply, i. e. SIPART PS2 (not for Ex d version) can be operated in a 2-wire system. The NCS (Non Contacting Sensor) consists of a potted sensor housing which must be mounted permanently and a magnet which is mounted on the spindle of linear actuators or on the shaft butt of part-turn actuators. For the version for travels > 14 mm (0.55 inch), the magnet and the NCS are premounted on a stainless steel frame and offer the same interface mechanically as the positioner itself, i. e. they can be mounted using the standard mounting kits 6DR4004-8V, -8VK and -8VL.

The installation of an EMC filter module in the positioner (controller unit) is necessary in order to ensure a connection level with EMC according to EC Declaration of Conformity when using external sensors (see "Selection and Ordering Data", "EMC Filter Module").

Function

The SIPART PS2 positioner works in a completely different way to normal positioners.

Mode of operation

Comparison of the setpoint and the actual value takes place electronically in a microcontroller. If the microcontroller detects a deviation, it uses a 5-way switch procedure to control the piezoelectric valves, which regulates the flow of air into and from the chambers of the pneumatic actuator or blows it in the opposite direction.

The microcontroller then outputs an electric control command to the piezoelectric valve in accordance with the size and direction of the deviation (deviation between setpoint and actual values). The piezoelectric valve converts the command into a pneumatic positional increment.

The positioner outputs a continuous signal in the area where there is a large system deviation (fast step zone); in areas of moderate system deviation (slow step zone) it outputs a sequence of pulses. No positioning signals are output in the case of a small system deviation (adaptive or variable deadband).

The linear or rotary motion of the actuator is detected by the mounting kit and transferred to a high-quality potentiometer over a shaft and a non-floating gear transmission.

The angular error of the pick-up in cases where the assembly is mounted on a linear actuator is corrected automatically.

When connected in a 2-wire system, the SIPART PS2 draws its power exclusively from the 4 to 20 mA setpoint signal. The electric power is also connected through the 2-wire bus signal with PROFIBUS operation (SIPART PS2 PA). The same applies for the FOUNDATION Fieldbus version.

Pneumatic block with piezoelectric valve precontrol

The piezoelectric valve can release very short control pulses. This helps achieve a high positioning accuracy. The pilot element is a piezoelectric bending converter which switches the pneumatic main controller unit. The pneumatic block is characterized by an extremely long service life.

Local operation

Local operation is performed using the built-in display and the three buttons. Switching between the operating levels Automatic, Manual, Configuring and Diagnosis is possible at the press of a button.

In manual mode the drive can be adjusted over the entire range without interrupting the circuit.

Operation and monitoring with the SIMATIC PDM configuration software

The configuration software SIMATIC PDM permits simple operation, monitoring, configuration and parameterization of the device. The diagnostic information available can be read via SIMATIC PDM from the device. Communication is carried out via the HART protocol or PROFIBUS PA. For the HART protocol, the device can be accessed both via a HART modem and via a HART-compatible input/output module (remote IO). The corresponding device description files, such as GSD and (Enhanced) EDD are available for both types of communication.

In addition, the SITRANS DTM provides software based on tried and tested EDD technology that can be used to parameterize field devices via a DTM (Device Type Manager) using an FDT frame application (e. g. PACTware). SITRANS DTM and the necessary device-specific enhanced EDD are available for download free of charge. The software provides the relevant communication interfaces for HART and PROFIBUS.

Automatic commissioning

With a simple configuration menu the SIPART PS2 can be quickly adapted to the fitting and adjusted by means of an automatic startup function.

During initialization, the microcontroller determines the zero point, full-scale value, the direction of action and the positioning speed of the fitting. From this data it establishes the minimum pulse time and the deadband, thus optimizing the control.

Low air consumption

A hallmark of the SIPART PS2 is its own extremely low consumption of air. Normal air losses on conventional positioners are very costly. Thanks to the use of modern piezoelectric technology, the SIPART PS2 consumes air only when it is needed, which means that it pays for itself within a very short time.

Positioners

SIPART PS2

Technical description

Comprehensive monitoring functions

The SIPART PS2 has various monitoring functions with which changes on the actuator and valve can be detected and signaled if applicable when a selectable limit has been exceeded. This information may be important for diagnosis of the actuator or valve. The measuring data to be determined and monitored, some of whose limits can be adjusted, include:

- Travel integral
- Number of changes in direction
- Alarm counter
- Self-adjusting deadband
- Valve end limit position (e. g. for detection of valve seat wear or deposits)
- Operating hours (also according to temperature and travel ranges) as well as min./max. temperature
- Operating cycles of piezoelectric valves
- Valve positioning time
- Actuator leakages

At a glance with the Diagnostics Cockpit

With the Diagnostics Cockpit, the HART variants of the SIPART PS2 provide a straightforward way of getting started with the world of diagnostic capabilities. All relevant information (set-point, actual value, control deviation, status of the diagnostic system, etc.) of the valve is available at a glance. Additional facts and details are just a few mouse clicks away from the Diagnostics Cockpit.

Status monitoring with 3-stage alarm concept

The intelligent electropneumatic SIPART PS2 positioner is equipped with additional monitoring functions. The status indications derived from these monitoring functions signal active faults of the unit. The severity of these faults are graded using "traffic light signaling", symbolized by a wrench in the colors green, yellow and red (in SIMATIC PDM and Maintenance Station):

- Need for maintenance (green wrench)
- Urgent need for maintenance (yellow wrench)
- Imminent danger of unit failure or general failure (red wrench)

This allows users to put early measures into action before a serious valve or actuator fault occurs which could result in a system shutdown. The fact that a fault indication is signaled, such as the onset of a diaphragm break in the actuator or the progressive sluggishness of a unit, enables the user to ensure system reliability at any time by means of suitable maintenance strategies.

This three-stage alarm hierarchy also allows early detection and signaling of other faults, such as the static friction of a packing box, the wearing of a valve plug/seating, or precipitations or incrustations on the fittings.

These fault indications can be output either line-conducted over the alarm outputs (see above) of the positioner (max. 3), or via communication over the HART or field bus interfaces. In this case, the HART, PROFIBUS and FF versions of SIPART PS2 permit a differentiation of the various fault indications, as well as a trend representation and histogram function of all key process variables with regard to the fittings.

The device display also displays the graded maintenance requirements, complete with identification of the source of the fault.

Maintenance required for valve

The Full Stroke Test, Step Response Test, Multi Step Response Test and Valve Performance Test provide detailed information about the maintenance required of the valve. With the help of HART communication, you receive comprehensive test results and can identify the extent of the maintenance measures. In order to quantify the performance capability of valves, characteristic values such as step response times (T63, T86, user-selectable Txx), dead times, overshoot, hysteresis, errors of measurement, non-linearity, etc., are determined.

Functional safety acc. to SIL2

The positioner is suitable for use on valves that satisfy the special requirements in terms of functional safety up to SIL 2 in accordance with IEC 61508 or IEC 61511. The variants 6DR5.1.-0.....-Z C20 are available for this.

These are single-acting positioners for mounting on pneumatic actuators with spring return.

The positioner vents the valve actuator on demand/in the event of a fault and puts the valve in the preset safety position.

This positioner meets the following requirement:

- Functional safety up to SIL 2 in accordance with IEC 61508 or IEC 61511 for safe venting.

SIPART PS 2 as "intelligent solenoid valve"

Open/Close valves, safety fittings in particular, are generally pneumatically controlled over a solenoid valve. If you use SIPART PS2 instead of this type of solenoid valve, the positioner performs two tasks in a single device (without extra wiring)

- Firstly, it switches the fitting off on demand by venting the actuator (functional safety acc. to SIL 2 (see above))
- Secondly, it can perform a Partial Stroke Test at regular intervals (1 - 365 days), which prevents the blocking of the fitting, e. g. due to corrosion or furring.

As in this case SIPART PS2 is constantly working in normal operation (e. g. 99 % position), it also acts as a permanent test function for the pneumatic output circuit, which is not usually possible when using a solenoid valve.

Solenoid valves on control valves can also not normally be tested during operation. They are therefore not necessary when using SIPART PS 2 with a 4-wire connection system as the venting is carried out on demand by SIPART PS2. This means that on control valves, both the control function and the shut-off function can be carried out by a single device.

Configuring

In configuring mode, the SIPART PS2 positioner can be configured to requirements and include the following settings:

- Input current range 0 to 20 mA or 4 to 20 mA
- Rising or falling characteristic curve at the setpoint input
- Positioning speed limit (setpoint ramp)
- Splitrange operation; adjustable start-of-scale and full-scale values
- Response threshold (deadband); self-adjusting or fixed
- Direction of action; rising or falling output pressure with rising setpoint
- Limits (start-of-scale and full-scale values) of positioning range
- Limits (alarms) of the final control element position; minimum and maximum values
- Automatic "tight closing" (with adjustable response threshold)
- The travel can be corrected in accordance with the valve characteristic curve.
- Function of binary inputs
- Function of alarm output etc.

Configuration of the various SIPART PS2 versions is largely identical.

Positioners

SIPART PS2

Technical specifications

Technical specifications

SIPART PS2 (all versions)

Rated conditions		Design	
Ambient conditions	For indoor and outdoor use	• Outlet air valve (deerate actuator for fail in place version)	
Ambient temperature	In hazardous areas, observe the maximum permitted ambient temperature according to the temperature class.	- 2 bar (29 psi)	4.3 Nm ³ /h (19.0 USgpm)
• Permitted ambient temperature for operation ²⁾³⁾	-30 ... +80 °C (-22 ... +176 °F)	- 4 bar (58 psi)	7.3 Nm ³ /h (32.2 USgpm)
• Altitude	2 000 m above sea level. At altitudes greater than 2 000 m above sea level, use a suitable power supply.	- 6 bar (87 psi)	9.8 Nm ³ /h (43.3 USgpm)
• Relative humidity	0 ... 100 %	Restrictor ratio	Adjustable up to ∞ : 1
Degree of protection ¹⁾	IP66 according to IEC/EN 60529/NEMA 4X	Auxiliary power consumption in the controlled state	< 3,6 · 10 ⁻² Nm ³ /h (0.158 USgpm)
Mounting position	Any; pneumatic connections and exhaust opening not facing up in wet environment	Sound pressure	L _{Aeq} < 75 dB L _{Amax} < 80 dB
Vibration resistance		Design	
• Harmonic oscillations (sine-wave) according to EN 60068-2-6/10.2008	3.5 mm (0.14"), 2 ... 27 Hz, 3 cycles/axis 98.1 m/s ² (321.84 ft/s ²), 27 ... 300 Hz, 3 cycles/axis	Mode of operation	
• Bumping (half-sine) according to EN 60068-2-27/02.2010	150 m/s ² (492 ft/s ²), 6 ms, 1000 shocks/axis	• Range of stroke (linear actuators)	3 ... 130 mm (0.12 ... 5.12 inch) (angle of positioner shaft 16 ... 90°) Larger range of stroke on request.
• Noise (digitally controlled) according to EN 60068-2-64/04.2009	10 ... 200 Hz; 1 (m/s ²) ² /Hz (3.28 (ft/s ²) ² /Hz) 200 ... 500 Hz; 0.3 (m/s ²) ² /Hz (0.98 (ft/s ²) ² /Hz) 4 hours/axis	• Angle of rotation range (part-turn actuators)	30 ... 100°
• Recommended continuous duty range of the complete fitting	≤ 30 m/s ² (98.4 ft/s ²) without resonance sharpness	Mounting type	
Climatic class	According to EN 60721-3	• On linear actuators	Using mounting kit 6DR4004-8V and where necessary with an additional lever arm 6DR4004-8L on actuators according to IEC 60534-6-1 (NAMUR) with ribs, bars or flat face.
• Storage	1K5, but -40 ... +80 °C (1K5, but -40 ... +176 °F)	• On part-turn actuators	Using mounting kit 6DR4004-8D or TGX:16300-1556 on actuators with mounting plane according to VDI/VDE 3845 and IEC 60534-6-2. The actuator-specific mounting console can be ordered separately, see the selection and ordering data.
• Transport	2K4, but -40 ... +80 °C (2K4, but -40 ... +176 °F)	Weight, positioner without option modules or accessories	
Pneumatic data		• 6DR5..0 Glass-fiber reinforced enclosure made from polycarbonate	Approx. 0.9 kg (1.98 lb)
Auxiliary power (air supply)	Compressed air, carbon dioxide (CO ₂), nitrogen (N), noble gases or cleaned natural gas	• 6DR5..1 Aluminum enclosure, narrow	Approx. 1.3 kg (2.86 lb)
• Pressure ⁴⁾	1.4 ... 7 bar (20.3 ... 101.5 psi)	• 6DR5..2 Stainless steel enclosure	Approx. 3.9 kg (8.6 lb)
Air quality to ISO 8573-1		• 6DR5..3 Aluminum enclosure	Approx. 1.6 kg (3.53 lb)
• Solid particulate size and density	Class 3	• 6DR5..5 Flameproof aluminum enclosure	Approx. 5.2 kg (11.46 lb)
• Pressure dew point	Class 3 (min. 20 K (36 °F) below ambient temperature)	• 6DR5..6 Flameproof stainless steel enclosure	Approx. 8.4 kg (18.5 lb)
• Oil content	Class 3	Material	
Unrestricted flow (DIN 1945)		• Enclosure	
• Inlet air valve (ventilate actuator) ⁵⁾		- 6DR5..0 Polycarbonate	Glass-fiber reinforced polycarbonate (PC)
- 2 bar (29 psi)	4.1 Nm ³ /h (18.1 USgpm)	- 6DR5..1 Aluminum, narrow	GD AISi12
- 4 bar (58 psi)	7.1 Nm ³ /h (31.3 USgpm)	- 6DR5..2 Stainless steel	Austenitic stainless steel 316 Cb, mat. No. 1.4581
- 6 bar (87 psi)	9.8 Nm ³ /h (43.1 USgpm)	- 6DR5..3 Aluminum	GD AISi12
• Outlet air valve (deerate actuator for all versions except fail in place) ⁵⁾		- 6DR5..5 Aluminum, flameproof	GK AISi12
- 2 bar (29 psi)	8.2 Nm ³ /h (36.1 USgpm)	- 6DR5..6 Flameproof stainless steel enclosure	Austenitic stainless steel 316 L, mat. No. 1.4409
- 4 bar (58 psi)	13.7 Nm ³ /h (60.3 USgpm)	• Pressure gauge block	Aluminum AIMgSi, anodized or stainless steel 316
- 6 bar (87 psi)	19.2 Nm ³ /h (84.5 USgpm)		

Dimensions	See "Dimensional Drawings" on page 5/24	Explosion protection	
Device versions		Explosion protection according to ATEX/IECEX	
<ul style="list-style-type: none"> In polycarbonate enclosure 6DR5..0 In aluminum enclosure 6DR5..1 In aluminum enclosure 6DR5..3 and 6DR5..5 In stainless steel enclosure 6DR5..2 and 6DR5..6 	Single-acting and double-acting Single-acting Single-acting and double-acting Single-acting and double-acting	<ul style="list-style-type: none"> Intrinsic safety "i" 	For enclosure 6DR5..0/1/2/3-0E; 6DR5..1/2/3-0F/K <ul style="list-style-type: none"> II 2 G Ex ia IIC T6/T4 Gb II 3 G Ex ic IIC T6/T4 Gc For enclosure 6DR5..1/2/3-0E/F/K <ul style="list-style-type: none"> II 2 D Ex ia IIIC T110°C Db
Gauge		<ul style="list-style-type: none"> Dust, protection with "t" enclosure 	For enclosure 6DR5..1/2/3-0D/K; 6DR5..6-0E <ul style="list-style-type: none"> II 2 D Ex tb IIIC T100°C Db
<ul style="list-style-type: none"> Degree of protection - Gauge made of plastic - Gauge made of steel - Gauge made of stainless steel 316 	IP31 IP44 IP54	<ul style="list-style-type: none"> For use in Zone 2 "ec" 	For enclosure 6DR5..1/2/3-0F/G/K <ul style="list-style-type: none"> II 3 G Ex ec IIC T6/T4 Gc
<ul style="list-style-type: none"> Vibration resistance 	According to EN 837-1	<ul style="list-style-type: none"> Flameproof enclosure "d" 	For enclosure 6DR5..5/6 <ul style="list-style-type: none"> II 2 G Ex d IIC T6/T4 Gb
Connections, electrical		Explosion protection in accordance with FM/CSA, suitable for installations according to NEC 500/NEC 505	
<ul style="list-style-type: none"> Screw terminals Cable gland - Without explosion protection as well as with Ex i - With explosion protection Ex d 	2.5 mm ² AWG30-14 M20x1.5 or ½-14 NPT Ex d certified M20x1.5; ½-14 NPT or M25x1.5	<ul style="list-style-type: none"> Intrinsic safety "IS" 	For enclosure 6DR5..0/1/2/3-0E/F; 6DR5..1/2/3-0K <ul style="list-style-type: none"> IS / I, II / 1 / A-D IS / 1 / (A)Ex / Ex ib / IIC, Gb For enclosure 6DR5..1/2/3-0E/F/K <ul style="list-style-type: none"> IS / III / 1 / E-G IS / 21 / (A)Ex / Ex ib / IIIC, Db, T110°C
Connections, pneumatic	Female thread G¼ or ¼-18 NPT	<ul style="list-style-type: none"> Dust, protection with "DIP" enclosure 	For enclosure 6DR5..1/2/3-0D/K; 6DR5..6-0E <ul style="list-style-type: none"> DIP / II, III / 1 / EFG DIP / 21 / (A)Ex tb / IIIC / T100°C / Ta=85°C
Controller		<ul style="list-style-type: none"> For use in Zone 2 / Div. 2 "NI" 	For enclosure 6DR5..1/2/3-0F/G/K; 6DR5..0-0F <ul style="list-style-type: none"> NI / 1 / 2 / A-D NI / 2 / (A)Ex nA / Ex ic / IIC, Gc
Controller unit		<ul style="list-style-type: none"> Flameproof enclosure "XP" 	For enclosure 6DR5..5/6 FM <ul style="list-style-type: none"> XP, CL.I, DIV.1, GP,ABCD XP, CL.I, ZN. 1, (A)Ex d IIC
<ul style="list-style-type: none"> Five-point switch Deadband - dEbA = Auto - dEbA = 0.1 ... 10 % 	Self-adjusting Self-adjusting Can be set as fixed value		
<ul style="list-style-type: none"> Scan time Resolution Transmission error Temperature influence effect 	10 ms ≤ 0,05 % ≤ 0,2 % ≤ 0.1 %/10 K (≤ 0.1 %/18 °F)		
Certificates and approvals		Natural gas as driving medium	For technical specifications using natural gas as driving medium, see operating instructions.
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1, complies with requirements of article 4, paragraph 3 (sound engineering practice SEP)		
CE conformity	You can find the appropriate directives and standards, including the relevant versions, in the EC Declaration of Conformity on the Internet.		
UL conformity	You can find the appropriate directives and standards, including the relevant versions, in the UL-CERTIFICATE OF COMPLIANCE on the Internet.		

- Max. impact energy 1 Joule for enclosure with inspection window 6DR5..0 and 6DR5..1 or max. 2 Joule for 6DR5..3.
- At ≤ -10 °C (≤ 14 °F) the display refresh rate of the indicator is limited. When using position feedback module, only T4 is permitted.
- The following applies to order suffix (order code) -Z M40: -40 ... +80 °C (-40 ... +176 °F).
- The following applies to fail in place: 3 ... 7 bar (43.5 ... 101.5 psi).
- With Ex d version (6DR5..5-...) values are reduced by approx. 20 %.

Positioners

SIPART PS2

Technical specifications

SIPART PS2 with and without HART

	Basic electronics without Ex protection	Basic electronics with Ex d explosion protection	Basic electronics with "ia"explosion protection	Basic electronics with explosion protection "ic", "ec", "nA", "t"
Electrical specifications				
Current input I_W				
• Rated signal range			0/4 ... 20 mA	
• Test voltage			840 V DC, 1 s	
• Binary input BIN1 (terminals 9/10; electrically connected to the basic device)		Suitable only for floating contact; max. contact load < 5 μ A at 3 V		
2-wire connection (terminals 6/8) 6DR50.. and 6DR53.. without HART 6DR51.. and 6DR52.. with HART				
Current to maintain the auxiliary power supply		≥ 3.6 mA		
Required load voltage U_B (corresponds to Ω at 20mA)				
• Without HART (6DR50..)				
- Typical	6.36 V (= 318 Ω)	6.36 V (= 318 Ω)	7.8 V (= 390 Ω)	7.8 V (= 390 Ω)
- max.	6.48 V (= 324 Ω)	6.48 V (= 324 Ω)	8.3 V (= 415 Ω)	8.3 V (= 415 Ω)
• Without HART (6DR53..)				
- Typical	7.9 V (= 395 Ω)	-	-	-
- max.	8.4 V (= 420 Ω)	-	-	-
• With HART (6DR51..)				
- Typical	6.6 V (= 330 Ω)	6.6 V (= 330 Ω)	-	-
- max.	6.72 V (= 336 Ω)	6.72 V (= 336 Ω)	-	-
• With HART (6DR52..)				
- Typical	-	8.4 V (= 420 Ω)	8.4 V (= 420 Ω)	8.4 V (= 420 Ω)
- max.	-	8.8 V (= 440 Ω)	8.8 V (= 440 Ω)	8.8 V (= 440 Ω)
• Static destruction limit	± 40 mA	± 40 mA	-	-
Effective internal capacitance C_i				
• Without HART	-	-	11 nF	"ic": 11 nF
• With HART	-	-	11 nF	"ic": 11 nF
Effective internal inductance L_i				
• Without HART	-	-	207 μ H	"ic": 207 μ H
• With HART	-	-	310 μ H	"ic": 310 μ H
For connecting to circuits with the following peak values	-	-	$U_i = 30$ V $I_i = 100$ mA $P_i = 1$ W	"ic": $U_i = 30$ V $I_i = 100$ mA "ec"/"nA"/"t": $U_n \leq 30$ V $I_n \leq 100$ mA
3-/4-wire connection (terminals 2/4 and 6/8) 6DR52.. with HART, explosion-protected 6DR53.. without HART, not explosion-protected)				
Load voltage at 20 mA	≤ 0.2 V (= 10 Ω)	≤ 0.2 V (= 10 Ω)	≤ 1 V (= 50 Ω)	≤ 1 V (= 50 Ω)
Power supply U_H	18 ... 35 V DC	18 ... 35 V DC	18 ... 30 V DC	18 ... 30 V DC
Current consumption I_H			($U_H - 7.5$ V)/2.4 k Ω [mA]	
Effective internal capacitance C_i	-	-	22 nF	"ic": 22 nF
Effective internal inductance L_i	-	-	0.12 mH	"ic": 0,12 mH
For connecting to circuits with the fol- lowing peak values	-	-	$U_i = 30$ V DC $I_i = 100$ mA $P_i = 1$ W	"ic": $U_i = 30$ V $I_i = 100$ mA "ec"/"nA"/"t": $U_n \leq 30$ V $I_n \leq 100$ mA
Electrical isolation	between U_H and I_W	between U_H and I_W	between U_H and I_W (2 intrinsically safe cir- cuits)	between U_H and I_W
HART communication				
HART version			7	
PC parameterization software	SIMATIC PDM; supports all device objects. The software is not included in the scope of delivery.			

SIPART PS2 with PROFIBUS PA/with FOUNDATION Fieldbus

	Basic electronics without Ex protection	Basic electronics with Ex d explosion protection	Basic electronics with "ia"explosion protection	Basic electronics with explosion protection "ic", "ec", "nA", "t"
Electrical specifications				
<u>Power supply, bus circuit</u>				
Bus voltage	9 ... 32 V	9 ... 32 V	9 ... 24 V	9 ... 32 V
For connecting to circuits with the following peak values			Bus-supplied	
<ul style="list-style-type: none"> • Bus connection with FISCO supply unit 			$U_i = 17.5 \text{ V}$ $I_i = 380 \text{ mA}$ $P_i = 5.32 \text{ W}$	"ic": $U_i = 17.5 \text{ V}$ $I_i = 570 \text{ mA}$ "ec"/"nA"/"t": $U_n \leq 32 \text{ V}$
<ul style="list-style-type: none"> • Bus connection with barrier 			$U_i = 24 \text{ V}$ $I_i = 250 \text{ mA}$ $P_i = 1.2 \text{ W}$	"ic": $U_i = 32 \text{ V}$ "ec"/"nA"/"t": $U_n \leq 32 \text{ V}$
Effective internal capacitance C_i	-	-	Negligibly	Negligibly
Effective internal inductance L_i	-	-	8 μH	"ic": 8 μH
Current consumption			11.5 mA \pm 10 %	
Additional error signal			0 mA	
<u>Safety shutdown can be activated with "jumper" (terminals 81/82)</u>			electrically isolated from bus circuit and binary input	
<ul style="list-style-type: none"> • Input resistance 			> 20 k Ω	
<ul style="list-style-type: none"> • Signal state "0" (shutdown active) 			0 ... 4.5 V or unconnected	
<ul style="list-style-type: none"> • Signal state "1" (shutdown not active) 			13 ... 30 V	
For connecting to power supply with the following peak values			$U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 1 \text{ W}$	"ec"/"nA": $U_n \leq 30 \text{ V}$ $I_n \leq 100 \text{ mA}$ "ic": $U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$
Effective Internal capacitance and inductance	-	-	Negligibly	Negligibly
Binary input BE1 for PROFIBUS (terminals 9/10); electrically connected to the bus circuit)			Bridged or connection to switching contact.	
Electrical isolation			Suitable only for floating contact; max. contact load < 5 μA at 3 V	
<ul style="list-style-type: none"> • For basic device without Ex protection and for basic device with Ex d 			Electrical isolation between basic device and the input for safety shutdown, as well as the outputs of the option modules	
<ul style="list-style-type: none"> • For basic device Ex "ia" 			The basic device and the input to the safety shutdown, as well as the outputs of the option modules, are separate, intrinsically safe circuits.	
<ul style="list-style-type: none"> • For basic device Ex "ic", "nA", "t" 			Electrical isolation between basic device and the input for safety shutdown, as well as the outputs of the option modules	
Test voltage			840 V DC, 1 s	
PROFIBUS PA communication				
Communication			Layers 1 and +2 according to PROFIBUS PA, transmission technology according to IEC 61158-2; slave function; layer 7 (protocol layer) according to PROFIBUS DP, EN 50170 standard with the extended PROFIBUS functions (all data acyclic, manipulated variable, feedbacks and status also cyclic)	
C2 connections			Four connections to master class 2 are supported; automatic connection setup 60 s after break in communication	
Device profile			PROFIBUS PA profile B, version 3.02, more than 150 objects	
Response time to master message			Typically 10 ms	
Device address			126 (when delivered)	
PC parameterization software			SIMATIC PDM; supports all device objects. The software is not included in the scope of delivery.	

Positioners

SIPART PS2

Technical specifications

	Basic electronics without Ex protection	Basic electronics with Ex d explosion protection	Basic electronics with "ia"explosion protection	Basic electronics with explosion protection "ic", "ec", "nA", "t"
FOUNDATION Fieldbus communication				
Communications group and class	According to technical specification of the Fieldbus Foundation for H1 communication			
Function blocks/Functions	Group 3, Class 31PS (Publisher Subscriber) 1 Resource Block (RB2) 1 Analog Output Function Block (AO) 1 PID Function Block (PID) 1 Transducer Block (Standard Advanced Positioner Valve) Link Active Scheduler (LAS)-Funktion			
Execution times of the blocks	AO: 30 ms PID: 40 ms			
Physical layer profile	123, 511			
FF registration	Tested with ITK 6.0			
Device address	22 (when delivered)			

Option modules

	Without Ex protection/ with Ex protection Ex d	With explosion protection "ia"	With explosion protection "ic", "ec", "nA", "t"
Alarm module	6DR4004-8A	6DR4004-6A	6DR4004-6A
3 binary output circuits		<ul style="list-style-type: none"> Alarm output A1: Terminals 41 and 42 Alarm output A2: Terminals 51 and 52 Alarm output: Terminals 31 and 32 	
• Power supply U_H	≤ 35 V	-	-
• Signal state			
- High (not activated)	Conductive, $R = 1$ k Ω , +3/-1 % *)	≥ 2.1 mA	≥ 2.1 mA
- Low *) (activated)	Blocked, $I_R < 60$ μ A	≤ 1.2 mA	≤ 1.2 mA
*) Low is also the status when the basic device is faulty or is without additional electrical power supply.	*) When used in the flameproof enclosure the current consumption must be limited to 10 mA per output.	Switching threshold with supply to EN 60947-5-6: $U_H = 8.2$ V, $R_i = 1$ k Ω	Switching threshold with supply to EN 60947-5-6: $U_H = 8.2$ V, $R_i = 1$ k Ω
• For connecting to circuits with the following peak values	-	$U_i = 15$ V $I_i = 25$ mA $P_i = 64$ mW	"ic": $U_i = 15$ V $I_i = 25$ mA "ec"/"nA"/"t": $U_n \leq 15$ V
Effective internal capacitance C_i	-	5.2 nF	5.2 nF
Effective internal inductance L_i	-	Negligibly	Negligibly
1 binary output circuit		Binary input BE2: Terminals 11 and 12, terminals 21 and 22 (bridge)	
• Electrically connected to the basic device			
- Signal state 0		Floating contact, open	
- Signal state 1		Floating contact, closed	
- Contact load		3 V, 5 μ A	
• Electrically isolated from the basic device			
- Signal state 0		≤ 4.5 V or open	
- Signal state 1		≥ 13 V	
- Natural resistance		≥ 25 k Ω	
• Static destruction limit	± 35 V	-	-
• For connecting to circuits with the following peak values	-	$U_i = 25.2$ V	"ic": $U_i = 25.2$ V "ec"/"nA"/"t": $U_n \leq 25.5$ V
Effective internal capacitance C_i	-	Negligibly	Negligibly
Effective internal inductance L_i	-	Negligibly	Negligibly
Electrical isolation		The 3 outputs, the input BE2 and the basic device are electrically isolated from each other	
Test voltage		840 V DC, 1 s	
Position feedback module	6DR4004-8J	6DR4004-6J	6DR4004-6J
DC output for position feedback			
1 current output: Terminals 61 and 62		2-wire connection	
Rated signal range		4 ... 20 mA, short-circuit proof	
Total operating range		3.6 ... 20.5 mA	
Power supply U_H	+12 ... +35 V	+12 ... +30 V	+12 ... +30 V
External loads R_B [k Ω]		$\leq (U_H [V] - 12 \text{ V})/I [\text{mA}]$	
Transmission error		≤ 0.3 %	
Temperature influence effect		≤ 0.1 %/10 K (≤ 0.1 %/18 °F)	
Resolution		≤ 0.1 %	
Residual ripple		≤ 1 %	
• For connecting to circuits with the following peak values	-	$U_i = 30$ V $I_i = 100$ mA $P_i = 1$ W	"ic": $U_i = 30$ V, $I_i = 100$ mA "ec"/"nA"/"t": $U_n \leq 30$ V, $I_n \leq 100$ mA $P_n \leq 1$ W
Effective internal capacitance C_i	-	11 nF	11 nF
Effective internal inductance L_i	-	Negligibly	Negligibly
Electrical isolation		Electrically isolated from the alarm option and safely isolated from the basic device	
Test voltage		840 V DC, 1 s	

Positioners

SIPART PS2

Technical specifications

	Without Ex protection	With explosion protection "ia"	With explosion protection "ic", "ec", "nA", "t"
SIA module	6DR4004-8G	6DR4004-6G	6DR4004-6G
Limit transmitter with slot-type initiators and alarm output			
2 slot-type initiators		<ul style="list-style-type: none"> Binary output (limit transmitter) A1: Terminals 41 and 42 Binary output (limit transmitter) A2: Terminals 51 and 52 	
<ul style="list-style-type: none"> Connection Signal state High (not activated) Signal state Low (activated) 2 slot-type initiators Function Connecting to circuits with the following peak values 	2-wire system to EN 60947-5-6 (NAMUR), for switching amplifier to be connected on load side	$> 2.1 \text{ mA}$ $< 1.2 \text{ mA}$ Type SJ2-SN NC (normally closed)	
	Rated voltage 8 V current consumption: $\geq 3 \text{ mA}$ (limit value not responded), $\leq 1 \text{ mA}$ (limit value responded)	$U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ $P_i = 64 \text{ mW}$	"ic": $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ "ec"/"nA": $U_n \leq 15 \text{ V}$ $P_n \leq 64 \text{ mW}$
Effective internal capacitance C_i	-	161 nF	161 nF
Effective internal inductance L_i	-	120 μH	120 μH
1 alarm output		Binary output: Terminals 31 and 32	
<ul style="list-style-type: none"> Connection Signal state High (not activated) Signal state Low (activated) Power supply U_H Connecting to circuits with the following peak values 	On switching amplifier according to EN 60947-5-6: (NAMUR), $U_H = 8.2 \text{ V}$, $R_i = 1 \text{ k}\Omega$.		
	$R = 1.1 \text{ k}\Omega$	$> 2.1 \text{ mA}$	$> 2.1 \text{ mA}$
	$R = 10 \text{ k}\Omega$	$< 1.2 \text{ mA}$	$< 1.2 \text{ mA}$
	$U_H \leq 35 \text{ V DC}$ $I \leq 20 \text{ mA}$	-	-
	-	$U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ $P_i = 64 \text{ mW}$	"ic": $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ "ec"/"nA": $U_n \leq 15 \text{ V}$ $P_n \leq 64 \text{ mW}$
Effective internal capacitance C_i	-	5.2 nF	5.2 nF
Effective internal inductance L_i	-	Negligibly	Negligibly
Electrical isolation	The 3 outputs are electrically isolated from the basic device.		
Test voltage	840 V DC, 1 s		

	Without Ex protection	With explosion protection "ia"	With explosion protection "ic", "t"
Mechanical limit switch module	6DR4004-8K	6DR4004-6K	6DR4004-6K
Limit transmitter with mechanical switching contacts			
2 limit value contacts		<ul style="list-style-type: none"> Binary output A1: Terminals 41 and 42 Binary output A2: Terminals 51 and 52 	
<ul style="list-style-type: none"> Max. switching current AC/DC Connecting to circuits with the following peak values 	4 A	-	-
Effective internal capacitance C_i	-	$U_i = 30\text{ V}$ $I_i = 100\text{ mA}$ $P_i = 750\text{ mW}$	"ic": $U_i = 30\text{ V}$ $I_i = 100\text{ mA}$ "t": $U_n = 30\text{ V}$ $I_n = 100\text{ mA}$
Effective internal inductance L_i	-	Negligibly	Negligibly
<ul style="list-style-type: none"> Max. switching voltage AC/DC 	250 V/24 V	30 V DC	30 V DC
1 alarm output		Binary output: Terminals 31 and 32	
<ul style="list-style-type: none"> Connection 	On switching amplifier according to EN 60947-5-6: (NAMUR), $U_H = 8.2\text{ V}$, $R_i = 1\text{ k}\Omega$.		
<ul style="list-style-type: none"> Signal state High (not activated) Signal state Low (activated) Auxiliary power 	$R = 1.1\text{ k}\Omega$ $R = 10\text{ k}\Omega$ $U_H \leq 35\text{ V DC}$ $I \leq 20\text{ mA}$	$> 2.1\text{ mA}$ $< 1.2\text{ mA}$ -	$> 2.1\text{ mA}$ $< 1.2\text{ mA}$ -
<ul style="list-style-type: none"> Connecting to circuits with the following peak values 	-	$U_i = 15\text{ V}$ $I_i = 25\text{ mA}$ $P_i = 64\text{ mW}$	"ic": $U_i = 15\text{ V}$ $I_i = 25\text{ mA}$ "t": $U_n = 15\text{ V}$ $I_n = 25\text{ mA}$
Effective internal capacitance C_i	-	5.2 nF	5.2 nF
Effective internal inductance L_i	-	Negligibly	Negligibly
Electrical isolation		The 3 outputs are electrically isolated from the basic device	
Test voltage		3 150 V DC, 2 s	
Rated conditions altitude	Max. 2 000 m NN At altitudes over 2 000 m NN, use a suitable power supply	-	-
	Without Ex protection	With explosion protection "ia", "ic"	With explosion protection "ec", "t", "na"
EMC filter module	EMC filter module type C73451-A430-D23 is required for connecting an electro-sensitive external position measurement, e.g. NCS module type 6DR4004 or an external potentiometer type C73451-A430-D78 or 6DR4004-1ES. For devices without explosion protection, other types of potentiometer with a resistance value von 10 kΩ can be connected.		
Resistance of external potentiometer		10 kΩ	
Peak values when powered by the base unit with PA (6DR55) or with FF communication (6DR56)	$U_{\max} = 5\text{ V}$	$U_o = 5\text{ V}$ $I_o = 75\text{ mA}$ statisch $I_o = 160\text{ mA}$ kurzfristig $P_o = 120\text{ mW}$ $C_o = 1\text{ }\mu\text{F}$ $L_o = 1\text{ mH}$	$U_{\max} = 5\text{ V}$
Peak values when supplied by other basic devices (6DR50/1/2/3)	$U_{\max} = 5\text{ V}$	$U_o = 5\text{ V}$ $I_o = 100\text{ mA}$ $P_o = 33\text{ mW}$ $C_o = 1\text{ }\mu\text{F}$ $L_o = 1\text{ mH}$	$U_{\max} = 5\text{ V}$
Electrical isolation		Electrically connected to the basic device	

Positioners

SIPART PS2

Technical specifications

	Without Ex protection	With explosion protection "ia"	With explosion protection "ic", "ec", "nA"
NCS sensor			
Position range			
• Linear actuator 6DR4004-.N.20		3 ... 14 mm (0.12 ... 0.55")	
• Linear actuator 6DR4004-.N.30	10 ... 130 mm (0.39 ... 5.12"); up to 200 mm (7.87") on request		
• Part-turn actuator		30° ... 100°	
Linearity for NCS sensor and for internal NCS module 6DR4004-5L/-5LE (after correction by means of positioner)		± 1 %	
Hysteresis for NCS sensor and for internal NCS module 6DR4004-5L/-5LE		± 0,2 %	
Temperature influence (range: rotation angle 120° or stroke 14 mm)		≤ 0,1 %/10 K (≤ 0.1 %/18 °F) for -20 ... +90 °C (-4 ... +194 °F) ≤ 0,2 %/10 K (≤ 0.2 %/18 °F) for -40 ... -20 °C (-40 ... -4 °F)	
Climatic class		According to EN 60721-3	
• Storage		1K5, but -40 ... +90 °C (1K5, but -40 ... +194 °F)	
• Transport		2K4, but -40 ... +90 °C (2K4, but -40 ... +194 °F)	
Vibration resistance			
• Harmonic oscillations (sine) according to IEC 60068-2-6		3.5 mm (0.14"), 2 ... 27 Hz; 3 cycles/axis 98.1 m/s ² (321.84 ft/s ²), 27 ... 300 Hz, 3 cycles/axis	
• Bumping according to IEC 60068-2-29		300 m/s ² (984 ft/s ²), 6 ms, 4 000 shocks/axis	
Degree of protection of enclosure		IP68 according to IEC EN 60529; NEMA 4X / Encl. Type 4X	
• Connecting to circuits with the following peak values	-	U _i = 5 V I _i = 160 mA P _i = 120 mW	U _i = 5 V
Effective internal capacitance C _i	-	180 nF	180 nF
Effective internal inductance L _i	-	922 μH	922 μH
Explosion protection according to ATEX/IECEX	-	Intrinsic safety "ia": II 2 G Ex ia IIC T6/T4 Gb	Intrinsic safety "ic": II 3 G Ex ic IIC T6/T4 Gc Non-sparking "ec": II 3 G Ex ec IIC T6/T4 Gc
Explosion protection according to FM	-	Intrinsic safety "ia": IS, Class I, Division 1, ABCD IS, Class I, Zone 1, AEx ib, IIC	Non-sparking, "ec"/"nA": NI, Class I, Division 2, ABCD NI, Class I, Zone 2, AEx ec, IIC
Permissible ambient temperature			
• ATEX/IECEX	-	T4: -40 ... +90 °C (-40 ... +194 °F) T6: -40 ... +70 °C (-40 ... +158 °F)	
• FM/CSA	-	T4: -40 ... +85 °C (-40 ... +185 °F) T6: -40 ... +70 °C (-40 ... +158 °F)	

Selection and ordering data	Article No.	Order code
SIPART PS2 electropneumatic positioner in enclosure made of polycarbonate, aluminum and stainless steel	6 DR 5	
<ul style="list-style-type: none"> Without HART With HART, not explosion-protected 2-, 3-, 4-wire (0/4 to 20 mA) With HART, explosion-protected Without HART, not explosion-protected PROFIBUS PA connection FOUNDATION Fieldbus connection 	0 1 2 3 5 6	
For actuator		
Single-acting	1	
Double-acting	2	
Enclosure		
Polycarbonate ⁴⁾	0	
Aluminum, narrow; only single-acting	1 1	
Stainless steel, without inspection window	2	
Aluminum	3	
Explosion protection		
Without		N
With protection type		E
• Intrinsic safety		
With protection type ¹⁾		D
• Non-sparking		
• Dust protection via enclosure		
With protection type ²⁾		F
• Intrinsic safety		
• Non-sparking		
With protection type ²⁾		G
• Non-sparking		
With protection type ¹⁾		K
• Intrinsic safety		
• Non-sparking		
• Dust protection via enclosure		
Connection thread electrical/pneumatic		
M20x1.5/G ¹ / ₄		G
1/2-14 NPT / 1/4-18 NPT		N
M20x1.5/1/4-18 NPT		M
1/2-14 NPT / G ¹ / ₄		P
M12 connector, A coding/ G ¹ / ₄ ³⁾		R
M12 connector, A coding/ 1/4-18 NPT ³⁾		S

► Available ex stock

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

- Enclosure: aluminum narrow 6DR5..1 or stainless steel 6DR5..2, each without inspection window in the cover. Aluminum 6DR5..3; Impact energy max. 2 joule.
- Enclosure: aluminum; Impact energy max. 2 joule on inspection window for enclosure 6DR5..1 or 6DR5..3.
- Connector M12 mounted and electrically connected in versions 6DR50.., 6DR55.. and 6DR56..
Connector M12 mounted in versions 6DR50.., 6DR51.., 6DR52.. and 6DR53..
Not for protection type "dust protection by enclosure" 6DR5...0D... and 6DR5...0K...

Selection and ordering data	Article No.	Order code
SIPART PS2 electropneumatic positioner in enclosure made of polycarbonate, aluminum and stainless steel	6 DR 5	
Limit monitor		
Installed, incl. 2nd cable gland		
Without		0
Alarm module; electronic (6DR4004-.A)		1
SIA module; slot-type initiators (6DR4004-.G)		2
Mechanical limit switch module (mechanical switching contacts (6DR4004-.K)) ⁴⁾		3
Internal NCS module (6DR4004-5L..), internal position detection by means of a potentiometer is not included and can be ordered through -Z K11 if needed.		9
		L 1 A
Option modules		
Installed, incl. 2nd cable gland		
Without		0
Position feedback module for position feedback signal (4 ... 20 mA) (6DR4004-.J)		1
EMC filter module for external position detectors in the SIPART PS2 enclosure (C73451-A430-D23), NCS sensor 6DR4004-.N..0 and external position detection by means of a third-party potentiometer is not included and can be ordered through -Z K11 if needed.		2
Position feedback module and EMC filter module for external position sensor, internal position detection by means of a potentiometer is not included and can be ordered through -Z K11 if needed.		3
Brief instructions		
German/English		A
French/Spanish/Italian/Chinese		B
Mounted pressure gauge block		
Without		0
<u>Gauge made of plastic IP31</u>		
Block made of aluminum, single-acting G ¹ / ₄ , scaled in MPa and bar		1
Block made of aluminum, double-acting G ¹ / ₄ , scaled in MPa and bar		2
Block made of alum., single-acting 1/4-18 NPT, scaled in MPa and psi		3
Block made of alum., double-acting 1/4-18 NPT, scaled in MPa and psi		4
<u>Gauge made of steel IP31</u>		
block made of aluminum, single-acting G ¹ / ₄ , scaled in MPa, bar, psi		9 R 1 A
Block made of aluminum, double-acting G ¹ / ₄ , scaled in MPa, bar, psi		9 R 2 A
Block made of aluminum, single-acting 1/4-18 NPT, scaled in MPa, bar, psi		9 R 1 B
Block made of aluminum, double-acting 1/4-18 NPT, scaled in MPa, bar, psi		9 R 2 B
<u>Gauge made of stainless steel 316 IP54</u>		
Block made of stainl. steel 316, single-acting G ¹ / ₄ , scaled in MPa, bar, psi		9 R 1 C
Block made of stainl. steel 316, double-acting G ¹ / ₄ , scaled in MPa, bar, psi		9 R 2 C
Block made of stainl. steel 316, single-acting 1/4-18 NPT, scaled in MPa, bar, psi		9 R 1 D
Block made of stainless steel 316, double-acting 1/4-18 NPT, scaled in MPa, bar, psi		9 R 2 D

⁴⁾ Not for protection type "non-sparking"



Positioners

SIPART PS2

Selection and Ordering data SIPART PS2

Selection and ordering data	Article No.	Order code	Selection and ordering data	Article No.	Order code
SIPART PS2 electropneumatic positioner in enclosure made of polycarbonate, aluminum and stainless steel	6 DR 5		SIPART PS2 electropneumatic positioner in enclosure made of polycarbonate, aluminum and stainless steel	6 DR 5	
Further designs Add "-Z" to Article No. and specify Order Code.		Order code	Measuring point description Max. 16 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA, specify in plain text: Y15:	Y15	
TAG plate made of stainless steel, 3-line Text line 1: Plain text from Y17 Text line 2: Plain text from Y15 Text line 3: Plain text from Y16	A20		Measuring point text Max. 24 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA, specify in plain text: Y16:	Y16	
Version with stainless steel sound absorbers Standard with stainless steel enclosure	A40		Measuring point number (TAG No.) Max. 32 characters, specify in plain text: Y17:	Y17	
Functional safety (SIL 2) only for 6DR5.1. (single-acting positioners) Device suitable for use according to IEC 61508 and IEC 61511	C20		Preset bus address Specify in plain text: Y25: (only for 6DR55.. and 6DR56..)	Y25	
M12 connector For the following option modules: <ul style="list-style-type: none"> • Position feedback module • External position detection system • Alarm module • SIA module Can only be ordered in connection with optional module	D53 D54 D55 D56		Customer-specific parameter setting Specify in plain text: Y30: ▶ Available ex stock	Y30	
Fail in Place Holding function on failure of auxiliary electrical power and/or pneumatic failure	F01				
Optimized control behavior for small drives¹⁾	K10				
Additional position detection by means of a potentiometer	K11				
Pneumatic terminal strip made of stainless steel 316	K18				
OPOS adapter with interface VDI/VDE 3847 Blanketing, only for single-acting, not for flameproof enclosures	K20				
Permitted ambient temperature during operation -40 ... 80 °C (-40 ... +176 °F) for 6DR5.11, 6DR5..2, 6DR5..3 (without inspection window)	M40				
Marine approval GL (Germanischer Lloyd) LR (Lloyds Register) BV (Bureau Veritas) DNV (Det Norske Veritas) ABS (American Bureau of Shipping) KR of shipping (Korean Register of Shipping)	S10 S11 S12 S13 S14 S15				

¹⁾ Not for following options: 6DR53..; 6DR5..1 and 6DR5..2; C20.

Selection and ordering data SIPART PS2 for flameproof enclosure

Selection and ordering data	Article No.	Order code
SIPART PS2 electropneumatic positioner, in flameproof aluminum enclosure, without cable gland	6 DR 5	
<ul style="list-style-type: none"> 5 - 0 E - 0 A 		
<p>Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>		
Version		
2-wire (4 to 20 mA)		
• Without HART	0	
• With HART	1	
2-, 3-, 4-wire (0/4 to 20 mA)		
• With HART	2	
• Without HART	3	
PROFIBUS PA connection	5	
FOUNDATION Fieldbus connection	6	
For actuator		
Single-acting	1	
Double-acting	2	
Connection thread electrical/pneumatic		
M20 x 1.5 / G¼		G
½-14 NPT / ¼-18 NPT		N
M20 x 1.5 / ¼-18 NPT		M
½-14 NPT / G¼		P
M25x1.5 / G¼		Q
Limit monitor		
Built-in		
Without		0
Alarm module; electronic (6DR4004-8A)		1
Internal NCS module (6DR4004-5L.), internal position detection by means of a potentiometer is not included and can be ordered through -Z K11 if needed.		9
		L 1 A
Option modules		
Built-in		
Without		0
Position feedback module for position feedback signal (4 ... 20 mA) (6DR4004-8J)		1
EMC filter module for external position sensor, internal position detection by means of a potentiometer is not included and can be ordered through -Z K11 if needed.		2
Position feedback module and EMC filter module for external position sensor, internal position detection by means of a potentiometer is not included and can be ordered through -Z K11 if needed.		3
Brief instructions		
German/English/Chinese		A
French/Spanish/Italian		B

► Available ex stock

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Selection and ordering data	Article No.	Order code
SIPART PS2 electropneumatic positioner, in flameproof aluminum enclosure, without cable gland	6 DR 5	
<ul style="list-style-type: none"> 5 - 0 E - 0 A 		
Mounted pressure gauge block		
Without		0
<u>Gauge made of plastic IP31</u>		
Block made of aluminum, single-acting G¼, scaled in MPa and bar		1
Block made of aluminum, double-acting G¼, scaled in MPa and bar		2
Block made of aluminum, single-acting ¼-18 NPT, scaled in MPa and psi		3
Block made of aluminum, double-acting ¼-18 NPT, scaled in MPa and psi		4
<u>Gauge made of steel IP44</u>		
Block made of aluminum, single-acting G¼, scaled in MPa, bar, psi		9 R 1 A
Block made of aluminum, double-acting G¼, scaled in MPa, bar, psi		9 R 2 A
Block made of aluminum, single-acting ¼-18 NPT, scaled in MPa, bar, psi		9 R 1 B
Block made of aluminum, double-acting ¼-18 NPT, scaled in MPa, bar, psi		9 R 2 B
<u>Gauge made of stainless steel 316 IP54</u>		
Block made of stainless steel 316, single-acting G¼, scaled in MPa, bar, psi		9 R 1 C
Block made of stainless steel 316, double-acting G¼, scaled in MPa, bar, psi		9 R 2 C
Block made of stainless steel 316, single-acting ¼-18 NPT, scaled in MPa, bar, psi		9 R 1 D
Block made of stainless steel 316, double-acting ¼-18 NPT, scaled in MPa, bar, psi		9 R 2 D

Positioners

SIPART PS2

Selection and ordering data SIPART PS2 for flameproof enclosure

Selection and ordering data	Article No.	Order code
SIPART PS2 electropneumatic positioner, in flameproof aluminum enclosure, without cable gland	6 DR 5	
<i>Further designs</i>	Order code	
Add "-Z" to Article No. and specify Order Code.		
TAG plate made of stainless steel, 3-line	A20	
Text line 1: Plain text from Y17 Text line 2: Plain text from Y15 Text line 3: Plain text from Y16		
Functional safety (SIL 2) only for 6DR5.1 (single-acting positioners)	C20	
Device suitable for use according to IEC 61508 and IEC 61511		
Fail in Place	F01	
Holding function in case of auxiliary electrical power failure		
Optimized control behavior for small drives¹⁾	K10	
Additional position detection by means of a potentiometer	K11	
Pneumatic terminal strip made of stainless steel 316	K18	
Permitted ambient temperature during operation -40 ... 80 °C (-40 ... +176 °F)	M40	
Measuring point description Max. 16 characters for HART, max. 32 characters for PROFIBUS PA and FOUNDATION Fieldbus, specify in plain text: Y15:	Y15	
Measuring point text Max. 24 characters for HART, max. 32 characters for PROFIBUS PA and FOUNDATION Fieldbus, specify in plain text: Y16:	Y16	
Measuring point number (TAG No.) Max. 32 characters, specify in plain text: Y17:	Y17	
Preset bus address Specify in plain text: Y25: (only for 6DR55.. and 6DR56..)	Y25	

► Available ex stock

¹⁾ Not for following options: 6DR53..; 6DR5..1 and 6DR5..2; C20.

Selection and ordering data SIPART PS2 for flameproof enclosure

Selection and ordering data	Article No.	Order code
SIPART PS2 electropneumatic positioner, in flameproof stainless steel enclosure, without cable gland	6 DR 5	
<p>Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	6 - 0 E	- 0 A
Version		
2-wire (4 to 20 mA)		
• Without HART	0	
• With HART	1	
2-, 3-, 4-wire (0/4 to 20 mA)		
• With HART	2	
• Without HART	3	
PROFIBUS PA connection	5	
FOUNDATION Fieldbus connection	6	
For actuator		
Single-acting	1	
Double-acting	2	
Connection thread electrical/pneumatic		
M20 x 1.5 / G¼		G
½-14 NPT / ¼-18 NPT		N
M20 x 1.5 / ¼-18 NPT		M
½-14 NPT / G¼		P
M25x1.5 / G¼		Q
Limit monitor		
Built-in		
Without		0
Alarm module; electronic (6DR4004-8A)		1
Internal NCS module (6DR4004-5L.), internal position detection by means of a potentiometer is not included and can be ordered through -Z K11 if needed.		9
Option modules		
Built-in		
Without		0
Position feedback module for position feedback signal (4 ... 20 mA) (6DR4004-8J)		1
EMC filter module for external position sensor, internal position detection by means of a potentiometer is not included and can be ordered through -Z K11 if needed.		2
Position feedback module and EMC filter module for external position sensor, internal position detection by means of a potentiometer is not included and can be ordered through -Z K11 if needed.		3
Brief instructions		
German/English/Chinese		A
French/Spanish/Italian		B

► Available ex stock

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Selection and ordering data	Article No.	Order code
SIPART PS2 electropneumatic positioner, in flameproof stainless steel enclosure, without cable gland	6 DR 5	
6 - 0 E		- 0 A
Mounted pressure gauge block		
Without		0
Gauge made of stainless steel 316 IP54		9 R 1 C
Block made of stainless steel 316, single-acting G¼, scaled in MPa, bar, psi		9 R 2 C
Block made of stainless steel 316, double-acting G¼, scaled in MPa, bar, psi		9 R 1 D
Block made of stainless steel 316, single-acting ¼-18 NPT, scaled in MPa, bar, psi		9 R 2 D
Block made of stainless steel 316, double-acting ¼-18 NPT, scaled in MPa, bar, psi		
Further designs	Order code	
Add "-Z" to Article No. and specify Order Code.		
TAG plate made of stainless steel, 3-line	A20	
Text line 1: Plain text from Y17		
Text line 2: Plain text from Y15		
Text line 3: Plain text from Y16		
Functional safety (SIL 2) only for 6DR5.1. (single-acting positioners)	C20	
Device suitable for use according to IEC 61508 and IEC 61511		
Fail in Place	F01	
Holding function on failure of auxiliary electrical power and/or pneumatic failure		
Optimized control behavior for small drives¹⁾	K10	
Additional position detection by means of a potentiometer	K11	
Permitted ambient temperature during operation -40 ... 80 °C (-40 ... +176 °F)	M40	
Measuring point description	Y15	
Max. 16 characters for HART, max. 32 characters for PROFIBUS PA and FOUNDATION Fieldbus, specify in plain text: Y15:		
Measuring point text	Y16	
Max. 24 characters for HART, max. 32 characters for PROFIBUS PA and FOUNDATION Fieldbus, specify in plain text: Y16:		
Measuring point number (TAG No.)	Y17	
Max. 32 characters, specify in plain text: Y17:		
Preset bus address	Y25	
Specify in plain text: Y25: only for 6DR55.. and 6DR56..)		

► Available ex stock

¹⁾ Not for following options: 6DR53..; 6DR5..1 and 6DR5..2; C20.

Positioners

SIPART PS2

Selection and Ordering data Accessories/Spare parts

Selection and ordering data	Article No.
Accessories	
Position feedback module for position feedback signal (4 ... 20 mA)	
• Without explosion protection	▶ 6DR4004-8J
• With ATEX/IECEX and FM/CSA explosion protection	▶ 6DR4004-6J
Alarm module for 3 alarm outputs and 1 binary input (functionality: 2 limit monitors, 1 fault alarm, 1 binary input)	
• Without explosion protection	▶ 6DR4004-8A
• With ATEX/IECEX and FM/CSA explosion protection	▶ 6DR4004-6A
SIA module (slot-type initiator alarm module, not for Ex d version)	
• Without explosion protection	▶ 6DR4004-8G
• With ATEX/IECEX and FM/CSA explosion protection	▶ 6DR4004-6G
Mechanical limit switch module (with mechanical ground contacts, not for Ex d version)	
• Without explosion protection	▶ 6DR4004-8K
• With explosion protection	▶ 6DR4004-6K
Internal NCS module	
For contact-free position detection, for installation in the positioner enclosure	▶
• Without explosion protection	▶ 6DR4004-5L
• With explosion protection	▶ 6DR4004-5LE
EMC filter module with and without explosion protection for connection of external position sensor (10 kΩ) or NCS sensor	▶ C73451-A430-D23
▶ Available ex stock	

Selection and ordering data	Article No.
Accessories	
NCS sensor for non-contacting detection of position (not for Ex d version)	▶ 6DR4004-N0
<p>Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	
Explosion protection	
Not explosion-proof	8
With protection type (ATEX/IECEX/FM)	6
• Intrinsic safety	
• Non-sparking	
Cable length	
6 m (19.68 ft)	N
20 m (65.67 ft)	P
40 m (131.23 ft)	R
Actuator type	
For part-turn actuators, glass fiber-reinforced polyester magnet holders ¹⁾	1
For linear actuators up to 14 mm (0.55 inch) ²⁾	2
For linear actuators > 14 ... 130 mm (0.55 ... 5.12 inch) ³⁾	3
For part-turn actuators, anodized aluminum magnet holders ¹⁾	4

- 1) Fitted with mounting console, available for order separately as accessory.
 2) Mounted with individual mounting solution. Only a NAMUR mounting bracket can be used as mounting base (order separately as accessory).
 3) Mounted with NAMUR interface. Article No. either 6DR4004-8V or 6DR4004-8V + 6DR4004-8L depending on stroke range. Or mounted without NAMUR interface, individual mounting solution. Article No. 6DR4004-8VK or 6DR4004-8VL can be used as individual mounting solution depending on the stroke range.

Selection and ordering data	Article No.
External position detection system (with explosion protection to ATEX/IECEX) for separate mounting of position sensor and controller unit (not for Ex d version), comprising SIPART PS2 polycarbonate enclosure with integral potentiometer and sliding clutch (without electronics and pneumatic block)	▶ C73451-A430-D78
The EMC filter module is additionally required for the controller unit. (separate ordering item, see above).	
Gauge block with	
2 gauges made of plastic IP31, block made of aluminum, single-acting G $\frac{1}{4}$, scaled in MPa and bar	▶ 6DR4004-1M
3 gauges made of plastic IP31, block made of aluminum, double-acting G $\frac{1}{4}$, scaled in MPa and bar	▶ 6DR4004-2M
2 gauges made of plastic IP31, block made of aluminum, single-acting $\frac{1}{4}$ -18 NPT, scaled in MPa and psi	▶ 6DR4004-1MN
3 gauges made of plastic IP31, block made of aluminum, double-acting $\frac{1}{4}$ -18 NPT, scaled in MPa and psi	▶ 6DR4004-2MN
2 gauges made of steel IP44 Block made of aluminum, single-acting G $\frac{1}{4}$, scaled in MPa, bar, psi	▶ 6DR4004-1P
3 gauges made of steel IP44 Block made of aluminum, double-acting G $\frac{1}{4}$, scaled in MPa, bar, psi	▶ 6DR4004-2P
2 gauges made of steel IP44 Block made of aluminum, single-acting $\frac{1}{4}$ -18 NPT, scaled in MPa, bar, psi	▶ 6DR4004-1PN
3 gauges made of steel IP44 Block made of aluminum, double-acting $\frac{1}{4}$ -18 NPT, scaled in MPa, bar, psi	▶ 6DR4004-2PN
2 gauges made of stainless steel 316 IP54 Block made of stainless steel 316, single-acting G $\frac{1}{4}$, scaled in MPa, bar, psi	▶ 6DR4004-1Q
3 gauges made of stainless steel 316 IP54 Block made of stainless steel 316, double-acting G $\frac{1}{4}$, scaled in MPa, bar, psi	▶ 6DR4004-2Q
2 gauges made of stainless steel 316 IP54 Block made of stainless steel 316, single-acting $\frac{1}{4}$ -18 NPT, scaled in MPa, bar, psi	▶ 6DR4004-1QN
3 gauges made of stainless steel 316 IP54 Block made of stainless steel 316, double-acting $\frac{1}{4}$ -18 NPT, scaled in MP, bar, psi	▶ 6DR4004-2QN
Pneumatic terminal strip made of stainless steel 316	
to replace the pneumatic terminal strip made of aluminum	
Single-acting with G $\frac{1}{4}$	▶ 6DR4004-1R
Double-acting with G $\frac{1}{4}$	▶ 6DR4004-2R
Single-acting with $\frac{1}{4}$ -18 NPT	▶ 6DR4004-1RN
Double-acting with $\frac{1}{4}$ -18 NPT	▶ 6DR4004-2RN
Mounting kit for NAMUR part-turn actuators	
(VDI/VDE 3845, with plastic coupling wheel, without mounting console)	▶ 6DR4004-8D
(VDI/VDE 3845, with stainless steel coupling, without mounting console)	▶ TGX:16300-1556
SIPART PS2 console for NAMUR installation on part-turn actuators	
• 80 x 30 x 20 mm	▶ 6DR4004-1D
• 80 x 30 x 30 mm	▶ 6DR4004-2D
• 130 x 30 x 30 mm	▶ 6DR4004-3D
• 130 x 30 x 50 mm	▶ 6DR4004-4D

Selection and Ordering data Accessories/Spare parts

Mounting kit for other part-turn actuators

The following mounting consoles can be used together with the NAMUR part-turn actuator mounting kit 6DR4004-8D.

- SPX (DEZURIK) Power Rac, sizes R1, R1A, R2 and R2A ▶ **TGX:16152-328**
- Masoneilan Camflex II ▶ **TGX:16152-350**
- Fisher 1051/1052/1061, sizes 30, 40, 60 to 70 ▶ **TGX:16152-364**
- Fisher 1051/1052, size 33 ▶ **TGX:16152-348**

Mounting kit for NAMUR linear actuators

- NAMUR linear actuator mounting kit with short lever (2 ... 35 mm (0.08 ... 1.38 inch)) ▶ **6DR4004-8V**
- Long lever for travels from 35 ... 130 mm (1.38 ... 5.12 inch) without NAMUR mounting bracket ▶ **6DR4004-8L**
- Reduced mounting kit (like 6DR4004-8V but without fixing angle and U-bracket), with short lever with up to 35 mm travel (1.38 inch) ▶ **6DR4004-8VK**
- Reduced mounting kit (like 6DR4004-8V but without fixing angle and U-bracket), with long lever with > 35 mm travel (1.38 inch) ▶ **6DR4004-8VL**
- Roll and disk made of stainless steel 316 for replacement of the Teflon roll and aluminum disk in the 6DR4004-8, -8VK and -8VL mounting kits for NAMUR linear actuators ▶ **6DR4004-3N**
- Two terminal strips made of stainless steel 316 for replacement of the aluminum terminal blocks in the 6DR4004-8V, -8VK and -8VL mounting kits for NAMUR linear actuators ▶ **6DR4004-3M**

Mounting kit for other linear actuators

- Masoneilan type 37/38, size 6 to 51 mm (<2 inch) ▶ **TGX:16152-595**
- Masoneilan type 87/88 ▶ **TGX:16152-1210**
- Masoneilan type 37/38, size 51 to 254 mm (>2 inch) ▶ **TGX:16152-1215**
- Fisher type 657/667, size 30 to 80 ▶ **TGX:16152-110**
- Samson actuator type 3277 yoke dimension = 101 mm (integrated connection without tube), not for Ex d ▶ **6DR4004-8S**

OPOS Interface according to VDI/VDE 3847

- OPOS adapter with interface VDI/VDE 3847, blanketing, not for flameproof enclosures ▶ **6DR4004-5PB**
- OPOS/NAMUR mounting kit with short lever for installation according to NAMUR or integrated installation without pipe ▶ **6DR4004-5PL**

Connection block, for safety solenoid valve with extended mounting flange to NAMUR

- For mounting to IEC 534-6 ▶ **6DR4004-1B**
- For SAMSON actuator (integrated mounting) see above ▶ **6DR4004-1C¹⁾**

Documentation

The entire documentation is available for download free-of-charge in various languages at:

<http://www.siemens.com/processinstrumentation/documentation>

SIPART PS2 Compact Instruction Manual

- English, French, German, Spanish, Italian, Dutch ▶ **A5E03436620**
- Estonian, Latvian, Lithuanian, Polish, Romanian, Croatian ▶ **A5E03436655**
- Bulgarian, Czech, Finnish, Slovakian, Slovenian ▶ **A5E03436664**
- Danish, Greek, Portuguese, Swedish, Hungarian ▶ **A5E03436683**

SITRANS I100 output isolator HART

(see "SITRANS I supply units and isolation amplifiers") with

- 24 V DC auxiliary power ▶ **7NG4124-0AA00**

SITRANS I200 output isolator HART

(see "SITRANS I supply units and isolation amplifiers") with

- 24 V DC auxiliary power ▶ **7NG4131-0AA00**

HART modem for connecting to PC or laptop

- with USB interface ▶ **7MF4997-1DB**

▶ Available ex stock

¹⁾ Only together with 6DR4004-8S

Scope of delivery for positioner

- 1 SIPART PS2 positioner as ordered
- 1 DVD with the complete documentation for all versions and accessories
- Getting Started "SIPART PS2 – Operation - a concise overview"

Selection and ordering data

Article No.

NCS-Sensor spare parts

Magnet holder made of fiberglass-reinforced polyester including magnet for non-contacting position detection for part-turn actuators

A5E00078030

Magnet holder made of anodized aluminum including magnet for non-contacting position detection for part-turn actuators

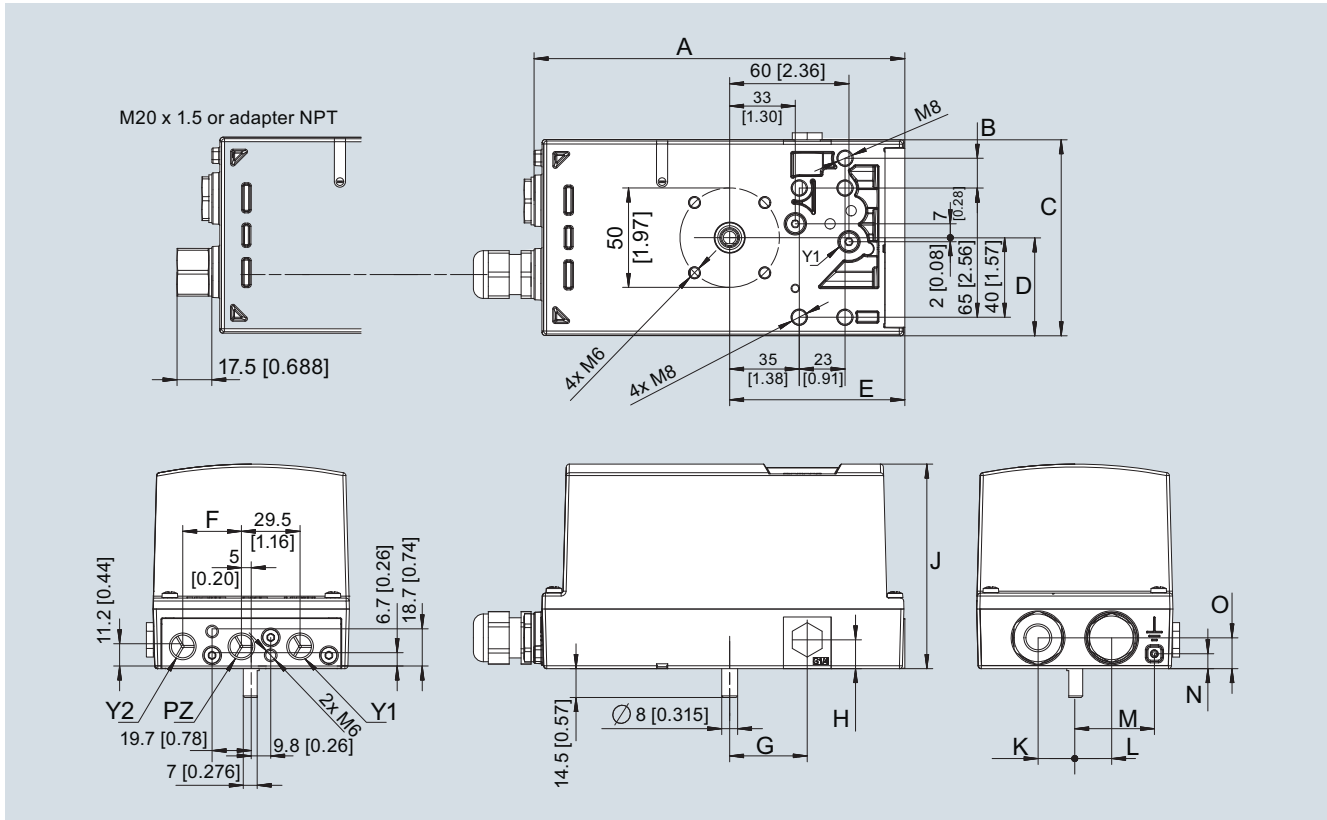
A5E00524070

Positioners
SIPART PS2

Dimensional drawings

Dimensional drawings

5



Non-flameproof enclosure, dimensions in mm (inch)

Value	6DR5..0		6DR5..1	6DR5..2	6DR5..3	
	G $\frac{1}{4}$	$\frac{1}{4}$ -NPT			G $\frac{1}{4}$	$\frac{1}{4}$ -NPT
A	184.5 (7.26)	186.5 (7.34)	185 (7.28)	186.5 (7.34)	186.5 (7.34)	188.5 (7.42)
B	-	-	-	15 (0.59)	-	-
C	95 (3.74)	-	84 (3.31)	99 (3.90)	-	98.6 (3.88)
D	48 (1.89)	-	34.5 (1.36)	49.5 (1.95)	-	48.6 (1.91)
E	88.5 (3.48)	-	90.5 (3.56)	88.5 (3.48)	-	88.8 (3.50)
F [*]	29.5 (1.16)	-	-	29.5 (1.16)	-	29.5 (1.16)
G	39 (1.54)	-	44 (1.73)	39 (1.54)	-	39 (1.54)
H	14.5 (0.57)	-	16 (0.63)	16 (0.63)	-	14.5 (0.57)
J	96.6 (3.80)	-	96.6 (3.80)	98.5 (3.88)	-	103 (4.06)
K	18.5 (0.73)	-	22 (0.87)	18.5 (0.73)	-	18.5 (0.73)
L	18.5 (0.73)	-	7 (0.23)	18.5 (0.73)	-	18.5 (0.73)
M	-	-	26.5	41.5	-	40
N	-	-	7.5	7.5	-	7.5
O	14.5 (0.57)	-	14.5 (0.57)	14.5 (0.57)	-	15.5 (0.61)

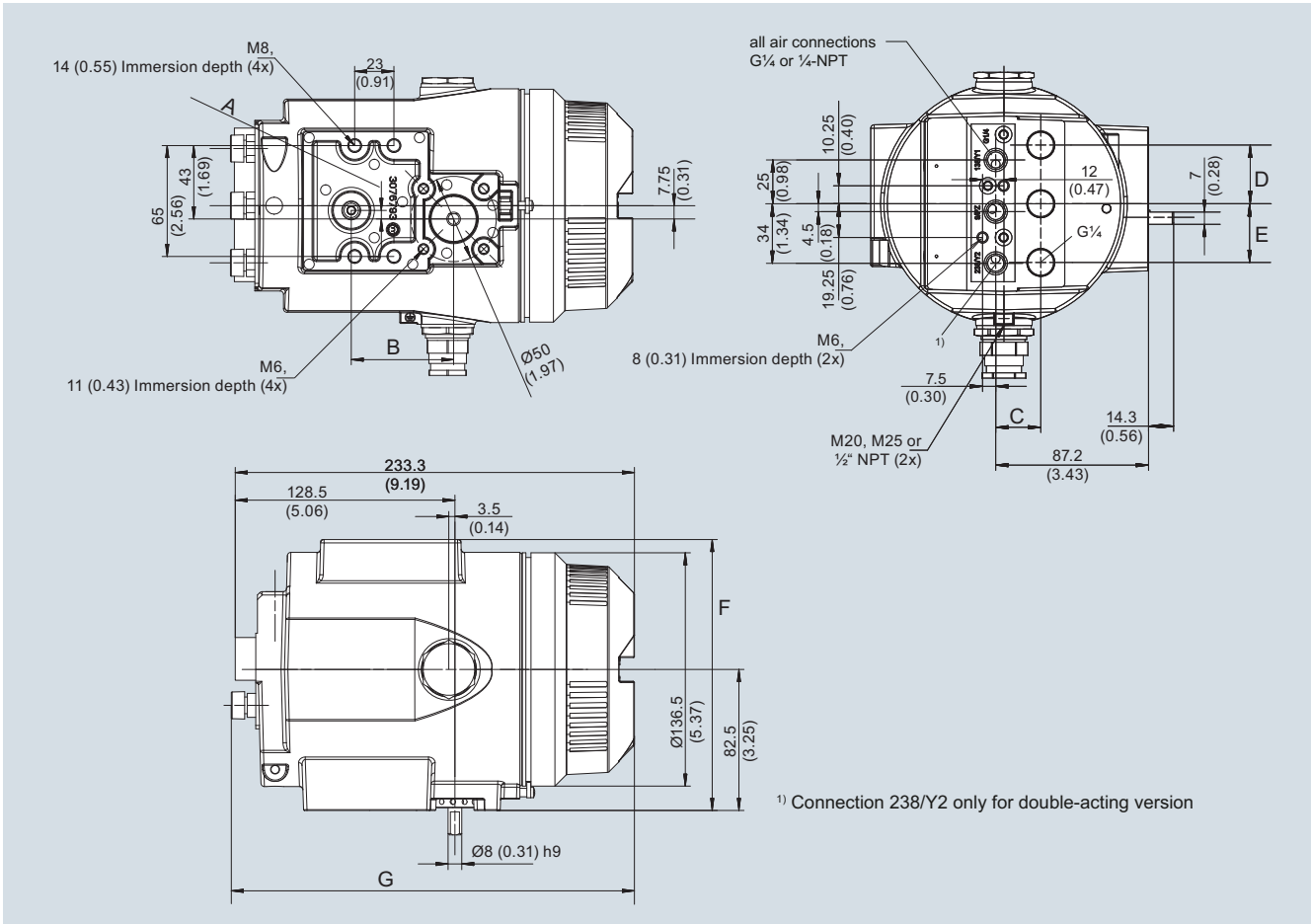
* Dimension does not apply to double-acting actuators

6DR5..0 Polycarbonate enclosure; dimensions with pneumatic connection G $\frac{1}{4}$ or $\frac{1}{4}$ NPT

6DR5..1 Aluminum enclosure, narrow, only single-acting

6DR5..2 Stainless steel enclosure, without inspection window

6DR5..3 Aluminum enclosure; dimensions with pneumatic connection G $\frac{1}{4}$ or $\frac{1}{4}$ NPT

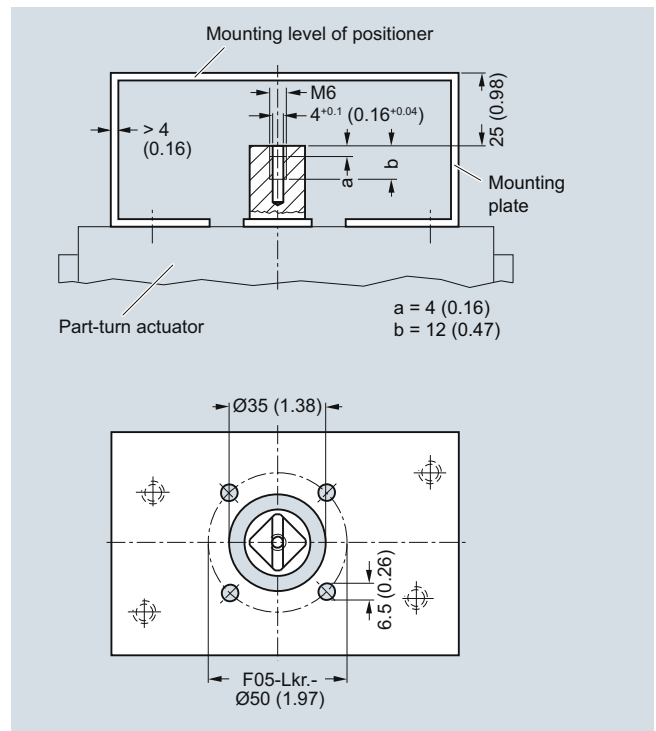


Flameproof enclosure, dimensions in mm (inch)

Maß	6DR5..5	6DR5..6
A	5 (0.2)	-
B	60 (2.36)	-
C	25.7 (1.01)	21.7 (.85)
D	33.5 (1.32)	25 (0.99)
E	33.5 (1.32)	-
F	158.5 (6.24)	160 (6.3)
G	235.3 (9.26)	227.6 (8.96)

6DR5..5 Aluminum enclosure, flameproof; dimensions with pneumatic connection G $\frac{1}{4}$ or $\frac{1}{4}$ NPT

6DR5..6 Stainless steel enclosure, flameproof



Mounting onto part-turn actuators; mounting consoles (scope of delivery of actuator manufacturer), extract from VDI/VDE 3845, dimensions in mm (inch)

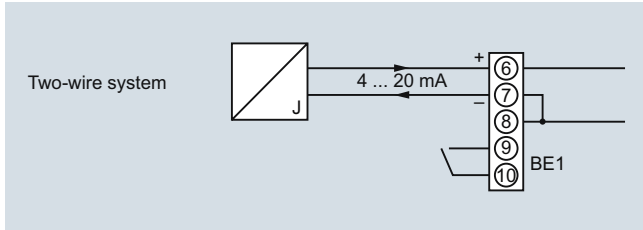
Positioners SIPART PS2

Schematics

Schematics

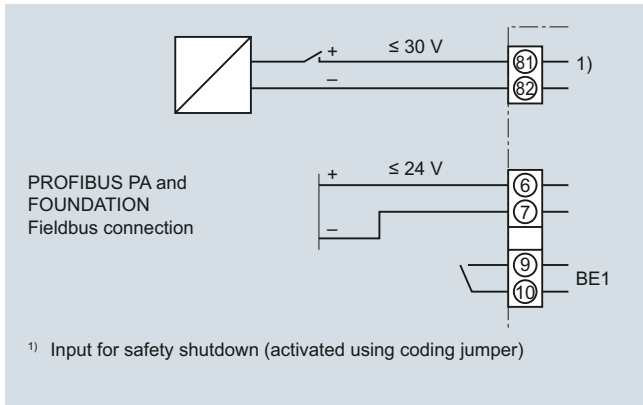
Electric connection of 2-wire devices (6DR50.. and 6DR51..)

Devices of types 6DR50.. and 6DR51.. are operated in a 2-wire system.



SIPART PS2 electropneumatic positioner, input circuit for 6DR50.. and 6DR51..

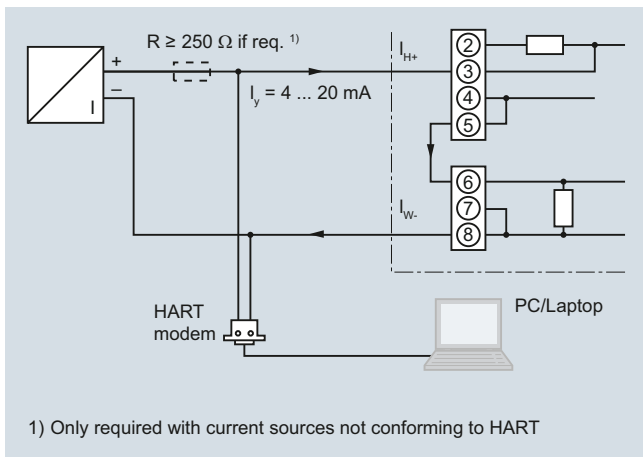
Electric connection of PROFIBUS PA device (6DR55..) and FOUNDATION Fieldbus device (6DR56..)



SIPART PS2 PA and SIPART PS2 FF electropneumatic positioner, input circuit for 6DR55.. and 6DR56..

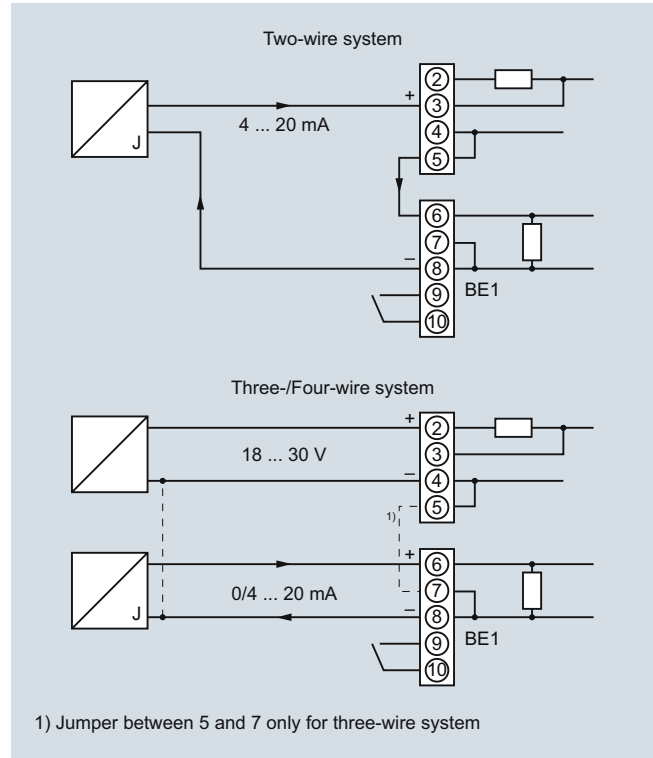
Electric connection of 2-, 3- and 4-wire device (6DR52.. and 6DR53..)

Devices of types 6DR52.. and 6DR53.. can be operated in a 2-, 3- and 4-wire system.



1) Only required with current sources not conforming to HART

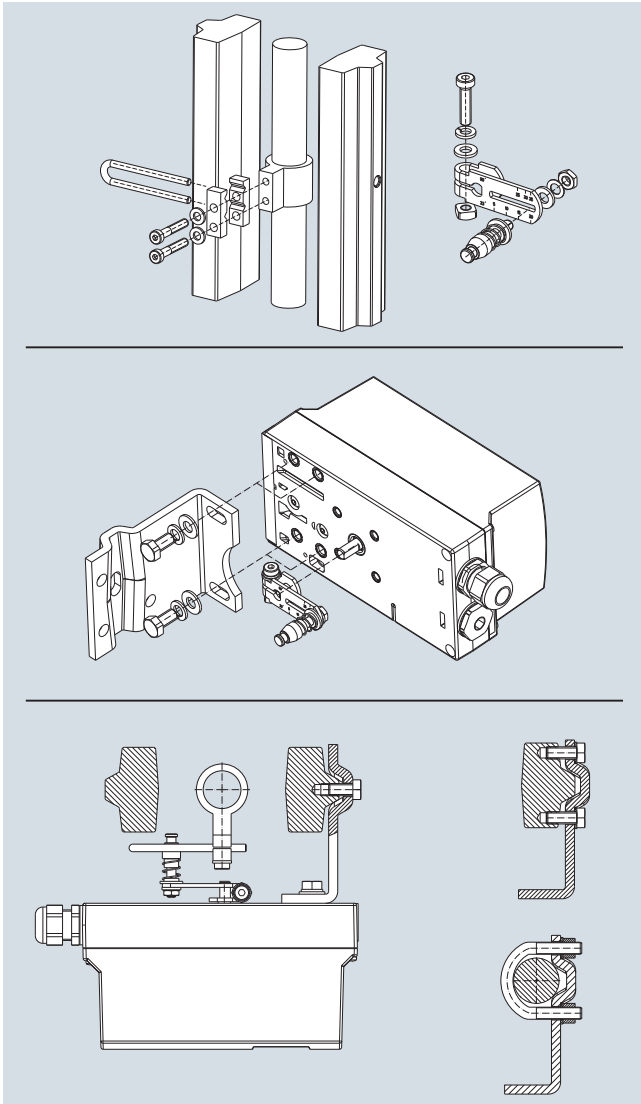
SIPART PS2 electropneumatic positioner, example of connection for communication through HART for 6DR52..



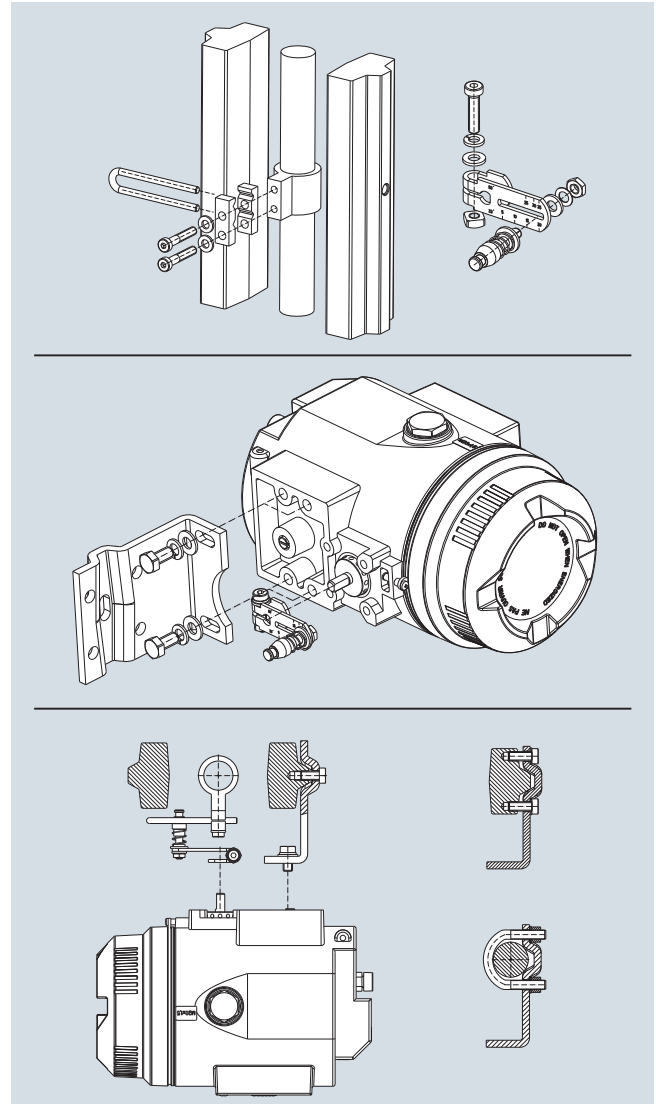
SIPART PS2 electropneumatic positioner, input circuits for 6DR52.. and 6DR53..

Mounting kit for NAMUR linear actuators

- 1 mounting bracket
- 2 mounting prisms
- 1 U-bracket
- 1 lever arm with adjustable pick-up roll
- 2 U-bolts
- Various screws and lock washers



Mounting of SIPART PS2 on linear actuators



Mounting of SIPART PS2 in flameproof aluminum enclosure on linear actuators

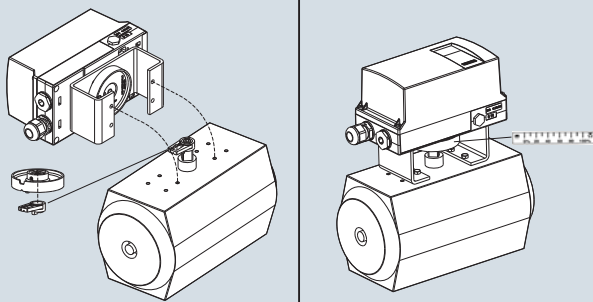
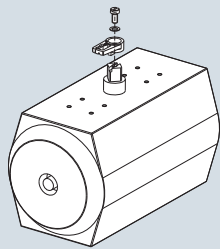
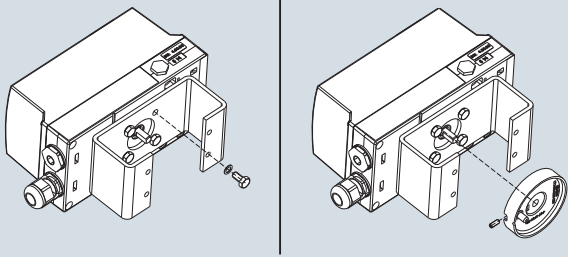
Positioners

Notes

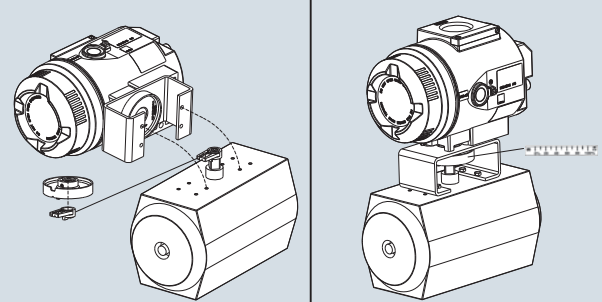
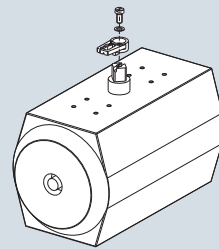
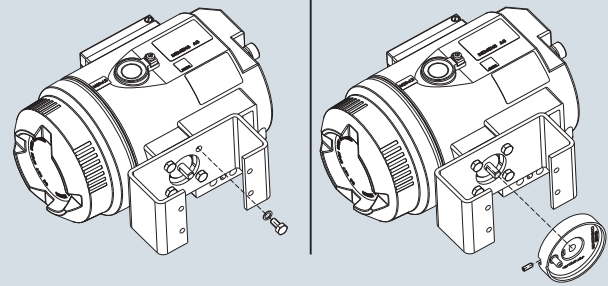
Mounting kit for NAMUR part-turn actuators

- 1 coupling wheel
- 1 driver pin
- 8 scales
- 1 pointer
- Various screws and lock washers

Caution: The mounting consoles and the screws for mounting onto the part-turn actuator are not included in the scope of delivery and must be provided by the customer (see "Technical specifications")



Mounting of SIPART PS2 on part-turn actuators



Mounting of SIPART PS2 in flameproof aluminum enclosure on part-turn actuators

More information

Special versions

On request

Process Protection



6/2	Overview
6/3	Acoustic and motion sensing
6/5	Acoustic sensors for pump monitoring SITRANS DA400 acoustic diagnostic unit
6/10 6/14	Acoustic sensors for material flow monitoring SITRANS AS100 acoustic sensor SITRANS CU02 control unit
6/17 6/23 6/25	Motion sensors Milltronics MFA 4p motion failure alarm controller Milltronics MSP-7 motion sensor SITRANS WM100 motion sensor

You can download all instructions, catalogs and certificates for Process Protection free of charge at:
www.siemens.com/processprotection

Process Protection

Overview

Overview

	Application	Device description	Page
Acoustic sensor for pump monitoring			
	Acoustic diagnostics unit for flow valve leakage monitoring in oscillating displacement pumps or for material flow monitoring of bulk solids in pipes, conveyors or raceways.	SITRANS DA400 <ul style="list-style-type: none"> • 4 inputs for structure-born noise sensors • 4 universal inputs • 6 digital outputs • With PROFIBUS DP or PROFIBUS PA • Sensor degree of protection IP66/IP68 	6/5
Acoustic sensors for material flow monitoring			
	Acoustic sensor for solids flow detection	SITRANS AS100 <ul style="list-style-type: none"> • Non-invasive • Screw in, bolt on, weld, or bond in place • Analog output • High and low sensitivity range of operation 	6/10
	Alarm control unit for use with SITRANS AS100 acoustic sensor to provide reliable continuous protection for bulk solid flow It processes signals from the sensor, providing relay and analog outputs for interface into a process.	SITRANS CU02 <ul style="list-style-type: none"> • 3 digit LCD display • 4 ... 20 mA output • Two programmable relays • Adjustable independent time delay for each relay • DIN rail mounting provides easy installation 	6/14
Motion sensors			
	Highly sensitive single set point motion sensor alarm unit, used with MSP probes	Milltronics MFA 4p <ul style="list-style-type: none"> • Probe/target separation up to 100 mm (4 inch) • Minimum velocity of moving ferrous target: 1 cm/sec. (2 fpm) 	6/17
	Heavy duty 3-wire motion sensor that provides an NPN open collector output to PLCs.	Milltronics MSP-7 <ul style="list-style-type: none"> • Up to 100 mm (4 inch) gap between target and probe • Corrosion resistant construction 	6/23
	Heavy-duty zero speed alarm switch	SITRANS WM100 <ul style="list-style-type: none"> • Detects the absence or presence of motion of rotating or reciprocating or conveying equipment 	6/25

Product documentation on DVD and Safety Note



Siemens products for process instrumentation will be delivered with a multi-language **Safety note** and a **Mini DVD - Process Instrumentation and Weighing Systems**.

On the DVD, customers can find many important operating instructions and certificates of our Siemens portfolio for process instrumentation and weighing systems.

Additionally, product or order-specific print material might be part of the delivery.

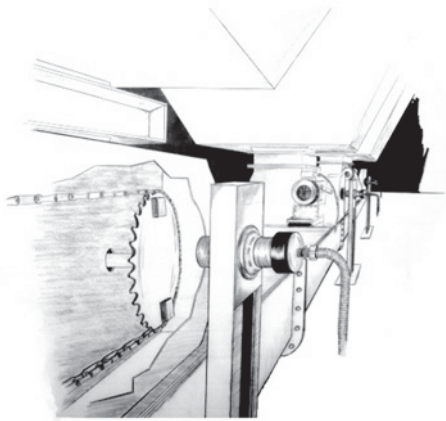
For further information see appendix page 10/11.

Overview

Process protection devices act as early warning systems to avoid costly process interruptions and breakdowns of equipment. Non-contacting motion sensors detect changes in motion and speed of conveying, reciprocating and rotating machinery.

Non-invasive acoustic sensors detect inaudible, high frequency acoustic emissions generated by friction and impact, caused by materials in motion. They can detect conditions of flow/no flow or high/low flow, to warn of blockages, product absence or equipment failure. They are located outside of the process, accurately detecting conditions without wear on the sensor.

Motion sensors can warn in case of equipment malfunction and shut down machinery in case of a slowdown or failure. They are rugged and perform even in harsh industrial conditions. Most of the MFA 4p motion sensing probes, as well as the SITRANS WM100, can be mounted up to 100 mm (4 inch) from the ferrous target, reducing the chance of damage to the probe and the equipment. The probes are not affected by moisture or dust build-up.



Motion sensing on drive shaft of rotary feeder

Mode of operation

Acoustic Sensing

Acoustic sensors monitor high frequency emissions generated by friction and the impact of flowing material or mechanical parts. The sensors can also sense the turbulence of gases or liquids leaking through valves and flanges. When matter vibrates between 0 Hz and 200 kHz, it creates acoustic energy. Sound energy between 20 Hz and 20 kHz can be detected by humans. Acoustic sensors detect high-frequency acoustic energy between 75 kHz and 175 kHz. Acoustic energy travels quickly through dense materials (metal) and poorly through less dense materials (air). Because the acoustic sensors are mounted directly to the external wall of the chute work, other plant noises are well below 75 kHz and effectively ignored by the sensors.

The acoustic sensors contain a specialized piezocrystal and filter circuit that responds effectively to the high-frequency band between 75 kHz and 175 kHz. As the crystal is excited by the acoustic energy, it produces a continuous electrical signal in direct proportion to the level of acoustic energy received. The SITRANS AS100 sensor output of 0 to 10 V DC can be applied to a PLC or to an optional control unit for a programmable alarm relay or 4 to 20 mA signal output.

Motion sensing

Siemens Milltronics probes work on the principle of Faraday's Laws of Electromagnetic Induction. When a ferromagnetic object enters the probe's permanent magnetic field, it distorts the flux, causing its coil windings to generate a voltage. This voltage is proportional to the strength of the magnet and the number of wire turns in the coil (constant in the probes) and the speed at which the ferrous target passes through the flux. The generated voltage is also inversely proportional to the square of the distance between the target and the probe.

The robust motion sensors provide the contacts to shut down machinery whenever under-speed, over-speed or plant equipment failure occurs. On belt, drag and screw conveyors, or on bucket elevators, fans and pumps, the speed alarm option can warn instantly of equipment malfunction. Some probes may be linked to a programmable logic controller to monitor equipment.

Process Protection

Acoustic and Motion sensing

Acoustic and Motion Sensing

Technical specifications

Process Protection Selection Guide

Criteria	SITRANS DA400	SITRANS AS100	Milltronics MFA 4p	Milltronics MSP-7	SITRANS WM100
Typical industries	Mining, water/waste-water, chemicals/petrochemicals and oil & gas industry	Aggregates, grain, cement, food processing, power generation, steel processing	Aggregates, cement, mining, wastewater, grain	General industrial applications	Aggregates, cement, mining
Typical applications	Oscillating displacement pumps such as diaphragm piston pumps, piston pumps and hose-type diaphragm piston pumps. Monitoring of flowing materials in pipes, conveyors or channels.	Pipes, pneumatic conveyors, aerated gravity flow systems, burst filter bag detection	Tail pulleys, driven pulleys, motor shaft sensing, screw conveyor flights, bucket elevators	Tail pulley shafts, driven pulleys, motor shaft sensing, belt or drag conveyors, screw conveyor flights, bucket elevators, fans and pumps	Tail pulleys, driven pulleys, motor shaft sensing, screw conveyor flights, bucket elevators
Operation	Acoustic detection of cavitation, optionally acoustic detection of impact noises of high frequency	Acoustic sensing	Motion sensing	Motion sensing	Motion sensing
Enclosure	Electronics housing, Makrolon IP65, sensor, stainless steel material number W.-Nr. 1.4571 (316Ti SST)	Compact 304 or 303 stainless steel, IP68	Type 4X/NEMA 4X/IP65 polycarbonate	Type 4X/NEMA 4X/IP67 aluminum	Type 4X/NEMA 4X/IP67 aluminum
Sensor mounting	Screw to outside of pump housing. For material flow monitoring on the outside of pipes, channels, chutes or raceways	Sensor non-invasive: glue or weld-on disc, bolt or weld-on tab, drill and tap	Non-contacting probes secured with supplied flange	Non-contacting probe secured with supplied flange	Non-contacting, secured with supplied flange
Operating temperature	Electronics: -20 ... +60 °C (-4 ... +140 °F) Sensor: -20 ... +110 °C (-4 ... +230 °F)	-20 ... +80 °C (-4 ... +176 °F) ¹⁾	-20 ... +50 °C (-4 ... +122 °F) ²⁾	-40 ... +60 °C (-40 ... +140 °F)	-40 ... +60 °C (-40 ... +140 °F)
Power requirements	19 V ... 36 V DC, < 100 mA	20 ... 30 V DC, 18 mA	100/115/200/230 V AC ± 10 % 50/60Hz, 15 VA	21 ... 28 V DC, 40 mA max.	115 or 230 V AC ± 10 % 50/60 Hz, 7 VA
Approvals	CE, PROFIBUS DP, and PROFIBUS PA conform, Ex protection to ATEX 1G or 1D	CE, RCM, CSA/FM Class II, Div. 1, Group E, F, G optional, ATEX II, 2GD, 3D optional, EAC	CSA _{US/C} , CE, RCM	CE, RCM	CSA _{US/C} , CE, RCM

¹⁾ Extended temperature model -40 ... +125 °C (-40 ... +257 °F) available (CE version)

²⁾ Probes available for -40 ... +260 °C (-40 ... +500 °F)

Process Protection

Acoustic sensors for pump monitoring

SITRANS DA400 acoustic diagnostic unit

Overview



The SITRANS DA400 acoustic diagnostic unit acoustically measures the structure-borne noise

- In the version for pump monitoring; on oscillating displacement pumps
- In the version for material flow monitoring; on pipes, conveying equipment or channels.

It comprises an electric diagnostic unit and up to four acoustic sensors.

Benefits

Benefits when pump monitoring

- Increased availability of the system through:
 - Advanced maintenance planning thanks to early recognition of defective components
 - Reduced downtimes (no fault locating necessary)
 - Increased maintenance intervals
 - Greater pump reliability
- Prevention of expensive consequential damage
- Increased safety of critical applications
- Early recognition of a reduction in power
- Increased productivity

Benefits when material flow monitoring

- Detection of insufficient or excessive inflow of material in a liquid or gas flow
- Detection of blockages or clogging
- Reduction of down times
- Increased product quality
- Increased availability
- Guaranteed operational safety
- Increased productivity

Application

In the version for pump monitoring, the SITRANS DA400 allows continuous, simultaneous and independent monitoring of up to four flow control valves in a pump for leaks. In addition, another four inputs are available for monitoring standard signals (e.g. diaphragm and temperature monitoring). This means that the condition of an oscillating displacement pump is monitored in every phase of its operation.

The SITRANS DA400 is used in all industries where an oscillating displacement pump is used.

The version for material flow monitoring monitors the material flow in liquids or gases that is usually as a result of impact or friction, e.g. against the pipe or channel wall.

If the acoustic diagnostic unit is used in potentially explosive areas, the sensors as well as the acoustic diagnostic unit can be installed in the Ex-zone.

If using the unit in potentially explosive areas, you have two options:

- Operation of the sensors over the safety barriers or
- Operation of the sensors over the SITRANS DA400 with explosion protection

Function

Product features

Continuous and independent status monitoring:

- Of the flow control valves, for leaks
- Of the membranes, for material fatigue
- Of the temperature loading of the hydraulic oil
- Of flowing bulk solids in pipes, conveying equipment or channels

Communication of the status to superordinate control systems:

- Via digital outputs
- Digitally, via PROFIBUS DP or PROFIBUS PA

Simple to operate and parameterize:

- Locally, via digital display and keys
- PROFIBUS DP and PROFIBUS PA

Mode of operation

Principle of measurement

Leaks in the flow control valves of oscillating displacement pumps are flows in which cavitation occurs. This results in sound waves that are transmitted to the valve housing, where they are recorded by the structure-borne sound sensor in the SITRANS DA400 on the outside.

The SITRANS DA400 utilizes the fact that with both an open valve and a closed intact valve, no cavitation occurs and the measured sound level thus corresponds to the operating noise of the pump. By contrast, with a closed defective valve cavitation does occur, which can be identified by a period increase in the sound level (see figures). The measured value from the SITRANS DA400 corresponds exactly to this increase in the sound level.

In the version for material flow monitoring, SITRANS DA400 continuously detects high-frequency acoustic oscillations by means of structure-born noise sensors.

Process Protection

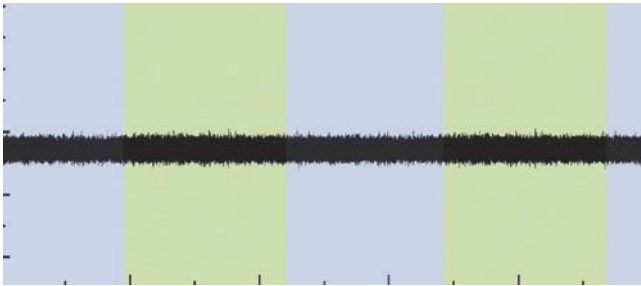
Acoustic sensors for pump monitoring

SITRANS DA400 acoustic diagnostic unit

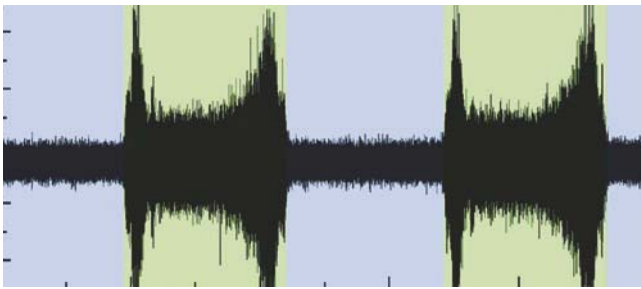
These oscillations are created by:

- Friction and impact of bulk solids in:
 - pipes, raceways or channels
 - chutes
 - conveyors
- Friction and impact of mechanical parts
- Bursting of bubbles
- Cavitation
- Turbulence in gas and liquid flows

The following shows an example of signal levels at an oscillating displacement pump



Signal from structure-borne sound sensor with intact valve



Signal from structure-borne sound sensor with defective valve

Sensor operation

The structure-borne sound sensor works on the piezoelectric principle. The structure-borne sound is injected into the sensor via the sensor base (mounting surface) and inside it is converted into an electrical voltage by a piezo-ceramic element. This is amplified in the sensor and transmitted via the cable.

The sensor frequency range lies in the ultrasonic range (> 20 kHz). The sensor is non-directional, i.e. the angle at which the sound wave impacts on the sensor base is not important.

Mode of operation of the safety barrier

The safety barrier comprises intrinsically-safe circuits. These circuits serve to operate intrinsically-safe components such as sensors and to isolate safety from the non-hazardous area with the SITRANS DA400 diagnostic unit.

Technical specifications

SITRANS DA400	Without Ex protection	With Ex protection
Input		
Acoustic channels		4
• Cycle time		10 ms
Only for connection to intrinsically safe sensors with:		
• Max. voltage U_o	-	≤ 5.5 V
• Max. current I_o	-	≤ 70 mA
• Max. power P_o	-	≤ 100 mW
• Internal capacitance C_i	-	≤ 1.2 μ F
• Internal inductance L_i	-	Negligible
Universal inputs		4
• Cycle time		80 ms
• Low pass filter time		1 s
Universal analog current input		
• Load	< 105 Ω	< 12 Ω
• Resolution		0.1 %
• Accuracy		0.5 %
• Fault signal	> 21 mA or < 3.6 mA (at 4 ... 20 mA)	
• Alarm monitoring hysteresis		0.5 %
• Static destruction limit	40 mA, 4 V	-
For connection with approved intrinsically safe circuits with:		
• Max. supply voltage U_i	-	≤ 30 V
• Max. short-circuit current I_i	-	≤ 100 mA
• Max. power P_{oi}	-	≤ 1 W
• Internal capacitance C_i	-	≤ 11 nF
• Internal inductance L_i	-	≤ 70 μ H
Universal input 24 V digital signal		
• Input resistance		> 19 k Ω
• Signal level Low		< 4.5 V or open
• Signal level High		> 7 V
• Hysteresis		> 1 V
• Static destruction limit	± 40 V	-
For connection with approved intrinsically safe circuits with:		
• Max. supply voltage U_i	-	≤ 30 V
• Max. short-circuit current I_i	-	≤ 100 mA
• Max. power P_{oi}	-	≤ 1 W
• Internal capacitance C_i	-	≤ 11 nF
• Internal inductance L_i	-	≤ 70 μ H

Process Protection

Acoustic sensors for pump monitoring

SITRANS DA400 acoustic diagnostic unit

SITRANS DA400	Without Ex protection	With Ex protection
Universal input closing contact <ul style="list-style-type: none"> For connection to closing contact with the maximum values: <ul style="list-style-type: none"> Max. voltage U_o Max. current I_o Max. power P_o Internal capacitance C_i Internal inductance L_i 	-	<ul style="list-style-type: none"> ≤ 10 V ≤ 1 mA ≤ 5 mW ≤ 11 nF ≤ 70 μH
8.2 V source for NAMUR signal (DIN EN 60947-5-6) <ul style="list-style-type: none"> Open circuit voltage Input resistance Static destruction limit for incorrect wiring 	8.2 V \pm 0.3 V, short-circuit proof < 950 Ω +20 V/-10 V	-
Output		
Digital outputs	6	6 (applicable for NAMUR switch hardener)
<ul style="list-style-type: none"> Semiconductor relay Switching voltage Destruction limit Max. switching current Signal status Low (no response) Signal status High (response) 	Individually isolated, short circuit-proof 24 V AC/36 V DC, any polarity 35 V AC, 50 V DC 100 mA	-
For connection with an intrinsically safe switching amplifier to DIN 19234 with: <ul style="list-style-type: none"> Max. supply voltage U_i Max. short-circuit current I_i Max. power P_{oi} Internal capacitance C_i Internal inductance L_i 	-	<ul style="list-style-type: none"> ≤ 1.2 mA (source to DIN 19234) ≥ 2.1 mA (source to DIN 19234) ≤ 15.5 V ≤ 25 mA ≤ 64 mW ≤ 5.2 nF Negligible
Conditions of use		
Installation conditions	Vertical wall mounting, cables fed in from below	
Climatic class	Class 4K4 according to EN 60721-3-4	
Mounting location	-	Zone 1 or zone 2
Permissible ambient temperature	-20 ... +60 °C (-4 ... +140 °F)	-
<ul style="list-style-type: none"> Temperature class T5 – T1 Temperature class T6 	-	<ul style="list-style-type: none"> -20 ... +60 °C (-4 ... +140 °F) -20 ... +50 °C (-4 ... +122 °F)
Mechanical load	Class 4M3 according to EN 60721-3-4	
Degree of protection to EN 60529	IP65	

SITRANS DA400	Without Ex protection	With Ex protection
Electromagnetic Compatibility	To EN 61326 and NAMUR NE 21	
• Emitted interference and interference immunity Usage limits for water <ul style="list-style-type: none"> Delivery side Number of strokes 	<ul style="list-style-type: none"> ≥ 10 bar a Min. 4 min⁻¹, max. 10 ... 500 min⁻¹ 	
Design		
Weight (without options)	Approx. 2.5 kg	
Dimensions (W x H x D) in mm (inch)	172 x 320 x 80 (6.8 x 12.6 x 3.2)	
Enclosure material	Macrolon (polycarbonate + 20 % glass fiber)	Makrolon (Polycarbonate + 20 % glass fibers), surface attenuated with CrNi layer and painted
Electrical connection via screw terminals	<ul style="list-style-type: none"> Rigid 2.5 mm (0.984 inch) Flexible 1.5 mm (0.59 inch) Flexible with connector sleeves 1.5 mm (0.59 inch) 	
Cable inlet via plastic cable joints	<ul style="list-style-type: none"> 2 x Pg 13.5 5 x Pg 11 	
Power supply		
Rated voltage	24 V DC	16 V DC
Operating range	19 ... 36 V DC	15 ... 17 V DC
Current consumption	< 100 mA	< 40 mA
For connection with approved intrinsically safe circuits with:		
<ul style="list-style-type: none"> Max. supply voltage U_i Max. short-circuit current I_i Max. power P_{oi} Internal capacitance C_i Internal inductance L_i 	-	<ul style="list-style-type: none"> ≤ 17.4 V ≤ 191 mA ≤ 1.35 W ≤ 33 nF ≤ 28 μH
Certificates and approvals		
Explosion protection to EN 50014, EN 50020 and EN 50021		
Intrinsic safety "i"	-	TÜV (German Technical Inspectorate) 06 ATEX 2952
Marking	-	II 2(1) G EEx is [ia] IIC T6
Communication		
PROFIBUS DP	RS 485, switchable terminating resistor	
Protocol	Cyclic with Master C1 and acyclic with Master C2	
Power supply	-	Bus-supplied
Bus voltage	-	9 ... 24 V
Current consumption	-	10.5 mA \pm 10 %

Process Protection

Acoustic sensors for pump monitoring

SITRANS DA400 acoustic diagnostic unit

SITRANS DA400	Without Ex protection	With Ex protection
Bus connection with FISCO supply unit, ia/ib group IIC or IIB	-	Yes
Layer 1 and 2 from PROFIBUS PA, transfer technology from IEC 1158-2	-	
• C2 connections	-	4 connections are supported in master class 2
• Device profile	-	PROFIBUS PA Profil V3.0 Rev. 1, Class B
• Device address	-	1 ... 126 (126 factory-set)
PC parameterization software	SIMATIC PDM (not included in the scope of delivery)	

Sensor for SITRANS DA400

Setup	<ul style="list-style-type: none"> • Piezoceramic sensor with pre-amplifier • Encapsulated electronics • 4-wire cable with anti-kink sleeve
Conditions of use	
Permissible ambient temperature	-40 ... +110 °C (-40 ... +230 °F)
Degree of protection to EN 60529	P66/IP68
Mechanical load	Class 4M7 according to EN 60721-3-4
Climatic class	Class 4K4 according to EN 60721-3-4
Design	
Housing material	Stainless steel 1.4571 (316Ti SST)
Cable	Ends with wire protectors and cable shoe for connection to the SITRANS DA400
Weight	125 g (0.276 lb)
Mounting location	Zone 0/1 or zone 20/21/22
Dimensions (W x H x D) in mm (inch)	26 x 29 x 40 (1.02 x 1.14 x 1.57)
Power Supply	Power fed from device
Certificates and approvals	
Explosion protection	
Intrinsic safety "i"	TÜV 2005 ATEX 2876 X
Marking	II 1 G EEx ia IIC T6/T5/T4 or II 1 D EEx ia D 20/21/22 T160
Permissible ambient temperature	
• Category 1G	
- Temperature class T4, T5	-20 ... +60 °C (-4 ... +140 °F)
- Temperature class T6	-20 ... +50 °C (-4 ... +122 °F)
• Category 2G	
- Temperature class T4	-40 ... +110 °C (-40 ... +230 °F)
- Temperature class T5	-40 ... +80 °C (-40 ... +176 °F)
- Temperature class T6	-20 ... +65 °C (-4 ... +149 °F)
• Category 1D or 2D	
- Temperature class T160	-40 ... +110 °C (-40 ... +230 °F)

Ex barriers for sensors	
Application area	For the intrinsically safe supply of the acoustic sensors in zone 1; the safety barriers must be installed between the SITRANS DA400 acoustic diagnostic unit and the sensor if only the sensors are being operated in the Ex zone.
Input	A maximum of two sensors can be connected.
Conditions of use	
Degree of protection to EN 60529	IP20
Permissible Ambient Temperature	-20 ... +60 °C (-4 ... +140 °F)
Design	
Weight	115 g (0.254 lb)
Housing material	Plastic, polyamide
Type of installation	Installation on mounting rail NS 32 or NS 35/7.5. The acoustic diagnostic unit SITRANS DA400 and the safety barrier must be operated outside the Ex zone.
Dimensions (W x H x D) in mm (inch)	68 x 77 x 42 (2.68 x 3.03 x 1.65)
Certificates and Approvals	
Explosion protection	
Intrinsic safety "i"	TÜV 05 ATEX 2917 X
Marking	II (2) G [EEx ib] IIC

Selection and Ordering data	Article No.
Acoustic diagnostics unit SITRANS DA400 with local programming and display	7MJ2400- A0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Communication	
• PROFIBUS DP	1
• PROFIBUS PA	2
Explosion protection	
• Without	A
• With EEx ia/ib to ATEX ¹⁾	B
Application software	
For continuous condition monitoring of positive displacement pumps	1
For material flow monitoring in pipes, raceways and conveyors	2
Acoustic sensors for diagnostics unit SITRANS DA400	7MJ2000-1 0 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Explosion protection	
• Without	A
• With EEx ia to ATEX	B
Cable (incl. pin and allen screw M6)	
20 m	B
40 m	C
100 m	F
Safety barriers for sensors	7MJ2010-1AA
For rail mounting NS 32 and NS35/7.5 in non-hazardous areas Explosion-protected output circuit EEx ib	

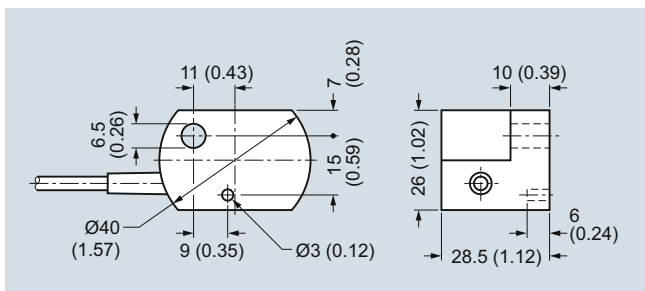
1) Not in combination with trigger sensor.

Process Protection

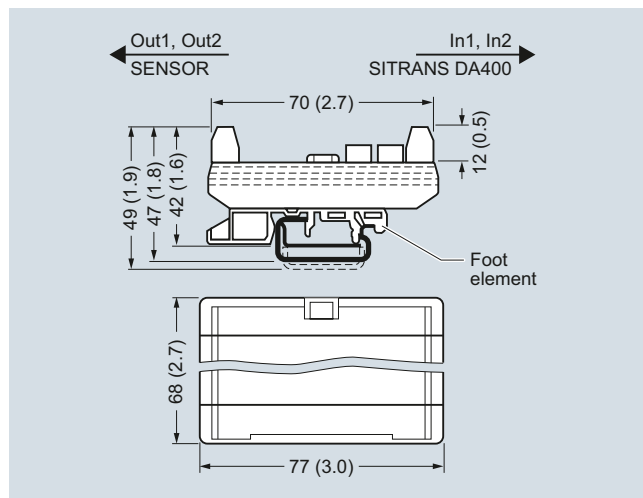
Acoustic sensors for pump monitoring

SITRANS DA400 acoustic diagnostic unit

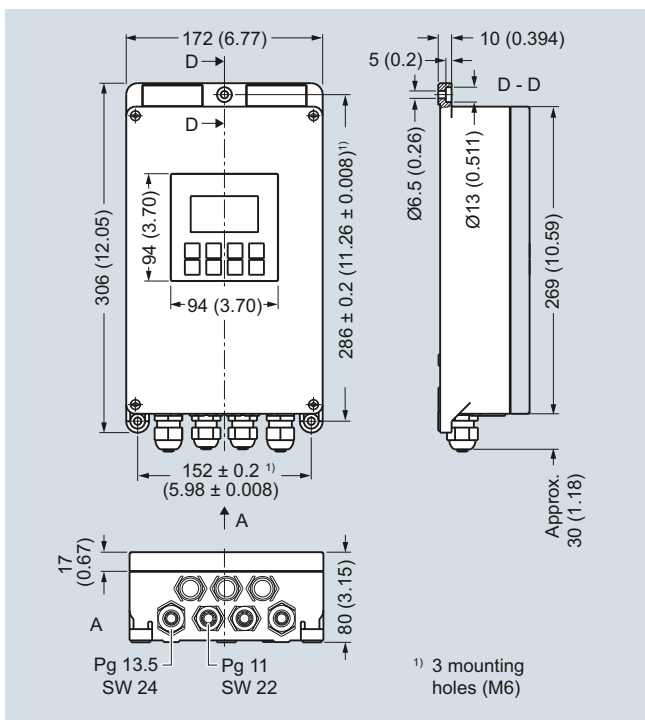
Dimensional drawings



Sensor for SITRANS DA400, dimensions in mm (inch)

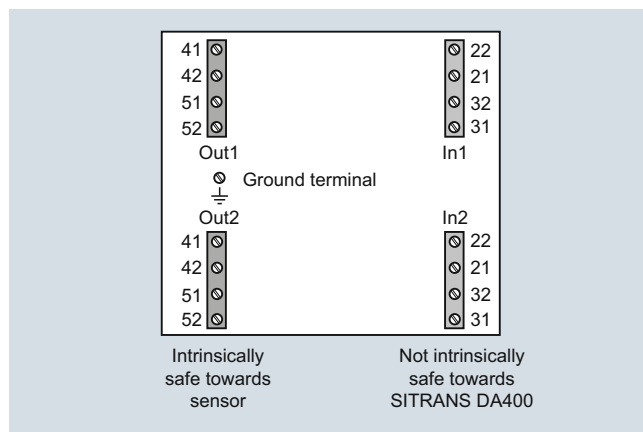


Safety barrier for SITRANS DA400, dimensions in mm (inch)



SITRANS DA400, dimensions in mm (inch)

Schematics



Safety barrier for SITRANS DA400, terminal assignment

	DO 1	DO 2	DO 3	Sens 3	Sens 4	In 3	In 4	PROFIBUS
L+ L-	31 32	41 42	51 52	yl gr br bl	yl gr br bl	I+ ⊥ DI 8V	I+ ⊥ DI 8V	A B
11 12	81 82	71 72	61 62	15 16 17 18	25 26 27 28	55 56 57 58	65 66 67 68	91 92
Supply	DO 6	DO 5	DO 4	yl gr br bl	yl gr br bl	I+ ⊥ DI 8V	I+ ⊥ DI 8V	A B
24V				Sens 1	Sens 2	In 1	In 2	PROFIBUS
DC								

- L+/L- Power supply (Any polarity with PROFIBUS PA)
- DO Digital output
- Sens Sensor
- In Input
- yl Yellow
- gr Green
- br Brown
- bl Black
- I+ Analog current input +
- ⊥ Ground
- DI Digital input
- A Signal A (green) with PROFIBUS DP, any with PROFIBUS PA
- B Signal B (red) with PROFIBUS DP, any with PROFIBUS PA

SITRANS DA400, terminal assignment

Process Protection

Acoustic sensors for material flow monitoring

SITRANS AS100 Acoustic sensor

Overview



SITRANS AS100 is an acoustic sensor used for solids flow detection.

Benefits

- Non-invasive
- Screw in, bolt on, weld, or bond in place
- Analog output
- High and low sensitivity range of operation

Application

SITRANS AS100 detects changes in high frequency sound waves from equipment and materials in motion. It detects and reacts instantly to changes in solids flow to warn of blockages, product absence, or equipment failure such as burst filter bags. This allows an operator to take early preventative action and avoid costly damage.

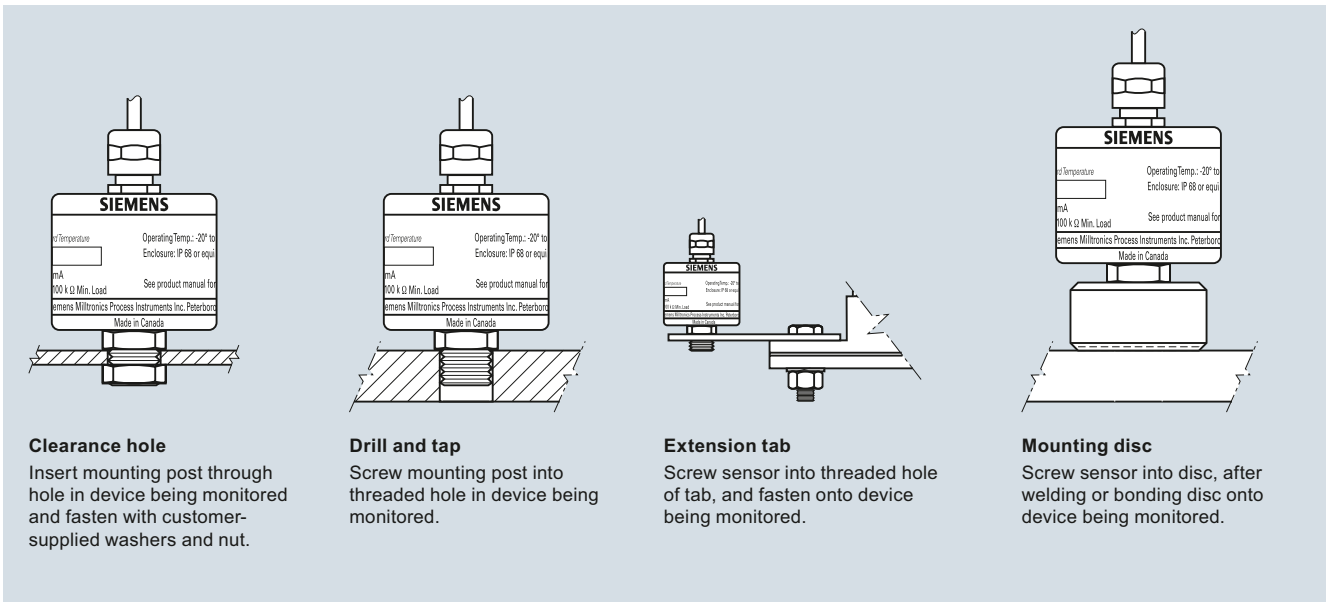
Common applications include pellets, powders and most bulk solids in pipes, chutes, vibratory feeders, pneumatic conveyors or aerated gravity flow systems.

Operating with a SITRANS CU02 control unit, the system detects conditions of high flow, low flow or no flow. It can be added to a control loop via a 4 to 20 mA output. Two relays are fully programmable and independent of each other and can be used to operate an alarm or control device.

With no moving parts and a type 304 or 303 stainless steel enclosure sealed against dust and moisture, this non-invasive unit requires little or no maintenance. With a dual operating range, the sensor offers an exceptionally wide range of application capabilities.

- Key Applications: pipes, chutes, vibratory feeders, aerated gravity flow systems, burst filter bag detection

Design



SITRANS AS100 mounting

Process Protection

Acoustic sensors for material flow monitoring

SITRANS AS100 Acoustic sensor

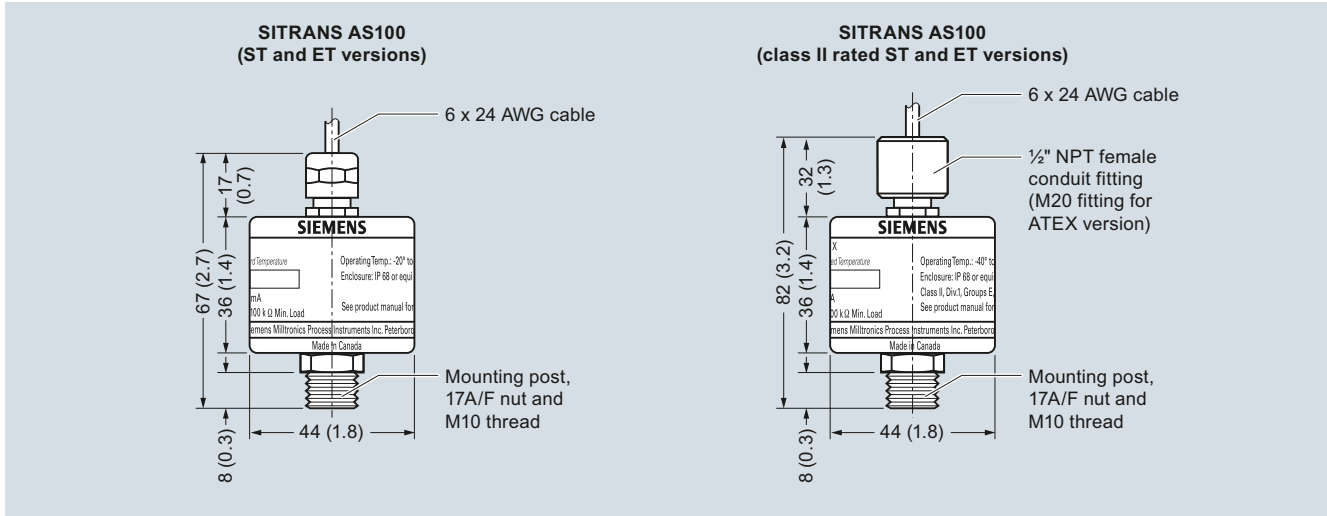
Technical specifications		Selection and Ordering data		Article No.
Mode of Operation		SITRANS AS100 Acoustic Sensor		7MH7560-
Operating principle	Acoustic sensing of high frequency emissions caused by impact or friction	An acoustic sensor used for solids flow detection.		0
Typical application	<ul style="list-style-type: none"> • Detects burst filter bags in dust collection systems • Detects material being conveyed in pneumatic conveyor lines • Route confirmation in chute work 	↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Model		Sensor		
Standard	Standard operating temperature range	Standard temperature range [-20 ... +80 °C (-4 ... +176 °F)] ¹⁾	1	
Extended	Extended operating temperature range	Extended temperature range [-40 ... +125 °C (-40 ... +257 °F)] ²⁾	3	
Operation		Extended temperature range [-30 ... +120 °C (-22 ... +248 °F)] ³⁾		4
Relative sensitivity	0.5 %/°C of reading, average over the operating range	Cable Length		A
Outputs	Analog, 0.08 ... 10 V DC nominal, 100 kΩ minimum load impedance	Sensor Mounting		A
Rated operating conditions		None		B
Amb. temperature for enclosure		Mounting disk		C
• Standard	-20 ... +80 °C (-4 ... +176 °F)	Mounting tab		
• Extended	<ul style="list-style-type: none"> • -40 ... +125 °C (-40 ... +257 °F) (CE only) • -30 ... +120 °C (-22 ... +248 °F) option 	Approvals		
Design		CE, RCM		1
Weight	0.4 kg (1 lb)	CSA/FM Class II, Div. 1, Group E, F, and G (includes ½" NPT female fitting)		3
Enclosure	Enclosure: 304 (1.4301) stainless steel [303 stainless steel (1.4305) on Class II version, aluminum 231 on 2GD version]	CSA Class II, Div. 1, Group E, F, and G (includes ½" NPT female fitting)		4
Degree of protection	IP68 (waterproof)	CE, RCM, FM/CSA Class II, Div. 1, Group E, F and G, ATEX II 3D (includes M20 female fitting)		5
Cable		ATEX II 2GD, c/w cable gland ⁴⁾		6
• Standard	4 m (13 ft) cable, PVC jacketed, 3 twisted pairs, 24 AWG (0.25 mm ²), shielded	1) Available with approval options 1, 3, 5, and 6 only		
• Extended	4 m (13 ft) cable, thermoplastic elastomer jacketed, 6 conductor, 24 AWG (0.25 mm ²) conductor, shielded	2) Available with approval option 1 only		
Power supply		3) Available with approval option 4 only		
20 ... 30 V DC, 18 mA (typical)		4) Available with sensor option 1 only and sensor mounting option A only		
Certificates and approvals		Selection and Ordering data		Order code
CE, RCM CSA/FM Class II, Div. 1, Group E, F, and G (optional), ATEX II 2GD (optional), ATEX II 3D (optional), EAC		Further designs		
		Please add "-Z" to Article No. and specify Order code(s).		
		Manufacturer's test certificate: According to EN 10204-2.2		C11
		Acrylic coated, stainless steel tag [12 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text		Y17
		Operating Instructions		
		All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation		
		Spare Parts		Article No.
		Mounting tab		7MH7723-1AA
		Mounting disk		7MH7723-1AB
		½" NPT adapter kit for standard temperature range sensor, not Class II approved		7MH7723-1BW
		M20 adapter kit for standard temperature range sensor, not Class II or ATEX approved		7MH7723-1BV
		½" NPT adapter kit for extended temperature range sensor, not Class II approved Note: Adapter kits are not CSA Class II approved		7MH7723-1BX
		◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.		

Process Protection

Acoustic sensors for material flow monitoring

SITRANS AS100 Acoustic sensor

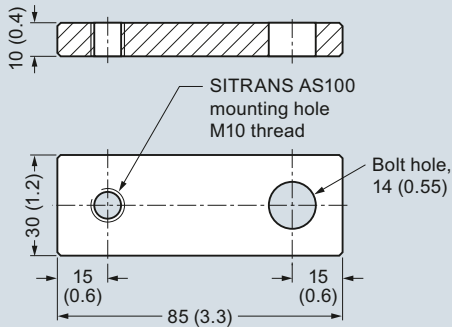
Dimensional drawings



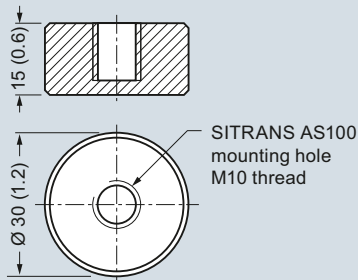
SITRANS AS100, dimensions in mm (inch)

Accessories

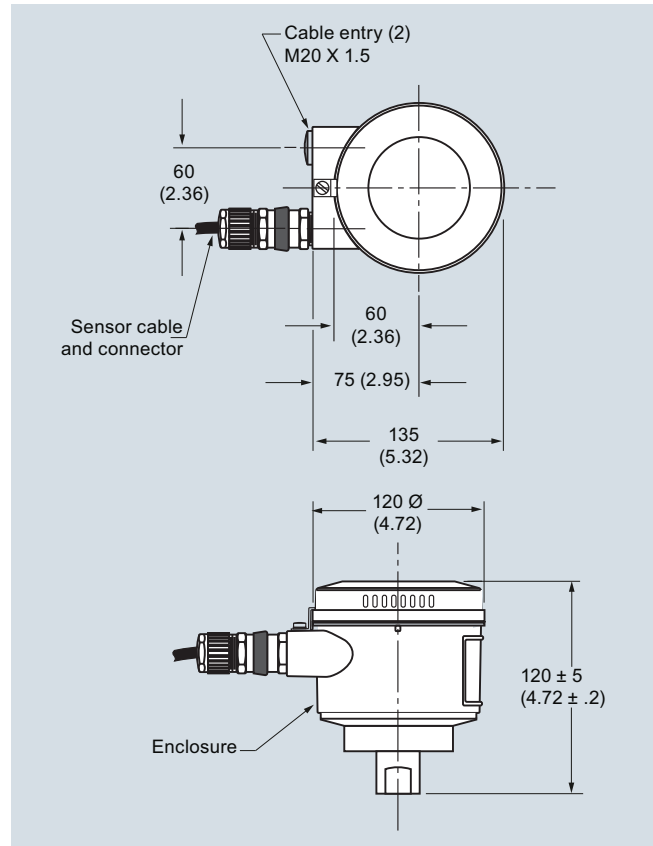
Extension tab - bolt on (304 stainless steel)



Mounting disc - bonded or welded (304 stainless steel)



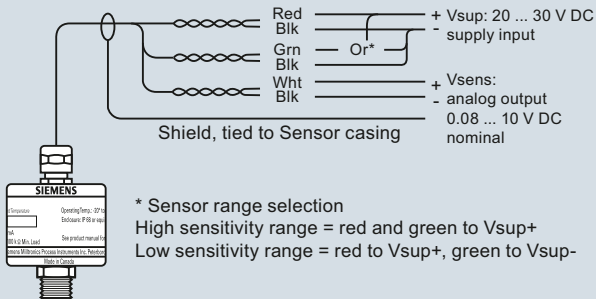
SITRANS AS100 accessories, dimensions in mm (inch)



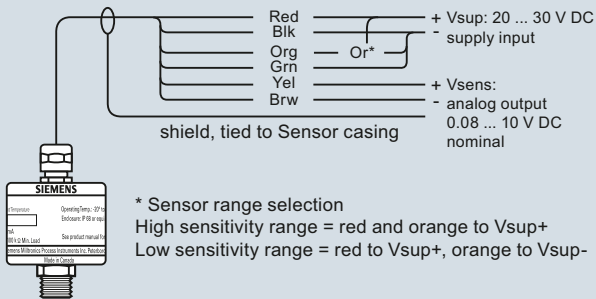
SITRANS AS100 (2D, 2G, XP version), dimensions in mm (inch)

Schematics

Standard temperature range



Extended temperature range



Interconnection

The longer the cable, the more susceptible it is to noise and earth loops. It is therefore recommended to use cable with heavy gauge conductors and good RF/electrical shielding (copper braid rather than drain and foil). A proper junction box close to the sensor is an ideal location not only to extend the cable but also to configure the wiring for high or low sensitivity range operation. The following table provides a guideline for suitable wire gauges where distances are considerable.

Max. distance between sensor and supply
(24 V or Control Unit).

AWG	Wire size		Distance	
	mm	mm ²	meters	feet
24	7 x 0.20	0.25	500	1 600
22	7 x 0.25	0.35	800	2 600
20	10 x 0.25	0.5	1 200	3 900

SITRANS AS100 connections

Process Protection

Acoustic sensors for material flow monitoring

SITRANS CU02 Control Unit

Overview



SITRANS CU02 is an alarm control unit, for use with SITRANS AS100 acoustic sensor, that provides reliable continuous protection for bulk solids flow.

Benefits

- 4 to 20 mA output
- Two programmable relays
- Adjustable independent time delay for each relay
- Adjustable start-up time delay
- DIN rail mounting provides easy installation
- Built-in password protection to parameters

Application

SITRANS CU02 receives a 0 to 10 V DC input signal from the SITRANS AS100 sensor, providing relay and analog outputs for interface into a process.

- Key Applications: with SITRANS AS100 for bulk solids flow

Function

The system can be readily configured for set points indicating such conditions as high flow, low flow or no flow. Alternatively, it can be added to a control loop via a 4 to 20 mA isolated output for trend monitoring proportional to the signal from the sensor.

Two relays are fully programmable and independent of each other and can be used to operate an alarm or control device. Alarming may be provided above or below a setpoint or within a band. Readings are also displayed locally by the SITRANS CU02 on its LCD.

The SITRANS CU02 may be mounted up to 500 m (1 500 ft) from the sensor.

Technical specifications

Mode of operation	
Measuring principle	Controller for acoustic sensing (SITRANS AS100)
Typical application	Connects to SITRANS AS100 to detect burst filter bag
Input	
	0 ... 10 V DC, from sensor
Output	
Output signal	4 ... 20 mA isolated output, 2 Form C relays - latching or non-latching - 5 amp at 250 V AC non-inductive
Sensor excitation	26 V DC
Max. load	750 Ω
Rated operating conditions	
Installation conditions	Indoor
• Location	
Ambient conditions	
• Ambient temperature for enclosure	-20 ... +50 °C (-4 ... +122 °F)
• Relative humidity	80 % for temperatures up to 50 °C (122 °F)
• Degree of protection	IP20
• Installation category	II
• Pollution degree	2
Design	
Weight	550 g (18 oz)
Dimensions (W x H x D)	55 x 75 x 110 mm (2.2 x 3 x 4.4 inch)
Material enclosure	Polycarbonate
Mounting	DIN Rail (DIN 46277 or DIN EN 50022), or wall mount, up to 500 m (1 500 ft) from sensor
Cable	2 twisted pair, 24 AWG (22 mm ²), shielded. Mount up to 500 m (1 500 ft) from sensor
Display	
	Liquid crystal, three digits, 9 mm (0.35 inch), high and multi-segment graphic symbols for operation status
Power supply	
Supply voltage	100, 115, 200, 230 V AC ± 15 %, 50/60 Hz, factory set
Power consumption	Max. 10 VA
Approvals	
	CSA _{US/CA} , CE, RCM, EAC

Process Protection
Acoustic sensors for material flow monitoring

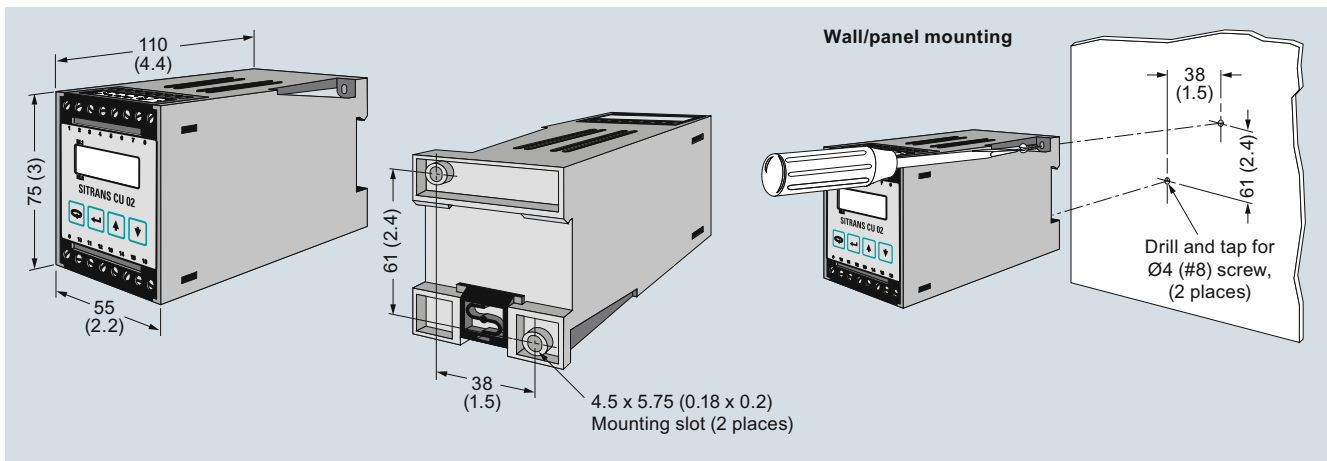
SITRANS CU02 Control Unit

Selection and Ordering data	Article No.
SITRANS CU02 Control Unit Alarm control unit for use with SITRANS AS100 acoustic sensor to provide reliable continuous protection for bulk solid flow ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7MH7562-
Power Supply 100 V AC 115 V AC 200 V AC 230 V AC	1 2 3 4
Enclosure Standard DIN Rail	A
Approvals CSA _{US/CA} , CE, RCM	A

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Manufacturer's test certificate: According to EN 10204-2.2	◆ C11
Acrylic coated, stainless steel tag [38 x 51 mm (1.5 x 2 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text	◆ Y18
Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.	

Dimensional drawings



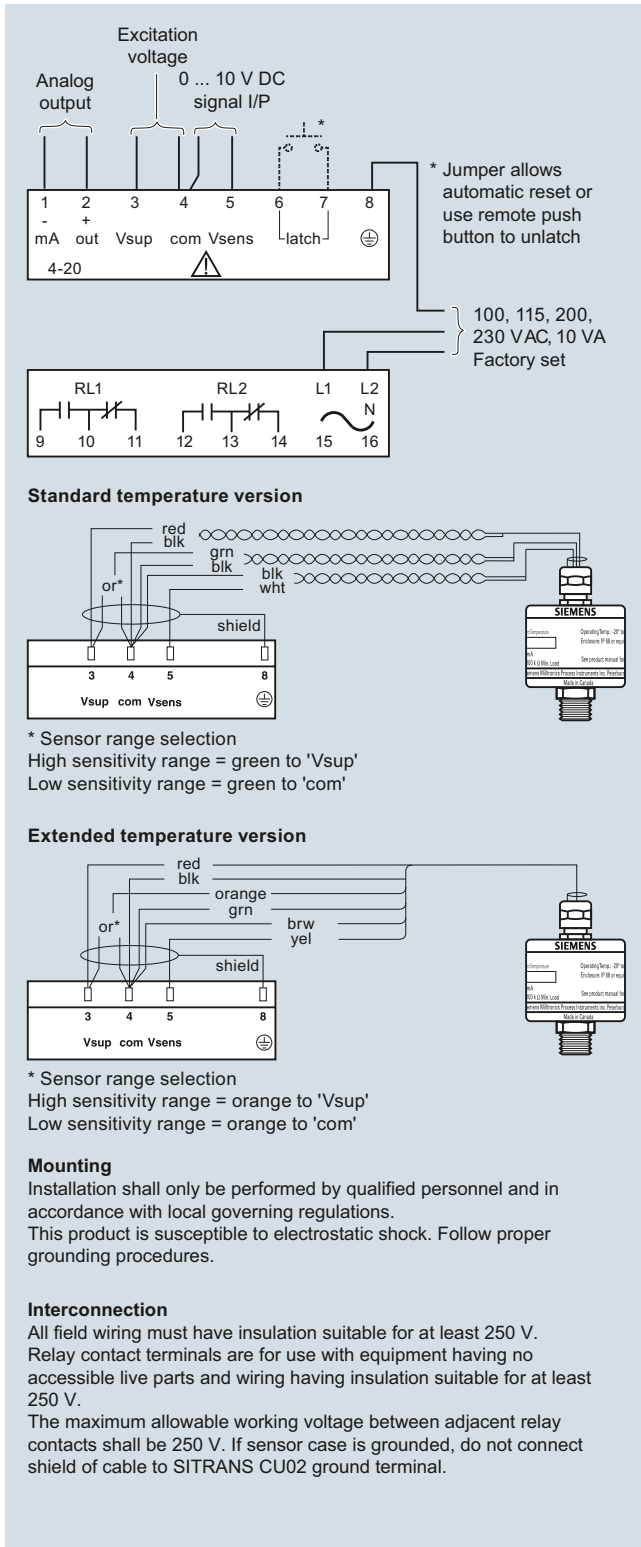
SITRANS CU02, dimensions in mm (inch)

Process Protection

Acoustic sensors for material flow monitoring

SITRANS CU02 Control Unit

Schematics



SITRANS CU02 connections

6

Overview



MFA 4p motion failure alarm controller is a highly sensitive single setpoint motion sensor system, used with Milltronics MSP probes.

Application

The MFA 4p detects changes in the motion and speed of rotating, reciprocating or conveying equipment. It warns of equipment malfunction and signals through contacts to shut down machinery in case of a slowdown or failure. Its reliability makes it a cost-effective way to protect valuable process equipment.

The single setpoint system suits most industrial applications. This versatile unit can be used on tail pulley shafts, driven pulleys, motor shaft sensing, belt or drag conveyors, screw conveyor flights, bucket elevators, fans and pumps.

A special feature is the adjustable 0 to 60 second time delay, allowing the monitored device to accelerate to normal running speed before monitoring begins. A wide range of probes are available to suit specific needs, including high temperatures and corrosive installations. The CE approval allows the MFA 4p to consistently meet the needs of the mining aggregate, cement and other primary and secondary industries.

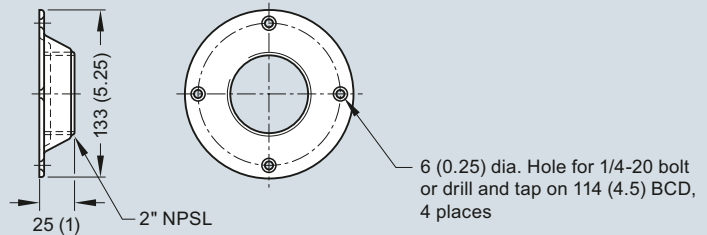
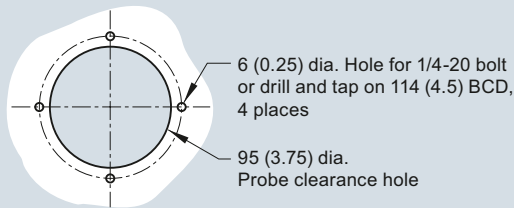
- Key Applications: tail pulleys, motor shaft sensing, screw conveyor flights, bucket elevators

Benefits

- Up to 100 mm (4 inch) gap between target and probe
- Switch selectable overspeed or underspeed detection
- Setpoint adjustment 0.15 to 3 000 PPM (pulses/minute)
- Adjustable start-up time delay
- Visual indication of probe operation and relay status
- General purpose, suitable for majority of industrial applications; rugged probe designs provide unmatched reliability

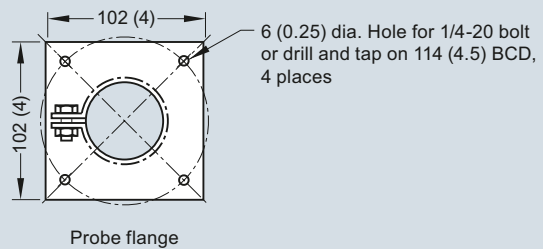
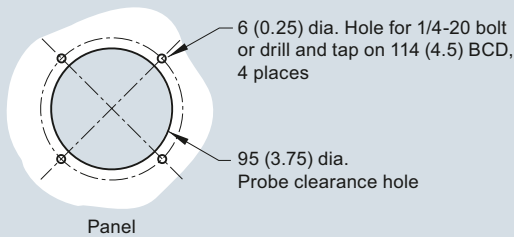
Design

Mounting for Milltronics MSP-12, MSP-3, XPP-5



Note: Mounting flange supplied with probe.

Mounting for Milltronics MSP-9



Milltronics MSP-12, MSP-3, MSP-9, XPP-5 mounting, dimensions in mm (inch)

Process Protection

Motion sensors

Milltronics MFA 4p motion failure alarm controller



Standard Milltronics MSP-12

- Heavy-duty general purpose motion probe
- Long lasting aluminum body with internal amplifier
- Convenient mounting flange and locknut for fast installation and setup
- Temperature rating: -40 ... +60 °C (-40 ... +140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67



Milltronics XPP-5

- CSA hazardous approval (Class I, Div. 1, Groups A, B, C, D; Class II Div. 1, Groups E, F, G; Class III)
- Aluminum body that is fully potted
- Convenient mounting flange and locknut
- 3/4" NPT male hub connection
- Operating temperature from -40 ... 60 °C (-40 ... 140 °F)
- Enclosure rating: Type/NEMA 4X,6, IP67



High temperature Milltronics MSP-3

- Heavy-duty, high temperature aluminum probe designed to withstand operating temperatures from -50 ... 260 °C (500 °F)
- Cast aluminum probe with convenient mounting flange and locknut
- 1.5 m (5 ft) of high temperature PTFE cable provided. Up to 30 m (100 ft) may be used.
- Amplifier remote mounted in enclosure 140 x 140 x 100 mm (5.5 x 5.5 x 4 inch), available in cast aluminum (1/2" NPT conduit entry), painted steel (Type/NEMA 4, IP65 rating), or stainless steel (Type/NEMA 4X, IP65 rating)
- Amplifier temperature rating -40 ... +60 °C (-40 ... +140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67



Stainless high temperature Milltronics MSP-9

- Heavy-duty, high temperature 304 stainless steel probe
- Special construction allows operation of probe in environment from -50 ... 260 °C (500 °F)
- 1.5 m (5 ft) special high temperature PTFE cable provided. Up to 30 m (100 ft) may be used.
- Amplifier remote mounted in enclosure 140 x 140 x 100 mm (5.5 x 5.5 x 4 inch), available in cast aluminum (1/2" NPT conduit entry), painted steel (Type/NEMA 4, IP65 rating), or stainless steel (Type/NEMA 4X, IP65 rating)
- Enclosure rating: Type/NEMA 4X, 6, IP67
- Amplifier temperature rating -40 ... +60 °C (-40 ... +140 °F)



Milltronics RMA (Remote Mounted Amplifier)



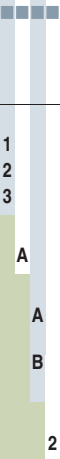
- Available for internal mounting within Probe, or in enclosure for remote mounting
- Enclosures available in cast aluminum (1/2" NPT entry), painted steel (Type/NEMA 4 rating) or stainless steel (Type/NEMA 4X, IP65 rating)
- Operating temp. from -40 ... +60 °C (-40 ... +140 °F)
- Enclosure rating: Type/NEMA 4X, 6, IP67




Milltronics motion probes



Technical specifications



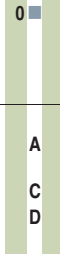
Mode of operation		Dynamic Range	
Measuring principle	Motion monitor and alarm	0 ... 7 200 PPM	
Typical application	Monitoring loss of motion in tail pulley, screw flights, bucket elevators	Ambient Temperature Range	
Features	<ul style="list-style-type: none"> • Switch selectable overspeed or underspeed detection • Setpoint adjustment: 0.15 ... 3 000 PPM • Adjustable start-up time delay: 0 ... 60 seconds • Visual indication of probe operation and relay status 	-20 ... +50 °C (-5 ... +122 °F)	
Output	2 relays working in unison, each providing 1 SPDT Form C relay contact, rated 8 A at 250 V AC resistive	Design	
Performance		Enclosure rating	
Repeatability	± 1 %	Type 4X/NEMA 4X/IP65 (standard and optional stainless steel)	
Dead band	± 0.25 %	Type 4/NEMA 4/IP65 (optional mild steel)	
		Enclosure dimensions	
		160 x 240 x 82 mm (6.3 x 9.5 x 3.2 inch)	
		Optional: mild steel or 304 (1.4301) stainless steel	
		203 x 254 x 102 mm (8 x 10 x 4 inch)	
		Enclosure material	
		Polycarbonate	
		Optional: mild steel or stainless steel	
		Power Supply	
		100/115/200/230 V AC switch selectable, 50/60 Hz, 15 VA ± 10 % of rated voltage	
		Certificates and approvals	
		CE, RCM, CSA _{US/IC} , FM	



Milltronics MFA 4p motion failure alarm controller



Selection and Ordering data	Article No.
MFA 4P Motion Failure Alarm Controller  7MH7144- A highly sensitive single setpoint motion sensor system, used with MSP probes.  Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Enclosure NEMA 4X, polycarbonate enclosure NEMA 4, painted mild steel enclosure NEMA 4X, 304 (1.4301) stainless steel enclosure	1 2 3
Input Voltage 100/115/200/230 V AC, 50/60 Hz, switch selectable	A
Speed detection version Standard, underspeed (U/S) or overspeed (O/S), switch selectable Slow speed (S/S), U/S or O/S detection, switch selectable (limit of 15 ppm)	A B
Approvals CE, RCM, CSA _{US/IC} , FM	2

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Manufacturer's test certificate: According to EN 10204-2.2	 C11
Acrylic coated, stainless steel tag [69 x 50 mm (2.7 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters), specify in plain text	 Y15
Painted mild steel, heated enclosure with viewing window for use down to -50 °C (-58 °F) (finished unit is mounted inside enclosure) [483 x 584 x 203 mm (19 x 23 x 8 inch)]	A35
Stainless steel, sun/weather shield (finished unit is field mounted inside enclosure) [357 x 305 x 203 mm (14 x 12 x 8 inch)]	 S50
Operating Instructions German Note: The operating instructions should be ordered as a separate item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. 7ML1998-5FM31
Spare Parts Transformer Circuit Card, standard Circuit Card, Slow speed Lid with overlay for MFA 4p	7MH7723-1DX 7MH7723-1DU 7MH7723-1DV 7MH7723-1GY

 We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.

Selection and Ordering data	Article No.
Milltronics RMA Remote Mounted Amplifier  7MH7145- Remote mounted amplifier for Milltronics MSP-3 and MSP-9 motion sensing probes.  Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Enclosure Aluminum enclosure, IP65, Type/NEMA 4X, ½" NPT entry Painted steel, Type/NEMA 4, IP65 rating 304 (1.4301) stainless steel enclosure, Type/NEMA 4X, IP65 rating	0 A C D

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s). Manufacturer's test certificate: According to EN 10204-2.20 Acrylic coated, stainless steel tag [38 x 51 mm (1.5 x 2 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text	 C11  Y18
Operating Instructions German Note: The operating instructions should be ordered as a separate item on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. 7ML1998-5FM31
Spare Parts Card, RMA	7MH7723-1DT

 We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.

Process Protection


Motion sensors

Milltronics MFA 4p motion failure alarm controller

Selection and Ordering data

Article No.

Milltronics Motion Sensing Probes

 **7MH7146-**

A series of motion sensing probes used with the MFA 4p.
 Milltronics MSP-3: heavy-duty, high temperature aluminum
 Milltronics MSP-9: heavy-duty, high temperature stainless steel
 Milltronics MSP-12: heavy-duty, general purpose
 Milltronics XPP-5: hazardous rated
 Note: Milltronics MSP-3 and MSP-9 probes require the use of Milltronics RMA (amplifier)

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Cable Length

Standard length (as described in Model options)¹⁾

Add Order code Y01 and plain text:
 "Total cable length ... m"

Extended cable length 2 ... 30 m (6.6 ... 98.4 ft)²⁾Extended cable length 31 ... 50 m (101.7 ... 164 ft)⁴⁾Extended cable length 51 ... 100 m (167.3 ... 328.1 ft)⁴⁾

Model [standard cable length/type]

MSP-3, 1/2" NPT cable inlet³⁾

[1.5 m (5 ft) high temperature cable]

MSP-9 [1.5 m (5 ft) high temperature cable]³⁾

MSP-12, 1/2" NPT cable inlet

XPP-5 [1.5 m (5 ft) cable, (CSA Class I, Groups A, B, C and D; Class II Groups E, F, and G)]

XPP-5 [10 m (32.8 ft) cable, (CSA Class I, Groups A, B, C, and D; Class II Groups E, F, and G)]

XPP-5 [15 m (49.2 ft) cable, (CSA Class I, Groups A, B, C, and D; Class II Groups E, F, and G)]

Approvals

CE, RCM

- 1) No Y01 needed in Order code for standard length
- 2) Only available with model options B, D, G, H, J
- 3) MSP-3 and MSP-9 probes required the use of RMA (amplifier)
- 4) Available with Model options G, H, and J only

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Total cable length: enter the total cable length in plain text description ◆ **Y01**

Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text ◆ **Y17**

Cable gland kit ◆ **A57**Manufacturer's test certificate: According to EN 10204-2.2 ◆ **C11**

Operating Instructions

German

Note: The operating instructions should be ordered as a separate item on the order.

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

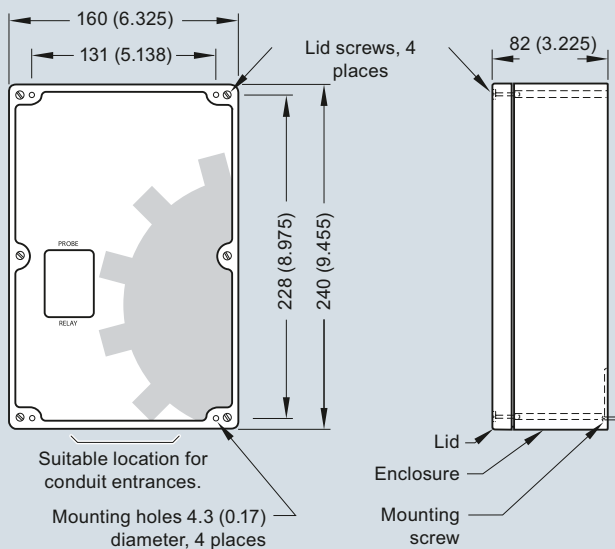
Spare Parts

Locknut, for MSP-3, MSP-7, MSP-12, XPP-5 **7MH7723-1CR**Mounting flange, for MSP-3, MSP-7, MSP-12, XPP-5 **7MH7723-1CS**Mounting bracket for MSP-9 **7MH7723-1CT**Lid, 1/2" NPT cable inlet for MSP-3, MSP-7, MSP-12 **7MH7723-1CU**Lid for MSP-9 **7MH7723-1CV**Lid gasket, for MSP-3, MSP-9 **7MH7723-1CW**Lid gasket, for MSP-7, MSP-12 **7MH7723-1CX**Motion cable gland adaptor kit **7MH7723-1JU**

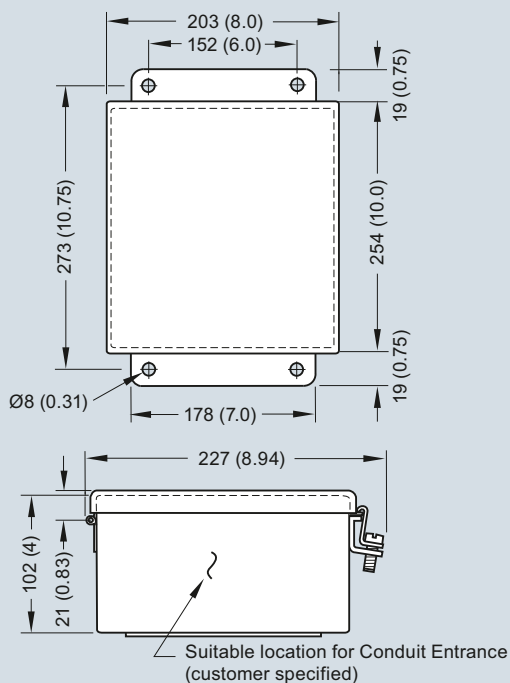
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

Dimensional drawings

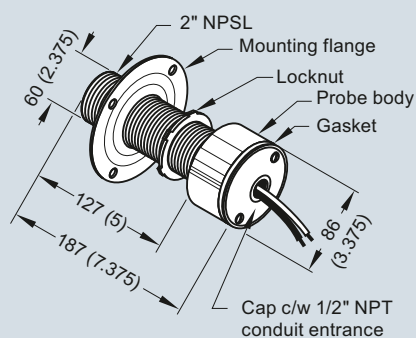
Type 4X/NEMA 4X/IP65 Polycarbonate Enclosure



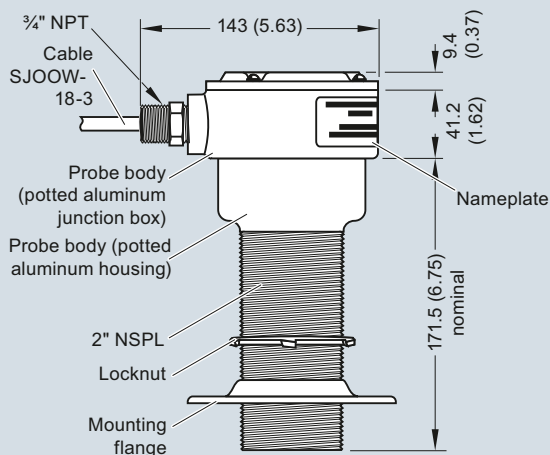
Type 4/NEMA 4/IP65 Painted Steel Enclosure & Type 4X/NEMA 4X/IP65 Stainless Steel Enclosure



Standard Probe MSP-12



Hazardous Locations XPP-5



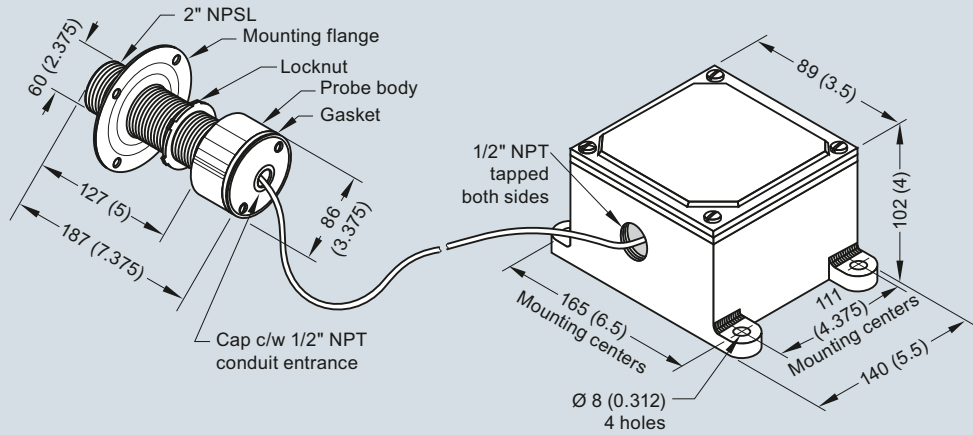
Milltronics MFA 4p and probe, dimensions in mm (inch)

Process Protection

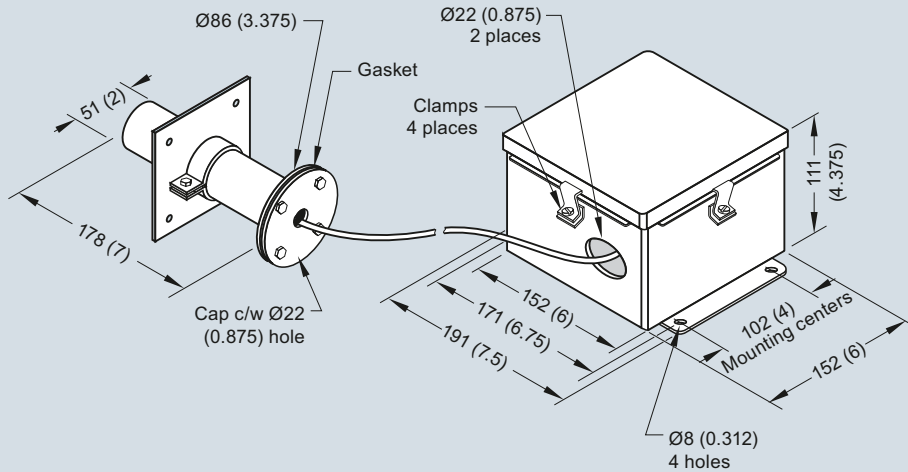
Motion sensors

Milltronics MFA 4p motion failure alarm controller

High temperature probe MSP-3



High temperature stainless steel probe MSP-9



Milltronics probes, dimensions in mm (inch)

Overview



Milltronics MSP-7 is a heavy-duty 3-wire motion sensor that provides an NPN open collector output to PLCs.

Application

The MSP-7 motion sensing probe can detect changes in the rotation and movement of ferrous equipment. When connected to a PLC it can warn of malfunction and signals to stop or slow down equipment, preventing costly failure or downtime. Its reliability makes it a very cost effective sensor.

The single setpoint system suits most industrial applications. This versatile unit can be used on tail pulley shafts, driven pulleys, motor shaft sensing, belt or drag conveyors, screw conveyor flights, bucket elevators, fans and pumps.

An NPN open collector 3-wire output allows for versatile connection to most PLC models and a large dynamic range ensures that the MSP-7 can detect changes in target speed for a variety of applications.

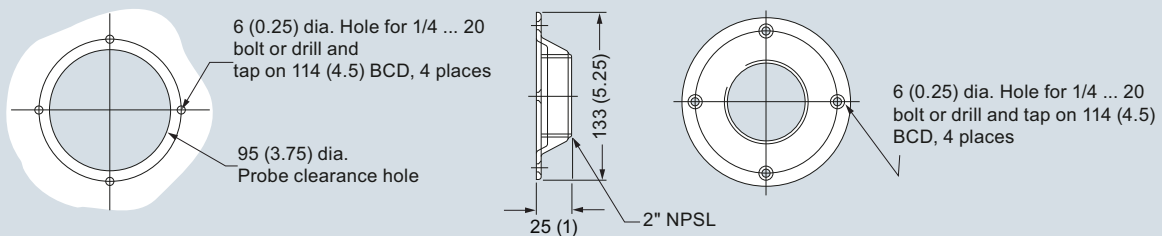
- Key Applications: tail pulleys, motor shaft sensing, screw conveyor flights, bucket elevators

Benefits

- Up to 100 mm (4 inch) gap between target and probe
- Corrosion resistant construction
- General purpose, suitable for majority of industrial applications; rugged probe designs provide unmatched reliability

Design

Mounting for Milltronics MSP-7



Note: Mounting flange supplied with probe.

Mounting for Milltronics MSP-7, dimensions in mm (inch)

Technical specifications


Mode of operation		Performance	
Measuring principle	Magnetic	Repeatability	± 1 %
Typical application	Monitoring loss of motion in tail pulley, screw flights, bucket elevators	Dead band	± 0.25 %
Features	<ul style="list-style-type: none"> • Rugged corrosion resistant aluminum body • Low voltage operation • Large dynamic range • Threaded body for finite adjustment 	Dynamic Range	0 ... 7 200 PPM
Output	NPN open collector, 2 kΩ pull up to input voltage, 330 Ω impedance, 40 mA max.	Ambient Temperature Range	-40 ... +60 °C (-40 ... +140 °F)
		Design	
		Enclosure rating	Type 4X/NEMA 4X/IP67
		Power Supply	21 ... 28 V DC, 40 mA max.
		Certificates and approvals	CE, RCM

Process Protection


Motion sensors

Milltronics MSP-7 motion sensor

Selection and Ordering data

Milltronics Motion Sensing Probes  **7MH7146-**

Milltronics MSP-7: heavy-duty, 3 wire stand alone

 Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Cable Length

Standard length (as described in Model options)¹⁾

Add Order code Y01 and plain text:

"Total cable length ... m"

Extended cable length 2 ... 30 m (6.6 ... 98.4 ft)



Model [standard cable length/type]

MSP-7, 1/2" NPT cable inlet [1.5 m (5 ft) cable]

Approvals

CE, RCM

1) No Y01 needed in Order code for standard length

 We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.

Article No.

7MH7146-

0

1

K

A

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Total cable length: enter the total cable length in plain text description

 **Y01**

Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]:
Measuring-point number/identification (max. 16 characters), specify in plain text

 **Y17**

Cable gland kit

 **A57**

Manufacturer's test certificate: According to EN 10204-2.2

 **C11**

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Spare Parts

Locknut, for MSP-3, MSP-7, MSP-12, XPP-5

Article No.

7MH7723-1CR

Mounting flange, for MSP-3, MSP-7, MSP-12, XPP-5

7MH7723-1CS

Lid, 1/2" NPT cable inlet for MSP-3, MSP-7, MSP-12



7MH7723-1CU

Lid gasket, for MSP-7, MSP-12

7MH7723-1CX

Motion cable gland adaptor kit

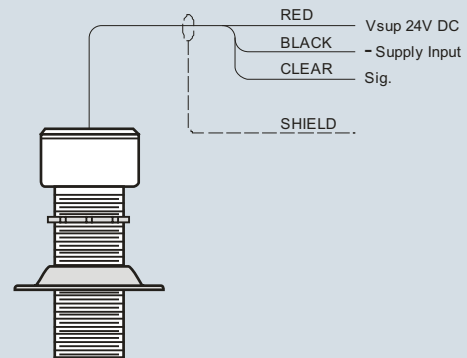
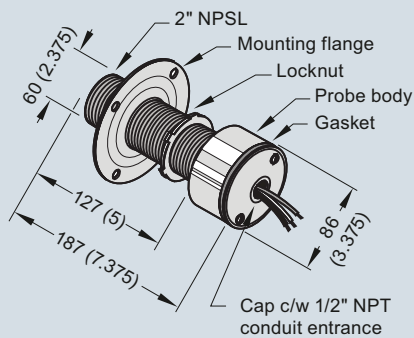
7MH7723-1JU

 We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.

6

Dimensional drawings

Stand alone probe Milltronics MSP-7



Stand alone probe Milltronics MSP-7, dimensions in mm (inch)

SITRANS WM100 motion sensor

Overview



SITRANS WM100 is a heavy-duty zero-speed alarm switch. This non-contacting unit provides cost-effective equipment protection even in the harshest conditions.

Benefits

- Up to 100 mm (4 inch) gap between SITRANS WM100 and targets
- Rugged, low maintenance suitable for tough environments
- 1 SPDT Form C relay contact
- Provides cost-effective protection
- Visual indication of target triggered pulse

Application

This rugged unit is impervious to dust, dirt, build-up and moisture and is ideal for such primary industries as mining, aggregate, and cement. Operating where other systems are prone to failure, the non-contacting design eliminates the need for lubricating, cleaning and part replacement. Downtime and clean-up expenses associated with conveying equipment failure are reduced by the SITRANS WM100. It alarms to minimize spillage, prevent extensive damage or even fire caused by belt slippage at the head pulley, and warns against conveyor malfunction.

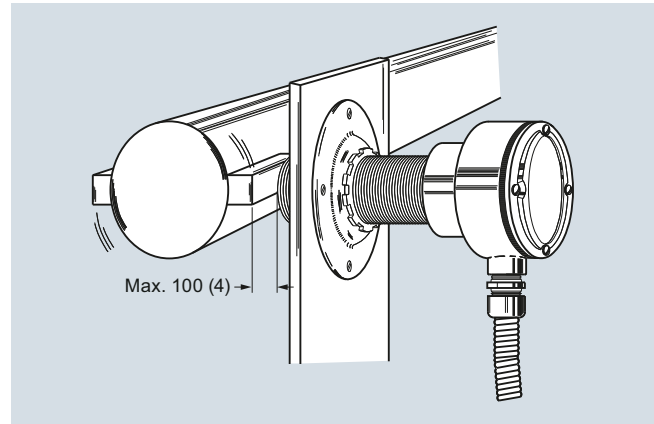
The SITRANS WM100 has built-in selectable start delays and 1 Form C relay contact. With an aluminum body, it operates from -40 to +60 °C (-40 to +140 °F).

- Key Applications: tail pulleys, driven pulleys, motor shaft sensing, screw conveyor flights, bucket elevators

Design

Mounting

The WM100 probe should be mounted, using the supplied mounting flange, onto a vibration-free structure. The gap between the probe and the target should be sufficient such that there is no danger of the target damaging the probe. The maximum allowable gap is 100 mm (4 inch) from the face of the target to the face of the probe for 4.5 x 4.5 mm (3/16 x 3/16 inch) keyway. The WM100 is sensitive to lateral disturbances to its magnetic field. If the WM100 is responding to motion from an interfering target, move the WM100 or install a ferrous plate (steel) as a shield between the WM100 and the interfering target. Where possible, the probe should be mounted such that the cable inlet is pointing downward to avoid accumulation of condensation in the casing. Connection of the probe should be made via flexible conduit for easier removal or adjustment of the probe.



SITRANS WM100 mounting, dimensions in mm (inch)

Technical specifications

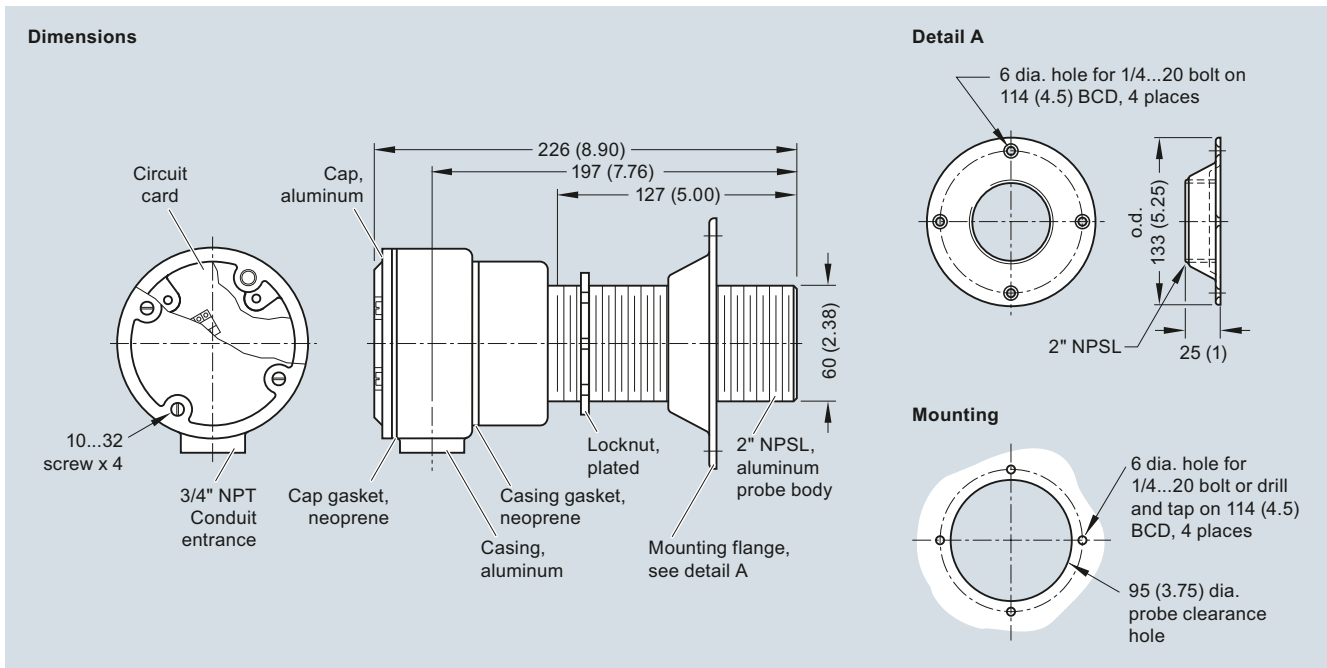
Mode of operation	
Measuring principle	Disruption of magnetic field by ferrous target
Typical application	Monitors absence or presence of motion in harsh conditions
Output	
Contact	1 SPDT Form C dry relay contact, rated 5 A at 250 V AC, fail-safe operation
Time delay	Start up: 10 ... 14 seconds (5 ... 7 seconds with 12 ppm jumper installed)
Zero Speed (selected via a common jumper)	5 seconds ± 1 (minimum speed 10 ... 15 ppm) or 10 seconds ± 2 (minimum speed 5 ... 7.5 ppm)
Rated operating conditions	
Operating temperature	-40 ... +60 °C (-40 ... +140 °F)
Design	
Probe body	Aluminum
Process mounting	2" NPSL
Connection box	Aluminum, 3/4" NPT conduit entrance, 5 screw terminals plus grounding terminal for electrical connection, max. 12 AWG (3.30 mm ²) wire size
Gasketing	Neoprene
Display	Red LED for verification of pulses
Enclosure rating	Type NEMA 4x, 6, IP67
Dynamic range	Minimum 6 or 12 pulses per minute Maximum 3 000 pulses per minute
Shipping weight	2 kg (4.4 lb)
Power supply	<ul style="list-style-type: none"> • 115 V AC/50 ... 60 Hz, 7 VA • 230 V AC/50 ... 60 Hz, 7 VA • ± 10 % of rated voltage
Certificates and approvals	CSA US/IC, CE, RCM

Process Protection
Motion sensors

SITRANS WM100 motion sensor

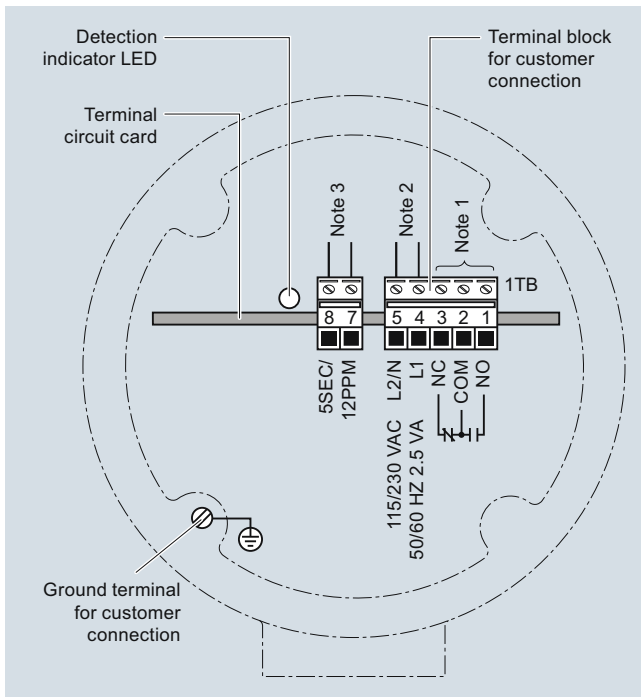
Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS WM100 A heavy-duty zero-speed alarm switch that does not require a controller. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7MH7158 - 0 A 0 0	Further designs Please add "-Z" to Article No. and specify Order code(s). Manufacturer's Test Certificate: According to EN 10204-2.2 Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text	
Model 115 V AC 230 V AC	A B	Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	C11 Y17
		Accessories Locknut Mounting flange Motion cable gland adaptor kit	Article No. 7MH7723-1CR 7MH7723-1CS 7MH7723-1JN

Dimensional drawings



SITRANS WM100 mounting, dimensions in mm (inch)

6

Schematics


SITRANS WM100 wiring

Notes:

1. Dry contacts shown in de-energized (alarm or shelf) state.
2. SITRANS WM100 is manufactured for either 115 or 230 V AC operation. Check WM100 nameplate for applicable voltage. Correct voltage must be supplied. Voltages lower than specified will result in an inoperative condition. Voltages higher than specified will severely damage unit.
3. For 5 second time delay and a minimum 12 ppm range, connect jumper across terminals 7 and 8. Without a jumper, the default is a 10 second time delay and a minimum 6 ppm range.

Process Protection

Notes

Supplementary Components



7/2	Product overview
	Isolating power supplies and Output isolators
7/4	SITRANS I100
7/7	SITRANS I200
	Displays
7/10	SITRANS RD100
7/12	SITRANS RD200
7/16	SITRANS RD300
	Remote data manager
7/20	SITRANS RD500
	Remote Terminal Unit
7/25	SIMATIC RTU3030C
	WirelessHART products
7/33	SITRANS AW200 - WirelessHART adapter
7/39	SITRANS AW210 - WirelessHART adapter
	Network transitions
7/43	IE/PB LINK PN IO





You can download all instructions, catalogs and certificates for Supplementary Components free of charge at www.siemens.com/processinstrumentation

Supplementary Components

Product overview

Overview

	Application	Description	Catalog page	Programming Software
Isolating power supplies and Output isolators				
	Isolating power supply for supplying 2- and 3-wire transmitters and for connecting mA sources in the hazardous area	SITRANS I100 Isolating power supply with HART for rail mounting, with intrinsically-safe input.	7/4	-
	Output isolator for controlling valve positioners, i/p converters or indicators in the hazardous area	SITRANS I200 Output isolator with HART for rail mounting, with intrinsically-safe output	7/7	-
Displays				
	2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation and for hazardous locations	SITRANS RD100 <ul style="list-style-type: none"> Versatile loop-powered meter that displays process variables in level, flow, pressure, temperature and weighing applications FM, CSA, and CE approved device that can be installed in a range of environments, including hazardous areas Large, easy-to-read display Easy to install and set up using quick two-step process 	7/10	-
	Universal input, panel mount remote digital display for process instrumentation. Supports RTD, TC, current and voltage inputs, and supporting software allows for remote configuration and data logging	SITRANS RD200 <ul style="list-style-type: none"> Universal remote display that accepts various inputs, making it an ideal fit for use with most field instruments Standard panel mount display with optional enclosures Two optional relays for alarm indication or process control applications Meter Copy feature to reduce setup time, cost and errors RD Software supporting remote configuration, monitoring and logging for up to 100 displays 	7/12	-
	A panel mount remote digital display for process instrumentation and acts as a multi-purpose, easy to use, rate/totalizer ideal for flow rate, total and control applications	SITRANS RD300 <ul style="list-style-type: none"> A remote display for level, flow, pressure, weighing, and other process instruments Acts as a multi-purpose, easy to use, rate/totalizer ideal for flow rate, total, and control applications Data can be remotely collected, logged and presented on your local computer using the free downloadable RD software. Accepts a single or dual input of current and voltage 	7/16	-
Remote data manager				
	Remote web display providing integrated web access, alarm event handling, and data capture for instrumentation	SITRANS RD500 <ul style="list-style-type: none"> Supports up to 128 devices with the flexible I/O modules and Modbus RTU and TCP devices, including field instruments Out-of-the-box operation, no software required, works with standard web browser Support Ethernet, cellular and PSTN communication Data and alarming through FTP, Email, SMS, HTML and Modbus TCP Up to 2 GB of data logging memory 	7/20	-

	Application	Description	Catalog page	Programming Software
Remote Terminal Unit				
	<p>The SIMATIC RTU3030C is a compact telecontrol unit with separate power supply. It collects measured values in applications that are spread over large geographical areas and transmits them to the control center with the help of an integrated UMTS modem.</p> <p>The measured values can be integrated in automation solutions such as SIMATIC PCS 7 TeleControl over industrial communication standards, such as DNP3 or IEC 60870-5-104. The SIMATIC RTU3030C is especially suitable for monitoring, simple control tasks or data logging in areas without power supply connection. The connected sensors can be supplied with energy via the RTU.</p>	<p>SIMATIC RTU3030C</p> <ul style="list-style-type: none"> • Energy-optimized operation • Flexible power supply through battery, rechargeable battery, solar and/or 12 to 24 V DC • Simple configuration with Web browser • Data buffering of process values with time stamps • Secure communication over OpenVPN, a secure tunnel of the TeleControl Server Basic or encrypted e-mail • Notifications via text messages • Integrated UMTS modem • Extended temperature range from -40 to +70 °C • Support for various protocols: TeleControl Basic, DNP3 and IEC 60870-5-104 • Additional enclosure protects against floods (IP68) 	7/25	-
WirelessHART products				
	WirelessHART adapter to enable standard 4 ... 20 mA or HART devices to wireless communication	<p>SITRANS AW200 - WirelessHART adapter</p> <ul style="list-style-type: none"> • Makes isolated information in HART field instruments airborne • Permits predictive instead of preventive maintenance strategies • Enables 4 ... 20 mA or HART devices to wireless communication • Up to 4 HART devices can be connected • Power up one connected field instrument 	7/33	<p>SIMATIC PDM</p> <ul style="list-style-type: none"> • Local with HART modem • Wireless via WirelessHART
	Explosion protected WirelessHART adapter to enable standard 4 ... 20 mA or HART devices to wireless communication	<p>SITRANS AW210 - WirelessHART adapter</p> <ul style="list-style-type: none"> • Wireless transfer of the process variable of a 4 to 20 mA device via direct connection • Wireless communication with up to 8 HART field devices in multidrop mode • Suitable for use in explosion-protected areas • Loop-powered or external power supply • Supports burst mode and event notification for adapters and connected devices 	7/39	<p>SIMATIC PDM</p> <ul style="list-style-type: none"> • Local with HART modem • Wireless via WirelessHART
Network transitions				
	<p>As an autonomous component, the IE/PB LINK PN IO provides a seamless transition between Industrial Ethernet and PROFIBUS.</p> <p>The IE/PB LINK PN IO also offers cross-network PG/OP communication by means of S7 routing.</p> <p>In addition, data record routing (PROFIBUS DP) is supported. This means it is possible, for example, to use SIMATIC PDM (on the PC) on Industrial Ethernet to parameterize and diagnose a PROFIBUS field device via the IE/PB LINK PN IO</p>	<p>IE/PB LINK PN IO</p> <ul style="list-style-type: none"> • Compact network transition between PROFINET and PROFIBUS • PROFINET IO proxy; connection of PROFIBUS DP slaves to PROFINET IO controller in accordance with PROFINET standard • Cross-network PG/OP communication by means of S7 routing • Cross-network access to data of S7 stations for visualization by means of S7 OPC server and S7 routing • High plant availability thanks to support of the Media Redundancy Protocol (MRP) • Module replacement without the need for a programming device, using the C-PLUG swap media for backing up the configuration data • Use in networks that support an exchange of devices without PG on the basis of the Link Layer Discovery Protocol (LLDP) • ET200 SP design 	7/43	-

Product documentation on DVD and Safety Note



Siemens products for process instrumentation will be delivered with a multi-language **Safety note** and a **Mini DVD - Process Instrumentation and Weighing Systems**.

On the DVD, customers can find many important operating instructions and certificates of our Siemens portfolio for process instrumentation and weighing systems.

Additionally, product or order-specific print material might be part of the delivery.

For further information see appendix page 10/11.

Supplementary Components

Isolating power supplies and Output isolators

SITRANS I100

Overview



Analog input 0/4 to 20 mA

The isolating power supplies are used for the intrinsically safe operation of 2- and 3-wire transmitters and for connecting to intrinsically safe mA sources.

The 2- and 3-wire transmitters are supplied with auxiliary power from the transmitter supply unit.

For 2-wire transmitters the isolators transfer the HART communication signal bidirectionally.

Benefits

- Active output 0/4 to 20 mA
- Suitable for 2-, 3-wire transmitters, 2-wire HART transmitters and mA sources
- Intrinsically safe input [Ex ia] IIC
- Galvanic isolation between input, output and auxiliary power
- Open-circuit and short-circuit monitoring and messaging for input and output (can be switched off)
- Installation possible in Zone 2 and Div. 2
- Can be used up to SIL 2 (IEC 61508)

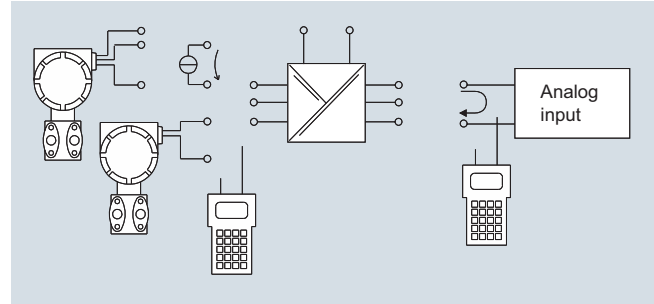
	Zones					
	0	1	2	20	21	22
Ex i interfaces	X	X	X	X	X	X
Installation in			X			X

Design

The HART isolating power supply is comprised of a compact plastic enclosure (IP30) and is equipped with push-in screw terminals.

On the front are a green LED for indicating the power supply status and a red LED for signaling errors.

The auxiliary power supply can be connected individually using push-in screw terminals or jointly for up to 40 units using pac-Bus.



SITRANS I100 isolating power supply, function block diagram

Technical specifications

SITRANS I100 Isolating Power Supplies with HART

Ex i input

Input signal	0/4 ... 20 mA with HART
Functional range	0 ... 24 mA
Max. input current for mA sources	50 mA
Transmitter supply voltage	≥ 16 V at 20 mA (for 2-, 3-wire)
Supply voltage residual ripple	≤ 25 mV _{eff}
No-load voltage	≤ 26 V
Short-circuit current	≤ 35 mA
Input resistance (AC impedance HART)	≈ 500 Ω
Input resistance for mA sources	30 Ω
Communication signal (on 2-wire transmitters)	Bidirectional HART transmission, 0.5 ... 30 kHz

Output

Output signal	0/4 ... 20 mA with HART
Load resistance R _L	0 ... 600 W (terminal 1+/-) 0 ... 379 W (terminal 3+/-) (with internal 221 Ω resistance for HART)
Residual ripple	≤ 40 μA _{eff}
No-load voltage	≤ 15.5 V
Communication signal	Bidirectional HART transmission, 0.5 kHz ... 30 kHz
Response time (10 % ... 90 %)	≤ 25 ms
Transfer behavior Input/Output	1:1 (0 ... 20 mA --> 0 ... 20 mA, 4 ... 20 mA --> 4 ... 20 mA)

Measuring accuracy

Accuracy, typical data expressed as % of calibrated span at U_N, 23 °C

Linearity error	≤ 0.1 %
Offset error	≤ 0.1 %
Temperature influence	≤ 0.1 %/10 K
Power supply effect within voltage range	≤ 0.01 %
Load resistance effect	≤ 0.02 %

Supplementary Components

Isolating power supplies and Output isolators

SITRANS I100

Rated conditions		Error detection Ex i input	
Degree of protection of enclosure	IP30	• Open circuit	< 2 mA
Degree of protection of terminals	IP20	• Short-circuit	> 22 mA
Ambient conditions		• Output behavior	= Input signal
• Ambient temperature	-20 ... +60 °C/+70 °C (-4 ... +140 °F/+158 °F) (see "Operating instructions")	• Output current at $I_{in} = 0$	$I_{out} = 0$ mA
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)	Error detection output	
• Relative humidity (no condensation)	≤ 95 %	• Open circuit	< 2 mA
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 Use in the industrial environment	Error messaging Ex i input/output	
Mechanical specifications		• Settings (LF switch)	Activated/deactivated
Screw terminals		• Error indication	LED red "LF"
• One-wire connection		Error messaging and power supply failure	• Contact (30 V/100 mA), closed to ground in case of error
- Rigid	0.2 ... 2.5 mm ² (0.00031 ... 0.0039 in ²)	• pac-Bus, floating contact (30 V/100 mA)	
- Flexible	0.2 ... 2.5 mm ² (0.00031 ... 0.0039 in ²)	Certificates and approvals	
- Flexible with end ferrules (without/with plastic ferrule)	0.25 ... 2.5 mm ² (0.00039 ... 0.0039 in ²)	Explosion protection ATEX	
• Two-wire connection		• EC type-examination certificate	DMT 03 ATEX E 010 X
- Rigid	0.2 ... 1 mm ² (0.00031 ... 0.00155 in ²)	• Degree of protection	II 3 (1) G Ex nA nC [ia] IIC T4 II (1) D [Ex iaD]
- Flexible	0.2 ... 1.5 mm ² (0.00031 ... 0.0023 in ²)	Installation	In Zone 2, Div. 2 and in the safe area
- Flexible with end ferrules	0.25 ... 1 mm ² (0.00039 ... 0.00155 in ²)	Other approvals	USA (FM) Canada (CSA) Shipping (DNV)
Weight	Approx. 160 g (0.35 lb)	Safety specifications (CENELEC)	
Type of installation	On DIN rail according to EN 50022 (NS35/15; NS35/7.5)	• Max. voltage U_o	27 V
Mounting position	Vertical or horizontal	• Max. current I_o	88 mA
Enclosure material	PA 6.6	• Max. power P_o	576 mW
Fire protecting class (UL-94)	V0	• Max. connectable capacitance C_o for IIC/IIB	90 nF/705 nF
Auxiliary power		• Max. connectable inductance L_o for IIC/IIB	2.3 mH/14 mH
Rated voltage U_N	24 V DC	• Internal capacitance C_i and inductance L_i	Negligible
Voltage range	18 ... 31.2 V	• Insulation voltage U_m	253 V
Residual ripple within voltage range	≤ 3.6 V _{SS}	• When connecting mA sources:	
Rated current (U_N , 20 mA)	70 mA	- Max. output voltage U_o	4.1 V
Power consumption (U_N , 20 mA)	1.7 W	- Max. connectable voltage U_i	30 V
Power loss (at U_N , $R_L = 250 \Omega$)	1.3 W	- Max. connectable current I_i	100 mA
Operation indicator	Green "PWR" LED	- Internal capacitance C_i and inductance L_i	Negligible
Reverse polarity protection	Yes	• For more information and value combinations	See "Certification"
Undervoltage monitoring	Yes (no faulty module/output states)		
Galvanic isolation			
• Test voltage according to EN 60079-11			
- Ex i input to output	1.5 kV AC		
- Ex i input to auxiliary power	1.5 kV AC		
- Ex i input to Error contact	1.5 kV AC		
• Test voltage according to EN 50178			
- Output to auxiliary power	350 V AC		
- Error contact to auxiliary power and output	350 V AC		

Supplementary Components

Isolating power supplies and Output isolators

SITRANS I100

Selection and Ordering data

Article No.

SITRANS I100 Isolating Power Supply with HART ▶ **7NG4124-0AA00**

For rail mounting, for supplying 2-/3-wire transmitters and for mA sources, output 0/4 ... 20 mA, with intrinsically safe input

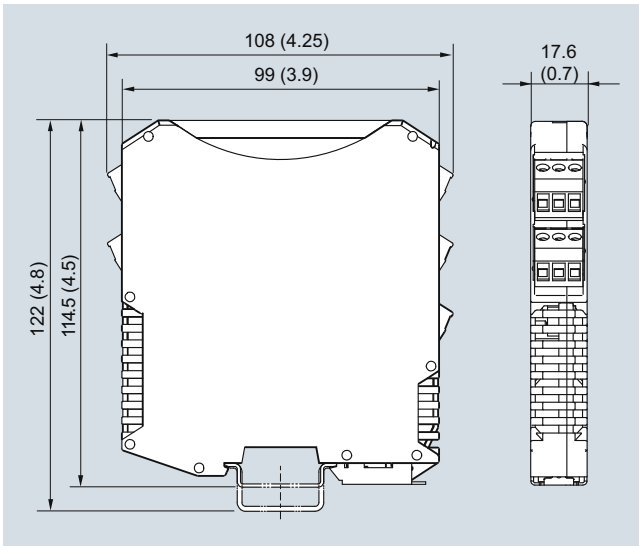
Accessories

pac-Bus basic set ▶ **7NG4998-1AA**
With 5 single elements and 1 terminal set (beginning and end)

pac-Bus extension set ▶ **7NG4998-1AB**
With 5 single elements

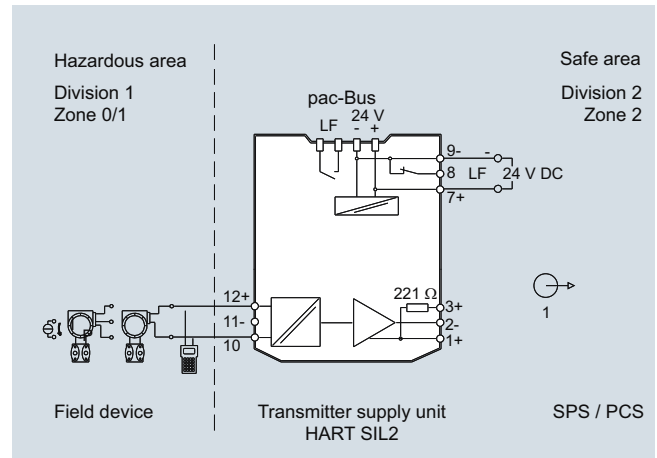
▶ Available ex stock.

Dimensional drawings

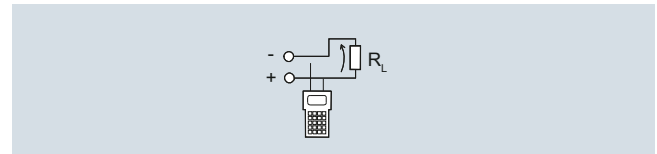


SITRANS I100 isolating power supply with HART, dimensions in mm (inch)

Schematics



SITRANS I100 isolating power supply with HART, connection diagram



SITRANS I100 isolating power supply with HART, output configuration

Overview



Analog output 0/4 to 20 mA for HART

The output isolators are used for the intrinsically safe operation of valve positioners, i/p converters or indicators.

Operation of intrinsically safe HART valve positioners (e.g. SIPART PS2 and SITRANS VP300) is also possible. The units transfer a superimposed HART communication signal bidirectionally.

Benefits

- For HART output signals 0/4 to 20 mA
- Intrinsically safe output [Ex ia] IIC
- Galvanic isolation between input, output and auxiliary power
- Open-circuit and short-circuit monitoring and messaging (can be switched off)
- Installation possible in Zone 2 and Div. 2
- Can be used up to SIL 2 (IEC 61508)

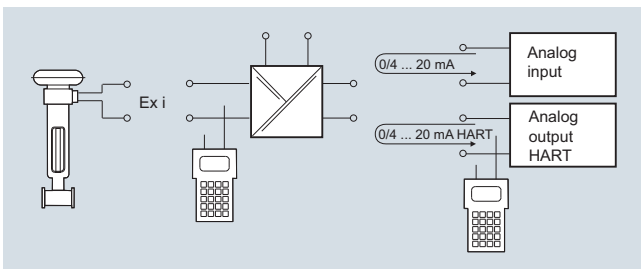
	Zones					
	0	1	2	20	21	22
Ex i interface	X	X	X	X	X	X
Installation in			X			X

Design

The HART output isolator is comprised of a compact plastic housing (IP30) and is equipped with push-in screw terminals.

On the front are a green LED for indicating the power supply status and a red LED for signaling errors.

The auxiliary power supply can be connected individually using push-in screw terminals or jointly for up to 40 units using pac-Bus.



SITRANS I200 output isolator, function block diagram

Technical specifications

SITRANS I200 output isolator with HART

Input

Input signal	0/4 ... 20 mA with HART
Functional range	0 ... 24 mA
Max. input current	50 mA
Input resistance (changeable switch LI)	225 Ω/550 Ω
Communication signal	Bidirectional HART transmission, 0.5 ... 30 kHz

Ex i output

Output signal	0/4 ... 20 mA with HART
Connectable load resistance	0 ... 800 Ω
Min. load resistance for short-circuit monitoring	150 Ω
Residual ripple	≤ 50 mV
No-load voltage	≤ 25.6 V
Response time (10 % ... 90 %)	≤ 25 ms
Transfer behavior Input/Output	1:1 (0 ... 20 mA --> 0 ... 20 mA, 4 ... 20 mA --> 4 ... 20 mA)

Measuring accuracy

Accuracy, typical data expressed as % of calibrated span at U_N , 23 °C

Linearity error	≤ 0.1 %
Offset error	≤ 0.1 %
Temperature influence	≤ 0.1 %/10 K
Power supply effect within voltage range	≤ 0.01 %
Load resistance effect	≤ 0.02 %

Rated conditions

Degree of protection of enclosure	IP30
Degree of protection of terminals	IP20
Ambient conditions	
• Ambient temperature	-20 ... +70 °C (-4 ... +158 °F) (see "Operating instructions")
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
• Relative humidity (no condensation)	≤ 95 %
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 Use in the industrial environment

Supplementary Components

Isolating power supplies and Output isolators

SITRANS I200

Mechanical specification

Screw terminals	
• One-wire connection	
- Rigid	0.2 ... 2.5 mm ² (0.00031 ... 0.0039 in ²)
- Flexible	0.2 ... 2.5 mm ² (0.00031 ... 0.0039 in ²)
- Flexible with end ferrules (without/with plastic ferrule)	0.25 ... 2.5 mm ² (0.00039 ... 0.0039 in ²)
• Two-wire connection	
- Rigid	0.2 ... 1 mm ² (0.00031 ... 0.00155 in ²)
- Flexible	0.2 ... 1.5 mm ² (0.00031 ... 0.0023 in ²)
- Flexible with end ferrules	0.25 ... 1 mm ² (0.00039 ... 0.00155 in ²)
Weight	Approx. 160 g (0.35 lb)
Type of installation	On DIN rail according to EN 50022 (NS35/15; NS35/7.5)
Mounting position	Vertical or horizontal
Enclosure material	PA 6.6
Fire protecting class (UL-94)	V0

Auxiliary power

Rated voltage U_N	24 V DC
Voltage range	18 ... 31.2 V
Residual ripple within voltage range	≤ 3.6 V _{SS}
Rated current (U_N , 20 mA)	80 mA
Power consumption (U_N , 20 mA)	1.3 W
Power loss (at U_N , $R_L = 500 \Omega$)	1.1 W
Operation indicator	Green "PWR" LED
Reverse polarity protection	Yes
Undervoltage monitoring	Yes (no faulty module/output states)
Galvanic isolation	
• Test voltage according to EN 60079-11	
- Ex i output to input	1.5 kV AC
- Ex i output to auxiliary power	1.5 kV AC
- Error contact to Ex i output	1.5 kV AC
• Test voltage according to EN 50178	
- Input to auxiliary power	350 V AC
- Error contact to auxiliary power and input	350 V AC
Error detection Ex i output	
• Open circuit	> 10 k Ω
• Short-circuit	< 15 Ω
• Input behavior	> 6 k Ω
• Open-circuit detection only for input current	≥ 3.6 mA
• Settings (LF switch)	Activated/deactivated
• Error indication	LED red "LF"
• Error messaging and power supply failure	<ul style="list-style-type: none"> • Contact (30 V/100 mA), closed to ground in case of error • pac-Bus, floating contact (30 V/100 mA)

Certificates and approvals

Explosion protection ATEX	
• EC type-examination certificate	DMT 03 ATEX E 012 X
• Degree of protection	II 3 (1) G Ex nA nC [ia] IIC T4 II (1) D [Ex iaD]
Installation	In Zone 2, Div. 2 and in the safe area
Other approvals	USA (FM) Canada (CSA) Shipping (DNV)
Safety specifications (CENELEC)	
• Max. voltage U_o	25.6 V
• Max. current I_o	96 mA
• Max. power P_o	605 mW
• Max. connectable capacitance C_o for IIC/IIB	103 nF/800 nF
• Max. connectable inductance L_o for IIC/IIB	1.9 mH/11 mH
• Internal capacitance C_i and induc- tance L_i	Negligible
• Insulation voltage U_m	253 V
• For more information and value combinations see "Certification".	

Selection and Ordering data

Article No.

SITRANS I200 output isolator with HART

For rail mounting, input
0/4 ... 20 mA, output 0/4 ... 20 mA,
intrinsically safe

Accessories

pac-Bus basic set

With 5 single elements and 1
terminal set (beginning and end)

pac-Bus extension set

With 5 single elements

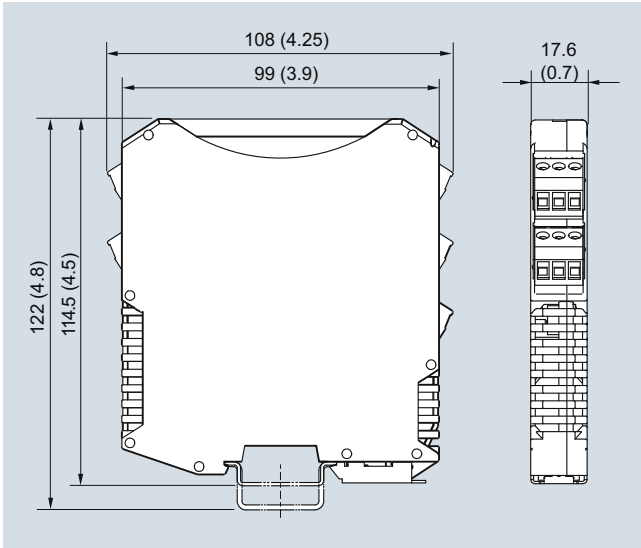
▶ Available ex stock.

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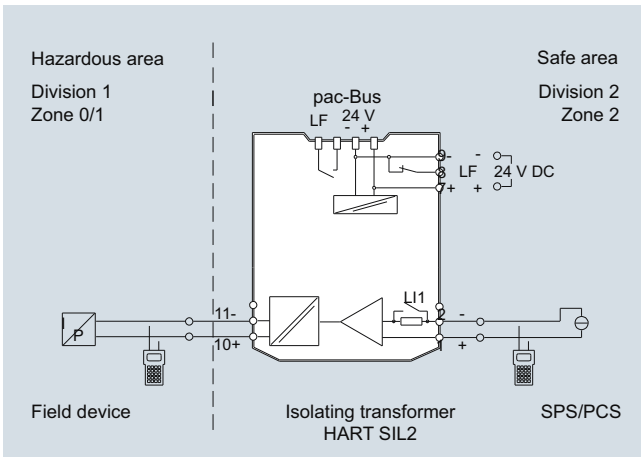
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Dimensional drawings



SITRANS I200 output isolator with HART, dimensions in mm (inch)

Schematics



SITRANS I200 output isolator with HART, connection diagram

Supplementary Components

Displays

SITRANS RD100

Overview



The SITRANS RD100 is a 2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation.

Benefits

- Easy setup
- Approved for hazardous locations
- NEMA 4X, IP67 impact-resistant enclosure
- Simple two-step calibration
- Two modes of input allow for easy servicing, with no interruption of loop required

Application

The RD100 is very versatile. It can be installed indoors or outdoors, in hot or cold environments, and in safe or hazardous areas.

It has been approved by FM and CSA as Intrinsically Safe and non-incendive, and operates from -40 to +85 °C (-40 to +185 °F), adding only 1 V to the loop.

Calibration consists of a quick two-step process involving the adjustment of only two non-interacting potentiometers.

- Key Applications: remotely displays process variables in level, flow, pressure, temperature, and weighing applications, in a 4 to 20 mA loop.

Technical specifications

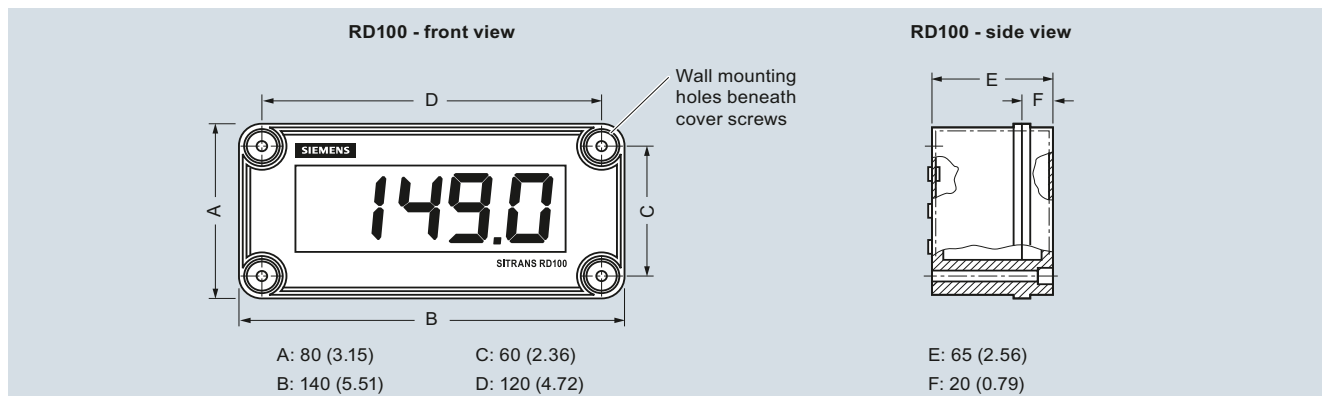
Mode of operation	
Measuring principle	Analog to digital conversion
Measuring range	4 ... 20 mA
Measuring points	1 instrument only
Accuracy	
	± 0.1 % of span ± 1 count
Rated operating conditions	
Ambient conditions	
• Operating temperature range	-40 ... +85 °C (-40 ... +185 °F)
Design	
Weight	340 g (12 oz)
Material (enclosure)	Impact-resistant glass filled polycarbonate body and clear polycarbonate cover
Degree of protection	NEMA 4X, IP67
Power supply	
External loop power supply	30 V DC max.
Display	
	• 1.0 inch (2.54 cm) high LCD
	• Numeric range from -1 000 ... +1 999
Certificates and approvals	
Non-hazardous	CE
Hazardous	
• Intrinsically Safe	• CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T4
	• CSA/FM Class I, Zone 0, Group IIC
	• CSA/FM Class I, Div. 2, Groups A, B, C, D
	• CSA/FM Class II and III, Div. 2, Groups F and G
• Non-incendive	
Options	
Mounting	• 2 inch (5.08 cm) pipe mounting kit (zinc plated or stainless steel)
	• Panel mounting kit

Selection and Ordering data	Article No.
SITRANS RD100	7ML5741-
A 2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation.	A 0 0 - 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Conduit hole location (½ inch)	
None	▶ 1
Bottom	▶ 2
Rear	▶ 3
Top	▶ 4
Approvals	
FM/CSA	A
CE	B

- ▶ Available ex stock. For details see page 10/11 in the appendix.
- ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.

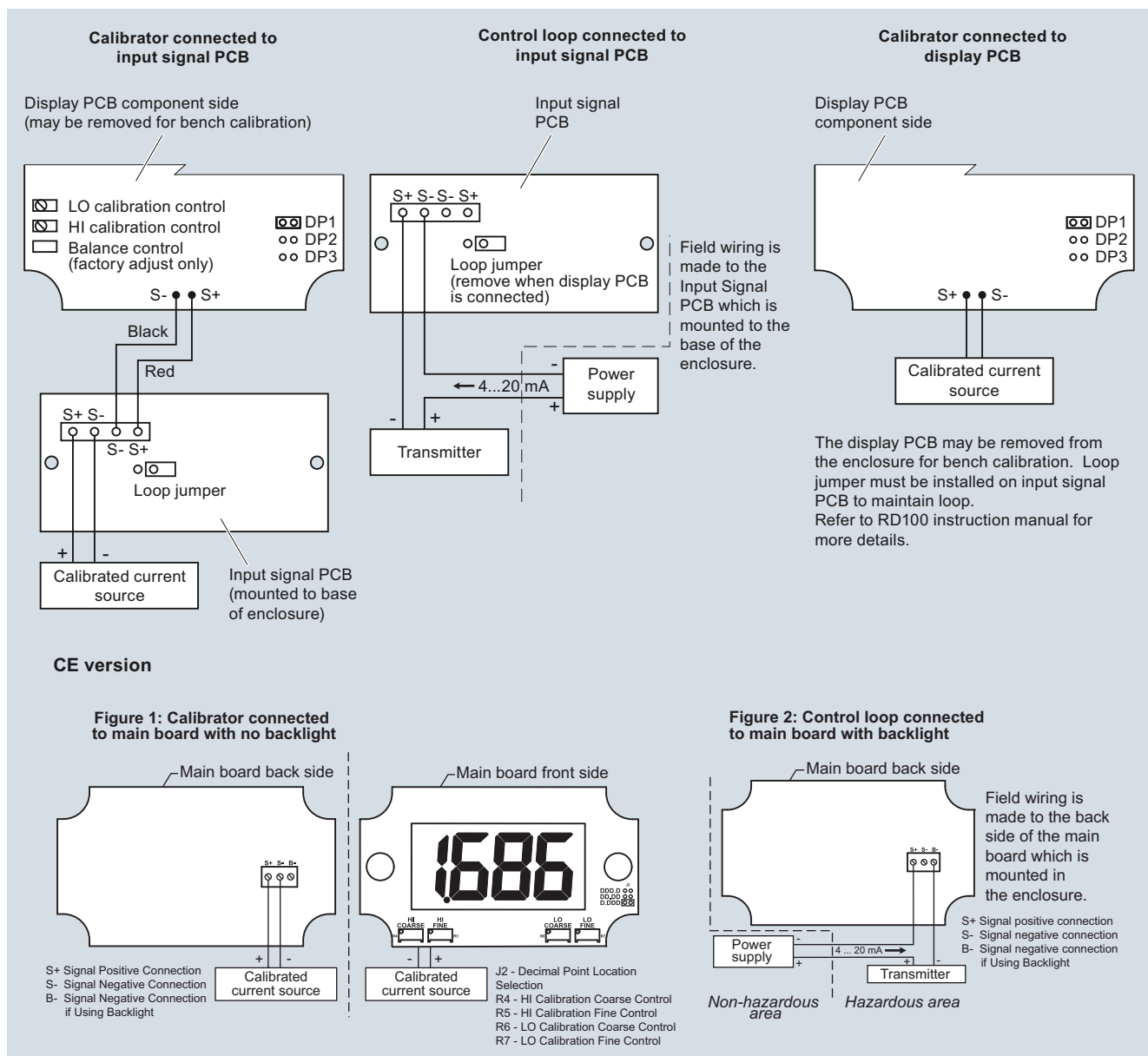
Selection and Ordering data	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
Panel mount kit	7ML1930-1BN
2 inch (5.08 cm) pipe mounting kit (zinc plated seal)	7ML1930-1BP
2 inch (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301)	7ML1930-1BQ

Dimensional drawings



SITRANS RD100, dimensions in mm (inch)

Schematics



SITRANS RD100 connections

Supplementary Components

Displays

SITRANS RD200

Overview



The SITRANS RD200 is a universal input, panel mount remote digital display for process instrumentation.

Benefits

- Easy setup and programming via front panel buttons or remotely using RD software
- Display readable in sunlight
- Universal input: accepts current, voltage, thermocouple, and RTD signals
- Single or dual 24 V DC transmitter power supply
- Serial communication using built in protocol or Modbus RTU
- Two optional relays for alarm indication or process control applications
- Linear or square root function supported
- Meter Copy feature to reduce setup time, cost, and errors
- RD software supports remote configuration, monitoring, and logging for up to 100 displays
- Other features include: 4 to 20 mA analog output option, pump alternation control, and optional NEMA 4 and 4X field enclosures
- 2X option for 30.5 mm (1.2 inch) high, red LED display

Application

The RD200 is a universal remote display for level, flow, pressure, temperature, weighing, and other process instruments.

Data can be remotely collected, logged and presented from as many as 100 displays on your local computer using the free downloadable RD Software.

The display accepts a single input of current, voltage, thermocouple, and RTD. This makes the RD200 an ideal fit for use with most field instruments.

The RD200 can be set up as a standard panel mount, or combined with optional enclosures to allow it to house up to 6 displays.

- Key Applications: tank farms, pump alternation control, local or remote display of level, temperature, flow, pressure and weighing instrument values, PC monitoring, and data logging with RD Software.

Technical specifications

Mode of operation	
Measuring principle	Analog to digital conversion
Measuring points	<ul style="list-style-type: none"> • 1 instrument • Remote monitoring of 100 instruments with PC and RD software
Input	
Measuring range	<ul style="list-style-type: none"> • 4 ... 20 mA, 0 ... 20 mA • 0 V DC ... 10 V DC, 1 ... 5 V, 0 ... 5 V • Thermocouple temperature <ul style="list-style-type: none"> • Type J: -50 ... +750 °C (-58 ... +1 382 °F) • Type K: -50 ... +1 260 °C (-58 ... +2 300 °F) • Type E: -50 ... +870 °C (-58 ... +1 578 °F) • Type T: -180 ... +371 °C (-292 ... +700 °F) • Type T, 0.1 ° resolution: -180.0 ... +371 °C (-199.9 ... +700 °F) • RTD temperature <ul style="list-style-type: none"> • 100 Ω RTD: -200 ... +750 °C (-328 ... +1 382 °F)
Output signal	
Output	<ul style="list-style-type: none"> • 4 ... 20 mA (optional) • Modbus RTU
Relays	2 SPDT Form C relays, rated 3 A at 30 V DC or 3 A at 250 V AC, non-inductive, auto-initializing (optional)
Communications	<ul style="list-style-type: none"> • RS 232 with PDC or Modbus RTU • RS 422/485 with PDC or Modbus RTU
Accuracy	
4 ... 20 mA optional output	± 0.1 % FS ± 0.004 mA
Process input	± 0.05 % of span ± 1 count, square root: 10 ... 100 % FS
Thermocouple temperature input	<ul style="list-style-type: none"> • Type J: ± 1 °C (± 2 °F) • Type K: ± 1 °C (± 2 °F) • Type E: ± 1 °C (± 2 °F) • Type T: ± 1 °C (± 2 °F) • Type T, 0.1 ° resolution: ± 1 °C (± 1.8 °F)
RTD temperature input	100 Ω RTD: ± 1 °C (± 1 °F)
Rated operating conditions	
Ambient conditions	
• Storage temperature range	-40 ... +85 °C (-40 ... +185 °F)
• Operating temperature range	-40 ... +65 °C (-40 ... +149 °F)
Design	
Weight	269 g (9.5 oz) (including options)
Material (enclosure)	<ul style="list-style-type: none"> • 1/8 DIN, high impact plastic, UL94V-0, color: gray • Optional plastic, steel and stainless steel (Type 304, EN 1.4301) NEMA 4 enclosures
Degree of protection	Type 4X, NEMA 4X, IP65 (front cover); panel gasket provided
Electrical connection	
mA output signal	2-core copper conductor, twisted, shielded, 0.82 ... 3.30 mm ² (18 ... 12 AWG), Belden 8 760 or equivalent is acceptable
Electrical connection and relay connection	Copper conductor according to local requirements, rated 3 A at 250 V AC

Power supply	
Input voltage option 1	85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max.
Input voltage option 2	12 ... 36 V DC; 12 ... 24 V AC, 6 W max.
Transmitter power supply	One or two isolated transmitter power supplies (optional)
<ul style="list-style-type: none"> • Single power supply • Dual power supplies 	One 24 V DC \pm 10 % at 200 mA max. Two 24 V DC \pm 10 % at 200 mA and 40 mA max.
External loop power supply	35 V DC max.
Output loop resistance	<ul style="list-style-type: none"> • 24 V DC, 10 ... 700 Ω max. • 35 V DC (external), 100 ... 1 200 Ω max.
Displays and controls	
Display	<ul style="list-style-type: none"> • 14 mm (0.56 inch) high LED • 2X option for 30.5 mm (1.2 inch) high, red LED • Numeric range from -1 999 ... +9 999 • Four digits, automatic lead zero blinking • Eight intensity levels
Memory	<ul style="list-style-type: none"> • Non-volatile • Stores settings for minimum of 10 years if power is lost
Programming	<ul style="list-style-type: none"> • Primary: front panel • Secondary: meter copy or PC with SITRANS RD software
Certificates and approvals	
	CE, UL, cUL
Options	
Enclosures	Plastic, steel, and stainless steel (Type 304, EN 1.4301) NEMA 4 and 4X enclosures
Mounting	<ul style="list-style-type: none"> • 2 inch (5.08 cm) pipe mounting kit (zinc plated seal) • 2 inch (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301)

Supplementary Components

Displays

SITRANS RD200

Selection and Ordering data

Article No.

SITRANS RD200

7ML5740-

A universal input, panel mount remote digital display for process instrumentation.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Input voltage

85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max.

▶ 1

12 ... 36 V DC; 12 ... 24 V AC, 6 W max.

▶ 2

Transmitter supply

None

▶ A

Single 24 V DC transmitter supply¹⁾

▶ B

Dual 24 V DC transmitter supply¹⁾²⁾

▶ C

Output

None

▶▶ A

2 relays

▶ B

4 ... 20 mA output

▶ C

Communication

Modbus RTU

▶▶ 0

Approvals

CE, UL, cUL

▶ 1

Display Size

Standard


▶▶ 0

2X option for 30.5 mm (1.2 inch) high, red LED

▶▶ 1

¹⁾ Available with input voltage option 1 only

²⁾ Available with output option C only

▶ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 10/11 in the appendix.

▶ Available ex stock when configured with the following options only: Input voltage: 1, Transmitter supply: B, Output : A, Communication: 0. For details see page 10/11 in the appendix.

Selection and Ordering data

Article No

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

SITRANS RD200 copy cable 2.1 m (7 ft)

7ML1930-1BR

SITRANS RD200 RS 232 serial adapter (copy cable included)

7ML1930-1BS

SITRANS RD200 RS 422/485 serial adapter (copy cable included)

7ML1930-1BT

RS 232 to RS 422/485 isolated converter

7ML1930-1BU

RS 232 to RS 422/485 non-isolated converter

7ML1930-1BV

SITRANS RD200 RS 232 and RS 485 isolated multi-input adapter board

7ML1930-1BW

USB to RS 422/485 isolated converter

7ML1930-1BX

USB to RS 422/485 non-isolated converter

7ML1930-1BY

RD200 USB serial adapter

7ML1930-6AH

USB to RS 232 converter

7ML1930-6AK

RD Software CD for 1 ... 100 displays

7ML1930-1CC

Low cost polycarbonate plastic enclosure for 1 display

7ML1930-1CF

2 inch (5.08 cm) pipe mounting kit (zinc plated seal) only available with 7ML1930-1CF

7ML1930-1BP

2 inch (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301) only available with 7ML1930-1CF

7ML1930-1BQ

Thermoplastic enclosure

For use with 1 display

7ML1930-1CG

For use with 2 displays

7ML1930-1CH

For use with 3 displays

7ML1930-1CJ

For use with 4 displays

7ML1930-1CK

For use with 5 displays

7ML1930-1CL

For use with 6 displays

7ML1930-1CM

Stainless steel enclosure (Type 304, EN 1.4301)

For use with 1 display

7ML1930-1CN

For use with 2 displays

7ML1930-1CP

For use with 3 displays

7ML1930-1CQ

For use with 4 displays

7ML1930-1CR

For use with 5 displays

7ML1930-1CS

For use with 6 displays

7ML1930-1CT

Steel enclosure

For use with 1 display

7ML1930-1CU

For use with 2 displays

7ML1930-1CV

For use with 3 displays

7ML1930-1CW

For use with 4 displays

7ML1930-1CX

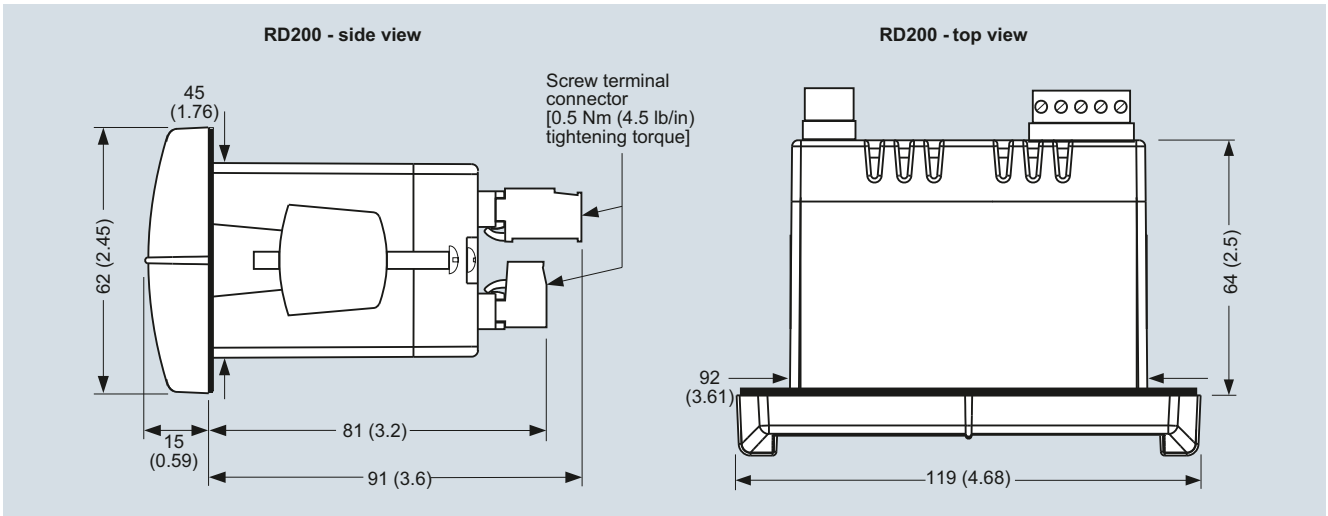
For use with 5 displays

7ML1930-1CY

For use with 6 displays

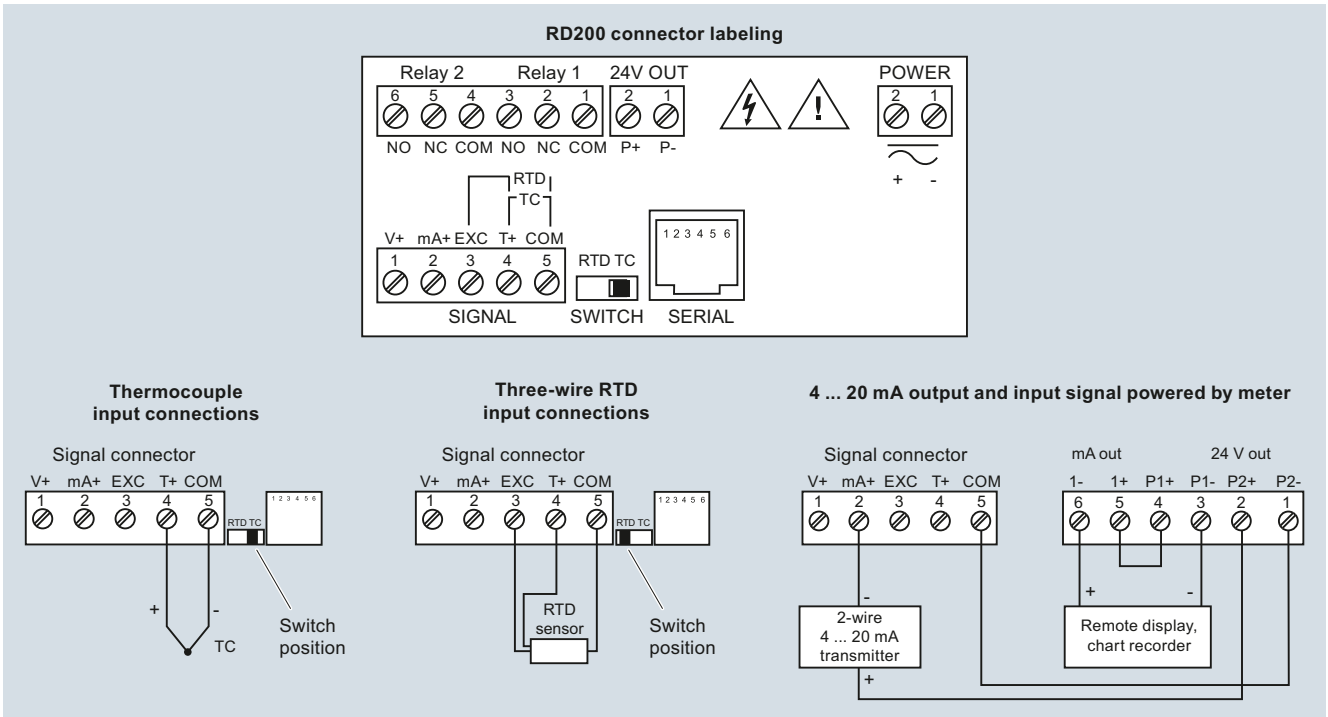
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Dimensional drawings



SITRANS RD200, dimensions in mm (inch)

Schematics



SITRANS RD200 connections

Supplementary Components

Displays

SITRANS RD300

Overview



The SITRANS RD300 is a panel mount remote digital display for process instrumentation and acts as a multi-purpose, easy to use, rate/totalizer ideal for flow rate, total, and control applications.

Benefits

- Easy setup and programming via front panel buttons or using free RD software available via USB drive
- Display readable in sunlight
- Input: accepts current and voltage
- Single or dual 24 V DC transmitter power supply
- Serial communication using built in protocol or Modbus RTU
- Supports up to 8 relays and 8 digital I/O for process control and alarming
- 32-Point linearization, square root or exponential linearization
- Multi-pump alternation control
- Supports total, grand total or non-resettable grand total
- 9-digit totalizer with total overflow feature
- Large dual-line, 6-digit display
- Configure, monitor, and datalog from a PC
- Dual-input option with math functions: addition, difference, average, multiplication, division, minimum, maximum, weighted average, ratio, concentration

Application

The RD300 is a remote display for level, flow, pressure, weighing, and other process instruments. This display also acts as a multi-purpose, easy to use rate/totalizer ideal for flow rate, total, and control applications.

Data can be remotely collected, logged and presented on your local computer using the free RD software available via USB drive.

The display accepts a single or dual input of current and voltage. This makes the RD300 an ideal fit for use with most field instruments.

The RD300 can be set up as a standard panel mount, or combined with optional enclosures to allow it to house up to 6 displays.

- Key Applications: tank farms, pump alternation control, local or remote display of level, flow, pressure and weighing instrument values, PC monitoring and data logging with RD Software.

Technical specifications

Mode of operation		Electrical connection	
Measuring principle	Analog to digital conversion	mA output signal	2-core copper conductor, twisted, shielded, 0.82 ... 3.30 mm ² (18 ... 12 AWG), Belden 8 760 or equivalent is acceptable
Measuring points	1 or 2 instruments	Electrical connection and relay connection	Copper conductor according to local requirements, rated 3A at 250 V AC
Input		Power supply	
Measuring range		Input voltage option	85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max. or jumper selectable 12/24 V DC \pm 10 %, 15 W max
• Current	4 ... 20 mA, 0 ... 20 mA	Transmitter power supply	Terminals P+ & P-: 24 V DC \pm 10 %, 12/24 V DC powered models selectable for 24, 10, or 5 V DC supply (internal jumper J4), 85 ... 265 V AC models rated at 200 mA max, 12/24 V DC powered models rated at 100 mA max, at 50 mA max for 5 or 10 VDC supply.
• Voltage	0 V DC ... +10 V DC, 1 ... 5 V, 0 ... 5 V	External loop power supply	35 V DC max.
Output signal		Output loop resistance	• 24 V DC, 10 ... 700 Ω max. • 35 V DC (external), 100 ... 1 200 Ω max.
Output	• 4 ... 20 mA (optional) • Modbus RTU	Displays and controls	
Relays	2 or 4 SPDT (Form C) internal and/or 4 SPST (Form A) external; rated 3 A at 30 V DC and 125/250 V AC resistive load; 1/14 HP (50 W) at 125/250 V AC for inductive loads (optional)	Main display	0.6 inch (15 mm) high, red LEDs
Communications	• RS 232 with Modbus RTU • RS 422/485 with Modbus RTU • USB configuration and monitoring port	Second display	0.46 inch (12 mm) high, red LEDs, 6-digits: each (-99 999 ... 999 999)
Accuracy		Memory	• Non-volatile • Stores settings for minimum of 10 years if power is lost
4 ... 20 mA optional output	\pm 0.1 % FS \pm 0.004 mA	Programming	• Primary: front panel • Secondary: Meter Copy or PC with SITRANS RD Software
Process input	\pm 0.05 % of span \pm 1 count, square root: 10 ... 100 % FS	Certificates and approvals	
Rated operating conditions		CE, UL, cUL	
Ambient conditions		Options	
• Storage temperature range	-40 ... +85 °C (-40 ... +185 °F)	Enclosures	Plastic, steel and stainless steel (Type 304, EN 1.4301) NEMA 4 and 4X enclosures
• Operating temperature range	-40 ... +65 °C (-40 ... +149 °F)		
Design			
Weight	269 g (9.5 oz) (including options)		
Material (enclosure)	• 1/8 DIN, high impact plastic, UL94V-0, color: gray • Optional plastic, steel and stainless steel (Type 304, EN 1.4301) NEMA 4 enclosures		
Degree of protection	Type 4X, NEMA 4X, IP65 (front cover); panel gasket provided		

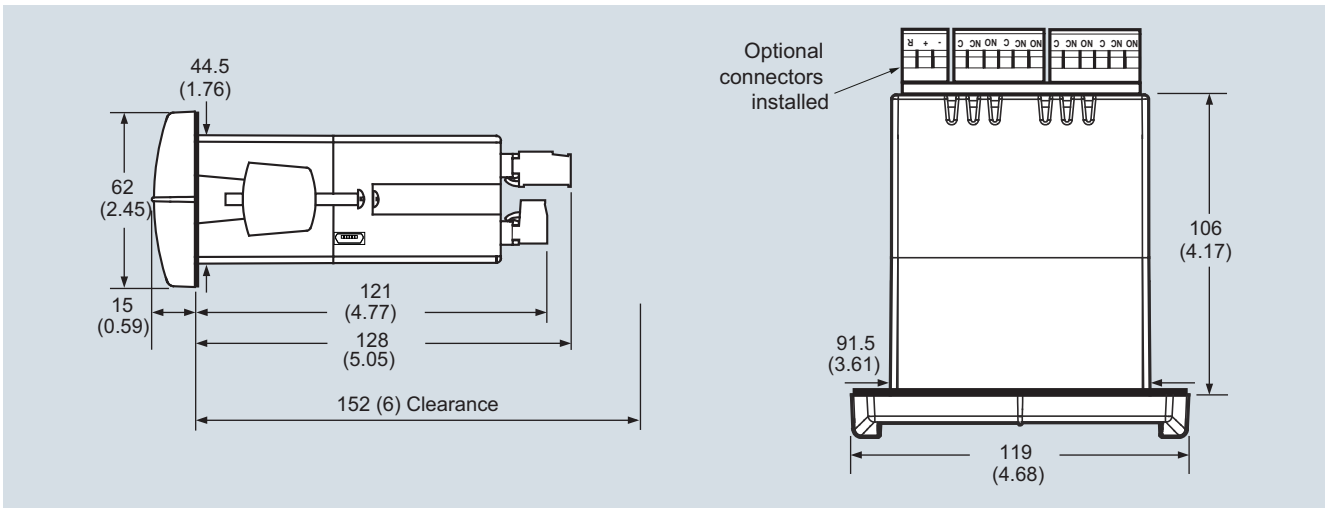
Supplementary Components

Displays

SITRANS RD300

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS RD300 Two input multi-line remote display compatible with Process Instrumentation instruments ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5744- - 0 A	Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Input voltage 85 ... 265 V AC, 50/60 Hz; 90 ... 265 V DC, 20 W max. 12 ... 36 V DC; 12 ... 24 V AC, 6 W max.	1 2	Accessories DIN-Rail Mounting Kit 4 Relays Expansion Module 4 Digital I/O Module Dual output 4 ... 20 mA expansion module for dual input meter Meter Copy Cable RS 232 Serial Adapter RS 422/485 Serial Adapter RD300 USB Serial Adapter USB to RS 232 Converter Snubber	7ML1930-6AB 7ML1930-6AC 7ML1930-6AD 7ML1930-6AP
Output None 2 Relays 4 Relays 4 ... 20 mA output 2 Relays and 4 ... 20 mA output 4 Relays and 4 ... 20 mA output	A B C D E F	RS 232 Serial Adapter RS 422/485 Serial Adapter RD300 USB Serial Adapter USB to RS 232 Converter Snubber	7ML1930-6AE 7ML1930-6AF 7ML1930-6AG 7ML1930-6AJ 7ML1930-6AK 7ML1930-6AL
Type Single input process and flow rate/totalizer Mtr Dual input process Mtr	A B	Plastic enclosure For 1 meter For 2 meters For 4 meters For 5 meters For 6 meters	7ML1930-6AM 7ML1930-6AN 7ML1930-1CK 7ML1930-1CL 7ML1930-1CM
Display Standard SunBright	0 1		
Approvals UL, C-UL and CE	0		

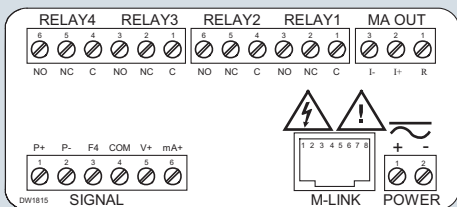
Dimensional drawings



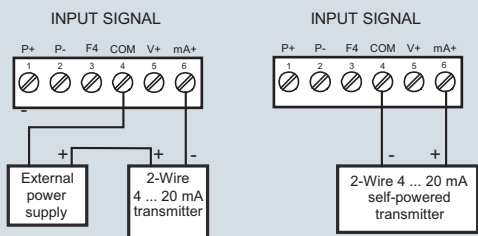
SITRANS RD300, dimensions in mm (inch)

Schematics

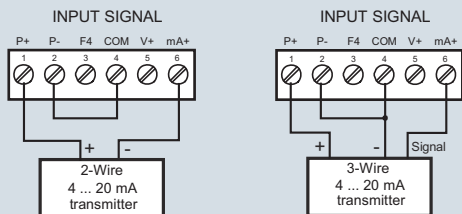
Connector labeling for fully loaded single input meter



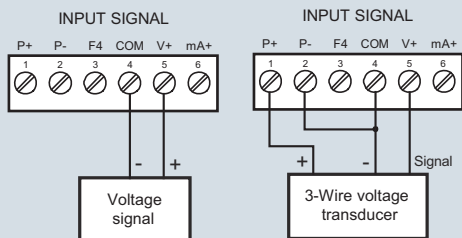
Transmitter powered by external supply or self-powered



Transmitter powered by internal supply



Voltage Input Connections



SITRANS RD300 connections

Supplementary Components

Remote Data Manager

SITRANS RD500

Overview



The SITRANS RD500 is a remote data manager providing remote monitoring through integrated web access, alarm event handling, and data capture for instrumentation and other devices.

Benefits

- RD500 supports report and alarm events via email, SMS, and FTP transfer
- Web provides worldwide access to instrument data and RD500 configuration and setup
- Simple configuration using a standard web browser, no programming or additional software required.
- Offers scalability with optional I/O modules for current (4 to 20 mA), voltage (0 to 10 V), thermocouple (TC), resistance temperature detector (RTD), and digital input, output and counter
- 10 base-TI 100 Base-TX Ethernet and support for GSM, GPRS, 3G, and PSTN provide flexible remote communications options
- Supports up to 128 devices with the flexible I/O modules and supports addressing for Modbus serial devices via RS 232 and RS 485 serial ports
- Integrated FTP server and client support FTP data synchronization to central servers
- Compact flash slot supports up to 2 gigabytes of expandable memory for data capture and storage, 1 gigabyte industrial compact flash card included
- Log files formats are CSV (comma separated values) for data files and HTML for report files
- Supports Modbus TCP via Ethernet and GPRS for easy integration into control systems
- Optional 3G Modem offers VPN support

Application

The RD500 is an easy-to-use remote data monitoring solution, using a web-based application and hardware modules. The unique modular approach allows a variety of process signals to be monitored, while the serial ports allow data to be collected from Modbus RTU devices and Modbus TCP via EtherNet.

The RD500 comprises a master communications module, and up to 16 slave modules. Various module types are available, allowing up to a maximum of 128 conventional inputs and outputs. The RD500's serial ports can support addressing for Modbus RTU slave devices including field instruments.

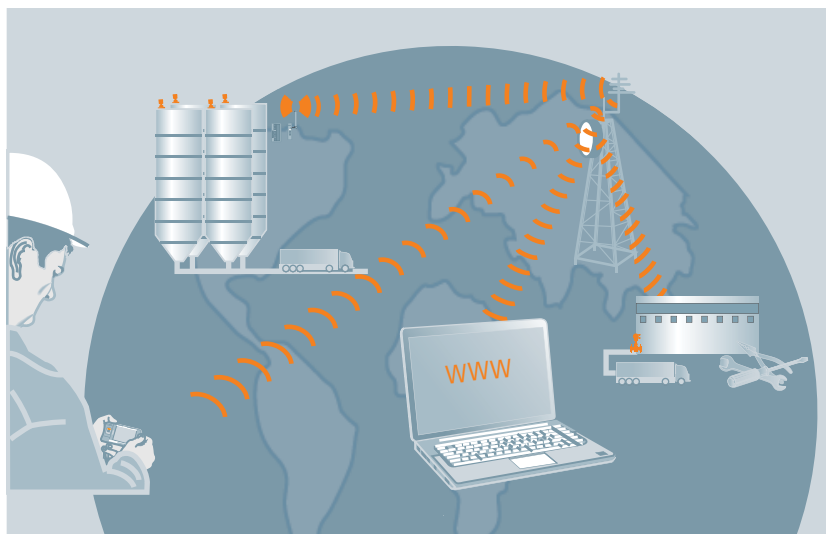
The RD500's built-in web server, FTP, and email client allows the process to be monitored remotely. Alarm notifications are com-

municated through email and SMS text messages to one or more recipients to ensure that appropriate actions are taken by personnel.

The RD500 supports modems, providing flexibility for applications in which cellular or landline connectivity is desired.

The RD500 is configured via a web-based interface - a standard browser is all the software you need to configure your system.

- Key Applications: remote monitoring of inventory, process, and maintenance applications, with web access to field instrumentation

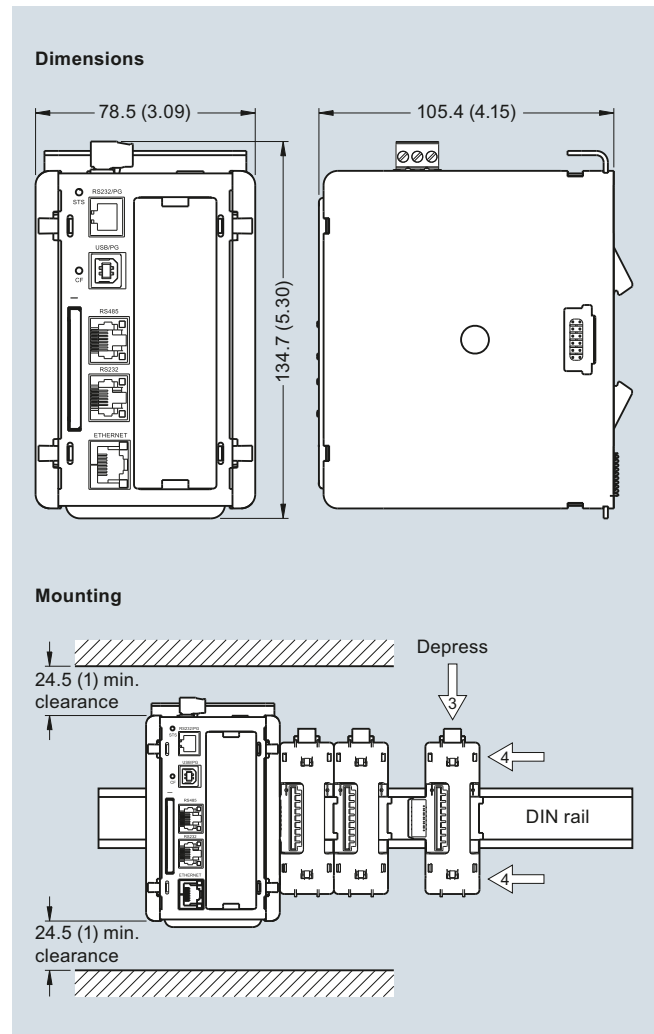


With SITRANS RD500, monitor inventory levels, process, environmental, and remote maintenance applications, and get web access to most types of field instrumentation, including flow, level, pressure, temperature measurement, and weighing.

Technical specifications

Mode of operation	
Measuring principle	Remote data monitor
Measuring points	<ul style="list-style-type: none"> Up to 128 standard inputs (conventional IO, see optional IO modules) Addressing for Modbus devices (Modbus RTU and Modbus TCP)
Input	
	See SITRANS RD500 module specifications table
Output	
	See SITRANS RD500 module specifications table
Accuracy	
	See SITRANS RD500 module specifications table
Rated operating conditions	
Storage temperature range	-30 ... +70 °C (-22 ... +158 °F)
Operating temperature	0 ... 50 °C (32 ... 122 °F)
Operating and storage humidity	80 % max relative humidity, non-condensing, from 0 ... 50 °C (32 ... 122 °F)
Design	
Material (enclosure)	High impact plastic and stainless steel
Installation category	1
Pollution degree	2
Weight	456.4 g (15.1 oz)
Mounting	Snaps onto standard DIN style top hat (T) profile mounting rails according to EN 50022 – 35 x 7.5 and – 35 x 15
Power	
	24 V DC ± 10 %
	400 mA min. (1 module)
	3.5 amps max. (16 modules)
	Must use Class 2 or SELV-rated power supply
Display	
Status LEDs	<ul style="list-style-type: none"> STS - status LED indicates condition of master TX/RX - transmit/receive LEDs show serial activity Ethernet - link and activity LEDs CF - CompactFlash LED indicates card status and read/write activity
Memory	
On-board user memory	4 MB of non-volatile Flash memory
On-board SDRAM	2 MB
Memory card	CompactFlash Type II slot for Type I and Type II cards; 1 GB (optional 2 GB)
Certificates and approvals	
Safety	<ul style="list-style-type: none"> UL listed to U.S. and Canadian safety standards for use in Class I, II, and III, Division 1 and 2 hazardous locations CE, RCM
Communication	
USB/PG port	Adheres to USB specifications 1.1. Device only using Type B connection.
Serial ports	Format and baud rates for each port are individually software programmable up to 115, 200 baud
RS232/PG port	RS 232 port via RJ12
Comms ports	RS 422/485 port via RJ45 and RS 232 port via RJ12
Ethernet port	10 BASE-T/100 BASE-TX; RJ45 jack is wired as a NIC (Network Interface Card)

Dimensional drawings



SITRANS RD500, dimensions in mm (inch)

Supplementary Components

Remote Data Manager

SITRANS RD500

SITRANS RD500 Module Specifications

	8 inputs, 6 solid state outputs	8 inputs, 6 relay outputs	8 channel, 4 ... 20 mA	8 channel ± 10 V	6 channel, RTD	8 channel thermocouple module
Order number	7ML1930-1ES	7ML1930-1ER	7ML1930-1EP	7ML1930-1EQ	7ML1930-1ET	7ML1930-1EU
Application	8 inputs, 6 outputs used to monitor contact or sensor inputs	8 inputs, 6 outputs used to monitor contact or sensor inputs	16 bit analog input module provides high density signal measurement for data monitoring applications and accepts 0/4 ... 20 mA process signals	16 bit analog input module provides high density signal measurement for data monitoring applications and accepts ± 10 V process signals	16 bit analog input module provides high-density signal measurement for data acquisition applications and accepts various RTD inputs	16 bit thermocouple input module provides high density signal measurement for data acquisition applications and accepts wide range of thermocouple types
Accuracy	Not applicable	Not applicable	± 0.1 % of span	± 0.1 % of span	± (0.2 % of span, 1 °C) 0 ... 50 °C (32 ... 122 °F); ± (0.1 % of span, 1 °C) 18 ... 28 °C (64 ... 82 °F); includes NIST conformity, A/D conversion errors, temperature coefficient and linearization conformity at 23 °C after 20 minutes warm-up	± (0.3 % of span, 1 °C); includes NIST conformity, cold junction effect, A/D conversion errors, temperature coefficient and linearization conformity at 23 °C after 20 minute warm-up
Mounting	Snaps onto standard DIN style top hat (T) profile mounting rails according to EN 50022 – 35 x 7.5 and – 35 x 15					
Inputs	Dip switch selectable for sink or source	<ul style="list-style-type: none"> Dip switch selectable for sink or source max. voltage: 30 V DC, reverse polarity protected Off voltage: < 1.2 V On voltage: > 3.8 V Input frequency: <ul style="list-style-type: none"> - Filter switch on: 50 Hz - Filter switch off: 300 Hz 	<ul style="list-style-type: none"> 8 single-ended ranges: 0 ... 20 mA or 4 ... 20 mA resolution: full 16-bit Sample time: 50 ... 400 ms depending on number of enabled inputs 	<ul style="list-style-type: none"> 8 single-ended ranges: 0 ... 10 V DC or ± 10 V DC resolution: full 16-bit Sample time: 50 ... 400 ms depending on number of enabled inputs 	<ul style="list-style-type: none"> 6 single-ended resolution: full 16-bit Sample time: 67 ... 400 ms depending on number of enabled inputs 	<ul style="list-style-type: none"> 8 single-ended resolution: full 16-bit Sample time: 50 ... 400 ms depending on number of enabled inputs
Outputs	Solid state output, switched DC, contact rating 1 A DC max.	Form A, NO pairs share common terminals: 1&, 3&4, 5&6 Current rating by pair: 3 Amps at 30 V DC/125 V AC resistive 1/10 HP at 125 V AC	Not applicable	Not applicable	Not applicable	Not applicable

Note:

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

For more information about industrial security,
<http://www.siemens.com/industrialsecurity>

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS RD500 The SITRANS RD500 is a remote data manager providing integrated web access, alarm event handling and data capture for instrumentation. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5750- A 0 0 - 0	Input configuration modules Note: one RD500 supports 16 input modules maximum RD500 8 channel 0 (4) ... 20 mA input module RD500 8 channel ± 10 V input module RD500 8 digital inputs/pulse counters, 6 relay outputs module RD500 8 digital inputs/pulse counters, 6 solid state outputs module ¹⁾ RD500 6 channel input, RTD module RD500 8 channel thermocouple module	◆ 7ML1930-1EP ◆ 7ML1930-1EQ ◆ 7ML1930-1ER ◆ 7ML1930-1ES ◆ 7ML1930-1ET ◆ 7ML1930-1EU
Communications Connection Ethernet ¹⁾	◆ 1	Optional equipment External cellular modem Internal modem card with antenna Industrial CompactFlash card, 2 GB Industrial CompactFlash card, 1 GB RJ11 serial to terminal block RS 232 RJ45 serial to terminal block RS 485 Modem antenna RD500 Spare Module base RD500 Spare End terminator Ethernet Cat 5e Red X/O cable for configuration, 1.52 m (5 ft) USB cable type A/B Remote mount external antenna 17 ft (5 m)	7ML1930-1GJ 7ML1930-1EY 7ML1930-1FB 7ML1930-1FC 7ML1930-1FD 7ML1930-1FE 7ML1930-1FF 7ML1930-1FG 7ML1930-1FH 7ML1930-1FM 7ML1930-1FN 7ML1930-1FY
Digital Communications to Instruments RS 485 Modbus RTU and Modbus TCP	◆ A	Operating Instructions RD500 8 channel 0 (4) ... 20 mA input module manual, English Note: Operating Instructions should be ordered as a separate line item. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	7ML1998-5MB01
¹⁾ Configuration limited to 16 modules. ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.		Accessories SITRANS RD100, loop powered display - see page 7/10 SITRANS RD200, universal input display with Modbus conversion - see page 7/12 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see page 7/16 ¹⁾ Configuration limited to 16 modules ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 10/11 in the appendix.	7ML5741-... 7ML5740-... 7ML5744-...

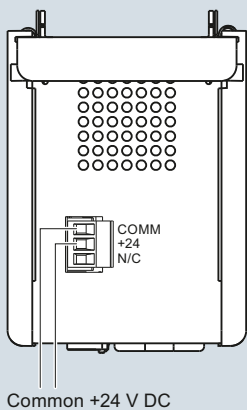
Supplementary Components

Remote Data Manager

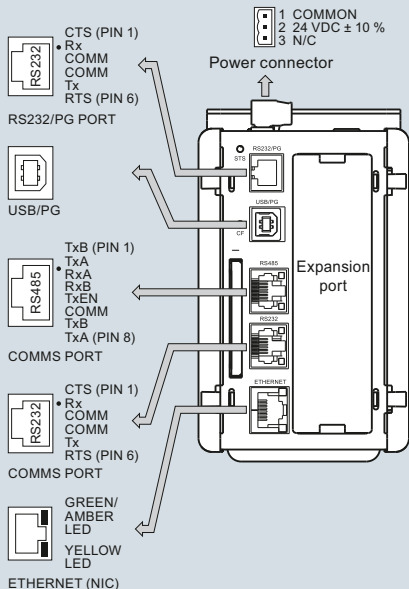
SITRANS RD500

Schematics

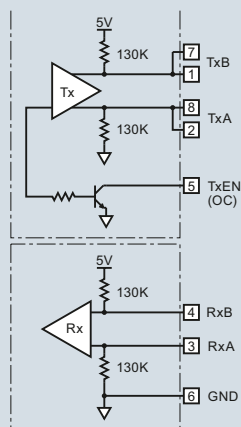
Power connection



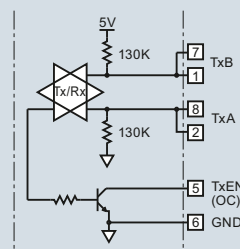
RD500 port pin outs



RS 422/485 4-wire connections

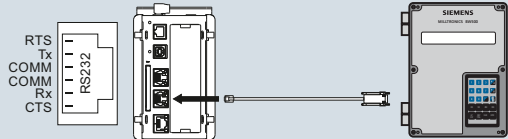


RS 485 2-wire connections

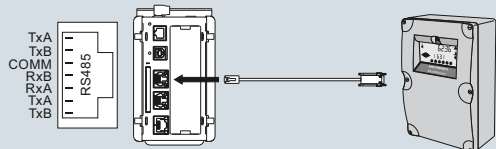


Communication ports

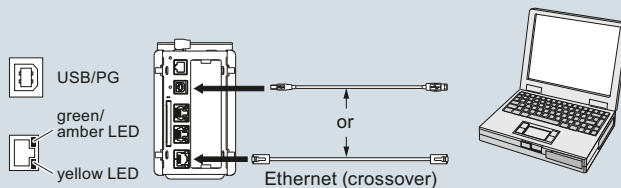
RS 232



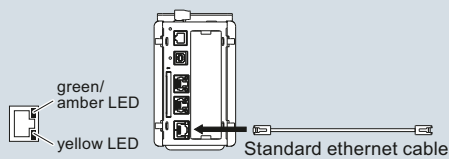
RS 485



Configuration ports



Ethernet connection (Port 3)



SITRANS RD500 connections

Overview



The RTU3030C is a compact telecontrol station (RTU: Remote Terminal Unit) for applications with their own power supply. It is particularly suited for the monitoring and control of remote stations that are not connected to an energy supply network; it can collect data of connected sensors with time stamp independently, preprocess the data, and transfer it to a control center by means of mobile radio. The RTU3030C is supplied with energy by a battery, an accumulator or solar panel or a 12 ... 24 V DC power supply unit.

The RTU3030C is characterized by the following properties:

- Global, wireless data exchange between a remote measuring point and a control center based on the mobile telecommunication standard UMTS (**U**niversal **M**obile **T**elecommunications **S**ystem) with data transmission speeds of up to 42 Mbps in the downlink (HSDPA) and 5.76 Mbps in the uplink (HSUPA)
- UMTS operation with fixed or dynamic IP addresses, depending on mobile telecommunication contract
- Communication with a telecontrol center with the help of the standard protocols DNP3 or IEC 60870-5-104
- Connection to Telecontrol Server Basic as of V3.0+SP2
- Acquisition of process signals, alarms, count pulses, measured values or output of switching commands by means of integrated inputs as well as digital inputs and outputs
- Time synchronization
 - on the basis of NTP (**N**etwork **T**ime **P**rotocol)
 - by means of the partner in the control room
 - by means of the mobile radio network
- Automatic sending of alarm emails or alarm text messages
- Wake-up station from sleep mode by means of text message or call
- Use as data logger by saving the process values to SD card
- Data buffering in the substations in the event of connection failures
- LED signaling for fast diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a standard mounting rail
- Use in tough environment due to extended temperature range from -40 to +70°C and IP68 protection due to external protective enclosure
- Fast commissioning thanks to easy configuration using the integrated web server

In conjunction with the "TeleControl Server Basic" control room software, the RTU3030C forms a telecontrol system with additional properties:

- Connection of up to 5000 telecontrol stations to the control center via OPC UA
- Central status monitoring of the substations
- No special provider services required for fixed IP addresses
- Teleservice access to the substations via mobile radio
- Wake-up of substations by calling or text message

Benefits

- **Flexible location of use**
A flexible power supply concept permits use of the RTU3030C at different measuring points in a widely distributed network, regardless of an existing energy supply network.
- **Rugged hardware**
The rugged hardware enables reliable operation even in tough environments with increased temperature range (-40°C to +70°C).
- **Flexible connection to control rooms**
Thanks to reloadable telecontrol protocols, different applications and connection options to different control rooms are supported in one device.
- **Fast and flexible data communication**
A time-driven and event-driven communication ensures that the operating personnel is informed immediately and reliably about alarms, statuses and values in the process.
- **Easy and cost-efficient engineering**
The integrated web server enables easy configuration by means of the standard web browser without additional engineering tool.
- **Fully automatic time stamp**
To enable subsequent and correct archiving of process data in the control system, all data frames are assigned with a time stamp at their place of origin.
- **Automatic buffering of process values**
The data is buffered in the substations to prevent the loss of data in case of connection failures.
- **Safe data transmission**
Use of the VPN technology OpenVPN and encrypted emails ensures secure data transmission.
- **Time is not lost in case of a power outage**
A buffered real time clock ensures that the correct time is available even after a power outage.
- **Elimination of travel and maintenance expenses**
Thanks to web-based management and integrated UMTS modem, configuration, diagnostics, control and monitoring can easily be performed remotely.

Supplementary Components

Remote Terminal Unit

SIMATIC RTU3030C

Application

The RTU3030C can be used as substation (Remote Terminal Unit) in telecontrol applications. Typical applications include the acquisition of measured values in plants that are spread over large geographical areas (e.g. level monitoring of water tanks in the water/wastewater industry).

- Data exchange and centralized data monitoring for automation systems spread over large geographical areas
- Connection of difficult-to-access external stations without a network infrastructure
- Connection of measuring points at locations without power supply infrastructure

These applications can be found in the most diverse sectors:

- Water/wastewater treatment plants
 - Detection of leaks or water loss
 - Monitoring of pumping stations, water towers/reservoirs
 - Acquisition and monitoring of level / pressure / flow / temperature
 - Flood protection
- Inventory management – Monitoring of levels in tanks and silos
- Agriculture monitoring – Monitoring of irrigation systems or greenhouses
- Wind power – Wind measurement for dimensioning of wind turbines

Design

The SIMATIC RTU3030C is a compact module in SIMATIC S7-1200 design:

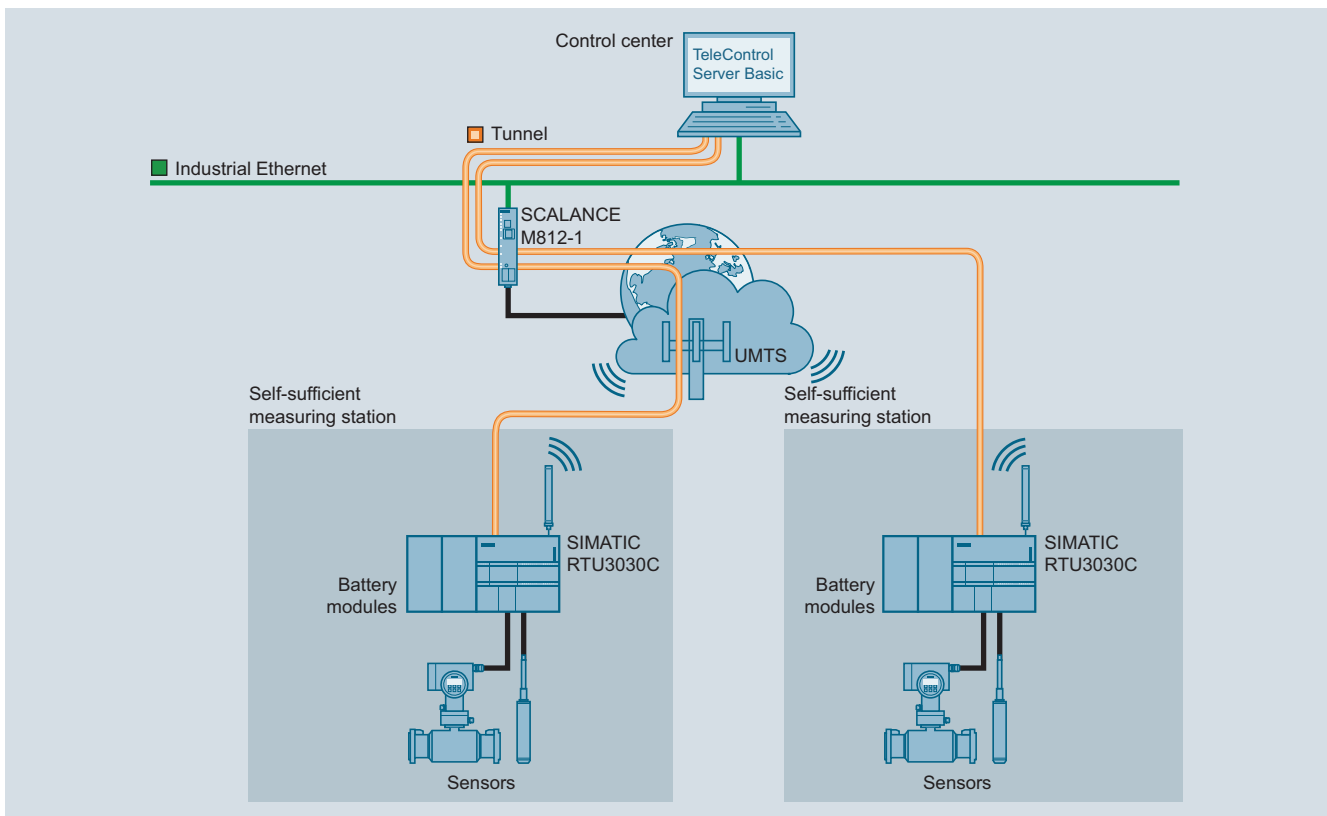
- Rugged, compact plastic enclosure for the temperature range -40 °C to +70 °C
- Easily accessible connection and diagnostics elements
- Easy mounting on a standard DIN rail
- Four plug-in screw terminal for eight digital inputs (pushbutton/switch/relay contacts) of which two can be configured as counter inputs
- Four plug-in screw terminal for four analog inputs: Current / voltage (0/4...20 mA, 0...10 V, 0...5 V) or temperature measurement (Pt1000)
- Two plug-in screw terminals for four digital outputs designed as relay contacts
- The close-loop (12 V or 24 V can be selected) and switchable controller outputs X10/X11 can be used for the supply of sensors and actuators
- 5-pin, plug-in terminal strip for connection of an 12 ... 24 V DC external supply voltage; connection protected against polarity reversal
- Connection socket for battery module (up to two battery modules can be connected)
- SMA antenna connection for GSM/GPRS/UMTS antenna
- RJ45 socket for connection to Industrial Ethernet at 10/100 Mbps (only local for commissioning)
- Pushbutton for the functions wake-up, shutdown, warm restart or reset to factory settings
- Slot for an SD card (Siemens SMC, SD or SDHC)
- Slot for a SIM card
- Installed temperature sensor for monitoring of temperature inside enclosure

The RTU3030C can be used as stand-alone device. The power supply can take place in independent operation by means of battery / accumulator / solar panel. The optional batteries (maximum of two modules) are connected directly on the left side of the device without additional wiring. The power can also be supplied by a 5-pin terminal strip on the bottom of the module, even in combination with battery modules. The antenna socket for the mobile radio antenna is located on the top, the SIM slot on the bottom and the SD slot on the front of the module. Removable screw-type terminals make for quick module replacement because the connected sensors must not be wired again.

Function

The RTU3030C is a compact telecontrol station. The station enables wireless connection to and monitoring of remote measuring points in TeleControl Server Basic or any other control room. To ensure independent operation, it can also switch between four operating modes:

- **Sleep mode**
All inputs and communication functions are turned off so that power consumption is minimal. Outputs can retain their last value.
- **Update mode**
Used to query the inputs and outputs. The query cycle can be configured individually.
- **Communication mode**
Wireless radio connection and communication to central office are active. UMTS enables fast data transmission.
- **Service mode**
Maintenance work can take place without loss of data.



Connection of the SIMATIC RTU3030C to TeleControl Server Basic through mobile radio

Energy-independent mode

The RTU3030C can be operated in energy saving mode. Depending on the communication requirements and the connected type of power supply (e.g. battery, solar accumulator), independent operation can thus be guaranteed for many years to come.

Data backup

Data losses are prevented by the data buffering mechanisms integrated in the product. In the event of a connection failure, time-stamped frames are buffered in the device. When the connection returns, the buffered values are automatically transferred to the control center in the right order.

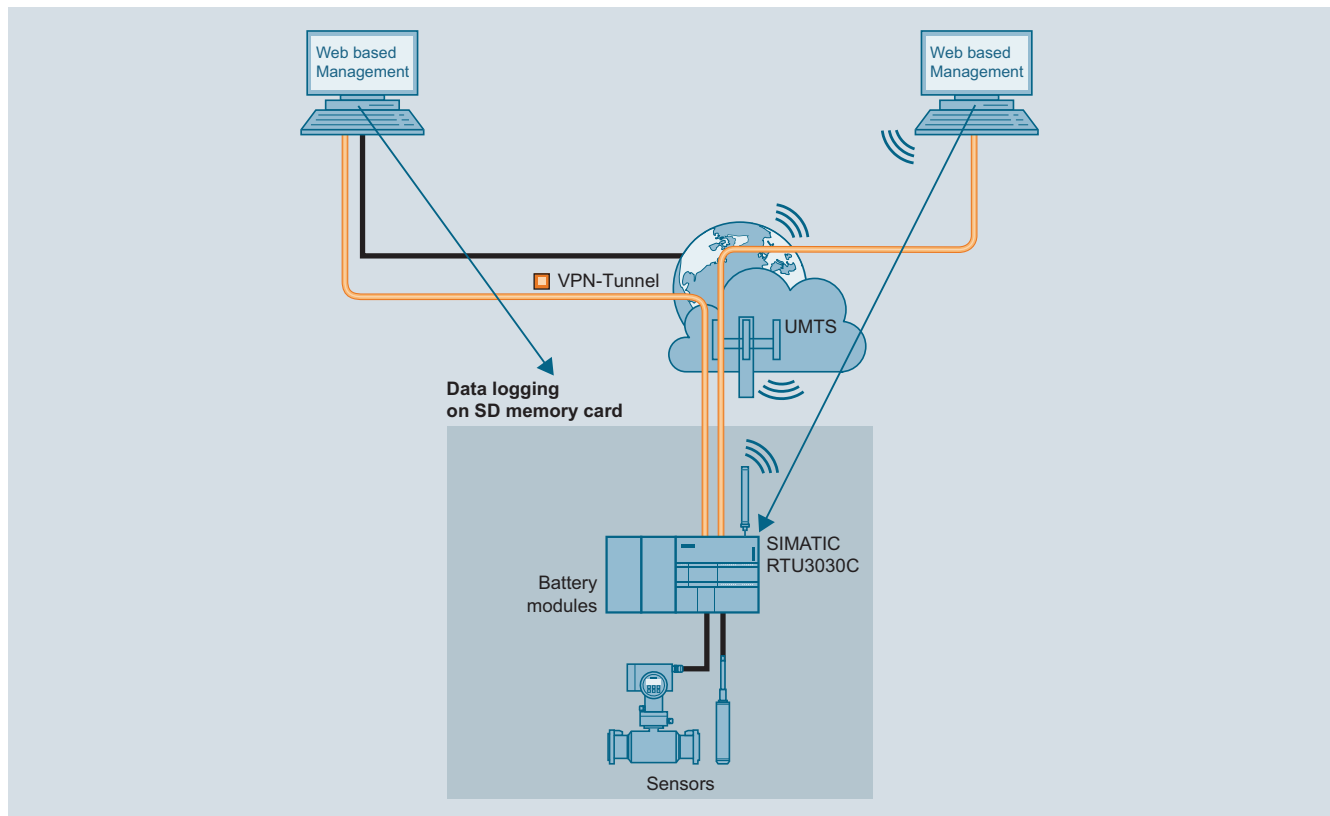
Data logging

The RTU3030C supports the backup of process data on SD card. The retentively saved data can be sent cyclically by email or, if necessary, downloaded directly using web-based management (WBM).

Supplementary Components

Remote Terminal Unit

SIMATIC RTU3030C



Data logging on SD card

Data point configuration

For data point configuration, the RTU supports a series of data point types: Digital input, digital output, analog input, counter input. Configuration of the data points can take place with little effort using the websites of the RTU3030C. The cyclic or event-controller transfer of measured values, setpoints or alarms can thus be implemented in only a few operations.

Data preprocessing

Ready-to-use program blocks (30 different types) enable data preprocessing directly in the RTU3030C. The process data can be linked by means of process blocks for basic control jobs. Use of analog and digital bit memories enables buffering of calculation results.

30 different types in the following groups are supported:

- Blocks for logical functions (e.g. AND, OR)
- Blocks for time functions (e.g. ON and OFF delay, astronomical clock)
- Blocks for analog value functions (e.g. threshold value monitoring)
- Counter blocks
- Blocks for messages (text messages, email)
- Relay blocks (latching relay, pulse relay)

Time synchronization

The RTU supports time synchronization and therefore ensures that historical data is given the correct time stamp. In addition to using the NTP protocol, you can synchronize the time via the telecontrol center or the wireless communication provider.

Alarms sent by email or text message

To make station conditions available to the service or maintenance personnel in a timely manner, alarm emails or alarm text messages can be configured. If previously defined events (such as threshold violation) were to occur, application-specific information is sent automatically by email or text message.

Telecontrol communication using standard protocols

For communication to the control room, the RTU3030C supports the standard protocols DNP3 or IEC 60870-5-104. The RTU functions as DNP3 station or as IEC slave. The RTU can also be connected to the TeleControl Server Basic (TCSB). TCSB enables a connection to any control room software, e.g. WinCC OA over OPC UA.

Remote maintenance

The RTU3030C provides remote maintenance access via WBM for access from the control room. If the RTU is in sleep mode, a text message or call will wake it up. When using the "TeleControl Basic" communication protocol, the wake-up text message can be generated in the CMT of TCSB.

Security mechanisms

Access to the RTU requires an authorization. Up to 20 different authorized email addresses or phone numbers can be defined in the WBM. Data is sent through an OpenVPN tunnel or a secure tunnel of the TeleControl Server Basic. Email messages can be encrypted (support of STARTTLS).

Diagnostics

The RTU3030C offers comprehensive diagnostic options for a quick and informative analysis of the station status. Basic diagnostic information, such as the status of the power supply, the communication connection and the inputs and outputs are signaled directly to the RTU by LEDs. The current status of the LEDs can also be retrieved through WBM.

Using the web server, comprehensive information can be retrieved, such as facts about the connection history, buffer status, and the transferred measured values.

Configuration over web server

Access to the integrated web server for diagnostics takes place locally from a PC or through the wireless communication interface. Configuration, firmware update or configuration changes can therefore be performed remotely without additional software thereby saving time and money.

Technical specifications

Order number	6NH3112-3BA00-0XX0
Product type designation	RTU3030C
Operating mode	Standby mode (Sleep mode), Actualization mode, Communication mode
Transmission rate	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• for GPRS transmission	
- with downlink maximum	85.6 kbit/s
- with uplink maximum	85.6 kbit/s
• with UMTS transmission	
- with downlink maximum	42 Mbit/s
- with uplink maximum	5.76 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for external antenna(s)	1
• for power supply	1
Number of slots	
• for SIM cards	1
• for memory cards	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• for external antenna(s)	SMA socket (50 ohms)
• for power supply	5-pole pluggable terminal block
Type of antenna	
• at port 1 connectable	mobile communications antenna (GSM/UMTS)
Interface design 1 Note	local connection only
Slot version	
• for SIM card	Mini SIM card, with adapter Micro SIM card also
• of the memory card	SD 1.0, SD 1.1, SDHC, Siemens SMC
Storage capacity of the memory card maximum	8 Gbyte
design of the removable storage C-PLUG	No
Signal-Inputs/outputs	
Number of electrical connections for digital input signals	8
Type of electrical connection for digital input signals	pluggable screw terminal block
Digital input version	Suitable for open-drain transistor or switch, 2-wire-technique
Number of electrical connections as counter inputs for digital input signals	2
Pulse duration at counter input minimum	0.1 ms
Pulse frequency at counter input maximum	5 000 Hz
Number of electrical connections for digital output signals	4
Type of electrical connection for digital output signals	pluggable screw terminal block
Digital output version	bistable relay, 2-wire-technique
Output current at digital output	300 mA; Limiting continuous current
Number of analog inputs Integrated	4
Connector type at the analog input	pluggable screw terminal block
Type of analog input	2-/3-/4-wire-technique
Product function parameterizable analog inputs	Yes; Current 0/4..20mA, Voltage 0..5/10V, Temperature (Pt1000) -80 .. +140°C
A/D resolution at the analog input	12 bit

Wireless technology	
Type of mobile wireless service	
• is supported	SMS, GPRS
• Note	GPRS (Multislot Class 10)
Type of mobile network is supported	GSM, UMTS
Operating frequency	
• for GSM transmission	850 MHz, 900 MHz, 1800 MHz, 1900 MHz
• with UMTS transmission	900 MHz, 2100 MHz
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage external at DC Rated value	12 ... 24 V
Supply voltage external at DC rated value	10.8 ... 28.8 V
Supply voltage from battery module at DC Rated value	7.8 V; Battery module is not in the scope of delivery (see accessories)
Type of output voltage for the supply of external devices	DC 12 V or 24 V
Consumed current Note	without connected consumers
Consumed current	
• from external supply voltage at 24 V DC	
- in standby mode typical	14 mA
- in update mode typical	35 mA
- in communication mode typical	83 mA
• with battery operation at 7.8 V DC	
- in standby mode typical	0.25 mA
- in update mode typical	65 mA
- in communication mode typical	192 mA
Power loss [W] Note	without connected consumers
Power loss [W] with external supply voltage at 24 V DC	
• in standby mode typical	0.34 W
• in update mode typical	0.85 W
• in communication mode typical	2 W
Active power loss with battery operation at 7.8 V DC	
• in standby mode typical	0.002 W
• in update mode typical	0.51 W
• in communication mode typical	1.5 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	-40 ... +60 °C
• for horizontally arranged busbars during operation	-40 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 30 °C without condensation during operation maximum	95 %
Protection class IP	IP20; IP68 with protective housing (see accessories)
Design, dimensions and weight	
Module format	Compact module
Width	130 mm
Height	100 mm
Depth	75 mm
Net weight	0.37 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• wall mounting	Yes

Supplementary Components

Remote Terminal Unit

SIMATIC RTU3030C

Performance data

Number of users/telephone numbers definable maximum	20
Number of user groups definable maximum	10
Number of program block types	30
Number of configurable program blocks	32

Performance data IT functions

Number of possible connections	
• as server by means of HTTP maximum	2
• as e-mail client maximum	1
Number of free texts for e-mails definable by user	20; maximum of 160 characters per user defined text
Number of entries in the e-mail buffer maximum	12
Storage capacity of the user memory	
• as flash memory file system	8 192 Mibyte

Performance data telecontrol

Suitability for use	
• Node station	No
• substation	Yes
• TIM control center	No
Control center connection	control center with IEC 60870-5, DNP3 function, TeleControl Server Basic
• by means of a permanent connection	supported
• by means of demand-oriented connection	supported
Protocol is supported	
• TCP/IP	Yes
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	No
• Modbus RTU	No
Product function data buffering if connection is aborted	Yes; at IEC: about 5,000 telegrams, at DNP3: about 10,900 telegrams, at TeleControl Server Basic: about 9,300 telegrams
Amount of data as user data per station in telecontrol mode maximum	256 Kibyte
Product feature Buffered message frame memory	Yes

Performance data Teleservice

Diagnostics function online diagnostics with SIMATIC STEP 7	No
Product function	
• program download with SIMATIC STEP 7	No
• Remote firmware update	Yes
Configuration software	
• required	No, configuration by using the integrated webserver

Product functions Diagnosis

Product function Web-based diagnostics	Yes
--	-----

Product functions Security

Suitability for operation Virtual Private Network	Yes
Operating mode Virtual Private Network note	OpenVPN-Client
Product function with VPN connection	OpenVPN
Type of encryption algorithms with VPN connection	AES-256, DES-168, BF (BlowFish)
Type of authentication procedure with VPN connection	certificate based
Type of authentication with Virtual Private Network PSK	No
Type of hashing algorithms with VPN connection	SHA-1, SHA-224, SHA-256
Number of possible connections with VPN connection	2; one simultaneous productive connection only
Product function	
• password protection for Web applications	Yes
• password protection for teleservice access	Yes
• password protection for VPN	Yes
• encrypted data transmission	Yes
• switch-off of non-required services	Yes

Product functions Time

Protocol is supported NTP	Yes
Product component Hardware real-time clock	Yes
Product feature Hardware real-time clock w. battery backup	Yes
Accuracy of the hardware real-time clock per day maximum	1.8 s
time synchronization	
• from NTP-server	Yes
• from control center	Yes
• from mobile network provider	Yes

Selection and ordering data

	Article No.		Article No.
SIMATIC RTU3030C 1)	6NH3112-3BA00-0XX0	Lithium-ion battery pack	6NH3112-3BA00-6XX0
Compact Low Power RTU for energy-independent applications; integrated UMTS modem; connection to TeleControl Server Basic; DNP3 and IEC60870-5-104 protocols		Powerful lithium-ion battery pack, 16 Ah (7.8 V nominal); also designed for extended temperature range from -40 to +70 °C	
Accessories		Enclosure in IP68 degree of protection	
TeleControl Server Basic V3.0		For SIMATIC RTU3030C; Note: Cable glands and sealing plugs must be ordered separately in the necessary quantity	
Software for 8 to 5000 stations; single license for one installation; OPC (UA) server for GPRS and Ethernet/Internet communication with SIMATIC S7-1200 and SIMATIC S7-200 (GPRS only); connection management to remote stations; routing for connections between S7 stations; German and English user interface; for Windows 7 Professional 32/64-bit + Service Pack 1 Windows 7 Enterprise 32/64-bit + Service Pack 1 Windows 7 Ultimate 32/64-bit + Service Pack 1 Windows Server 2008 32-bit + Service Pack 2 Windows Server 2008 R2 Standard 64-bit Service Pack 1		<ul style="list-style-type: none"> • Aluminum enclosure; Temperature range -40 to +80 °C; • Stainless steel enclosure; Temperature range -60 to +135 °C; 	6NH3112-3BA00-1XX3 6NH3112-3BA00-1XX1
<ul style="list-style-type: none"> • TeleControl Server Basic 8 V3 Connection management for 8 SIMATIC S7-1200 or S7-200 stations • TeleControl Server Basic 32 V3 Connection management for 32 SIMATIC S7-1200 or S7-200 stations • TeleControl Server Basic 64 V3 Connection management for 64 SIMATIC S7-1200 or S7-200 stations • TeleControl Server Basic 256 V3 Connection management for 256 SIMATIC S7-1200 or S7-200 stations • TeleControl Server Basic 1000 V3 Connection management for 1000 SIMATIC S7-1200 or S7-200 stations • TeleControl Server Basic 5000 V3 Connection management for 5000 SIMATIC S7-1200 or S7-200 stations • TeleControl Server Basic UPGR V3 Upgrade package from Version V2.x to V3 for all license sizes 	6NH9910-0AA21-0AA0 6NH9910-0AA21-0AF0 6NH9910-0AA21-0AB0 6NH9910-0AA21-0AC0 6NH9910-0AA21-0AD0 6NH9910-0AA21-0AE0 6NH9910-0AA21-0GA0	PG16 cable gland	6NH3112-3BA00-1XX4
		For IP68 enclosure, temperature range -40 to +100 °C, nickel-plated brass	
		Sealing plugs M16	6NH3112-3BA00-1XX5
		For IP68 enclosure, temperature range -40 to +100 °C, nickel-plated brass	
		SIMATIC Memory Card	
		4 MB	6ES7954-8LC02-0AA0
		12 MB	6ES7954-8LE02-0AA0
		24 MB	6ES7954-8LF02-0AA0
		256 MB	6ES7954-8LL02-0AA0
		2 GB	6ES7954-8LP01-0AA0
		ANT896-4MA 2G/3G/4G antenna	6GK5896-4MA00-0AA3
		Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional characteristic; can be rotated radially with additional joint; with SMA connector for direct mounting on the device; antenna gain 2dBi; IP54	
		ANT896-4ME 2G/3G/4G antenna	6GK5896-4ME00-0AA0
		Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional characteristic; with N-Female connector for remote installation indoors and outdoors; antenna gain 3dBi; IP66	
		ANT794-4MR antenna	6NH9860-1AA00
		Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; weather-resistant for indoor and outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket, screws, wall plugs	
Battery enclosure for independent RTU	6NH3112-3BA00-1XX2		
For lithium-ion battery pack; matching part for SIMATIC RTU3030C; Note: Battery must be ordered separately.			

Supplementary Components

Remote Terminal Unit

SIMATIC RTU3030C

	Article No.
SIMATIC NET Antenna Connection Cable N/SMA male/male Flexible antenna connecting cable for connection of antenna and SCALANCE M <ul style="list-style-type: none"> • 0.3 m • 1 m • 2 m • 5 m 	6XV1875-5LE30 6XV1875-5LH10 6XV1875-5LH20 6XV1875-5LH50
SIMATIC NET Antenna N-Connect Male/Male Flexible Connection Cable Flexible connection cable for connecting an RCoax cable or antenna to a SCALANCE W-700 access point with N-Connect connections; pre-assembled with two N-Connect male connections <ul style="list-style-type: none"> • 1 m • 2 m • 5 m • 10 m 	6XV1875-5AH10 6XV1875-5AH20 6XV1875-5AH50 6XV1875-5AN10
SIMATIC NET N-Connect/N-Connect Female/Female Panel Feedthrough Cabinet feedthrough for wall thicknesses up to 4.5 mm, two N-Connect female connections	6GK5798-2PP00-2AA6
Lightning Protector LP798-1N Lightning protector with N/N female/female connection, IP67 (-40 to +85 °C), frequency range: 0 ... 6 GHz	6GK5798-2LP00-2AA6
SITOP PSU100C 1-phase, 12 V DC/2 A Stabilized power supply Input: 100 ... 230 V AC Output: 12 V DC/2 A	6EP1321-5BA00
SITOP PSU100C 1-phase, 12 V DC/6.5 A Stabilized power supply Input: 100 ... 230 V AC Output: 12 V DC/6.5 A	6EP1322-5BA10
SITOP PSU100C 1-phase, 24 V DC/1.3 A Stabilized power supply Input: 120 ... 230 V AC Output: 24 V DC/1.3 A	6EP1331-5BA10
SITOP PSU100C 1-phase, 24 V DC/2.5 A Stabilized power supply Input: 100 ... 230 V AC Output: 24 V DC/2.5 A	6EP1332-5BA00
SITOP PSU100C 1-phase, 24 V DC/3.7 A Stabilized power supply Input: 100 ... 230 V AC (110 ... 300 V AC) Output: 24 V DC / 3.7 A limited output power NEC class 2	6EP1332-5BA20

¹⁾ Note national approvals under <http://www.siemens.com/mobilenetwork-approvals>

More information

Technical requirements/compatibility

Telecontrol Server Basic Version V3 SP1 is required for connection to a Telecontrol control room.

Overview



SITRANS AW200 WirelessHART adapter

The SITRANS AW200 WirelessHART adapter is a battery-powered communication component, which integrates HART and 4 to 20 mA field devices into a WirelessHART network. On the wireless communication side, the adapter supports the WirelessHART standard. HART and 4 to 20 mA field devices are connected on the field device side.

The SITRANS AW200 WirelessHART adapter

- Support the WirelessHART standard (HART V 7.1)
- Features a very high degree of security for wireless data transmission
- Integrates one 4 to 20 mA field device or up to four HART field devices (in multidrop mode) into a WirelessHART network
- Features intelligent energy management for the power supply of connected field devices
- Can be easily parameterized using SIMATIC PDM

Benefits

- High quality and service life
- Save on wiring costs for difficult installation conditions (e.g. moveable equipment parts) or for temporary installations
- Subsequent integration of an installed field device with HART interface into maintenance and diagnostic systems if the control system does not feature the required communication mechanisms.
- Proven HART devices can continue to be used for wireless communication, without any limitations.
- Field devices with a 4 to 20 mA interface (without HART) can also be connected.
- Intelligent energy management to achieve the best possible life time for the installed battery unit.
- Optimum addition to wired communication and expansion of solution options for system solutions in process automation.
- Burst mode and event notification parameterization for the adapter and connected field devices.

Application

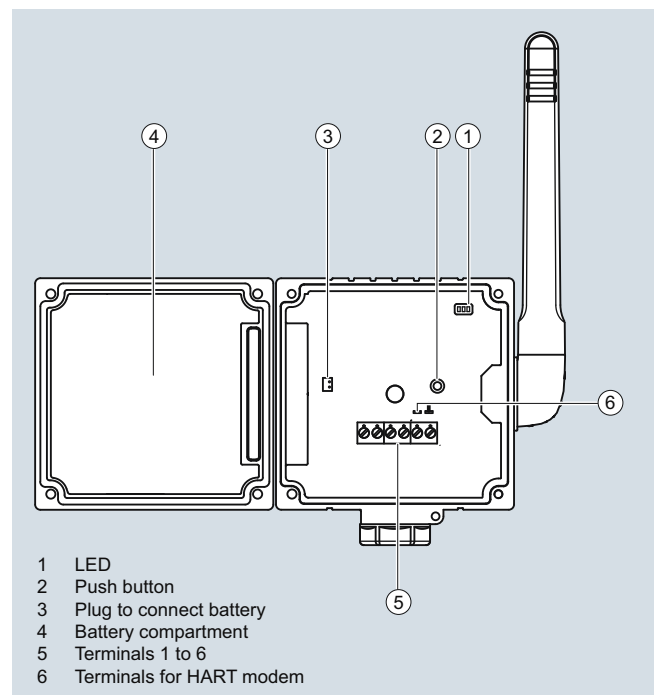
The WirelessHART adapter can be used in a number of different applications, e.g.

- Access to installed basis
Diagnostic information is obtained from existing wired HART devices through a permanent electrical connection of a WirelessHART adapter, and is sent to an asset management software near the system, e.g. SITRANS MDS.
- Status monitoring of the plant
Wireless devices are mounted at critical points in the plant, which are not usually connected to the control room due to difficult accessibility or extensive costs for wiring. Better data flow and diagnostics increase the system's reliability, transparency and safety.
- Process optimization
A temporary installation of a standard 4 to 20mA or HART device together with the WirelessHART adapter SITRANS AW200 allows flexible monitoring and plant optimization at lower costs and reduced effort.
- Process monitoring
Measured values from e.g. tanks or silos are transmitted to a superordinate system in regular time intervals, together with the device and battery status.

Design

The SITRANS AW200 WirelessHART adapter consists of

- A housing with mounted antenna
- Electronics
- A high-performance lithium battery unit



SITRANS AW200 WirelessHART adapter, assembly

The housing can be opened by loosening 4 screws. This allows to access the electronics and battery unit. The battery unit can be removed without the use of tools, since it is connected to the housing with clips.

The back of the housing features a connection part with a fixing nut onto which different replaceable connecting pieces can be screwed to mount the adapter directly on a field device.

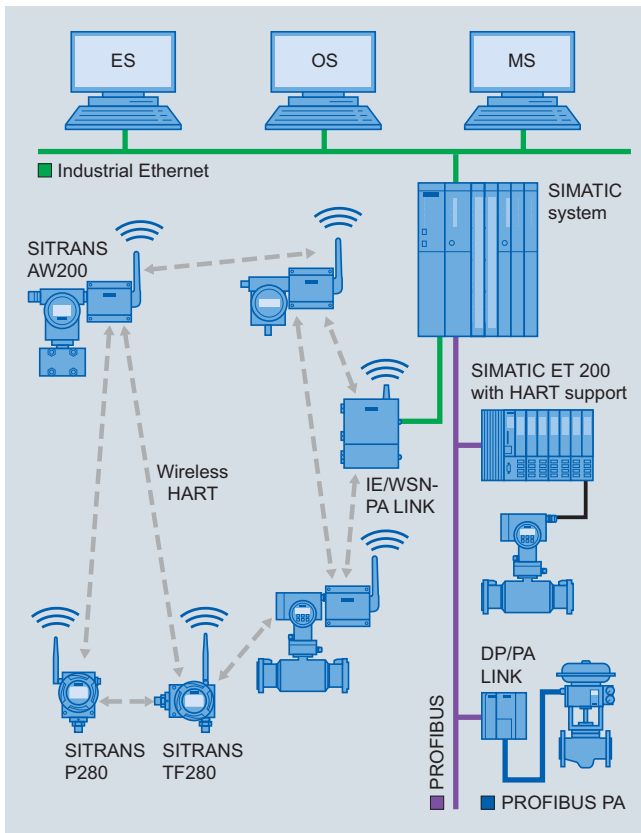
The bottom of the housing contains an optional cable opening which can be used for a cable gland. In the case of an offset mounted adapter, it is possible to feed up to 2 cables.

Supplementary Components

WirelessHART products

SITRANS AW200 - WirelessHART adapter

Function



SITRANS AW200 WirelessHART adapter functional diagram

Measured values and diagnostic information of connected field devices with HART communication are transmitted via a wired connection to the WirelessHART adapter. The adapter transmits this information in the form of wireless signals to the IE/WSN-PA LINK, the Siemens WirelessHART gateway. From here, the information is available to the network of the system.

Where a field device with a 4 to 20 mA output signal is connected to the adapter, only the measured value will be transmitted.

Following parameterization and integration into a WirelessHART network, each WirelessHART adapter is able to recognize its neighbors. It notes the strength of the wireless signal, synchronizes itself, receives network information and then establishes connections to the neighbors in the wireless network. A WirelessHART network organizes itself. Manual settings for organizational purposes are not required.

Two- and four-wire field devices can be connected to a WirelessHART adapter. In the case of a connected two-wire field device, power can be supplied by the adapter. Where multiple two-wire field devices are connected (multi drop operation), the adapter must be connected to an external power supply.

The WirelessHART adapter may also be connected in parallel to an already existing installation which consists of a power supply and a HART field device.

Interface	Connection	Function
1	—	Power supply for the field device
2	—	HART/4 ... 20 mA
3	—	External supply/Dimensions
4	—	High-resistance HART connection
5, 7	—	High-resistance HART connection
6, 8	—	Mass, high-resistance connection

Terminal block with 6 screw connection clamps

Parameterization

The SITRANS AW200 configured via HART. This can be done using a handheld communicator or even more conveniently with a HART modem and the SIMATIC PDM parameterization software.

Initial start-up of the adapter is usually carried out via SIMATIC PDM and HART modem or a handheld communicator. During initial start-up, the network ID and join key is set up in the adapter, among others. Using these parameters, the adapter is then integrated into an existing WirelessHART network.

Once it is integrated into the network, the adapter and connected HART devices can be conveniently operated via the WirelessHART network or with the onsite HART modem.

Siemens HART field devices for the adapter

HART and 4 to 20mA field devices can be connected to the SITRANS AW200 WirelessHART adapter. Depending on the electrical data of the field devices, they can receive their power supply from the WirelessHART adapter or will require an external power supply. Please find current information about connectivity to field devices from Siemens as FAQ under <http://www.siemens.com/automation/service&support>.

Note:

Siemens will only approve the Siemens HART field devices listed there for the adapter, and will only supply technical support for these devices.

Based on HART specifications, it is generally possible to connect devices that are not listed, however with the following limitations:

- All warranties and liabilities will be excluded.
- No technical support

Technical specifications

Input		Design	
Input	Point-to-Point connection to a HART field device or Point-to-Point connection to a 4 ... 20 mA field device or Up to four HART field devices with external power supply which are integrated using the multidrop method	Weight	0.5 kg without battery, 0.75 kg with battery
Communication	HART communication using multidrop method, 4 ... 20 mA power signal with Point-to-Point connection	Enclosure	
Protocol	HART V7 (compatible with previous HART versions)	• Material	• Polyester (PBT FR) • Aluminium
Transfer rate	1200 bits/s using HART multidrop method	• Cable entry	2x M20 x 1.5
Output		Degree of protection	IP65, IP66; NEMA 4
Communication	WirelessHART V7	Antenna	Omnidirectional dipolar aerial, vertical rotation
Transfer rate	Nominal 250 kBits/s	Mounting adapter	M20 x 1.5 on M20 x 1.5, M20 x 1.5 on G $\frac{1}{2}$, M20 x 1.5 on $\frac{1}{2}$ " - 14 NPT, M20 x 1.5 on $\frac{3}{4}$ " - 14 NPT
Transmission frequency band	2.4 GHz (ISM band)	Power supply	
Range (under reference conditions)	Outside areas up to 250 m, within buildings up to 50 m	Battery	Lithium thionylchlorid high-performance battery unit
RF signal strength	Can be configured: 0 dBm and 10 dBm	Supply voltage	5 ... 7.2 V DC
Output signals		Capacity	19 Ah at 20 °C
• WirelessHART adapter	Measured voltage and up to three other variables may be selected from the following: adapter temperature, battery voltage, energy consumed, expected battery life time	Service life	Up to 5 years, depending on update rate, connected field device and ambient conditions
• 4 ... 20 mA field device	Scaled or linearized process values	Voltage supply for one field device (independent of multidrop)	
• HART field device	Up to four process variables, can be configured via PDM or gateway	• No-load voltage	8 ... 23 V DC
Measuring accuracy (as per reference conditions IEC 61298-2)		• Current	4 ... 20 mA DC (as per NAMUR recommendation NE 43)
Max. measuring error (4 ... 20 mA circuit)	0.125 % re: measuring range	• Fault current	I ≤ 3.6 mA or I ≥ 21 mA
Effect of ambient temperature (4 ... 20 mA circuit)	5 µA/10 K	• Protection	Short-circuit proof, activated at voltages > 25 mA
Rated conditions		External voltage supply for one or more field devices (multidrop)	
Location	Outside/Inside	• Voltage	< 30 V DC
Ambient conditions		• Current	< 25 mA
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F) The capacity of the battery decreases rapidly if ambient temperature falls below -30 °C.	Certificates and approvals	
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F) without batteries < 21 °C with batteries	Wireless communication approvals	ETSI (R&TTE) FCC Part 15.247 for wireless applications in the 2.4 GHz transmission frequency band EN 300328
• Relative humidity	Max 90 % at 25 °C (non-condensating)	ATEX approvals	ATEX II 2G Ex ia IIC T4 ATEX II 2G Ex ia IIC T4 Gb, ATEX II 2D Ex tb [ia] IIIC IP6x T 70°C Db
• Resistance to vibration	20 ≤ f ≤ 2000 Hz: 0,01 g ² /Hz as per IEC 68-2-64	CSA approvals	Class I, DIV 1, GRP ABCD Class I, DIV 2, GRP ABCD Class I, Zone 1, Ex ia IIC, AEx ia IIC T4/T3C Class II, DIV 1, GRP EFG Class II, DIV 2, GRP FG
• Shock resistance	15 g, 11 ms as per IEC 68-2-27	IECEx approvals	Class III IECEx Ex ia IIC T4 IECEx Ex ia IIC T4 Gb, IECEx Ex tb [ia] IIIC T 70°C Db
Electromagnetic compatibility	As per EN 61326, EN 301 489-1/17 and NAMUR NE 21		

Supplementary Components

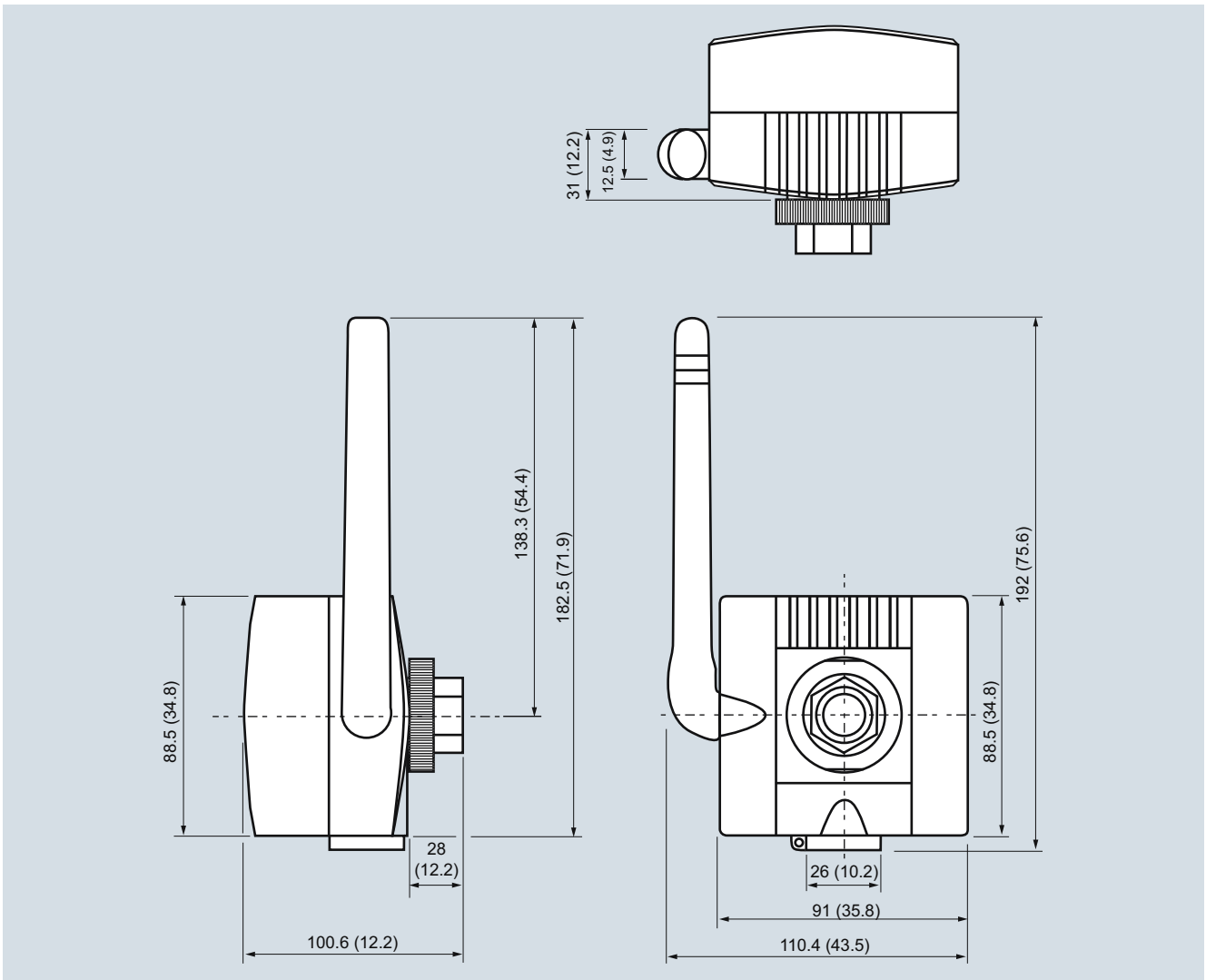
WirelessHART products

SITRANS AW200 - WirelessHART adapter

Selection and ordering data	Article No.
SITRANS AW200 adapter for WirelessHART communication ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7MP3112- 0-0AA0
WirelessHART adapter AW200 with 4 ... 20 mA- or HART interface Without battery	1
Power supply Battery powered	A
Certificates and approvals¹⁾ CE, CSA ATEX II 2G Ex ia IIC T4 ATEX II 2G Ex ia IIC T4 Gb ATEX II 2D Ex tb [ia] IIIC IP6x T 70°C Db Class I, DIV 1, DIV 2, GRP ABCD, Class I, Zone 1, Ex ia IIC, AEx ia IIC T4/T3C, Class II, DIV 1, GRP EFG, DIV 2, GRP FG, Class III IECEx Ex ia IIC T4 IECEx Ex ia IIC T4 Gb IECEx Ex tb [ia] IIIC T 70°C Db	A B C E F G
Enclosure Polyester Aluminium	0 1
Accessories	
Lithium battery for SITRANS AW200	7MP3990-0AA00
Thread adapter for direct mounting of the adapter to a field device • M20 thread adapter • Thread adapter G½ • Thread adapter ½" - 14 NPT • Thread adapter ¾" - 14 NPT	7MP3990-0BA00 7MP3990-0BB00 7MP3990-0BC00 7MP3990-0BD00
Mounting bracket for attaching to wall/pipe, material: stainless steel SS304, including cable gland	7MP3990-0CA00

¹⁾ Approvals B, C, E, F,G available soon.

Dimensional drawings

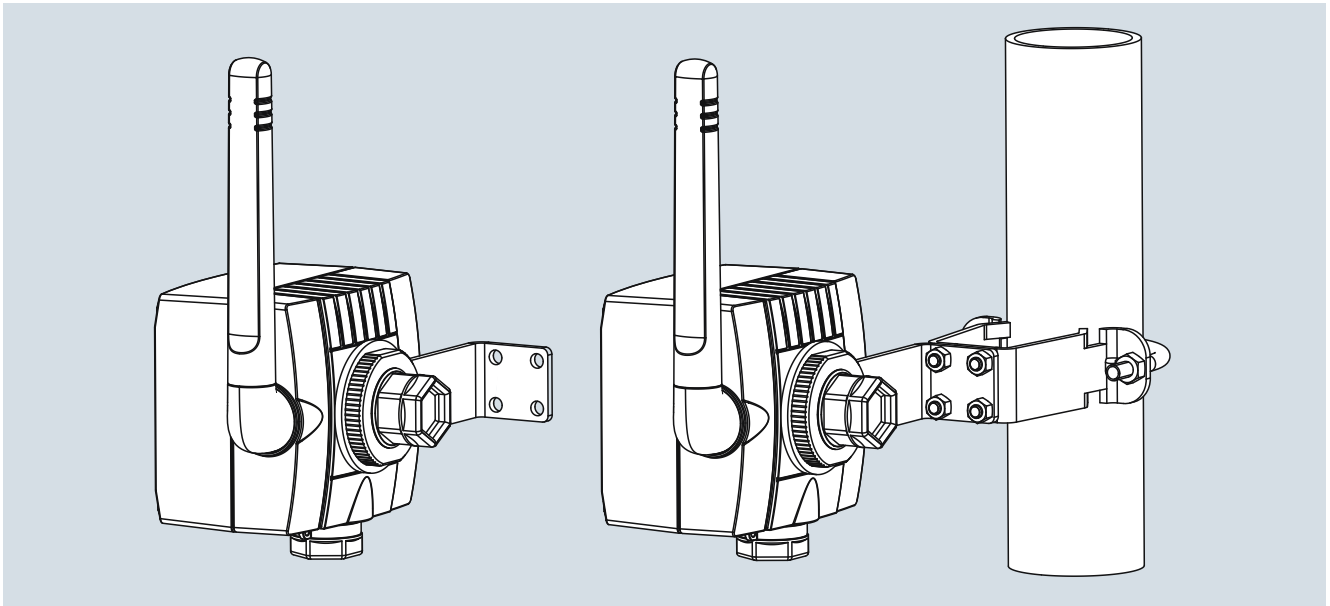


SITRANS AW200 WirelessHART adapter, dimensions in mm (inch)

Supplementary Components

WirelessHART products

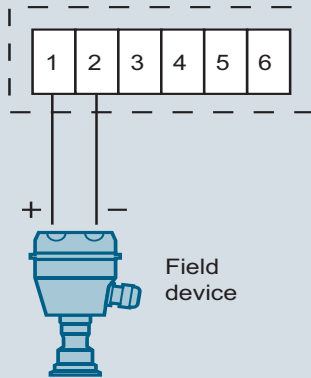
SITRANS AW200 - WirelessHART adapter



SITRANS AW200 with built-in mounting bracket for wall or pipe mounting

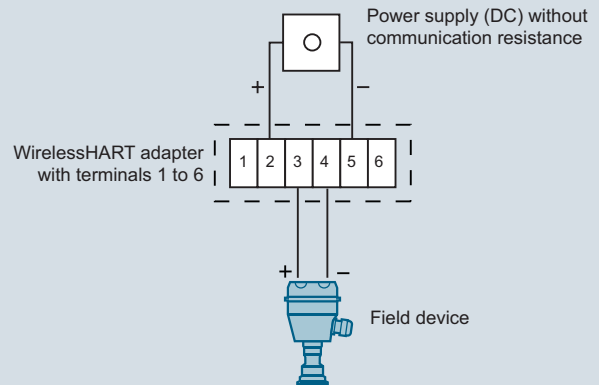
Schematics

WirelessHART adapter with terminals 1 to 6



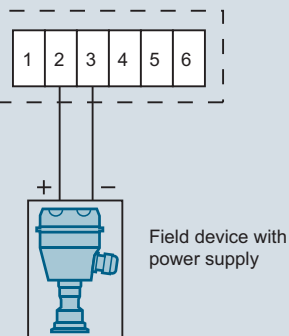
Connection of a two-wire field device, power supply provided by adapter

Power supply (DC) without communication resistance



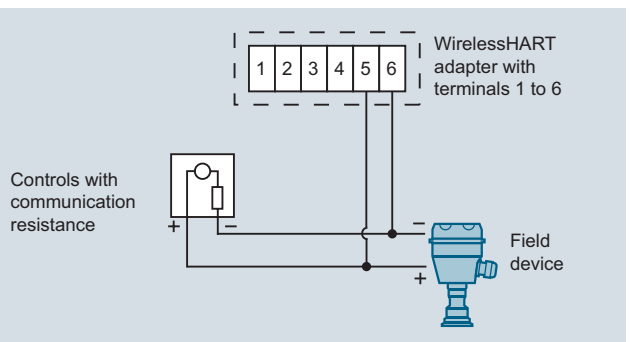
Connection of a two-wire field device with external power supply

WirelessHART adapter with terminals 1 to 6



Connection of a four-wire field device

WirelessHART adapter with terminals 1 to 6



Connection of adapter parallel to wired 4 to 20 mA communication

7

Overview



SITRANS AW210 WirelessHART adapter

The WirelessHART adapter SITRANS AW210 is a communication component which can integrate a wide range of field devices into a WirelessHART network. On the wireless communication side, the adapter supports the WirelessHART standard. HART and 4 to 20 mA field devices are connected on the field device side.

The WirelessHART adapter SITRANS AW210

- Supports the WirelessHART standard (HART V 7.1)
- Features an extremely high degree of security for wireless data transmission.
- Integrates a 4 to 20 mA field device into a WirelessHART network
- Integrates up to eight HART field devices (in multidrop mode) into a WirelessHART network
- Can be powered with the 4 to 20 mA loop or an external power supply
- Power management can be activated to minimize energy consumption
- Easy to configure with SIMATIC PDM, AMS, Handheld 475.

Benefits

- "Intrinsically safe" or "Explosion proof"
- High quality and service life
- Extremely rugged enclosure
- No additional cabling required with loop power supply
- Subsequent integration of an installed field device with HART interface into maintenance and diagnostic systems if the control system does not feature the required communication mechanisms
- Proven HART devices can continue to be used for wireless communication without any limitations
- Field devices with a 4 to 20 mA interface (without HART) can also be connected
- Ideal addition to wired communication and to the range of system solutions in process automation
- Burst mode and event notification configuration for the adapter and connected field devices

Application

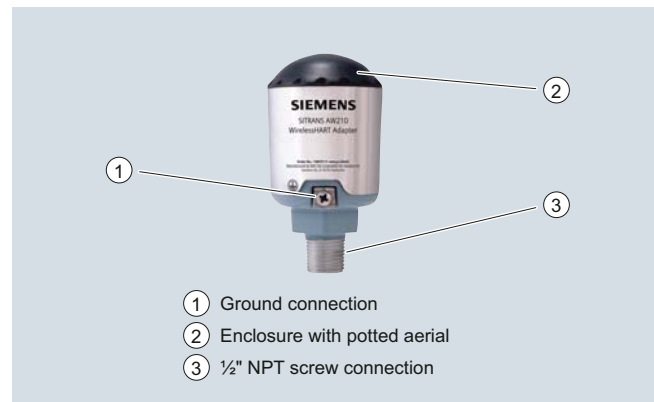
The WirelessHART adapter can be used in a number of different applications:

- Access to installed basis
Diagnostic information is obtained from existing wired HART devices thanks to the permanent electrical connection of a WirelessHART adapter and power from the 4 to 20 mA loop. This information is sent to central system-based asset management software such as SITRANS MDS.
- Status monitoring of the plant
Wireless devices are mounted at critical points in the plant which are not usually connected to the control room due to difficult access or high wiring costs. Better data flow and diagnostics increase plant reliability, transparency and safety.
- Process optimization
Temporary installation of a 4 to 20mA or standard HART device together with a SITRANS AW210 WirelessHART adapter allows easier, flexible monitoring and plant optimization at lower costs. SITRANS AW210 can also be usefully used where there is already an external power supply, or one is needed anyway.
- Process monitoring
Measured values, for example from tanks or silos, are transmitted to a higher-level system at regular intervals together with the device status. SITRANS AW210 is particularly easy to use with 4-wire devices, as they have an external power supply.

Design

SITRANS AW210 WirelessHART Adapter consists of:

- An enclosure with a fitted aerial
- Electronics



SITRANS AW210 Wireless-HART Adapter, assembly

The enclosure contains the potted electronics and the wireless module. The aerial is fitted at the top in the enclosure.

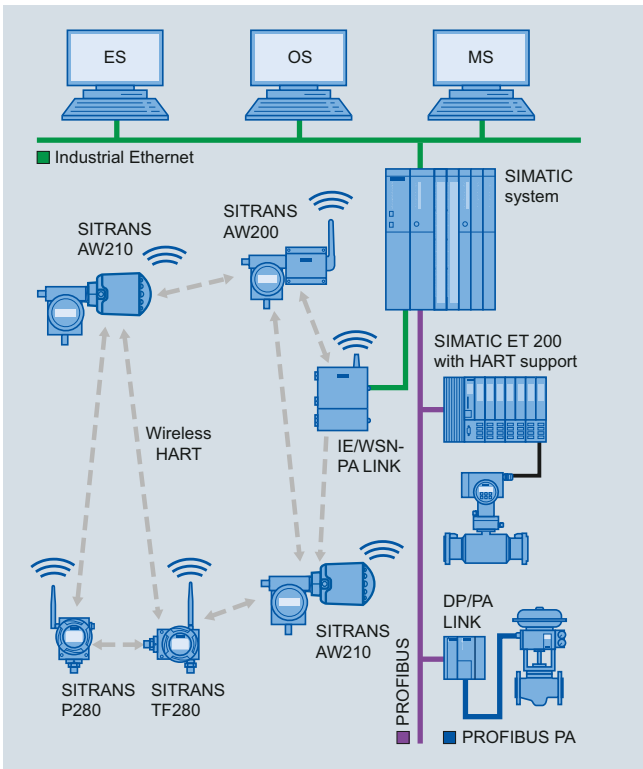
On the base of the enclosure is the connector with a 1/2" NPT female thread. Six cables run from this connector to connect the adapter.

Supplementary Components

WirelessHART products

SITRANS AW210 - WirelessHART adapter

Function



SITRANS AW210 WirelessHART Adapter, functional diagram

The measured values and diagnostic information from the connected field devices with HART communication are transmitted to the WirelessHART adapter over wired connections. The adapter transmits this information as wireless signals to the IE/WSN-PA link, the Siemens WirelessHART gateway. The measured values, all parameters and diagnostic information about the plant network can be accessed from this gateway.

If a field device with a 4 to 20 mA output signal is connected to the adapter, the current will be converted to a digital measured value and transmitted on the basis of a measuring range specified in SITRANS AW210.

Following configuration and integration into a WirelessHART network, each WirelessHART adapter is able to recognize its neighbors. It notes the strength of the wireless signal, synchronizes itself, receives network information and then establishes connections to its neighbors in the wireless network. A WirelessHART network organizes itself. Manual settings for organization are not required.

Two-wire and four-wire field devices can be connected to a WirelessHART adapter. Either up to 2 or up to 8 HART field devices can be connected to the adapter, depending on the selected product version. The adapter either has an external voltage supply or is loop-powered. The WirelessHART adapter can therefore also be connected in parallel to an existing installation consisting of a voltage supply and a HART field device.

Parameter assignment

SITRANS AW210 is configured via HART. Configuration can be carried out using handheld communicator 475 or, more conveniently, with a HART modem and the SIMATIC PDM configuration software.

Initial startup of the adapter is usually carried out via SIMATIC PDM and a HART modem or a handheld communicator. During initial startup, the network ID and join key are set in the adapter. These parameters are used to integrate the adapter into an existing WirelessHART network.

Following integration into the network, the adapter and HART devices connected can be conveniently operated via the WirelessHART network or locally, as detailed above.

Siemens HART field devices for the adapter

In principle, all HART devices certified by the HART Communication Foundation (HCF) can be operated with the SITRANS AW210 WirelessHART adapter. See <http://www.siemens.com/automation/service&support> for FAQ with the latest information on connectivity for Siemens field devices.

Note:

Siemens has only approved the Siemens HART field devices listed there for the adapter, and will only provide technical support for these devices.

Based on HART specifications, it is generally possible to connect devices that are not listed, however with the following restrictions:

- All warranties and liability will be excluded
- No technical support

Technical specifications

Input

Point-to-point connection to a HART field device or
Point-to-point connection to a 4 ... 20 mA field device or
Up to eight HART field devices with an external voltage supply integrated using multidrop

Communication

- HART communication with multidrop, as primary or secondary HART master (can be specified)
- 4 ... 20 mA current signal with a point-to-point connection scaling in user-defined measuring range in SITRANS AW210
 - Linear
 - User-defined scaling with up to 32 points

Protocol

HART V7 (compatible with previous HART versions)

Supplementary Components

WirelessHART products

SITRANS AW210 - WirelessHART adapter

Output Communication Transmission frequency band Range (under reference conditions) RF signal strength Output signals <ul style="list-style-type: none"> WirelessHART adapter <ul style="list-style-type: none"> 4 ... 20 mA field device HART field device 	WirelessHART V7 2.4 ... 2.4835 GHz (ISM band), 16-channel frequency hopping spread spectrum Outside up to 235 m (771 ft) 10 dBm <ul style="list-style-type: none"> HART Cmd 3 Measured current and up to 4 other dynamic variables (mea- sured values, derived values) or device variables HART Cmd 9 Up to 8 dynamic variables with status HART Cmd 48 Additional status information Scaled or linearized process values <ul style="list-style-type: none"> HART Cmd 3 Measured current and up to 4 other dynamic variables (mea- sured values, derived values) or device variables HART Cmd 9 Up to 8 dynamic variables with status HART Cmd 48 Additional status information 	Certificates and approvals Wireless communication approvals <ul style="list-style-type: none"> CE (R&TTE, EMC) FCC Part 15.247 for wireless ap- plications in the 2.4 GHz trans- mission frequency band IC 	
Update time for output signals	You can set the update times sep- arately for the adapter and the connected devices. The possible settings are: <ul style="list-style-type: none"> 1, 2, 4, 8, 16, 32 s 1, 2, 5, 10, 30, 60 min (times also depend on the gateway) 	Explosion protection Intrinsic safe "i" gases and vapors Intrinsic safe dust Non-sparking (zone 2) Explosion protection to FM for US Intrinsic safe, Non-sparking Explosion protection to FM for CA Intrinsic safe, Non-sparking	II 1G Ex ia IIC T*; IP68 T* = T5 for Ta = -40 ... +85 °C T* = T6 for Ta = -40 ... +75 °C II 1 D Ex iaD 20 IP68 T95C; Ta = -40 ... +85 °C II 3 G Ex nA nC IIC T* Gc; IP68 T* = T5 for Ta = -40 ... +85 °C T* = T6 for Ta = -40 ... +75 °C IS/I,II,III/1/ABCDEFGF/ T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C NI/I/2/ABCD/ T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C S/II,III/2/EFG/ T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C I/0/AEx ia/IIC/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; 20/AEx iaD/T95°C; Ta = -40 ... 85 °C I/2/AEx nA nC/IIC/ T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C; IP68 IS/I,II,III/1/ABCDEFGF/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; NI/I/2/ABCD/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; S/II,III/2/EFG/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; I/0/Ex ia/IIC/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C; I/2/Ex nA nC/IIC/ T5 Ta = -40 ... +85 °C T6 Ta = -40 ... +75 °C II/1/EFG Ta = -40 ... +85 °C; IP68
Measuring accuracy Max. measuring error (4 ... 20 mA circuit)	1 % of measuring range, 40 ... 85 °C (104 ... 185 °F)	Flameproof gases and vapors Protection by enclosure dust Explosion protection to FM for US Explosion proof, flameproof, gas, dust Explosion protection to FM for CA Explosion proof, flameproof, gas, dust	II 2 G Ex d IIC T* Gb; IP68 T* = T5 for Ta = -40 ... +85 °C T* = T6 for Ta = -40 ... +75 °C II 2 D Ex tb IIIC T95°C Ta = -40 ... +85 °C; IP68 XP/I/1/ABCD I/1 AEx d IIC T5, T6 Gb DIP/II,III/1/EFG 21/AEx tb IIIC T95°C T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C Type 6P, IP68 XP/I/1/ABCD I/1 Ex d IIC T5, T6 Gb DIP/II,III/1/EFG T5 Ta = -40 ... +85 °C, T6 Ta = -40 ... +75 °C
Rated conditions Location Ambient conditions <ul style="list-style-type: none"> Ambient temperature <ul style="list-style-type: none"> Storage temperature Electromagnetic compatibility	Outside/inside -40 ... +85 °C (-40 ... +185 °F) In hazardous areas up to 75 °C (167 °F) -40 ... +85 °C (-40 ... +185 °F) To EN 301 489-17 and EN 300 328-1		
Design Weight Enclosure <ul style="list-style-type: none"> Material - Enclosure - Cap <ul style="list-style-type: none"> Cable entry Degree of protection Aerial	0.46 kg (1.01 lb) Aluminum alloy, RoHS-compliant polyurethane corrosion-resistant coating Resin ½" NPT female thread IP68 Potted in enclosure		
Auxiliary power Power supply Loop-powered, operating current	Loop power 1 ... DC 2.5 V, can be set by user in 0.5 V DC increments DC 3.2 ... 25 mA operating cur- rent; overvoltage, surge and reverse polarity protection		

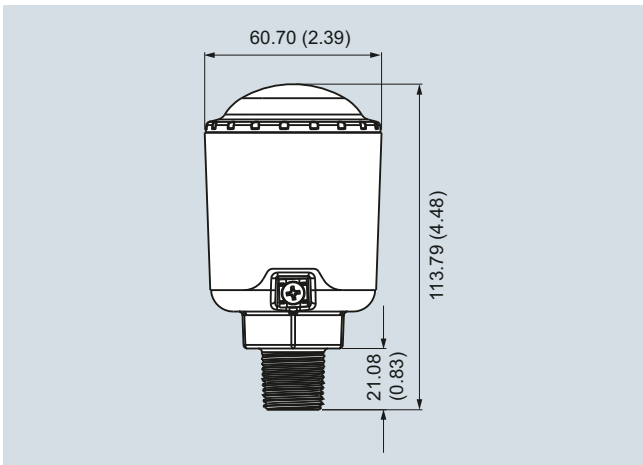
Supplementary Components

WirelessHART products

SITRANS AW210 - WirelessHART adapter

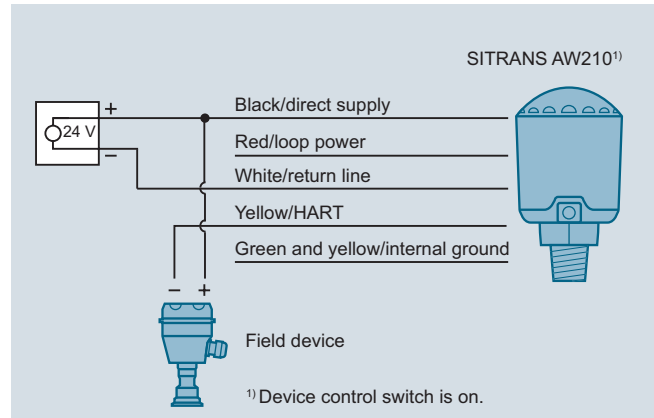
Selection and ordering data	Article No.
SITRANS AW210 Adapter for WirelessHART communication	7MP3111-0-0AA0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
WirelessHART-Adapter AW210 with 4 ... 20 mA- or HART interface	
2 devices	1
8 devices	2
Auxiliary Power	A
Loop powered or 24 V DC (external)	
Certificates and approvals	B
Intrinsically safe gas, vapors and dust (ATEX), Intrinsic Safe (FM)	
Explosion proof gas, vapour and dust (ATEX), Explosion proof (FM)	C
Enclosure	0
Aluminum	
Accessories	
Thread adapter M20 x 1.5 (male thread) on 1/2-14 NPT (female thread) IP65, not explosion proof	7MP1990-0BA00

Dimensional drawings

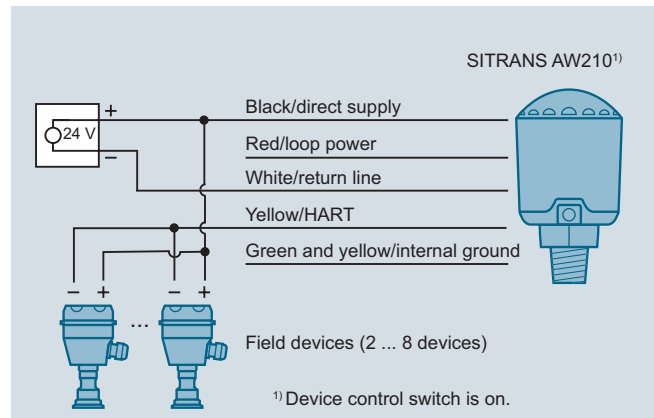


SITRANS AW210 WirelessHART adapter, dimensions in mm (inches)

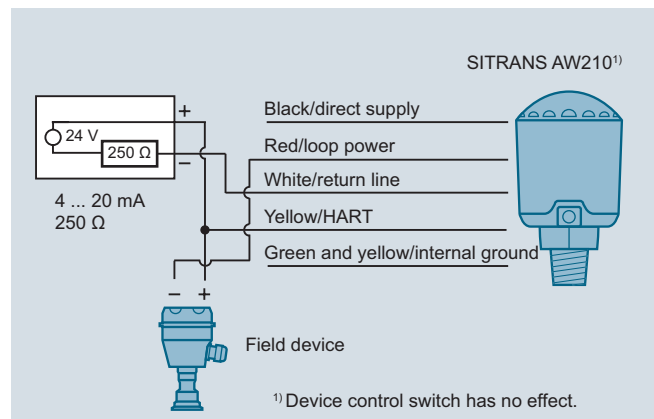
Schematics



External 24 V DC power supply, connection of one device



External 24 V DC power supply, connection of multiple devices



Loop power for connection of one 4 ... 20 mA HART device

Overview



PN	DP-M	DP-S	ASI-M		
●	●				

- Compact network transition between PROFINET and PROFIBUS
 - Connection to Industrial Ethernet via integrated 2-port real-time switch with 100 Mbps full duplex connection with auto-sensing for automatic switchover
 - In case of replacement part: Connection to PROFINET also with 10 Mbps half duplex
 - Connection to PROFIBUS with 9.6 Kbps to 12 Mbps
- PROFINET IO proxy; connection of PROFIBUS DP slaves to PROFINET IO controller in accordance with PROFINET standard: From the viewpoint of the IO controller, all DP slaves are handled like I/O devices with Ethernet interface, i.e. the IE/PB LINK PN IO is their proxy
- Cross-network PG/OP communication by means of S7 routing
- Cross-network access to data of S7 stations for visualization by means of S7 OPC server and S7 routing; via the IE/PB LINK PN IO, access can be made from the Industrial Ethernet (e.g. for HMI applications with OPC client interface) to data of the S7 stations on the PROFIBUS by means of the S7 OPC server.
- High plant availability thanks to support of the Media Redundancy Protocol (MRP)
- Module replacement without the need for a programming device, using the C-PLUG swap media for backing up the configuration data
- Use in networks that support an exchange of devices without PG on the basis of the Link Layer Discovery Protocol (LLDP)
- ET200 SP design: use of the BusAdapter (BA) of the SIMATIC ET 200SP system for freely selecting the connection technology and physical characteristics for the PROFINET side

Benefits

PROFINET applications

- Protection of investment due to simple connection of PROFIBUS DP slaves to PROFINET IO controller
- Also enables use in plants with PROFIsafe applications
- Independence from individual vendors through support of the PROFINET standard for distributed field devices
- Easy engineering and extensive diagnostics options due to optimum TIA integration

Applications with vertical integration

- Worldwide access to data of the PROFIBUS stations via Industrial Ethernet and Internet for vertical integration
- Access to process data from all enterprise levels
- Loading of STEP 7 programs from a central location

Application

As an autonomous component, the IE/PB LINK PN IO provides a seamless transition between Industrial Ethernet and PROFIBUS.

Using the IE/PB LINK PN IO as a proxy, you can continue to use existing PROFIBUS nodes (even with PROFIsafe functionality V2.0 or higher) and integrate them into a PROFINET application.

The IE/PB LINK PN IO also offers cross-network PG/OP communication by means of S7 routing.

In addition, data record routing (PROFIBUS DP) is supported. This means it is possible, for example, to use SIMATIC PDM (on the PC) on Industrial Ethernet to parameterize and diagnose a PROFIBUS field device via the IE/PB LINK PN IO.

Design

The IE/PB LINK PN IO has all the advantages of the SIMATIC ET200 SP design:

- Compact design; the front of the rugged plastic casing features:
 - Two RJ45 ports for connecting to Industrial Ethernet; the connection is made via the IE FC RJ45 Plug 90 with 90° cable outlet or via a standard patch cable
 - A 9-pin sub-D socket for connection to PROFIBUS
 - A 4-pin terminal strip for connecting the external redundant supply voltage of 24 V DC (two infeeds)
 - Diagnostics LEDs
- Optional connection possibility for Industrial Ethernet via BusAdapter (BA) of the SIMATIC ET 200SP system at the front
- Simple installation; the IE/PB LINK PN IO is mounted on a DIN rail
- Can be operated without a fan
- Fast device replacement in the event of a fault by using the optional C-PLUG swap medium (not included in scope of supply)

Supplementary Components

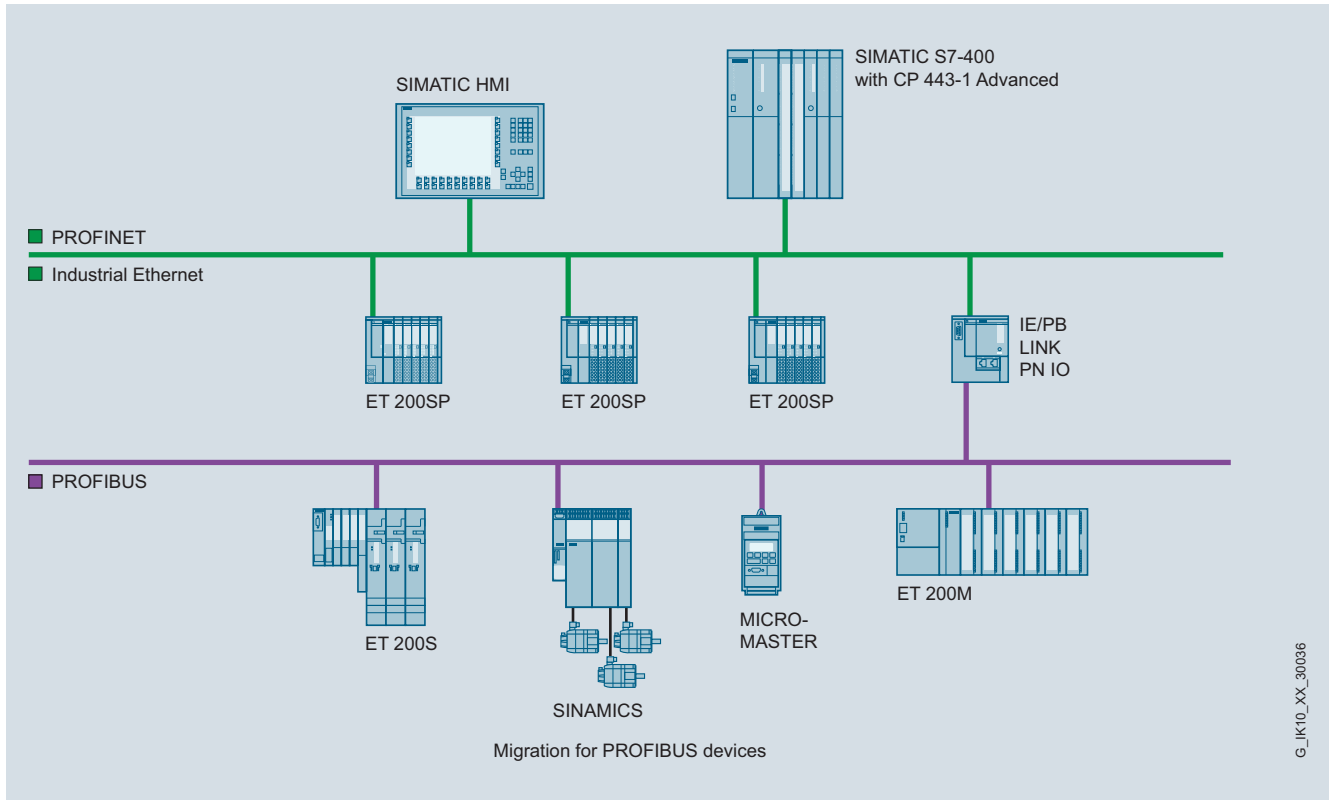
Network transitions

IE/PB LINK PN IO

Function

PROFINET

- PROFINET IO proxy; connection of PROFIBUS DP slaves to PROFINET IO controller with real-time property, according to PROFINET standard



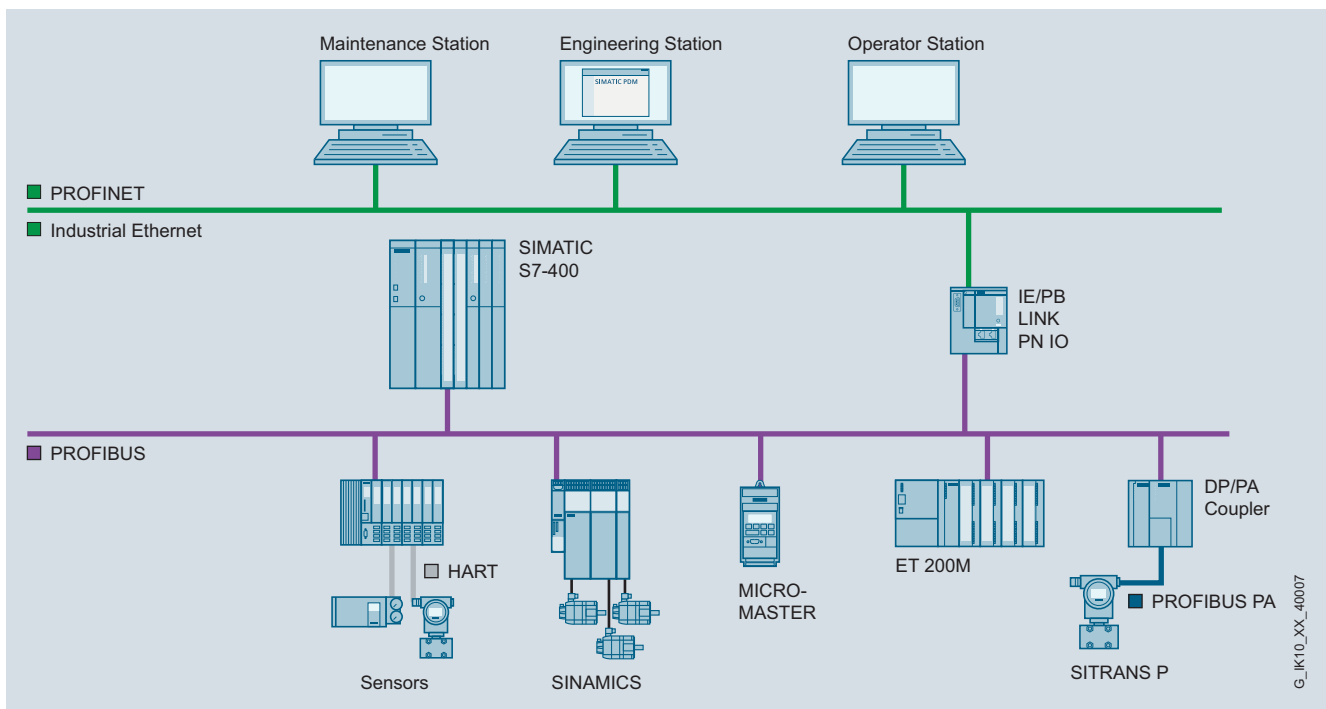
Example configuration: Seamless integration of PROFIBUS nodes into PROFINET via the IE/PB LINK PN IO as proxy

Additional functionality for vertical integration

- S7 routing
 - Permits cross-network PG communication, i.e. all S7 stations on Industrial Ethernet or PROFIBUS can be programmed remotely using the programming device.
 - Access can be made to visualization data of S7 stations on the PROFIBUS from HMI stations on the Industrial Ethernet.
- Data record routing (PROFIBUS DP)
 - Using this option, the IE/PB LINK PN IO can be used as a router for data records that are forwarded to field devices (DP slaves). SIMATIC PDM (Process Device Manager) is a tool that creates data sets of this type for parameterizing and diagnosing field devices. The configuration of the IE/PB LINK PN IO is possible not only via the STEP 7 / TIA Portal but also via the PST (Primary Setup Tool).

The additional functions for vertical integration can also be used in an existing PROFIBUS application without PROFINET for connection to a higher-level Industrial Ethernet.

In this case, the IE/PB LINK PN IO is used as an additional DP-Master Class 2 on a PROFIBUS segment for linking to Industrial Ethernet and offers the above functions.



Example configuration: Use of the IE/PB LINK PN IO as a default gateway without TIA Portal / STEP 7

Media redundancy (MRP)

Within a PROFINET network with a ring topology, the IE/PB LINK PN IO supports the media redundancy protocol MRP as an MRP client

Diagnostics

Extensive diagnostic options are available via STEP 7 or SNMP, including:

- Diagnosis of the assigned PROFIBUS field devices; using the IE/PB LINK PN IO as a proxy, the connected DP slaves can be diagnosed in the same manner as PROFINET IO devices (even in the user program of the PROFINET IO controller)
- General diagnostics and statistics functions
- Connection diagnostics
- Diagnostic buffer
- Integration into network management systems through the support of SNMP V1 MIB-II

Configuration

STEP 7 V5.5 SP4 or higher or STEP 7 Professional (TIA Portal) V14 Update 1 with an HSP is required for configuring the full functional scope of the IE/PB LINK PN IO.

For the IE/PB LINK PN IO, STEP 7 automatically generates the necessary parameters, e.g. the addresses and all necessary routing information.

The configuration data for PROFINET IO created with STEP 7 is saved on the IO controller. Attention must however be paid to the memory capacity. The initialization data for the Industrial Ethernet interface is backed up on the C-PLUG (Configuration Plug) swap media. The IE/PB LINK PN IO can be swapped in the event of failure without a programming device because the relevant configuration data is saved on the IO controller or on the C-PLUG.

- SINEMA E (license-free TIA Portal for network components)
 - The IP and PROFIBUS parameters, as well as the network settings, can also be assigned with SINEMA E (V14 or higher), if the IE/PB LINK PN IO is only to be used as a network transition and not as a PROFINET IO device.
- Primary Setup Tool (PST)
 - The IP and PROFIBUS parameters, as well as the network settings, can also be assigned without STEP 7 / TIA Portal, but with the aid of PST (Version 4.3 or higher).

Supplementary Components

Network transitions

IE/PB LINK PN IO

Technical specifications

Order number	6GK1411-5AB10	Performance data PROFIBUS DP	
Product type designation	IE/PB LINK PN IO	Service as DP master	
Transmission rate		• DPV1	Yes
Transfer rate		Number of DP slaves on DP master usable	65
• for Industrial Ethernet	10 ... 100 Mbit/s	Amount of data	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s	• of the address area of the inputs as DP master total	2 048 byte
Interfaces		• of the address area of the outputs as DP master total	2 048 byte
Number of interfaces acc. to Industrial Ethernet	1	• of the address area of the inputs per DP slave	244 byte
Number of electrical connections		• of the address area of the outputs per DP slave	244 byte
• at the 1st interface acc. to Industrial Ethernet	2	Performance data S7 communication	
• at the 1st interface acc. to PROFIBUS	1	Number of possible connections for S7 communication	
• for power supply	2	• maximum	32
Type of electrical connection		Performance data multi-protocol mode	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)	Number of active connections with multi-protocol mode	48
• at the 1st interface acc. to Industrial Ethernet	RJ45 port	Performance data PROFINET communication as PN IO-Device	
• for power supply	4-pole terminal block	Product function PROFINET IO device	Yes
Design of the removable storage C-PLUG	Yes	Performance data telecontrol	
Supply voltage, current consumption, power loss		Protocol is supported	
Type of voltage of the supply voltage	DC	• TCP/IP	Yes
Supply voltage external	24 V	Product function MIB support	Yes
Supply voltage external at DC Rated value	24 V	Protocol is supported	
Relative positive tolerance at DC at 24 V	20 %	• SNMP v1	Yes
Relative negative tolerance at DC at 24 V	15 %	• DCP	Yes
Consumed current		• LLDP	Yes
• from external supply voltage at DC at 24 V typical	0.2 A	Identification & maintenance function	
• from external supply voltage at DC at 24 V maximum	0.3 A	• I&M0 - device-specific information	Yes
Power loss [W]	4.8 W	• I&M1 - higher-level designation/location designation	Yes
• I&M3 - comment		• I&M3 - comment	Yes
Permitted ambient conditions		Product functions switch	
Ambient temperature		Product feature Switch	Yes
• for vertical installation during operation	0 ... 40 °C	Product function	
• for horizontally arranged busbars during operation	0 ... 60 °C	• Configuration with STEP 7	Yes
• during storage	-40 ... +70 °C	Product functions Routing	
• during transport	-40 ... +70 °C	Service as PROFIBUS dataset routing	Yes
Relative humidity at 25 °C without condensation during operation maximum	95 %	Number of possible connections at data record routing maximum	32
Protection class IP	IP20	Product functions Redundancy	
Design, dimensions and weight		Product function	
Width	100 mm	• Ring redundancy	Yes
Height	117 mm	Protocol is supported Media Redundancy Protocol (MRP)	Yes
Depth	74 mm	Product functions Time	
Net weight	0.6 kg	Product function SICLOCK support	Yes
Mounting type		Product function pass on time synchronization	Yes
• 35 mm DIN rail mounting	Yes	Protocol is supported	
		• NTP	Yes

Selection and ordering data

	Article No.		Article No.
IE/PB LINK PN IO	6GK1411-5AB10	S7-300 mounting rail	6ES7390-1AB60-0AA0
Network transition between Industrial Ethernet and PROFIBUS with PROFINET IO functionality, TCP/IP, S7 routing and data record routing, 10/100 Mbps Fast Ethernet, 9.6 to 12 Mbps PROFIBUS; including electronic manual on CD-ROM German, English, French, Spanish, Italian		S7-300 PS 307 load power supply	6ES7307-1BA01-0AA0
IE FC TP Standard Cable GP 2 x 2 (Type A)	6XV1840-2AH10	24 V DC	
4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/IE FC RJ45 Plug; PROFINET-compliant; with UL approval; sold by the meter; max. length 1 000 m, minimum order 20 m		STEP 7 Version 5.5	
IE FC RJ45 Plug 180		Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows XP Prof., Windows 7 Professional/Ultimate Type of delivery: German, English, French, Spanish, Italian; including license key on USB stick, with electronic documentation	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface		For CP 343-1 Lean, CP 343-1, CP 343-1 Advanced, CP 343-1 ERPC, CP 443-1, CP 443-1 Advanced, CP 443-1 RNA	
<ul style="list-style-type: none"> • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units 	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	<ul style="list-style-type: none"> • Floating license on DVD • Rental license for 50 hours • Software Update Service on DVD (requires current software version) • Upgrade floating license 3.x/4.x/5.x to V5.5; on DVD • Trial license STEP 7 V5.5; on DVD, 14 day trial 	6ES7810-4CC10-0YA5 6ES7810-4CC10-0YA6 6ES7810-4BC01-0YX2 6ES7810-4CC10-0YE5 6ES7810-4CC10-0YA7
IE FC Stripping Tool	6GK1901-1GA00	STEP 7 Professional V12 Engineering Software	
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables		Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows XP Home SP3 (STEP 7 Basic only), Windows XP Professional SP3 (32 bit), Windows 7 Home Premium SP1 (STEP 7 Basic only), Windows 7 Professional SP1 (32/64 bit), Windows 7 Enterprise SP1 (32/64 bit), Windows 7 Ultimate SP1 (32/64 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32/64 bit) Form of delivery: German, English, Chinese, Italian, French, Spanish	
CSM 377 Compact Switch Module	6GK7377-1AA00-0AA0	For CP 1543-1, CP 343-1 Lean, CP 343-1, CP 343-1 Advanced, CP 343-1 ERPC, CP 443-1, CP 443-1 Advanced	
Unmanaged switch for connection of a SIMATIC S7-300-CPU, ET 200M and up to three further nodes to Industrial Ethernet operating at 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM		<ul style="list-style-type: none"> • STEP 7 Professional V12, floating license • STEP 7 Professional V12, trial license • Upgrade STEP 7 Professional V11 to STEP 7 Professional V12, floating license • Upgrade STEP 7 Professional 2006/2010 to STEP 7 Professional V12, floating license • PowerPack & upgrade from STEP 7 V5.4/V5.5 to STEP 7 Professional V12, floating license • PowerPack STEP 7 Basic V12 to STEP 7 Professional V12, floating license 	6ES7822-1AA02-0YA5 6ES7822-1AA02-0YA7 6ES7822-1AA02-0YE5 6ES7822-1AA02-0XE5 6ES7822-1AA02-0XC5 6ES7822-1AA02-0YC5
C-PLUG	6GK1900-0AB00		
Swap medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot			
PROFIBUS FC Standard Cable GP	6XV1830-0EH10		
Standard type with special design for fast mounting, 2-core, shielded,			
PROFIBUS FastConnect bus connector RS 485 Plug 180	6GK1500-0FC10		
With insulation displacement terminals, with 180° cable outlet, for industrial PC, SIMATIC HMI OP, OLM; max. transmission rate 12 Mbps			
PROFIBUS FastConnect Stripping Tool	6GK1905-6AA00		
Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables			

Supplementary Components

Network transitions

IE/PB LINK PN IO

	Article No.
<p>STEP 7 Professional Engineering Software V12; software download incl. license key 2</p> <p>E-mail address required for the delivery</p> <ul style="list-style-type: none"> STEP 7 Professional V12, floating license STEP 7 Professional V12, trial license; Upgrade STEP 7 Professional V11 to STEP 7 Professional V12, floating license Upgrade STEP 7 Professional 2006/2010 to STEP 7 Professional V12, floating license PowerPack & upgrade from STEP 7 V5.4/V5.5 to STEP 7 Professional V12, floating license PowerPack STEP 7 Basic V12 to STEP 7 Professional V12, floating license <p>STEP 7 Professional V13 engineering software</p> <p>Target system: SIMATIC S7-300/400, SIMATIC S7-1200/1500, SIMATIC C7, SIMATIC WinAC</p> <p>Requirement: Windows 7 Professional (32 bit), Windows 7 Enterprise (32 bit), Windows 7 Ultimate (32 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32 bit)</p> <p>Form of delivery: German, English, Chinese, Italian, French, Spanish</p> <p>For CP 1243-1, CP 1543-1, CM 1542-1, CP 343-1 Lean, CP 343-1, CP 343-1 Advanced, CP 343-1 ERPC, CP 443-1, CP 443-1 Advanced</p> <ul style="list-style-type: none"> STEP 7 Professional V13, floating license STEP 7 Professional V13, trial license Upgrade STEP 7 Professional 2006/2010 to STEP 7 Professional V13, floating license PowerPack & upgrade STEP 7 V5.4/V5.5 to STEP 7 Professional V13, floating license PowerPack STEP 7 Basic V13 to STEP 7 Professional V13, floating license STEP 7 Professional V13, Software Update Service, 1 year; current software version required STEP 7 Professional V13, Software Update Service Compact, 1 year; current software version required STEP 7 Professional Software Update Service; 1 year; for STEP 7 Professional and STEP 7 Professional in the TIA Portal, requires current software version STEP 7 Professional Software Update Service Compact; 1 year; for STEP 7 Professional and STEP 7 Professional in the TIA Portal, requires current software version 	<p>6ES7822-1AE02-0YA5</p> <p>6ES7822-1AE02-0YA7</p> <p>6ES7822-1AE02-0YE5</p> <p>6ES7822-1AE02-0XE5</p> <p>6ES7822-1AE02-0XC5</p> <p>6ES7822-1AE02-0YC5</p> <p>6ES7822-...</p> <p>6ES7822-...</p> <p>6ES7822-...</p> <p>6ES7822-...</p> <p>6ES7822-...</p> <p>6ES7822-...</p> <p>6ES7822-...</p> <p>6ES7822-...</p> <p>6ES7810-...</p> <p>6ES7810-...</p>

Accessories

C-PLUG

BusAdapter

The BusAdapters offer a free selection of connection technology and physical characteristics for the PROFINET interface. **Alternatively**, they can be used for the Industrial Ethernet interface on the device.

The following bus adapter versions are supported by the IE/PB LINK PN IO:

Versions with two PN copper interfaces (RJ45 or FastConnect (FC))

- BA 2xRJ45 with 2 RJ45 connections
- BA 2xFC with 2 FastConnect connections: enables maximum system availability, even when subjected to shocks and high electromagnetic loads. This is because the FastConnect cables are fully shielded and laid directly in the BusAdapter.

Versions with one or two PN fiber-optic cable (FOC) connections

- BA 2xSCRJ with 2 SCRJ FO connections with increased potential difference
- BA SCRJ / RJ45, each with one SCRJ FO and RJ45 connection (media converter)
- BA SCRJ / FC, each with one SCRJ FO and FastConnect connection (media converter)
- BA 2xLC with two glass fiber-optic connections (Lucent Connector) with increased potential difference
- BA SCRJ / RJ45, each with one glass fiber-optic and RJ45 connection (media converter)
- BA LC / FC with one glass fiber-optic and one FastConnect connection (media converter)

The version for connecting IP67 modules of the SIMATIC ET 200AL (BA-SEND, BA 1xFC) is not supported.

More information

<http://www.siemens.com/profinet>

Communication and Software



Communication

- 8/2 HART protocol
- 8/3 PROFIBUS
- 8/4 FOUNDATION Fieldbus

Software

- 8/5 SIMATIC PDM -
Process Device Manager
- 8/17 SITRANS DTM
- 8/18 SITRANS Library

Communication and Software

Communication

HART protocol

Overview

HART is a widely used communication standard for field devices. Specification of HART devices takes place through the HCF (HART Communication Foundation).

The HART standard expands the analog 4 to 20 mA signal for modulated, industry-proven, digital signal transmission.

Benefits

- Service-proven analog measured value transmission
- Simultaneous digital communication with bidirectional data transmission
- Possibility of transmitting several measured variables from one field device (e.g. diagnosis, maintenance and process data)
- Connection to higher-level systems such as PROFIBUS DP
- Easy installation and startup

Use in conjunction with SIMATIC PDM

- Cross-vendor operation of all HART devices by means of standardized parameter records
- HART field devices that are described by HART DD are integrated in SIMATIC PDM through the HCF catalog. HART DD (Device Description) is standardized in SIMATIC PDM, multi-vendor and very widely used. Other HART field devices are integrated in SIMATIC PDM through EDD (Electronic Device Description)
- Easy operation and startup of field devices, also in hard-to-reach locations
- Expanded diagnosis, evaluation and logging functions

Application

These devices can be connected in different ways:

- Using the distributed I/O system
 - SIMATIC ET 200M with the HART modules
 - SIMATIC ET 200iSP with the HART modules or with analog modules 4 to 20 mA and a HART handheld communicator
- Using a HART modem, with which a point-to-point connection is established between the PC or engineering station and the HART device
- Using HART multiplexers, which are contained in the HART server of the HCF

Integration

Siemens field devices for process automation which are listed in this catalog and can be controlled using HART:

Measuring instruments for pressure

SITRANS P300
SITRANS P310
SITRANS P DS III
SITRANS P410
SITRANS P500

Measuring instruments for temperature

SITRANS TF
SITRANS TH300
SITRANS TR300
SITRANS TW

Flowmeters

SITRANS F M MAG 5000
SITRANS F M MAG 6000 19" / IP67
SITRANS F M MAG 6000 I / I Ex
SITRANS F M Transmag 2
SITRANS F C MASS 6000 19" / IP67 / Ex d
SITRANS F C FCT030
SITRANS F S FST030
SITRANS FUS060
SITRANS FX300

Measuring instruments for level

SITRANS Probe LR
SITRANS Probe LU
SITRANS LUT400
SITRANS LR200
SITRANS LR250
SITRANS LR260
SITRANS LR460
SITRANS LR560
SITRANS LG240 / LG 250 / LG 260 / LG 270

Positioners

SIPART PS2

Power supply units and isolation amplifiers

SITRANS I

Selection and Ordering data

Article No.

HART modem

With USB connection ▶

7MF4997-1DB

▶ Available ex stock

Overview

Today, distributed automation solutions based on open field buses are state-of-the-art in large areas of the manufacturing industry and process engineering. It is only with field buses that the functional benefits of digital communication can be put to full use, e.g. better resolution of measured values, diagnosis options and remote parameterization.

PROFIBUS is today's most successful open field bus with a large installed base for a wide range of application. Standardization to IEC 61158 / EN 50170 provides you with future protection for your investment.

Benefits

- A uniform modular system from the sensor into the control level enables new plant concepts
- Problem-free exchangeability of field devices, including from different manufacturers, that comply with the standard profile
- Networking of transmitters, valves, actuators etc.
- Implementation of intrinsically safe applications through use of the field bus in hazardous areas
- Easy installation of 2-wire lines for joint energy supply and data transmission
- Reduced cabling costs through savings of material and installation time
- Reduced configuration costs through central, simple engineering of the field devices (PROFIBUS PA and HART with SIMATIC PDM, also cross-vendor)
- Fast and error-free installation
- Lower service costs thanks to simpler wiring and plant structure plus extensive diagnosis options
- Greatly reduced commissioning costs through simplified loop check
- Scaling/digitizing of the measured values in the field device already, hence no rescaling necessary in SIMATIC PCS 7

Application

PROFIBUS is suitable for fast communication with distributed I/Os (PROFIBUS DP) in production automation as well as for communication tasks in process automation (PROFIBUS PA). It is the first field bus system that meets the demands of both areas with identical communication services.

The transmission technique of the PROFIBUS PA is tailored to the needs of the process industry. Interoperability between field 10/11 devices from different manufacturers and remote parameterization of the field devices during operation are guaranteed by the standardized communication services.

Using SIMATIC PDM (Process Device Manager), a uniform and cross-vendor tool for configuring, parameterizing, commissioning and diagnosis of intelligent process devices on the PROFIBUS, it is possible to configure a wide variety of process devices from different manufacturers using one uniform graphical user interface.

PROFIBUS PA can just as readily be used in standard environments as well as hazardous areas. For use in hazardous areas, PROFIBUS PA and all connected devices have to be designed with type of explosion protection Ex [i].

The uniform protocol of PROFIBUS DP and PROFIBUS PA enables the two networks to be interlinked, thus combining time-based performance with intrinsically safe transmission.

Function

PROFIBUS PA expands PROFIBUS DP with near-process components for the direct connection of actuators and sensors.

For PROFIBUS PA the RS 485 transmission technique was replaced by a different technique optimized for intrinsically safe application. Both techniques are internationally standardized in IEC 61158.

PROFIBUS PA uses the same communication protocol as PROFIBUS DP; the communication services and telegrams are identical.

For PROFIBUS PA the data and energy supply for the field devices can be directed through a 2-wire line.

Integration

Siemens field devices for process automation which are listed in this catalog and can be controlled using PROFIBUS:

PROFIBUS PA

Measuring instruments for pressure

SITRANS P300
 SITRANS P DS III
 SITRANS P410

Measuring instruments for temperature

SITRANS TH400

Flowmeters

SITRANS F M MAG 6000 19" / IP67
 SITRANS F M MAG 6000 I / I Ex
 SITRANS F M Transmag 2
 SITRANS F C MASS 6000 19" / IP67 / Ex d
 SITRANS FUS060

Measuring instruments for level

Pointek CLS200 and CLS300
 SITRANS Probe LU
 SITRANS LR200
 SITRANS LR250
 SITRANS LR260
 SITRANS LR460
 SITRANS LR560

Electropneumatic positioners

SIPART PS2

Acoustic sensor for pump monitoring

SITRANS DA400

PROFIBUS DP

Measuring instruments for temperature

SITRANS TO500

Flowmeters

SITRANS F M MAG 6000 19" / IP67
 SITRANS F M MAG 6000 I
 SITRANS F C MASS 6000 19" / IP67
 SIFLOW FC070 (via ET200M)

Measuring instruments for level

HydroRanger 200
 MultiRanger 100/200
 SITRANS LU01, LU02, LU10

Acoustic sensor for pump monitoring

SITRANS DA400

Communication and Software

Communication

FOUNDATION Fieldbus

Overview

Today, distributed automation solutions based on open field buses are state-of-the-art in large areas of the process engineering industry. It is only with field buses that the functional benefits of digital communication can be put to full use, e.g. better resolution of measured values, diagnosis options and remote parameterization.

Like PROFIBUS PA, the FF bus (FOUNDATION Fieldbus) is an open field bus with a large installed base for a wide range of application. Standardization to IEC 61158 / EN 50170 provides you with future protection for your investment.

Benefits

- A uniform modular system from the sensor to the connection to the control level enables new plant concepts
- Networking of transmitters, valves, actuators etc.
- Implementation of intrinsically safe applications through use of the field bus in hazardous areas
- Easy installation of 2-wire cables for joint energy supply and data transfer
- Reduced cabling costs through savings of material and installation time.
- Reduced configuration costs through central, simple engineering of the field devices, also cross-vendor
- Fast and error-free installation
- Lower service costs thanks to simpler wiring and plant structure plus extensive diagnosis options
- Greatly reduced commissioning costs through simplified loop check
- Scaling/digitizing of the measured values in the field device already, hence no rescaling necessary in SIMATIC PCS 7

Application

The transfer technology of the FOUNDATION Fieldbus is tailored to the needs of the process industry. Interoperability between field devices from different manufacturers and remote parameterization of the field devices during operation are guaranteed by the standardized communication services.

FOUNDATION Fieldbus can just as readily be used in standard environments as in hazardous areas. For use in hazardous areas, FOUNDATION Fieldbus and all connected devices have to be designed with type of explosion protection Ex [i].

Function

FOUNDATION Fieldbus enables the direct connection of actuators and sensors.

FOUNDATION Fieldbus is based on a transfer optimized for intrinsically safe application. The transfer technology is internationally standardized in IEC 61158.

For FOUNDATION Fieldbus the data and energy supply for the field devices can be directed through a 2-wire cable.

FOUNDATION Fieldbus enables device-to-device communication ("control in the field").

Integration

Siemens field devices for process automation which are listed in this catalog and can be controlled using Foundation Fieldbus:

Measuring instruments for pressure

SITRANS P300
SITRANS P DS III
SITRANS P410

Measuring instruments for temperature

SITRANS TH400

Electropneumatic positioners

SIPART PS2

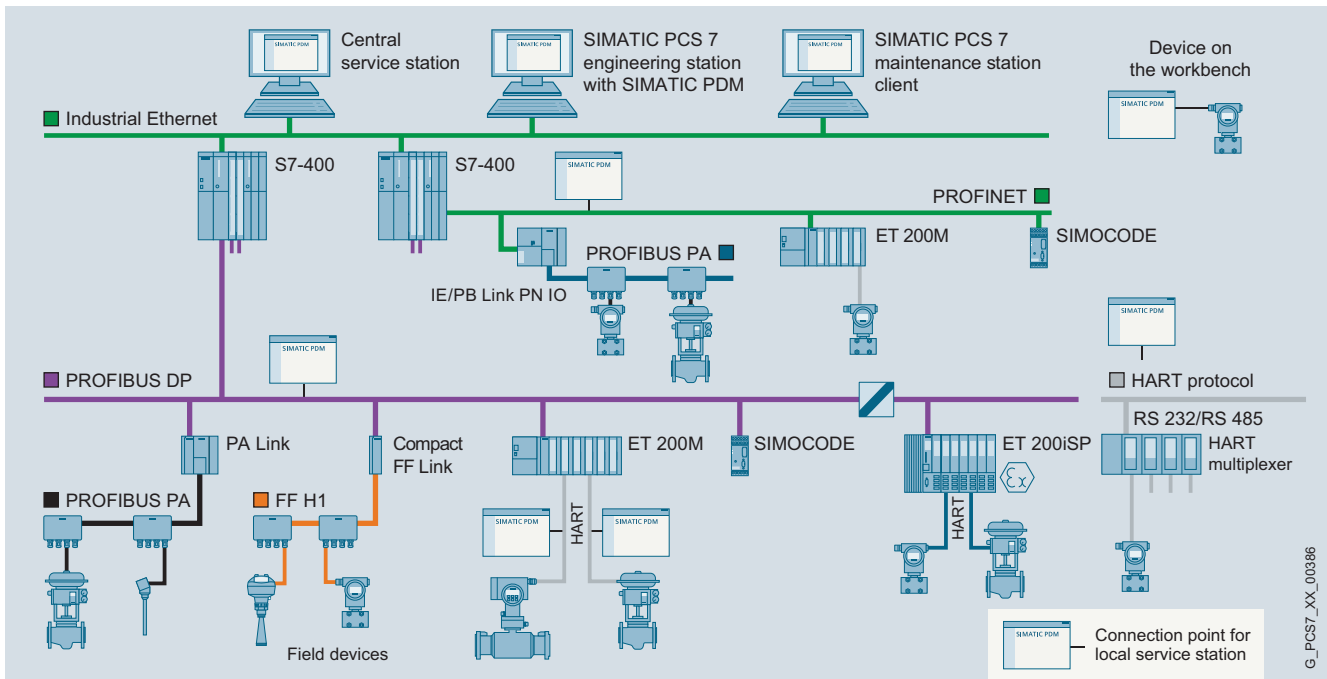
Flowmeters

SITRANS F M MAG 6000
SITRANS F M MAG 6000 I / I Ex
SITRANS F C MASS 6000

Level meters

SITRANS LR250
SITRANS LR560

Overview



Configuration options with SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, vendor-independent tool for the configuration, parameter assignment, commissioning, diagnostics and servicing of intelligent field devices (sensors and actuators) and field components (remote I/Os, multiplexers, control-room devices, compact controllers), which in the following sections will be referred to simply as devices.

With *one* software product, SIMATIC PDM enables users to work with over 3 500 devices and device variants of Siemens and over 200 other manufacturers worldwide on a *single* homogeneous user interface.

The user interface satisfies the requirements of the VDI/VDE GMA 2187 and IEC 65/349/CD directives. Parameters and functions for all supported devices are displayed in a consistent and uniform fashion independent of their communications interface. Even complex devices with several hundred parameters can be represented clearly and processed quickly. Using SIMATIC PDM it is very easy to navigate in highly complex stations such as remote I/Os and even connected field devices.

From the viewpoint of device integration, SIMATIC PDM is the most powerful open process device manager on the global market. Devices which previously were not supported can be integrated in SIMATIC PDM by importing their device descriptions (EDD). This provides security for your investment and saves you investment costs, training expenses and follow-up costs.

SIMATIC PDM supports the operative system management in particular through:

- Uniform presentation and operation of devices
- Uniform representation of diagnostics information
- Indicators for preventive maintenance and servicing
- Detection of changes in the project and device
- Increasing the operational reliability
- Reducing the investment, operating and maintenance costs

Maintenance personnel can assign field device parameters using Microsoft Internet Explorer at mobile and stationary workstations with SIMATIC PDM. Practically every workstation integrated in the production plant can be used for configuration. Service personnel are thus able to work directly at the location of the field device, while data is stored centrally in the engineering station or maintenance station. This leads to a significant shortening of maintenance and travel times.

When a maintenance station is configured in the SIMATIC PCS 7 process control system, SIMATIC PDM is integrated in it and transmits parameter data and diagnostic information. You can switch directly to the SIMATIC PDM views from the diagnostics faceplates in the maintenance station.

A SIMATIC PDM user administration system based on SIMATIC Logon is used to assign various roles with defined function privileges to users. These function privileges refer to SIMATIC PDM system functions, e.g. writing to the device.

For all devices described per Electronic Device Description (EDD), SIMATIC PDM delivers a range of information for display and further processing on the maintenance station, e.g.:

- Device type information (electronic rating plate)
- Detailed diagnostics information (manufacturer information, information on error diagnostics and troubleshooting, further documentation)
- Results of internal condition monitoring functions
- Status information (e.g. local configuration changes)
- Information on changes (audit trail report)
- Parameter information

Communication and Software

Software

SIMATIC PDM Process Device Manager

Application

Many years of real-world use have yielded the following main use cases for SIMATIC PDM:

- Single Point Station
 - For handling a single field device
 - Direct connection to the device
- Local service and parameter assignment station
 - For handling multiple field devices on the fieldbus segment or remote I/O station
 - Connection to the local bus segment
- Central service and parameter assignment station
 - For centralized handling of field devices or a production plant
 - Connection on the plant bus
 - Access to field devices via the SIMATIC automation systems;
 - Can be used multiple times within an automation project, e.g. as service and parameter assignment stations for various plant units
 - Information on the fieldbuses and connected field devices can be transferred from the engineering station.
- HART service and parameter assignment station
 - For processing HART field devices
 - Connection to the local HART multiplexer networks or the Ethernet networks of the "Wireless HART Gateways"
- Field device configuration on the SIMATIC PCS 7 engineering station
 - For handling field devices in the hardware configurator of the PCS 7 engineering station or locally at the field device via a mobile SIMATIC PDM client
 - Data storage on the PCS 7 engineering station
 - Using the communication paths of the engineering station
- Field device configuration and servicing on the SIMATIC PCS 7 maintenance station
 - For field device management during the operating phase of the automation plant
 - Field device handling via the operator stations of the PCS 7 maintenance station or via a mobile SIMATIC PDM client locally on the field device
 - SIMATIC PDM supplies the PCS 7 maintenance station with information on the field device type, parameter assignment and diagnostics.

Components	Product packages							
	SIMATIC PDM Stand alone				SIMATIC PDM system-integrated			
	Minimum configuration	Basic configuration	Service and parameter assignment station		in the configuration environment			
			local	central	SIMATIC S7	SIMATIC PCS 7		
PDM Single Point	PDM Basic	PDM Service	PDM Stand alone Server	PDM S7	PDM PCS 7	PDM PCS 7 Server	PDM PCS 7 FF	
SIMATIC PDM TAGs ¹⁾ in product package	1	4	4 + 50	4 + 100	4 + 100	4 + 100	4 + 100	4 + 100
SIMATIC PDM expansion options								
Count Relevant Licenses (accumulative)	<i>cannot be expanded</i>	- 10 TAGs - 100 TAGs - 1 000 TAGs	o	o	o	o	o	o
SIMATIC PDM Basic	●	●	●	●	●	●	●	●
SIMATIC PDM Extended	o	o	●	●	●	●	●	●
SIMATIC PDM integration in STEP 7/PCS 7	o	o	o	●	●	●	●	●
SIMATIC PDM Routing ²⁾	o	o	o	o	●	●	●	●
SIMATIC PDM Server	o	o	●	●	o	o	●	o
SIMATIC PDM 1 Client ³⁾	o	o	● (2 x)	●	o	o	o	o
SIMATIC PDM Communication FOUNDATION Fieldbus	o	o	o	o	o	o	o	●
SIMATIC PDM HART server	o	o	o	o	o	-	-	-

SIMATIC PDM product structure

- Product component is part of the product package
- o Optional product component for the product package; order additive
- Product component is not relevant for the product package or not available

1) For TAG definition, see "Design" section under "SIMATIC PDM TAGs"

2) In combination with SIMATIC PDM Integration in STEP 7/PCS 7

3) In combination with SIMATIC PDM Server

Customer-oriented product structure

The customer-oriented product structure of SIMATIC PDM provides optimal support for the named main use cases and enables you to adapt the scope of functions and performance to your individual requirements. The product range is organized as follows:

SIMATIC PDM Stand alone product packages

- SIMATIC PDM Single Point, a minimum configuration for single device handling
- SIMATIC PDM Basic for local service and parameter assignment stations as well as basic configuration for individual product package with optional product components
- SIMATIC PDM Service for local service and parameter assignment stations
- SIMATIC PDM Stand alone Server for central service and parameter assignment stations, e.g. for various plant units

SIMATIC PDM system-integrated product packages

- SIMATIC PDM S7 for local SIMATIC S7 engineering and service stations
- Various configurations for central SIMATIC PCS 7 engineering and service stations:
 - SIMATIC PDM PCS 7
 - SIMATIC PDM PCS 7 Server (enables device parameter assignment and diagnostics on clients of the PCS 7 engineering station and PCS 7 Maintenance Station)
 - SIMATIC PDM PCS 7-FF (supports the FOUNDATION Fieldbus H1)

In some circumstances, the product packages can be expanded with optional product components (for details, see the Design section).

Selection criteria

In addition to considering the environment of use and the functional and performance features when selecting the product (see table in "Design" section), also observe the system requirements (see "Technical specifications" section).

Communication and Software

Software

SIMATIC PDM Process Device Manager

Design

Product range	SIMATIC PDM V9.0							
	Single Point	Basic	Service	Stand alone Server	S7	PCS 7	PCS 7 Server	PCS 7-FF
TAGs contained	1	4	4 + 50	4 + 100	4 + 100	4 + 100	4 + 100	4 + 100
Project: Create offline	●	●	●	●	●	●	●	●
Project: Usable TAG extensions	–	●	●	●	●	●	●	●
Project: Process device network view	●	●	●	●	●	●	●	●
Project: Process device plant view	●	●	●	●	●	●	●	●
Project: Export/import devices	–	–	●	●	–	–	–	–
Project: Export/import parameters	–	○	●	●	●	●	●	●
Project: HW Config	–	○	○	○	●	●	●	●
Project: Utilization of SIMATIC PDM options	–	●	●	●	●	●	●	●
Project: Integration in STEP 7/PCS 7	–	○	○	○	●	●	●	●
Communication: HART modem	●	●	●	●	●	–	–	–
Communication: HART interface	●	●	●	●	●	–	–	–
Communication: PROFIBUS DP/PA	●	●	●	●	●	●	●	●
Communication: HART over PROFIBUS DP	●	●	●	●	●	●	●	●
Communication: FF H1	–	○ ¹⁾	○ ¹⁾	○ ¹⁾	○	○	○	●
Communication: Modbus	●	●	●	●	●	●	●	●
Communication: Ethernet	●	●	●	●	●	●	●	●
Communication: PROFINET	●	●	●	●	●	●	●	●
Communication: HART over PROFINET	●	●	●	●	●	●	●	●
Devices: Export/import parameters	–	○	○	●	●	●	●	●
Devices: Comparison of parameter values	–	○	○	●	●	●	●	●
Devices: Saving parameters	●	●	●	●	●	●	●	●
Devices: Change log (Audit Trail)	–	○	○	●	●	●	●	●
Devices: Calibration report	–	○	○	●	●	●	●	●
Devices: Print function	●	○	○	●	●	●	●	●
Devices: Document manager	–	○	○	●	●	●	●	●
Lifelist: Basic functionality	●	●	●	●	●	●	●	●
Lifelist: Expanded functionality (scan range, diagnostics, export, addressing)	–	○	○	●	●	●	●	●
Communication: Data record routing	–	○	○	○	○	●	●	●
Communication: HART multiplexer	–	○	○	○	○	–	–	–
Communication: Wireless HART	–	○	○	○	○	–	–	–
Function: HART SHC mode (increased communication speed)	●	●	●	●	●	●	●	●
Function: Device parameterization on PCS 7 maintenance station clients	–	○	○	○	○	○	●	○
Function: Device parameter assignment on SIMATIC PDM clients	–	○	○	● (2 ×)	○	○	○	○

SIMATIC PDM overview of functions and features

- Product component is part of the product package
- Optional product component for the product package; order additive
- Product component is not relevant for the product package or not available

1) Not in Stand alone mode

SIMATIC PDM Stand alone product packages

SIMATIC PDM Single Point V9.0

This minimum configuration with handheld functionality is intended for handling exactly *one* field device via point-to-point coupling. It cannot be expanded with functions or with SIMATIC PDM TAG or SIMATIC PDM 1 Client licenses. Upgrading to a different product variant, e.g. SIMATIC PDM Basic, or a different product version is also not possible.

Supported communication types:

- PROFIBUS DP/PA
- HART communication (modem, RS 232 and via PROFIBUS/PROFINET)
- Modbus
- Ethernet
- PROFINET

The functionality is matched accordingly. The device functions are supported as defined in the device description, for example:

- Managing the device library and unlimited device selection
- Parameter assignment and diagnostics according to the device description
- Exporting and importing of parameter data
- Device identification
- Lifelist
- Printing the parameter list

SIMATIC PDM Basic V9.0

SIMATIC PDM Basic is for local service and parameter assignment stations on any computers (IPC/notebook) with local connection to bus segments or direct connection to the device.

Supported communication types:

- PROFIBUS DP/PA
- HART communication (modem, RS 232 and via PROFIBUS/PROFINET)
- Modbus
- Ethernet
- PROFINET

SIMATIC PDM Basic is equipped with all basic functions required for operation and parameter assignment of devices. That is, compared to SIMATIC PDM Single Point, it has the following additional functions:

- EDD-based diagnostics in the lifelist
- Memory function (only exporting and importing of parameter data)
- Report function
- Communication with HART field devices via remote I/Os

As a basic block for an individual configuration, SIMATIC PDM Basic can be expanded with all functional SIMATIC PDM options (PDM Routing only in combination with PDM Integration in STEP 7/PCS 7 required) as well as with cumulative sets of 10, 100 or 1 000 SIMATIC PDM TAGs. Without TAG expansion, SIMATIC PDM Basic is suitable for projects with up to 4 TAGs. SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option.

The SIMATIC PDM Extended option allows activation of additional SIMATIC PDM system functions (for details, see SIMATIC PDM Extended V9.0 under "Optional product components").

SIMATIC PDM Service V9.0

With this product package for extended service, local service and parameter assignment stations can be realized on any type of computer (IPC/notebook) with a local connection to a bus segment or direct connection to field devices.

It comprises:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- 50 SIMATIC PDM TAGs

Like SIMATIC PDM Basic, SIMATIC PDM Service can be expanded with all functional SIMATIC PDM options (PDM Routing only in combination with PDM Integration in STEP 7/PCS 7 required) as well as with cumulative SIMATIC PDM TAGs (sets of 10, 100 or 1 000) (see "Optional product components"). SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option. It is permitted to upgrade to another product version.

Note: For use of gateways and for PROFINET or Ethernet communication with field devices, SIMATIC PDM TAG licenses are charged for according to the objects configured in the process device plant view as follows:

- 10 SIMATIC PDM TAGs per S7 DSGW (data record gateway) with one PROFIBUS subnet
- 20 SIMATIC PDM TAGs per S7 DSGW with more than one PROFIBUS subnet
- 10 TAGs per IE/PB Link
- 1 TAG per field device (except in the case of special specifications)

SIMATIC PDM Stand alone Server V9.0

With the SIMATIC PDM Stand alone Server product package, you can establish central service and parameter assignment stations that operate according to the client/server principle. Portals opened on licensed SIMATIC PDM clients (SIMATIC PDM sessions) enable handling of production plant field devices via the SIMATIC PDM server on the plant bus assigned via registration. The product package can be used multiple times within a plant, e.g. for various plant units. It comprises:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM Server
- 2 × SIMATIC PDM 1 Client
- 100 SIMATIC PDM TAGs

SIMATIC PDM Stand alone Server can be expanded with all functional SIMATIC PDM options (PDM Routing only in combination with PDM Integration in STEP 7/PCS 7 required) as well as with cumulative sets of 10, 100 or 1 000 SIMATIC PDM TAGs and SIMATIC PDM 1-client licenses (see "Optional product components"). The portals opened on these clients (SIMATIC PDM sessions) must also be licensed with the SIMATIC PDM 1-client licenses (besides the SIMATIC PDM clients). For details about this, refer to "SIMATIC PDM 1 Client" under "Optional product components". For user management of the SIMATIC PDM clients, the SIMATIC Logon product is also required. It is possible to upgrade to another product version.

Note: For use of gateways and for PROFINET or Ethernet communication with field devices, SIMATIC PDM TAG licenses are charged for according to the objects configured in the process device plant view (for details, see corresponding note under SIMATIC PDM Service V9.0).

Communication and Software

Software

SIMATIC PDM Process Device Manager

SIMATIC PDM system-integrated product packages

SIMATIC PDM S7 V9.0

The SIMATIC PDM S7 product package designed for use in a SIMATIC S7 configuration environment is intended for setup of a local SIMATIC S7 engineering and service station. It requires the installation of STEP 7 V5.5+SP4. It includes:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- 100 SIMATIC PDM TAGs

SIMATIC PDM S7 can be expanded with the functional options SIMATIC PDM Routing, SIMATIC PDM Communication FOUNDATION Fieldbus, SIMATIC PDM Server, and SIMATIC PDM HART Server as well as with cumulative SIMATIC PDM TAGs (sets of 10, 100 or 1 000) (see "Optional product components"). SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option.

SIMATIC PDM PCS 7 V9.0

The SIMATIC PDM PCS 7 product package suitable for use in a SIMATIC PCS 7 configuration environment is intended for use in a central SIMATIC PCS 7 engineering and service station. It comprises:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- 100 SIMATIC PDM TAGs

SIMATIC PDM PCS 7 can be expanded with the functional options SIMATIC PDM Communication FOUNDATION Fieldbus and SIMATIC PDM Server as well as with cumulative SIMATIC PDM TAGs (sets of 10, 100 or 1 000) (see "Optional product components"). SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option.

SIMATIC PDM PCS 7 Server V9.0

Instead of SIMATIC PDM PCS 7, the SIMATIC PDM PCS 7 Server product package expanded with the SIMATIC PDM Server option can also be used for a central SIMATIC PCS 7 engineering and service station. Field devices integrated using an Electronic Device Description (EDD) can then be assigned parameters on any client of the SIMATIC PCS 7 Maintenance Station as well as on local SIMATIC PDM clients. The following are components of SIMATIC PDM PCS 7 Server:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- SIMATIC PDM Server
- 100 SIMATIC PDM TAGs

SIMATIC PDM PCS 7 Server can be expanded with the functional option SIMATIC PDM Communication FOUNDATION Fieldbus as well as with cumulative sets of 10, 100 or 1 000 SIMATIC PDM TAGs and SIMATIC PDM 1-Client licenses (see "Optional product components"). The portals opened on these clients (SIMATIC PDM sessions) must also be licensed with the SIMATIC PDM 1-client licenses (besides the SIMATIC PDM clients). For details about this, refer to "SIMATIC PDM 1 Client" under "Optional product components".

SIMATIC PDM PCS 7-FF V9.0

Instead of SIMATIC PDM PCS 7, the SIMATIC PDM PCS 7-FF product package expanded with the SIMATIC PDM Communication FOUNDATION Fieldbus option can also be used for a central SIMATIC PCS 7 engineering and service station. This additionally supports parameter assignment of field devices on FOUNDATION Fieldbus H1. Components of SIMATIC PDM PCS 7-FF are:

- SIMATIC PDM Basic (incl. 4 SIMATIC PDM TAGs)
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- SIMATIC PDM Communication FOUNDATION Fieldbus
- 100 SIMATIC PDM TAGs

SIMATIC PDM PCS 7-FF V9.0 can be expanded with the functional option SIMATIC PDM Server as well as with cumulative sets of 10, 100 or 1 000 SIMATIC PDM TAGs (see "Optional product components"). SIMATIC PDM 1 Client licenses (sets of 1) can also be added in combination with the SIMATIC PDM Server option.

Optional product components

Option SIMATIC PDM Extended V9.0

The SIMATIC PDM Extended option enables you to unlock other system functions for SIMATIC PDM Basic and SIMATIC PDM, for example:

- Change log
- Calibration report
- Extended information in the Lifelist
- Export and import functions
- Print functions
- Document manager
- Comparison function

This functionality is already integrated in the following product packages: SIMATIC PDM Stand alone Server, SIMATIC PDM S7, SIMATIC PDM PCS 7, SIMATIC PDM PCS 7 Server and SIMATIC PDM PCS 7-FF.

Option SIMATIC PDM Integration in STEP 7/PCS 7 V9.0

This option is used for the integration of SIMATIC PDM in a SIMATIC S7 or SIMATIC PCS 7 configuration environment. SIMATIC PDM can then be started directly from the hardware configurator (HW Config) in STEP 7/SIMATIC PCS 7.

This functionality is already integrated in the product packages of category "SIMATIC PDM system-integrated" (SIMATIC PDM S7, SIMATIC PDM PCS 7, SIMATIC PDM PCS 7 Server, and SIMATIC PDM PCS 7-FF).

Option SIMATIC PDM Routing V9.0

If SIMATIC PDM is used on an engineering station, the SIMATIC PDM Routing option enables handling of every device in the field that can be configured per EDD throughout the plant and across different bus systems and remote I/Os. SIMATIC PDM Routing can be used in combination with SIMATIC PDM Integration in STEP 7/SIMATIC PCS 7.

Routing is already integrated in SIMATIC PDM PCS 7, SIMATIC PDM PCS 7 Server, and SIMATIC PDM PCS 7-FF. SIMATIC PDM Routing can be additionally installed as an option on a local SIMATIC S7 engineering and service station with SIMATIC PDM S7.

Option SIMATIC PDM Server V9.0

The server functionality can be activated in a local or central service station with this option. It enables parameter assignment of selected field devices on any client of the SIMATIC PCS 7 Maintenance Station as well as on local SIMATIC PDM clients. This functionality is already integrated in the SIMATIC PDM Stand alone Server and SIMATIC PDM PCS 7 Server. The SIMATIC PDM clients as well as the portals opened on these clients (SIMATIC PDM sessions) must be licensed with SIMATIC PDM 1 client licenses. For details about this, refer to "SIMATIC PDM 1 Client" under "Optional product components".

Option SIMATIC PDM Communication FOUNDATION Fieldbus V9.0

In a SIMATIC S7/PCS 7 configuration environment, using this option SIMATIC PDM can communicate with field devices on the FOUNDATION Fieldbus H1 via the FF link.

This functionality is already integrated in the SIMATIC PDM PCS 7-FF product package.

Option SIMATIC PDM HART Server V9.0

This option permits the use of HART multiplexers from various vendors in SIMATIC PDM. Furthermore, wireless HART field devices can also be parameterized with SIMATIC PDM.

SIMATIC PDM TAGs (version-independent)

Depending on the project size, the SIMATIC PDM TAGs supplied with a product package (except SIMATIC PDM Single Point) can be cumulatively expanded with sets of 10, 100 or 1 000 SIMATIC PDM TAGs.

A SIMATIC PDM TAG corresponds to a SIMATIC PDM object that represents the individual field devices or field components within a project, e.g. measuring instruments, positioners, switching devices or remote I/Os. SIMATIC PDM TAGs are also relevant for diagnostics with the lifelist of SIMATIC PDM. In this case, TAGs are considered to be all recognized devices with diagnostics capability, whose detailed diagnostics is effected through the device description (EDD).

SIMATIC PDM 1 Client (version-independent)

Cumulative 1 client license newly introduced with SIMATIC PDM V9.0 for SIMATIC PDM configurations with SIMATIC PDM Server, e.g. SIMATIC PDM Stand alone Server or SIMATIC PDM PCS 7 Server. The license is used to activate registered SIMATIC PDM clients and SIMATIC PDM sessions (opened portals) on these clients.

Each "SIMATIC PDM 1 Client" license activates one SIMATIC PDM client with one SIMATIC PDM session. A SIMATIC PDM session is defined as one opened portal together with the parameter views of the field devices opened from the portal. Each additional simultaneously opened SIMATIC PDM session on this client requires its own "SIMATIC PDM 1 Client" license. For larger projects, up to 30 registered SIMATIC PDM Clients are possible.

The "SIMATIC PDM 1 Client" license must be transferred to the computer with the SIMATIC PDM Server. The SIMATIC PDM Standalone Server product package comes with 2 "SIMATIC PDM 1 Client" licenses.

SIMATIC PDM Software Media Package V9.0

The current SIMATIC PDM installation software is offered without a license in the form of the SIMATIC PDM Software Media Package. Purchasing of corresponding software licenses is necessary to unlock the product-specific functionalities.

With SIMATIC PDM product packages, when supplied via physical delivery (not with optional product components), a SIMATIC PDM Software Media Package is supplied together with each ordering item. Further SIMATIC PDM Software Media Packages must be ordered separately as required.

The software of the SIMATIC PDM Media Package without a license can be used for demonstration purposes in demo mode. The SIMATIC PDM functionality is limited as follows in demo mode:

- Stand alone mode
- Storage functions disabled
- Export and import functions disabled
- Expanded functionality disabled
- Communication functions restricted

Information on ordering and delivery

SIMATIC PDM is among the products for which the installation software is provided in the form of a software Media package. Software Media packages and product-specific software licenses are separate packages, which are not merged into a single delivery unit for a physical delivery.

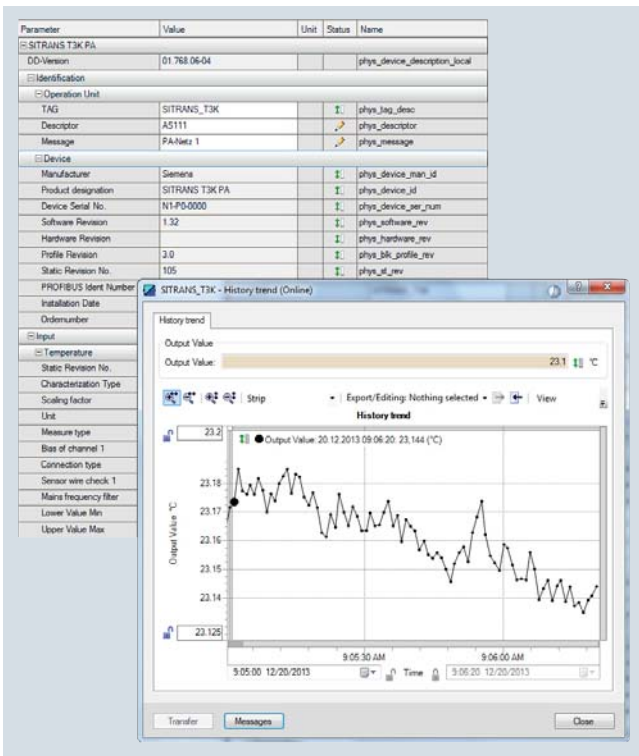
The number of delivered software Media packages can be determined by the number of ordered items. You can find more information under "Delivery form package" in the "Software Media and Logistics", "PCS 7 Software Packages" section.

Communication and Software

Software

SIMATIC PDM Process Device Manager

Function



SIMATIC PDM, parameter view and trend window

SIMATIC PDM core functions

- Creation of project-specific device libraries
- Adjustment and modification of device parameters
- Comparing (e.g. project and device data)
- Plausibility testing of data input
- Device identification and testing
- Device status indication (operating modes, interrupts, states)
- Simulation
- Diagnostics (standard, detailed)
- Export/import (parameter data, logs, documents)
- Management (e.g. networks and PCs)
- Commissioning functions, e.g. measuring circuit tests of device data
- Lifecycle management functions, e.g. for device replacement
- Global and device-specific modification logbook for user operations (audit trail)
- Device-specific calibration reports
- Graphic presentations of echo envelope curves, trend displays, valve diagnosis results etc.
- Presentation of incorporated manuals
- Document manager for integration of up to 10 multiMedia files

Integration

Device integration

SIMATIC PDM supports all devices described by EDD (Electronic Device Description). EDD is standardized to EN 50391 and IEC 61804. Internationally it is the most widely used standardized technology for device integration. At the same time, it is the guideline of the established organizations for

- PROFIBUS and PROFINET (PI – PROFIBUS & PROFINET International)
- HART (HCF: HART Communication Foundation)
- FF (Fieldbus Foundation)

The devices are integrated directly in SIMATIC PDM through a company-specific EDD or the current HCF or Fieldbus Foundation libraries. To achieve improved transparency, they can be managed in project-specific device libraries.

Field devices are described in the EDD in terms of functionality and construction using the Electronic Device Description Language (EDDL). Using this description, SIMATIC PDM automatically creates its user interfaces with the specific device data. Existing devices can be updated, and further devices integrated into SIMATIC PDM, by simply importing the manufacturer's device-specific EDD.

Fieldbus Foundation provides pre-defined device descriptions (standard DD) for the basic functions of specific field device types. The basic functions are implemented using various standard function and transmission blocks.

Technical support

If you wish to use devices which cannot be found in the SIMATIC PDM device description library, we would be pleased to help you integrate them.

Support Request

You can request support by service specialists at Technical Support by using a "Support Request" on the Internet:

www.siemens.com/automation/support-request

Contacts in the Region

The Technical Support responsible for your Region can be found on the Internet at:

www.automation.siemens.com/partner

Technical specifications

SIMATIC PDM V9.0	
Hardware	• PG/PC/notebook with processor corresponding to operating system requirements
Operating system (alternatives)	<p>Can be used generally:</p> <ul style="list-style-type: none"> • Windows 7 Professional/Ultimate/Enterprise SP1, 32-bit/64-bit <p>Only with integration in SIMATIC PCS 7:</p> <ul style="list-style-type: none"> • Windows Server 2008 R2 SP1 Standard Edition, 64-bit • Windows Server 2012 R2 SP1 Standard Edition, 64-bit
Integration in STEP 7/PCS 7	<ul style="list-style-type: none"> • SIMATIC PCS 7 V8.0+SP2 (without Communication FOUNDATION Fieldbus) • SIMATIC PCS 7 V8.1/V8.2 (with/without ServicePack) • STEP 7 V5.5+SP4
SIMATIC PDM Client	• Internet Explorer 10 or 11

Ordering data	Article No.	Article No.	Article No.
<p>SIMATIC PDM Stand alone product packages</p> <p>Minimum configuration</p> <p>SIMATIC PDM Single Point V9.0 including 1 TAG; product package for operation and configuration of one field device; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET</p> <p>Additional functions or SIMATIC PDM TAGs are not possible</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, floating license for 1 user</p> <ul style="list-style-type: none"> • Goods delivery (without SIMATIC PCS 7 Software Media Package) License key on USB flash drive and certificate of license, bundled with 1 x SIMATIC PDM Software Media Package per ordering position • Online delivery (without SIMATIC PCS 7 Software Media Package) License Key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) <u>Note: Email address required!</u> 	<p>6ES7658-3HA58-0YA5</p> <p>6ES7658-3HA58-0YH5</p>	<p>Configuration for local service and parameter assignment station</p> <p>SIMATIC PDM Service V9.0 Product package for service and measuring circuit tests on a local service station, with</p> <ul style="list-style-type: none"> • SIMATIC PDM Basic incl. 4 TAGs • 50 TAGs <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, floating license for 1 user</p> <ul style="list-style-type: none"> • Goods delivery (without SIMATIC PCS 7 Software Media Package) License key on USB flash drive and certificate of license, bundled with 1 x SIMATIC PDM Software Media Package per ordering position • Online delivery (without SIMATIC PCS 7 Software Media Package) License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) <u>Note: Email address required!</u> 	<p>6ES7658-3JD58-0YA5</p> <p>6ES7658-3JD58-0YH5</p>
<p>Basic configuration for individual product package as well as local service and parameter assignment stations</p> <p>SIMATIC PDM Basic V9.0 including 4 TAGs; product package for operation and configuration of field devices and components; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET</p> <p>6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, floating license for 1 user</p> <ul style="list-style-type: none"> • Goods delivery (without SIMATIC PCS 7 Software Media Package) License key on USB flash drive and certificate of license, bundled with 1 x SIMATIC PDM Software Media Package per ordering position • Online delivery (without SIMATIC PCS 7 Software Media Package) License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) <u>Note: Email address required!</u> 	<p>6ES7658-3AB58-0YA5</p> <p>6ES7658-3AB58-0YH5</p>	<p>Configuration for central service and parameter assignment station</p> <p>SIMATIC PDM Stand alone Server V9.0 Product package for service and device management in plant units, with</p> <ul style="list-style-type: none"> - SIMATIC PDM Basic incl. 4 TAGs - SIMATIC PDM Extended - SIMATIC PDM Server - 2 x SIMATIC PDM 1 Client - 100 TAGs <p>6 languages (German, English, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, single license for 1 installation</p> <ul style="list-style-type: none"> • Goods delivery (without SIMATIC PCS 7 Software Media Package) License key on USB flash drive and certificate of license, bundled with 1 x SIMATIC PDM Software Media Package per ordering position • Online delivery (without SIMATIC PCS 7 Software Media Package) License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) <u>Note: Email address required!</u> 	<p>6ES7658-3TX58-0YA5</p> <p>6ES7658-3TX58-0YH5</p>

Communication and Software

Software

SIMATIC PDM Process Device Manager

SIMATIC PDM system-integrated product packages

Configuration for local SIMATIC S7 engineering and service station

SIMATIC PDM S7 V9.0

Product package for use in a SIMATIC S7 configuration environment, with

- SIMATIC PDM Basic incl. 4 TAGs
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- 100 TAGs

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, floating license for 1 user

- Goods delivery (without SIMATIC PCS 7 Software Media Package)
License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position
- Online delivery (without SIMATIC PCS 7 Software Media Package)
License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)
Note: Email address required!

6ES7658-3KD58-0YA5

6ES7658-3KD58-0YH5

Configuration for central SIMATIC PCS 7 engineering and service stations

SIMATIC PDM PCS 7 V9.0

Product package for use in a SIMATIC PCS 7 configuration environment

6 languages (German, English, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit

floating license for 1 user, with

- SIMATIC PDM Basic incl. 4 TAGs
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- 100 TAGs
- Goods delivery (without SIMATIC PCS 7 Software Media Package)
License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position
- Online delivery (without SIMATIC PCS 7 Software Media Package)
License Key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)
Note: Email address required!

6ES7658-3LD58-0YA5

6ES7658-3LD58-0YH5

SIMATIC PDM PCS 7-FF V9.0

Product package for use in a SIMATIC PCS 7 configuration environment, including FOUNDATION Fieldbus H1 communication

6 languages (German, English, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit

floating license for 1 user, with

- SIMATIC PDM Basic incl. 4 TAGs
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- SIMATIC PDM Communication FOUNDATION Fieldbus
- 100 TAGs

- Goods delivery (without SIMATIC PCS 7 Software Media Package)
License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position

6ES7658-3MD58-0YA5

- Online delivery (without SIMATIC PCS 7 Software Media Package)
License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)

6ES7658-3MD58-0YH5

Note: Email address required!

SIMATIC PDM PCS 7 Server V9.0

Product package for use in a SIMATIC PCS 7 configuration environment, including server functionality

6 languages (German, English, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit

Single license for 1 installation, with

- SIMATIC PDM Basic incl. 4 TAGs
- SIMATIC PDM Extended
- SIMATIC PDM integration in STEP 7/PCS 7
- SIMATIC PDM Routing
- SIMATIC PDM Server
- 100 TAGs

- Goods delivery (without SIMATIC PCS 7 Software Media Package)
License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per ordering position

6ES7658-3TD58-0YA5

- Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package)
License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download)

6ES7658-3TD58-0YH5

Note: Email address required!

**Optional product components
for SIMATIC PDM****SIMATIC PDM Extended V9.0**

For enabling additional system functions

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, floating license for 1 user

- Goods delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key on USB flash drive and certificate of license
- Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download and online certificate of license
Note: E-mail address required!

6ES7658-3NX58-2YB5**6ES7658-3NX58-2YH5****SIMATIC PDM Integration in
STEP 7/SIMATIC PCS 7 V9.0**

For integration in a SIMATIC S7/SIMATIC PCS 7 configuration environment

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, floating license for 1 user

- Goods delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key on USB flash drive and certificate of license
- Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download and online certificate of license
Note: E-mail address required!

6ES7658-3BX58-2YB5**6ES7658-3BX58-2YH5****SIMATIC PDM Routing V9.0**

For plant-wide navigation to field devices

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, floating license for 1 user

- Goods delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key on USB flash drive and certificate of license
- Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download, online certificate of license
Note: E-mail address required!

6ES7658-3CX58-2YB5**6ES7658-3CX58-2YH5****SIMATIC PDM Server V9.0**

For activating the server functionality

6 languages (German, English, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, single license for 1 installation

- Goods delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key on USB flash drive, certificate of license
- Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download and online certificate of license
Note: E-mail address required!

6ES7658-3TX58-2YB5**6ES7658-3TX58-2YH5****SIMATIC PDM Communication
FOUNDATION Fieldbus V9.0**

For communication with field devices on FOUNDATION Fieldbus H1

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, floating license for 1 user

- Goods delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key on USB flash drive and certificate of license
- Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download and online certificate of license
Note: E-mail address required!

6ES7658-3QX58-2YB5**6ES7658-3QX58-2YH5****SIMATIC PDM HART Server
V9.0**

For using HART multiplexers as well as for configuration of wireless HART field devices

6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs on Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit, floating license for 1 user

- Goods delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key on USB flash drive and certificate of license
- Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download and online certificate of license
Note: E-mail address required!

6ES7658-3EX58-2YB5**6ES7658-3EX58-2YH5**

Communication and Software

Software

SIMATIC PDM Process Device Manager

SIMATIC PDM 1 Client

Cumulative client license for SIMATIC PDM configurations with SIMATIC PDM Server, software class A, single license for 1 installation

- Goods delivery
License key on USB flash drive and certificate of license
- Online delivery
License key download and online certificate of license
Note: Email address required!

6ES7658-3UA00-2YB5

6ES7658-3UA00-2YH5

SIMATIC PDM TAGs

TAG licenses for expanding the available TAG volume, cumulative, software class A, floating license for 1 user

- Goods delivery
License key on USB flash drive and certificate of license
 - 10 TAGs
 - 100 TAGs
 - 1 000 TAGs
- Online delivery
License key download and online certificate of license
Note: E-mail address required!
 - 10 TAGs
 - 100 TAGs
 - 1 000 TAGs

6ES7658-3XC00-2YB5

6ES7658-3XD00-2YB5

6ES7658-3XE00-2YB5

6ES7658-3XC00-2YH5

6ES7658-3XD00-2YH5

6ES7658-3XE00-2YH5

SIMATIC PDM Software Media Package

SIMATIC PDM Software Media Package V9.0

Installation software without license, 6 languages (German, English, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 32/64-bit, Windows Server 2008 R2 Standard 64-bit, or Windows Server 2012 R2 Standard 64-bit

Note:

Can only be used in conjunction with a valid license or in demo mode!

- Goods delivery (without SIMATIC PCS 7 Software Media Package)
SIMATIC PDM and device library software on DVD
- Online delivery (without SIMATIC PCS 7 Software Media Package)
SIMATIC PDM and device library software download
Note: E-mail address required!

6ES7658-3GX58-0YT8

6ES7658-3GX58-0YG8

More information

Update/Upgrade

Existing installations based on SIMATIC PDM V6.x or V8.x (including SP in each case) can be upgraded directly to V9.0 with upgrade packages. Alternatively, an upgrade is also possible as part of the Software Update Service.

Projects with SIMATIC PDM V7.0 can only be upgraded to version 9.0 by first upgrading to version 8.0. Two upgrade packages are offered for SIMATIC PDM V8.x:

- SIMATIC PDM Upgrade Package Basic¹⁾ (with/without SIMATIC PDM HART Server option in each case) for configurations based on:
 - SIMATIC PDM Basic
 - SIMATIC PDM Service
 - SIMATIC PDM S7
 - SIMATIC PDM PCS 7
- SIMATIC PDM Upgrade Package Complete¹⁾ for configurations based on:
 - SIMATIC PDM PCS 7 Server
 - SIMATIC PDM PCS 7-FF

1) Optional product components for SIMATIC PDM such as PDM Extended, PDM Integration in STEP 7/PCS 7, PDM Routing, PDM Server and PDM Communication FOUNDATION Fieldbus are each included in a product package listed in the SIMATIC PDM Upgrade Package Basic or SIMATIC PDM Upgrade Package Complete and are implicitly authorized to be updated via the corresponding license. The SIMATIC PDM Upgrade Package Complete is required for use of the product components PDM Server or PDM Communication FOUNDATION Fieldbus.

For further information, see catalog ST PCS 7.

Overview

SITRANS DTM provides an easy way for Field Device Tool (FDT)/ Device Type Manager (DTM) users to parameterize Siemens Instruments using international standards.

Benefits

- Same look and feel for all Siemens field instruments
- Support for Quick start wizards and other dialog boxes
- Quick overview using table and tree views
- Online and offline configuration
- Conformity to IEC profiles for HART and PROFFIBUS

Application

Electronic Device Description (EDD) is a proven way to describe the behavior and functionality of field instruments and other automation components.

For many years, EDD-based tools such as SIMATIC PDM from Siemens or handheld communicator have been used successfully in the process industry. Some years ago, an additional technology called FDT / DTM with the same approach was introduced to the market. To support the FDT DTM Technology for Siemens devices, the software SITRANS DTM has been developed which combines both EDD and FDT technologies.

SITRANS DTM uses EDDs as the device description and provides the DTM interface to allow the integration of our field instruments into FDT-frame applications.

The following field instruments are currently available in SITRANS DTM:

- SITRANS TH300 HART
- SITRANS TH400 PA
- SITRANS P300 HART
- SITRANS P500
- SITRANS P DSIII HART
- SITRANS F M MAG 6000 DP/PA
- SITRANS F C MASS 6000 PA/PA
- SITRANS FC430
- SITRANS PROBE LU 6 m, 12 m, HART
- SITRANS LR200 HART, PA
- SITRANS LR250 HART, PA
- SITRANS LR260 HART, PA
- SITRANS LR560 HART, PA
- SITRANS LUT400 HART
- SIPART PS2 HART, PA, FF

Technical specifications**SITRANS DTM****Version**

Current Version	3.1
• Compatible with PACTware versions	3.6, 4.0, 4.1
• Compatible with Windows	XP, 7
• Certified by FDT group	Yes

Free DTM software can be downloaded from:
<http://www.siemens.com/sitransdtm>

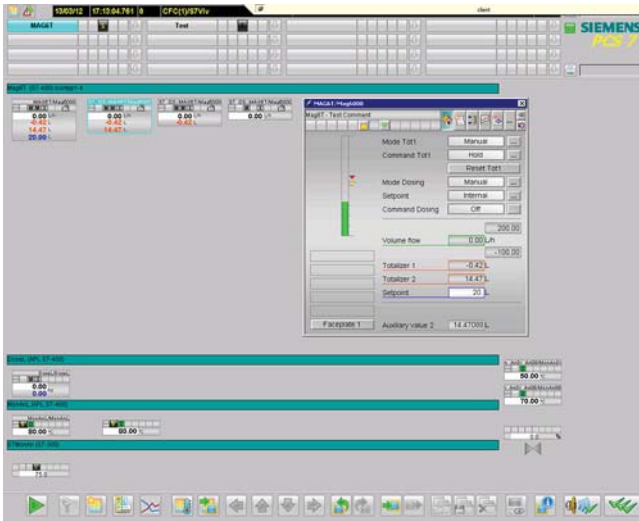
Click on Support in the collateral list on the right side of the web page, and choose Software downloads.

Communication and Software

Software

SITRANS Library

Overview



The SITRANS Library for SIMATIC PCS 7 V8.0 and higher extends standard functionality of the SIMATIC PCS 7 process control system concentrated in the SIMATIC PCS 7 Advanced Process Library (APL) with technological blocks and faceplates for device-specific functions of the SITRANS field devices.

Benefits

This allows you to easily operate all device functions, such as the dosing of the SITRANS FM MAG6000, in a single faceplate. In addition, it also supports operation and monitoring via Touch Panels as well as the integration in SIMATIC S7 applications. The SITRANS Library is based on the modern design of the Advanced Process Library (APL). Together with the APL, the SITRANS Library enables you to create harmonic solutions with a consistent look & feel and optimum use of the functions of the SITRANS field devices in many industries.

It helps accelerate the engineering process, reduces the time-to-market, and simplifies process control. In addition, operator functions (such as "Dosing") and process-related diagnostic information (such as empty pipe detection and flow direction) are provided.

Note:

SITRANS Library can be used in combination with SIMATIC PCS 7 version V8.0 and higher.

Application

The SITRANS Library can be used in combination with SIMATIC PCS 7 and SITRANS field devices.

You can find the current list of the SITRANS field devices and the supported SIMATIC PCS 7 versions at <http://support.automation.siemens.com/WW/view/en/85285872>

The SITRANS Library can be used for all core sectors of the process industry. These are:

- Chemical industry
- Pharmaceutical industry
- Water and wastewater
- Glass and solar
- Oil & gas
- Food and beverage industry
- Minerals and mining

Design

The product structure, however, is geared toward the operational environment in the SIMATIC PCS 7 process control system. Consequently, SITRANS Library is offered in the form of an engineering component:

- SITRANS Library
Engineering software with engineering license for one customer plant
- SITRANS Library
Runtime license for one automation system (SIMATIC PCS 7 automation systems of all designs and S7-300 controllers)

The SITRANS Library product component enables you to perform configuration work on a SIMATIC PCS 7 engineering station.

The SITRANS Library product component allows you to run blocks from a library on an automation system.

When using function blocks from SITRANS Library in SIMATIC PCS 7 automation systems, note that SIMATIC PCS 7 AS Runtime POs are also booked.

Function

SITRANS Library for SIMATIC PCS 7

Sublibrary for the functional expansion of the SIMATIC PCS 7 Advanced Process Library with:

- Function blocks and faceplates for the SITRANS F M MAG 6000 DP with dosing function for SIMATIC S7-400, SIMATIC S7-300 and panel interface blocks
- Function blocks and faceplates for SITRANS field devices for SIMATIC S7-400 and SIMATIC S7-300 with WinCC.

The function blocks are configured in CFC.

Control and monitoring from a panel is configured with the panel interface blocks for example for the SITRANS F M MAG 6000 DP. Taking operating rights and hierarchical operating concepts (multi-control room operation) into consideration, the technological function can then be operated from both an operator station and a Touch Panel.

Detailed information for which field devices which systems and system versions are supported and about free-of-charge download see under:

<http://support.automation.siemens.com/WW/view/en/85285872>

Selection and Ordering Data

Article No.

SITRANS Library

Block library for SIMATIC PCS 7 V8.0 and higher and SIMATIC S7 with function blocks and face plates as well as electronic documentation

Engineering software, software class A, two languages (English, German), runs under operation system
Windows XP Professional 32 Bit,
Windows 7 Ultimate 32/64 Bit,
Windows Server 2003 R2 Standard 32 Bit or
Windows Server 2008 R2 Standard 64 Bit,
single license for 1 installation

- Engineering license for one customer plant. Delivery form: can be downloaded, with certificate of license

7MP2990-0AA00

Services for Process Instrumentation



9/2	Lifecycle Services for Process Instrumentation
9/2	Lifecycle Services
9/4	Field Services for Process Instrumentation
9/5	Calibration and Verification
9/7	Remote Services for Process Instrumentation
9/9	Inventory Baseline Services
9/10	Lifecycle Information Services
9/11	Managed Support Services
9/12	Technical Support Services
9/13	Asset Optimization Services
9/14	Extended Exchange Option
9/15	Extended Warranty for Process Instrumentation
9/17	Lifecycle Service Contracts

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Overview

Introduction to Siemens Industry Services

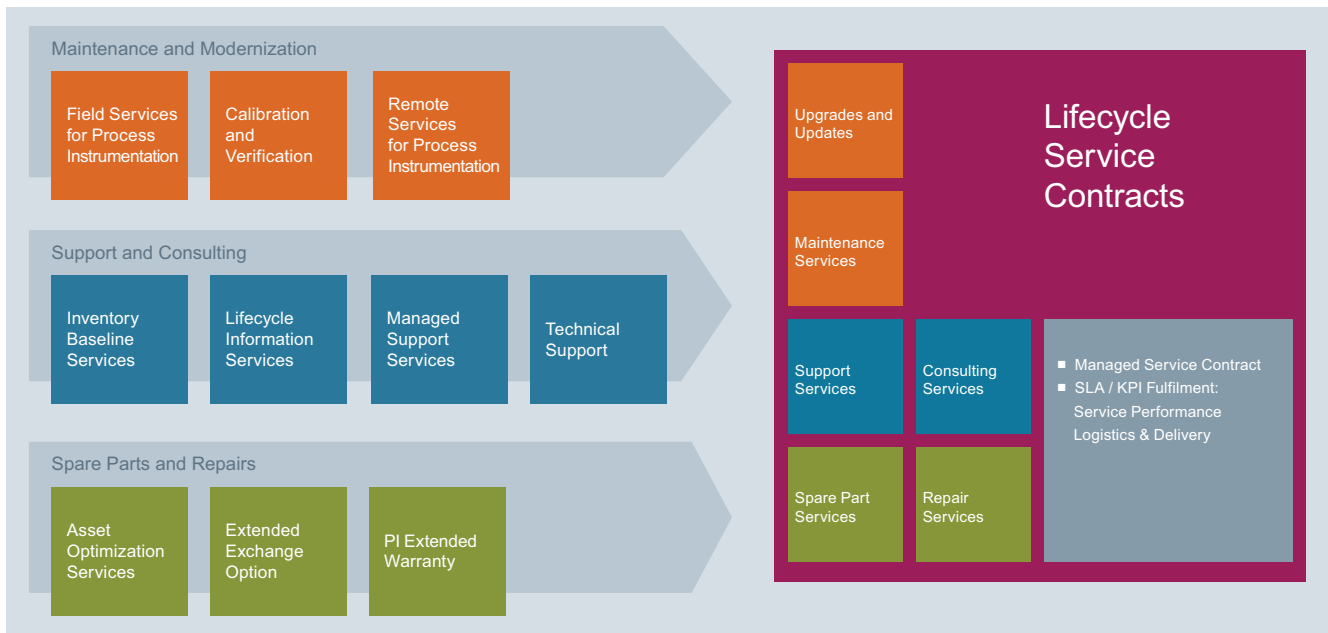
As an industry partner, we offer you an unrivaled range of services and support based on our extensive technology and industry know-how. With our offer, you gain a high level of reliability and shape the digital future of your company. Our Industry Services cover the complete life cycle of your machines and plants and help you to increase their profitability and efficiency and to take advantage of the opportunities for digitalization while simultaneously reducing your total cost of ownership.

To learn more about Siemens Industry Services, see Appendix, page 10/5 and online at

www.siemens.com/industrieservices

Lifecycle Services for Process Instrumentation

Below is an overview of the specific Lifecycle Services for process instrumentation – a component of the Siemens Industry Services.



Lifecycle Services for process instrumentation – from individual services to a Lifecycle Service Contract

When it comes to making operating costs predictable and optimizing them continuously, protecting investments and thus ensuring plant availability, the key criterion for success is the serviceability of your instrumentation. That is the reason for our reactive, proactive and preventive Lifecycle Services for process instrumentation, which ensure the serviceability of instruments in modern plants at optimized costs throughout their life cycle. These individual services can be easily integrated on a product-specific basis into service programs or even into customized service contracts that are tailored to your specific requirements.

The standardized, yet flexible structure of our services for process instrumentation provides a future-proof basis for:

- Protection of your investment
- Assurance of plant availability
- Long-term predictability of maintenance costs
- Cost-optimized modernizations

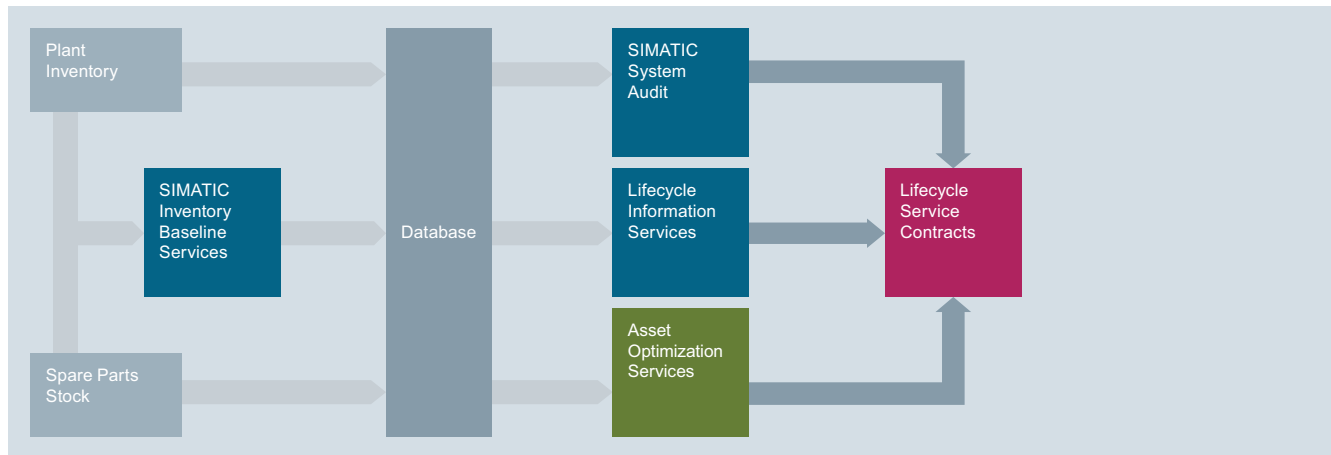
Applications

Service programs: Combination of selected portfolio elements

Service programs are selected packages of services for a product family or a service topic. The individual portfolio elements are coordinated to ensure seamless coverage throughout the entire life cycle and support optimum use of your products and systems. The individual services of a service program can also be used separately.

Based on the portfolio elements of our Lifecycle Services for process instrumentation, the following service programs are offered:

Installed Base Capture & Analytics Services

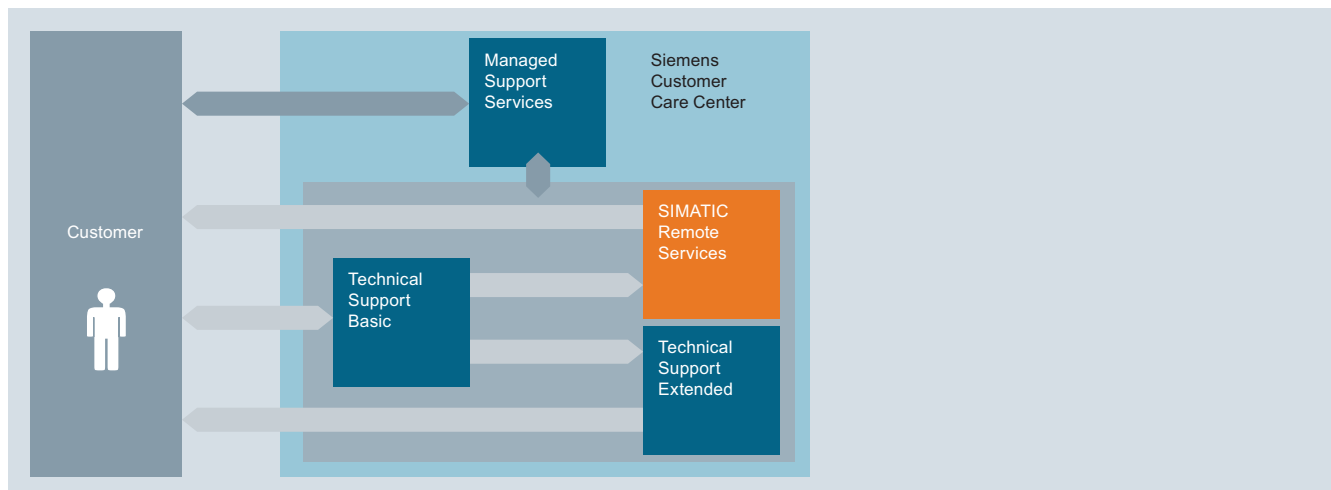


"Installed Base Capture & Analytics Services" service program

"Installed Base Capture & Analytics Services" are used to analyze and optimize the installed base. Ideally they include the following service elements:

- Inventory Baseline Services - inventory of installed field instruments
- Certified calibration and verification of field instruments
- Lifecycle Information Services - periodic life cycle status reports for all installed field instruments
- Asset Optimization Services - guaranteed spare part availability and optimized stock

Professional System Support



The "Professional System Support" service program combines the following portfolio elements:

- Managed Support Services
- Technical Support
- Remote Services for Process Instrumentation

More Information

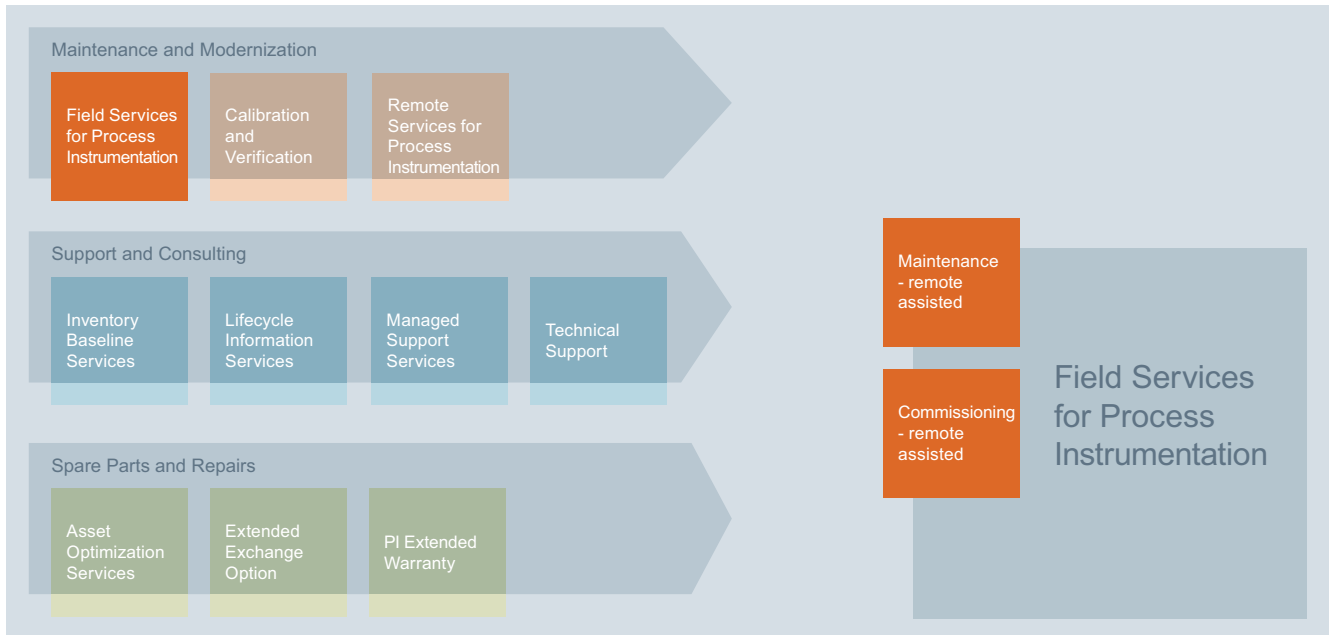
Additional information is available on the Internet at:
www.siemens.com/pils

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Field Services for Process Instrumentation

Overview



Perfect plant integration through commissioning and maintenance are the key to optimal availability of field instruments and plants. However, the time spent and labor involved is often to the detriment of the core business. This can be avoided by using a qualified external service provider like Siemens - without compromising contractual security, achievability or coordination and adaptation to meet customer and process requirements.

Commissioning and maintenance - remote assisted

Experienced and qualified service personnel of Siemens Industry Services specialize in the commissioning and maintenance of field instruments and also have access to expertise from cross-industry applications and projects within a global service network. Customers receive optimal service from Siemens based on its extensive experience in the process industry environment and as a manufacturer of process instrumentation.

- Recording of process tag data
- Monitoring of operating conditions/instrument status
- Monitoring of installation
- Programming based on customer specifications
- Monitoring of instrument function
- Backup of data/parameters
- Creation of service documentation

In the event of a remote service request, on-site personnel are supported by a product specialist via the Siemens Remote Service Platform with Desktop Sharing.

Benefits

- Shorter response time and time-to-solution
- Direct contact between customer and manufacturer in close collaboration with the responsible on-site service
- Maximization of field instrument service life
- Reduction in downtime and associated costs through early detection of operational or environmental weak points and implementation of correspondingly schedulable counter-measures.

Ordering data

Article No.

Field Services for process instrumentation field devices

- Commissioning - remote assisted (only in Germany)
- Maintenance - remote assisted (only in Germany)

9LA1110-8S ■■■ - ■■■■ 1)

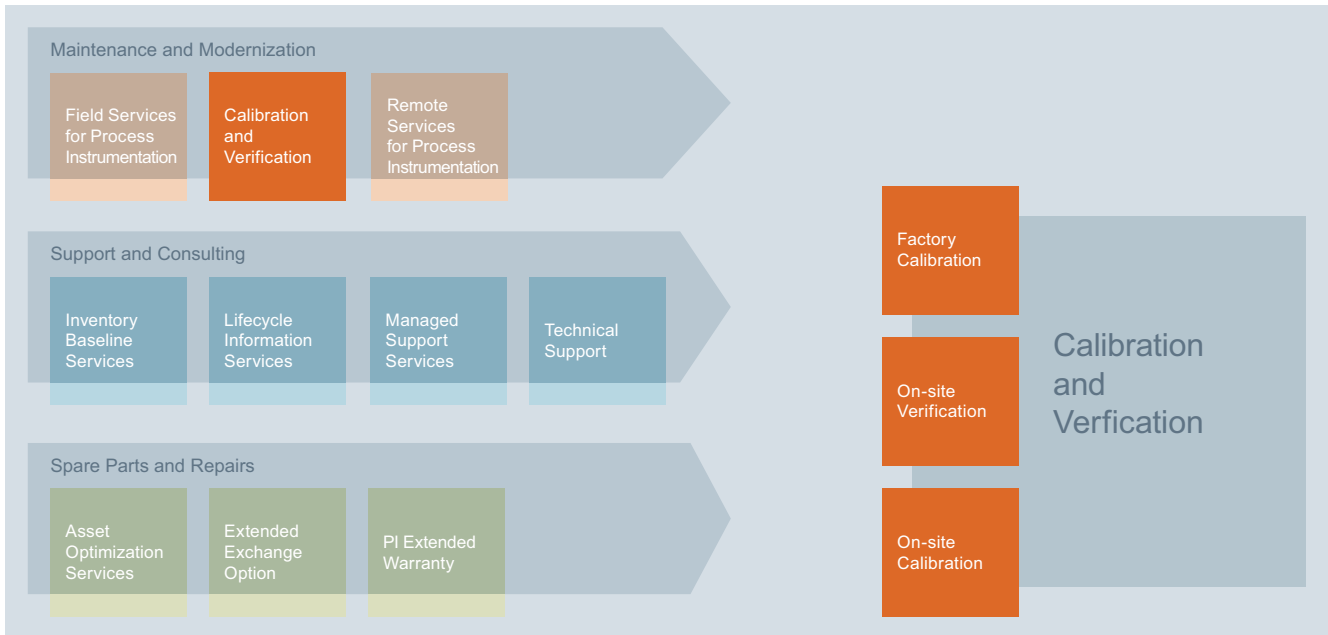
9LA1110-8T ■■■ - ■■■■ 1)

1) Total price is dependent on the configuration. Please use the PIA Selector for configuration www.pia-portal.automation.siemens.com

More Information

Additional information is available online at: www.siemens.com/pils

Overview



Our comprehensive Calibration and Verification Services assure maximum reliability and precision for your process measuring equipment.

- The **Factory Calibration** module provides factory and laboratory calibrations (according to ISO 9001, ISO/IEC 17025) for pressure, temperature and flow rate measuring equipment made by Siemens as well as other manufacturers.
- The **On-site Verification** module is an economical and time-saving alternative to sending field equipment back to the factory.
- With the **On-site Calibration** module, Siemens ensures sustainable and reliable quality assurance of your measurements.

	Pressure	Temperature	Flow Rate	Weighing Technology
Factory calibration ISO 9001	✓	✓	✓	
Accredited Laboratory Calibration ISO 17025	✓	✓	✓	
On-site Calibration ISO 9001	✓	✓		✓
On-site Verification ISO 9001			✓	

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Calibration and Verification

Benefits

Reasons for calibration of field instruments

- Periodic calibration for quality assurance according to ISO 9000
- Compliance with standards, guidelines or legal requirements
- Verification of custody transfer measurements
- Early detection of errors

Reasons for verification of flowmeters

- Alternative to expensive wet calibration
- Testing without uninstalling the process instrumentation
- Differentiation between product- and installation-related errors

Ordering data

Article No.

Factory Calibration for SITRANS P	9LA1110-8QB ■ ■ - ■ ■ ■ ■ ■ 1)
Factory Calibration for SITRANS FM	9LA1110-8QD ■ ■ - ■ ■ ■ ■ ■ 1)
Factory Calibration for SITRANS FC Coriolis	9LA1110-8QE ■ ■ - ■ ■ ■ ■ ■ 1)
On-site Calibration for flowmeters (only in Germany)	9LA1110-8RB ■ ■ - ■ ■ ■ ■ ■ 1)
On-site Calibration for belt scales (only in Germany)	9LA1110-8RM ■ ■ - ■ ■ ■ ■ ■ 1)
On-site Calibration for SITRANS FM (only in Germany)	9LA1110-8T ■ ■ ■ ■ - ■ ■ ■ ■ ■ 1)
Flat charge for travel and setup	9LA1110-8RA ■ ■ - ■ ■ ■ ■ ■ 1)

¹⁾ Total price is dependent on the configuration. Please use the PIA Selector for configuration www.pia-portal.automation.siemens.com

More Information

Additional information is available on the Internet at:
www.siemens.com/piscv

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Remote Services for Process Instrumentation

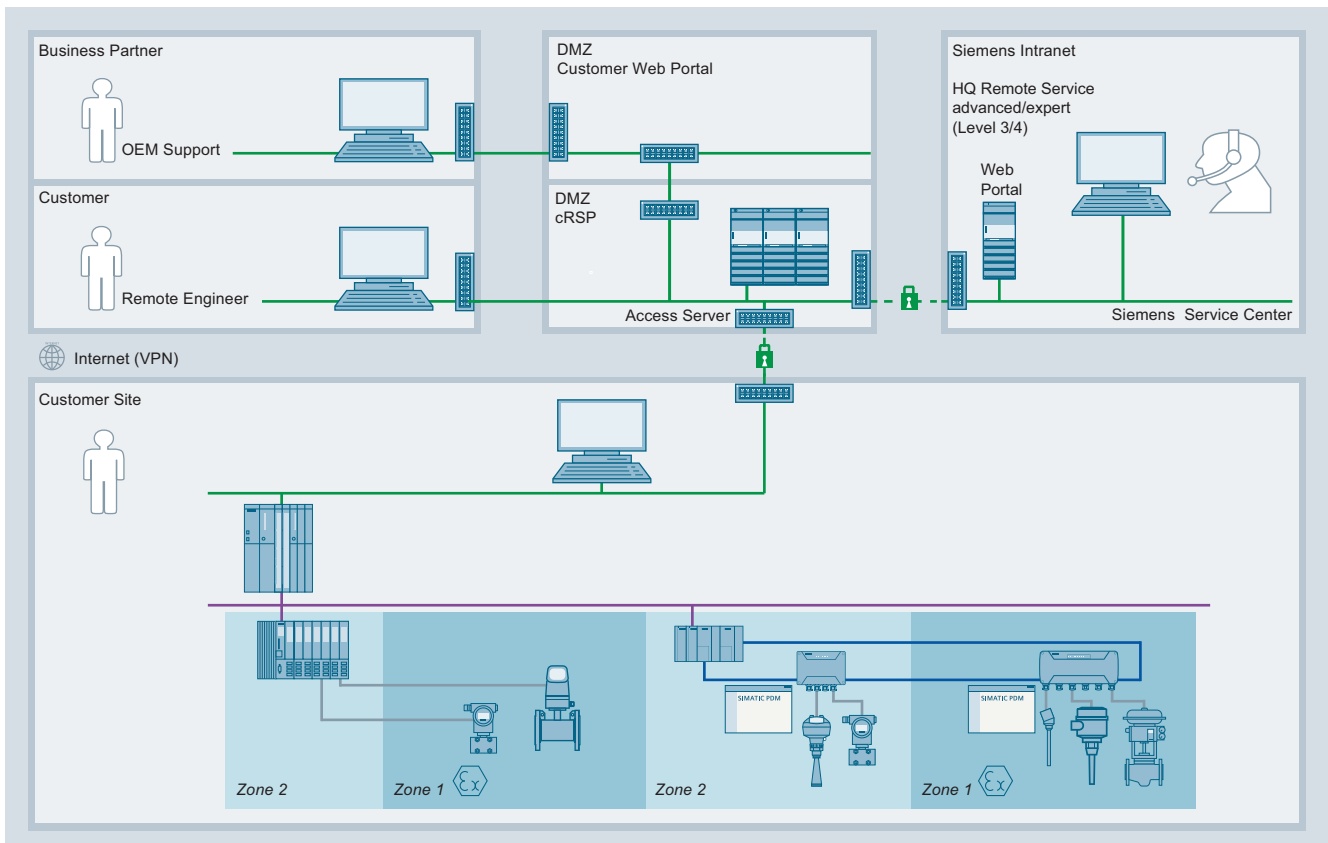
Overview



Remote Services for Process Instrumentation

Remote Services for Process Instrumentation ensure reactive support for all installed field devices. Reactive Remote Services provide a low-cost introduction to a modern efficient support service. Service availability based on the Siemens Remote Service (SRS) platform and remote access tools forms the basis for rapid troubleshooting or a comprehensive consultation regarding your machine or plant.

The "Remote Access Services" (so-called connectivity packages), which are required once per installation, enable communication between the customer system and Siemens IT infrastructure (cRSP = common Remote Service platform) and comprise different hardware and software components.



Siemens Remote Service platform

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Remote Services for Process Instrumentation

Benefits

- Secure remote connection of your automation system to the SIMATIC TechSupport IT infrastructure
- Direct worldwide connection to the network of Siemens system experts
- Provision of remote IT infrastructure including support and maintenance
- Complete transparency due to central administration of all system accesses
- Compatible with generally valid Industrial Security concepts
- TÜV/CERT certification of Siemens cRSP infrastructure

Ordering data

Article No.

Remote Services via cRSP

9LA1110-1P - - - - - ¹⁾

¹⁾ Total price is dependent on the configuration. Please use the PIA Selector for configuration www.pia-portal.automation.siemens.com

More Information

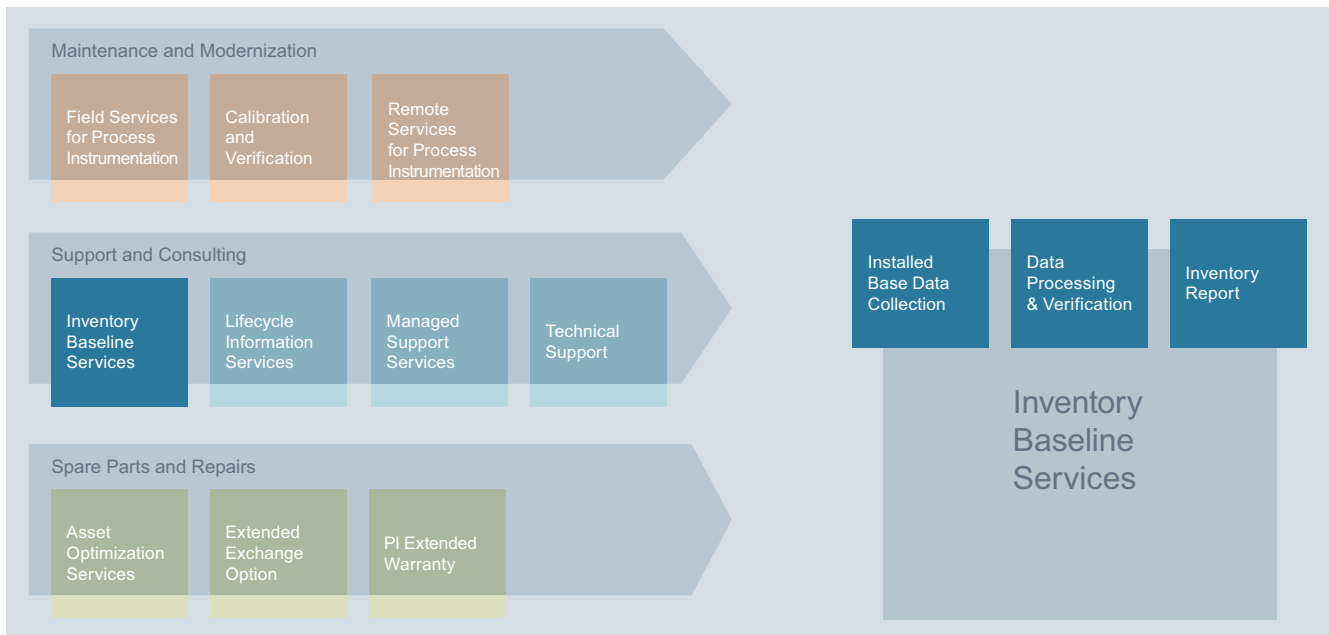
Additional information is available online at:
www.siemens.com/siremote

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Inventory Baseline Services

Overview



It is essential to make the right decisions when planning modernizations or when budgeting for necessary maintenance measures. The basis for such decisions is an in-depth knowledge of the field instruments being used. This requires:

- Standardized and complete information collection on all installed process instrumentation components
- Information collection using the least possible time and money.
- Documentation of results in standardized reports

With its Inventory Baseline Services, Siemens offers modern data-driven services that use new methods and tools to help you plan maintenance of machines and plants even more efficiently.

Making an inventory gives you an overview of the currently installed plant equipment and the spare parts in stock. The inventory results serve as a decision-making aid when planning future measures for maintenance and modernization.

Inventory Baseline Services make the installed components of machines and plants transparent and create the database for other Lifecycle Services, such as Lifecycle Information Services or Asset Optimization Services.

Benefits

- Cost-efficient and standardized inventorying
- Valid decision-making aid for planned plant expansions, modernizations as well as for preparation for updates/upgrades
- Solid basis for planning and implementation of other Lifecycle Services

Ordering data

Article No.

Complete order processing in HQ

9LA1110-8AJ00-1AB0

Up to 50 field instruments

Evaluation of SDT data in HQ

9LA1110-8AJ00-2AB0

Up to 50 field instruments

Expanded data volume for large plants

9LA1110-8AJ00-3AB0

for additional 50 field instruments

More Information

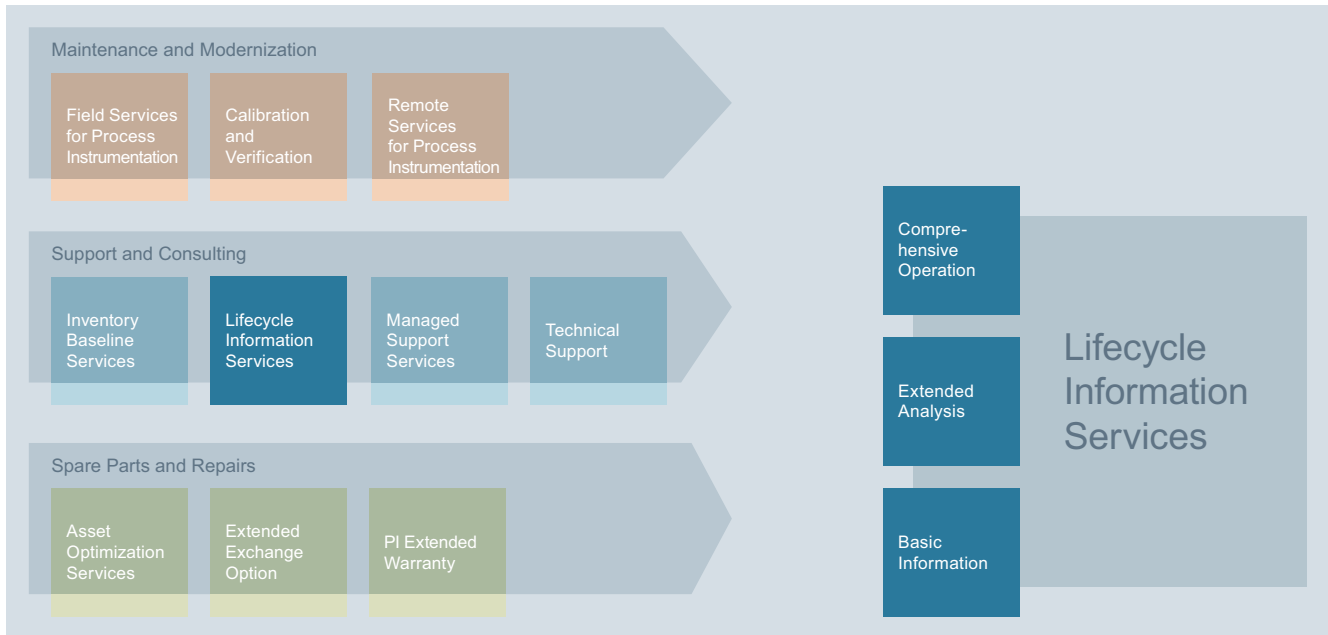
Additional information is available online at:
www.siemens.com/sibs

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Lifecycle Information Services

Overview



For planning your maintenance strategy, Lifecycle Information Services periodically provide you with detailed information on the product life cycle of the utilized components.

The Lifecycle Information Services have a modular structure so that you need only request information that you actually require. Each of the following three methods returns a plant-specific report as result. You can decide for yourself how comprehensive you want this report to be.

- **Basic Information**
Product Lifecycle Status focusing on analysis of functional obsolescence
- **Extended Analysis**
"Basic Information" module and analysis of product-related statistical mean time between failures (MTBF)
- **Comprehensive Operation**
"Extended" module supplemented with plant-specific information on updates/upgrades and general recommendations

Benefits

- Proactive, periodic service information for reduction of obsolescence risks
- Assurance of plant availability through specific service recommendations
- Prevention of unscheduled downtimes or cost-intensive supply bottlenecks
- Evaluation of new technological innovations

Ordering data

Article No.

Basic Information

- Up to 50 article numbers
 - One-time service
 - Cyclically 1 × per year
 - Cyclically 2 × per year
 - Cyclically 4 × per year
- 50 to 150 article numbers
 - One-time service
 - Cyclically 1 × per year
 - Cyclically 2 × per year
 - Cyclically 4 × per year
- 150 to 300 article numbers
 - One-time service
 - Cyclically 1 × per year
 - Cyclically 2 × per year
 - Cyclically 4 × per year

9LA1110-8AG10-1AA0
9LA1110-8AG10-1AB0
9LA1110-8AG10-1AC0
9LA1110-8AG10-1AD0

9LA1110-8AG10-1BA0
9LA1110-8AG10-1BB0
9LA1110-8AG10-1BC0
9LA1110-8AG10-1BD0

9LA1110-8AG10-1CA0
9LA1110-8AG10-1CB0
9LA1110-8AG10-1CC0
9LA1110-8AG10-1CD0

Extended Analysis

Auf Anfrage

Comprehensive Operation

Auf Anfrage

Additional options

- Lifecycle Information Services - extension by 1 day

9LA1110-8AG10-8AA0

More Information

Additional information is available online at:
www.siemens.com/lis

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Managed Support Services

Overview



Managed Support Services offer competent and efficient support through a "Dedicated Support Manager" who, as the central contact person, ensures an efficient exchange of information between all parties involved.

The Dedicated Support Manager coordinates and prioritizes all activities, is familiar with the customer's plant, knows the maintenance processes and the installed base and, if necessary, uses remote access for diagnostic and troubleshooting purposes.

Benefits

- Quicker processing and resolution of complex support requests
- Simplification of requests by means of central coordination and an exclusive "incoming" channel
- Higher "first-time-fix-rate"
- Avoidance of expensive on-site service calls
- Greater transparency of the support measures performed through active support management

Ordering data

Article No.

You can choose from three different product versions. When ordering, the minimum contractual term is always at least one year.

Managed Support Service

- Limited to 30 hours of support
- Limited to 45 hours of support
- Limited to 55 hours of support

9LA1110-1BA00
9LA1110-1BB00
9LA1110-1BC00

More Information

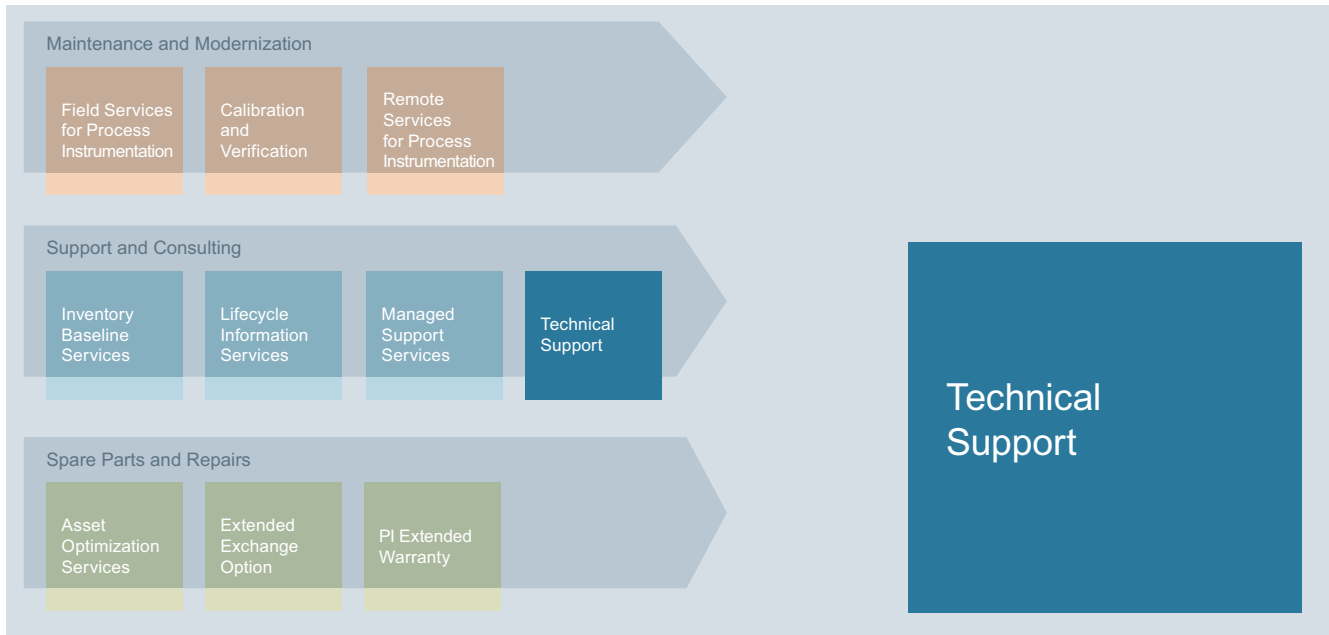
Additional information is available online at:
www.siemens.com/mss

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Technical Support Services

Overview



The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries - ranging from basic support to customized support contracts. Even discontinued products and products that are no longer available are fully supported so that the value of your investment is preserved over the long term.

Ways to contact Technical Support

Online, using the Support Request form - A Support Request is the primary incoming channel for questions regarding Siemens Industry products. When you submit a Support Request, your request is assigned a unique ticket number that facilitates tracking. A Support Request gives you direct access to technical experts, recommended solutions for a wide range of issues (e.g. FAQs) and status tracking.

www.siemens.com/automation/support-request

By phone - You can get in touch with Technical Support experts in Germany at: +49 (911) 895-7222

Contact information for Technical Support in your region is available in the Siemens Personal Contacts database at

www.siemens.com/aspa

Benefits

- Personal contacts for all questions regarding Siemens Industry products
- Available during regular business hours on work days
- Available free of charge online and by phone
- Fast commissioning and reduced energy expenditure
- Fast and competent support in critical situations

More Information

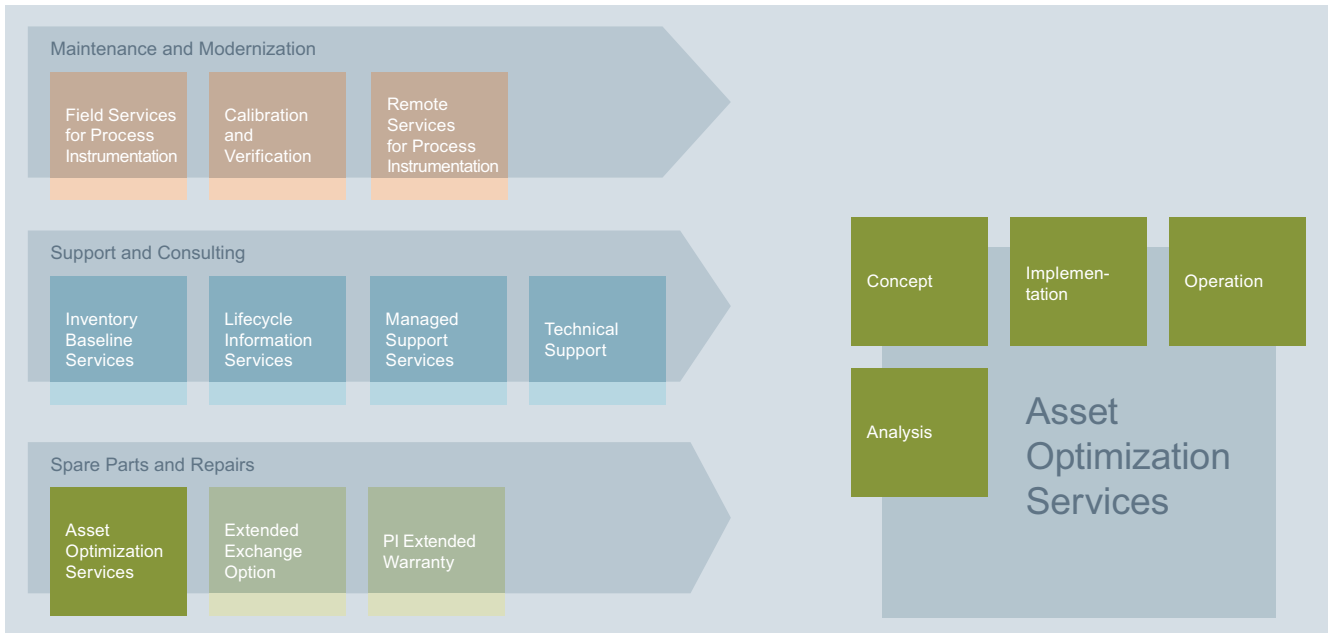
Additional information is available online at:
www.siemens.com/sios

Services for Process Instrumentation

Lifecycle Services für die Prozessinstrumentierung

Asset Optimization Services

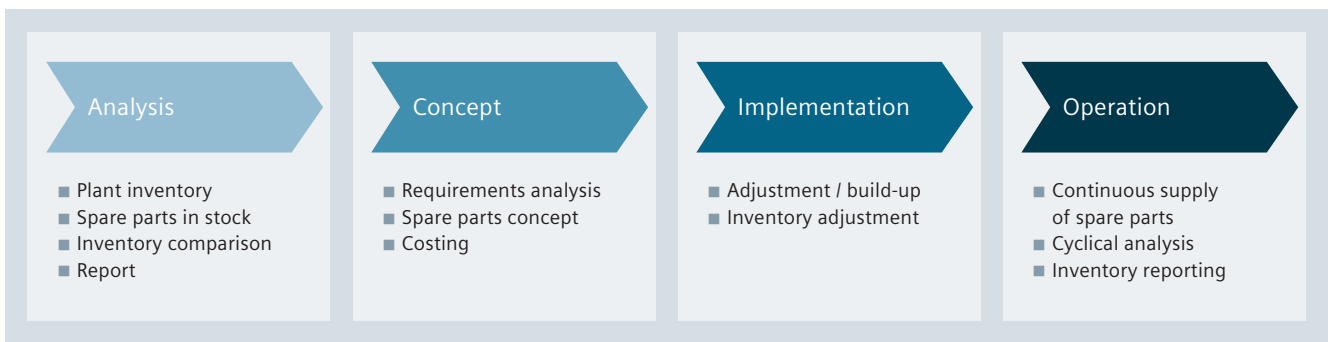
Overview



High plant availability with optimal spare parts supply - Asset Optimization Services provide a structured and systematic procedure for the holistic optimization of the supply of spare parts.

The four phases of Asset Optimization Services are coordinated with one other but can also be used independently:

- **Phase I: Analysis**
Determination of the current spare parts situation on site: availability, product life cycle, spare part delivery times
- **Phase II: Concept**
The concept phase consists of an analysis of the actual requirements and the development of a spare parts concept.
- **Phase III: Implementation**
Based on the results of the concept phase, the required warehouse structures, storage locations and spare parts are set up.
- **Phase IV: Operation**
The optimized and continuous supply of spare parts is an essential contribution to high plant availability. Depending on the specific contractual agreements, cyclic inventory analysis and a regular exchange of information also take place.



Benefits

- Creates transparency about the actual spare parts requirements
- Ensures spare parts availability over the entire life cycle of the machine or plant and therefore fulfills an important prerequisite for improved serviceability
- Shift to external inventory keeping and continuous supply with necessary spare parts

Ordering data

Ordering data	Article No.
Analysis	On request
Concept	On request
Implementation	On request
Operation	On request

More Information

Additional information is available online at www.siemens.com/aos

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Extended Exchange Option

Overview



Extended Exchange Option offers extended replacement of defective products and systems that have failed under intended use, for example, due to material defects. An EEO can be ordered up to 12 months after product delivery. The running time of the EEO can be specified in 6-month increments ranging from 24 to 60 months from the time of product delivery. Within this pe-

riod, you receive free replacement of defective products that were included as part of the EEO agreement.

The EEO can be ordered for practically all currently marketed Siemens Industry products. Wear parts are excluded from the EEO.

Benefits

- More transparency about operating costs of a machine or plant
- Reduction of economic risk through better predictability
- EEO can be adapted to customer requirements by the product selection and flexible running time.

Ordering data

When ordering an EEO, please provide the following information to your personal contact in the regional sales office: requested products with quantity, article number and delivery date, location of end customer and requested contract running time.

The standard warranty is an integral component of an EEO and is taken into account on a product-specific basis in the cost calculation.

The number of EEO units needed is calculated as follows: 1% of list price x running time in years (e.g. 3.5 years)

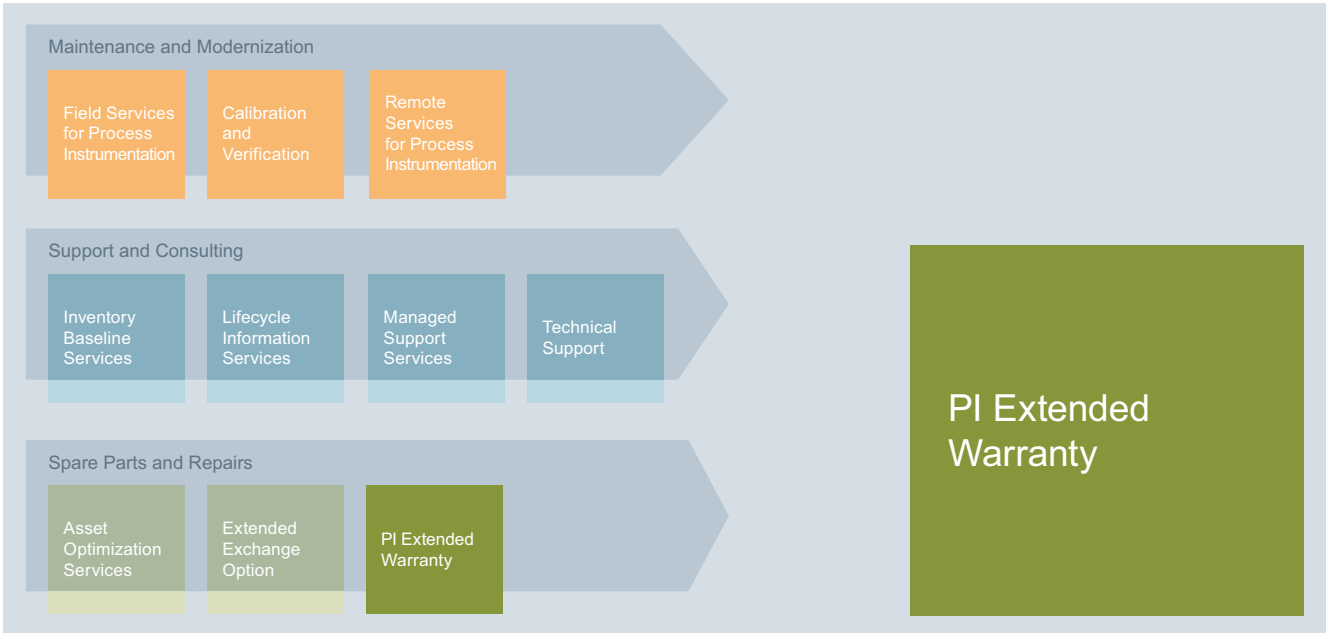
The total price of the products covered with an EEO results from: Number of EEO units needed x 2.5 €.

Extended Exchange Option – one EEO unit	Article No.
	6ES7997-2AA00-0AX0

More Information

Additional information is available online at: www.siemens.com/eeo

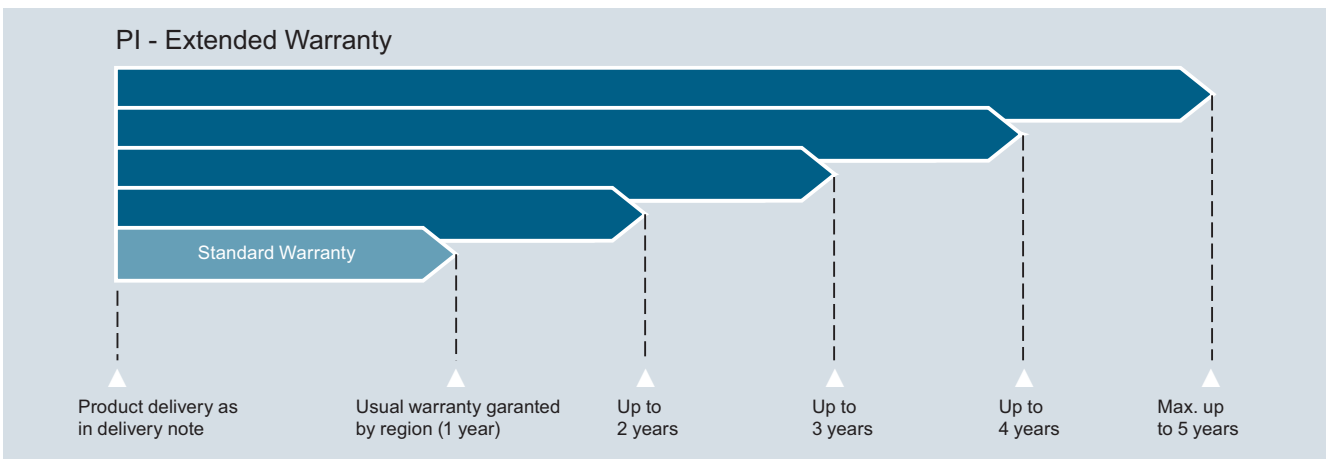
Overview



The Process Instrumentation (PI) Extended Warranty enables you to protect yourself against unforeseeable maintenance costs for your Siemens process instrumentation order. The Extended Warranty applies to repair and replacement of defective devices that have failed under intended use, for example, due to material defects. An Extended Warranty can be purchased for all Siemens process instrumentation devices together with the product order. A running period of 24, 36, 48 or 60 months can be selected and starts on product delivery. The selection of an

Extended Warranty applies to all process instrumentation devices in the respective order that have a serial number (for traceability). In case of a warranty claim, the defective device can be returned worldwide using the "Returned goods process" of the respective region.

The Extended Warranty can be ordered at any time from our local sales office. If you are interested or have further questions, feel free to contact the sales office.



Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

PI Extended Warranty

Benefits

- **Easy to order**
One-time payment together with the product order ensures protection of devices over an extended period.
- **Cost transparency**
During the running time of the Extended Warranty, no costs will be incurred for repairs, unless caused by the customer.
- **High flexibility**
The running time can be flexibly selected according to your requirements.
- **Global availability**
In the case of a warranty claim, the defective device can be returned to one of our worldwide offices.
- **Traceability**
If required, a certificate can be generated containing a list of covered devices including their running time. The running time for a device can additionally be traced by entering the serial number in the Siemens PIA Lifecycle Portal.

Ordering data

Extended Warranty

- For a total of 24 months
- For a total of 36 months
- For a total of 48 months
- For a total of 60 months

Article No.

GWK-PI-EXWARR-02
GWK-PI-EXWARR-03
GWK-PI-EXWARR-04
GWK-PI-EXWARR-05

More Information

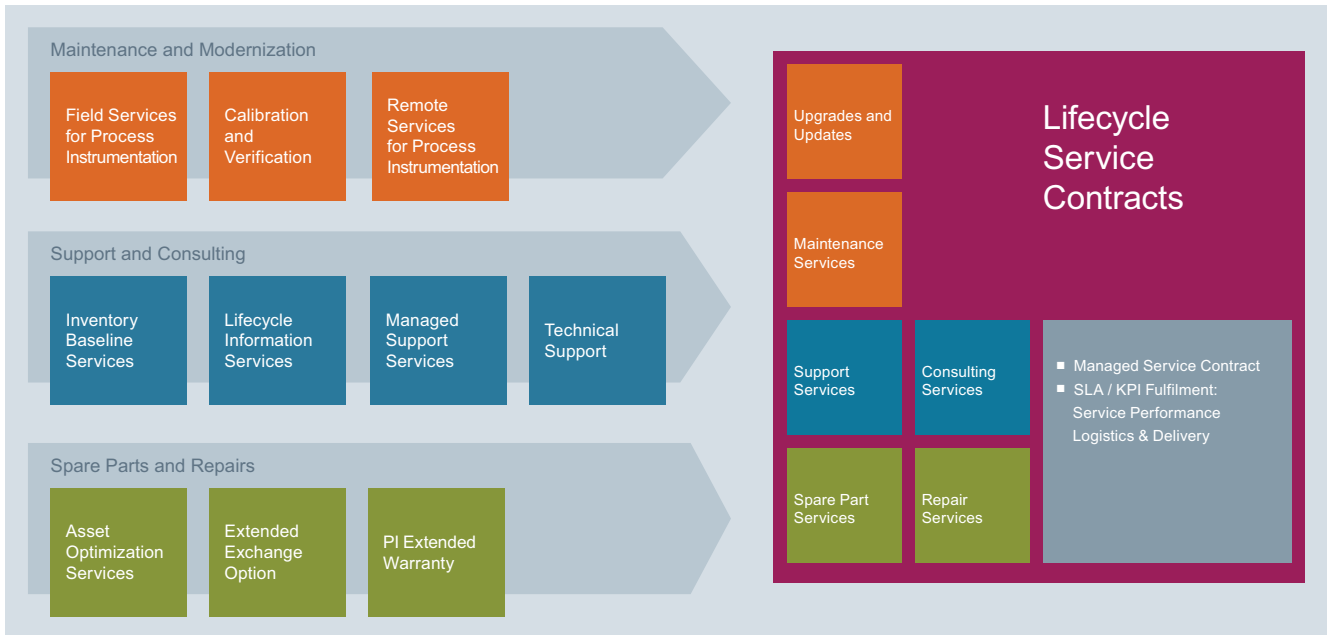
Additional information is available online at:
www.siemens.com/pi-extended-warranty

Services for Process Instrumentation

Lifecycle Services for Process Instrumentation

Lifecycle Service Contracts

Overview



The service elements introduced in the preceding sections form the basis for customized Lifecycle Service Contracts for process instrumentation. In addition, specific contract parameters, so-called service KPIs, can be agreed upon individually. A prerequisite for entering into a Lifecycle Service Contract is an in-depth knowledge of the installed system base.

Long-term investment protection

Ongoing service of plants keeps the risk of obsolescence (failure) low; the optimized maintenance costs are largely constant and therefore predictable.

Benefits

Benefits of a long-term service contract

- Long-term investment protection
- Better predictability of maintenance costs
- Increased plant availability, for example, through promised arrival times for service, guaranteed spare parts supply and preventive maintenance measures
- Assurance of availability (minimization of failure risk) of utilized field instruments
- Protection of system know-how of the manufacturer
- Proactive contract management

Services for Process Instrumentation

Notes

Appendix



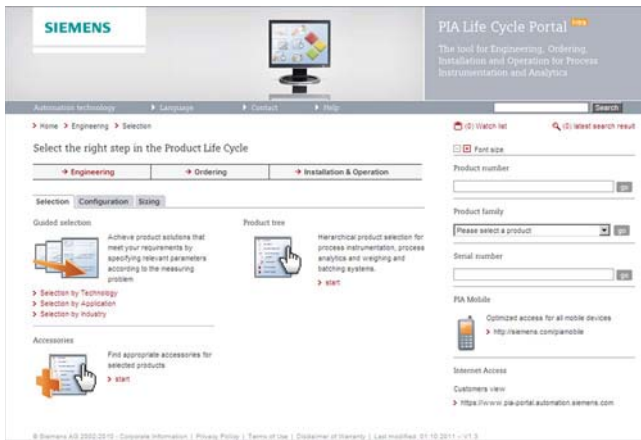
10/2	PIA Life Cycle Portal Engineering, Ordering, Installation and Operation Tool
10/3	Online Services Information and Ordering Options on the Internet and DVD
10/4	Information and Download Center, Social Media, Mobile Media
10/6	Industry Services Industry Services – Portfolio overview
10/8	Online Support
10/9	SITRAIN – Training for Industry
10/10	Course offer for Process Instrumentation
10/11	Delivery Time Quick Ship Program, Stock Items
10/12	Product documentation Documentation in shipped products, QR Code, SIOS
10/13	Partner at Siemens
10/14	Partner at Industry Siemens Partner Program
10/15	Pressure Equipment Directive (2014/68/EU)
10/18	Functional safety
10/19	Software Licenses
10/22	Conditions of sale and delivery

Appendix

PIA Life Cycle Portal

Engineering, Ordering, Installation and Operation Tool

Overview



The PIA Life Cycle Portal provides the appropriate functionality in all stages of the Product Life Cycle for products of Process Instrumentation, Process Analytics and Weighing Technology.

The application guides you through Engineering & Selection, supports you at the Order and provides tools and information for Installation and Operation.

- **Phase 1:** Selection & Planning
- **Phase 2:** Ordering
- **Phase 3:** Installation & Operation
- **Additional features:** e. g. PIA Mobile

Phase 1: Selection & Planning



Selection

Achieve product solutions that meet your requirements by specifying relevant parameters according to the measuring point by using the *guided selection* or select the product directly in the *product and accessories tree*.



Configuration

Configure a selected product step by step and use the integrated configuration knowledge to avoid errors.



Sizing & calculation

Sizing & calculation tools for Gas Analyzers, Weighing and Batching Systems and Flow measurement instruments.

Phase 2: Ordering



Bulk upload

Verify several part numbers in one step by uploading a simple text file.



Watchlist & projects

Collect products in a *watch list* and save it as a *project* for later use.



Interface to the Industry Mall

Order the selected products with the ordering system for Siemens' automation and drive solutions.

Phase 3: Installation & Operation



Spare parts

Find appropriate *spare parts* for selected products or corresponding product families.



After sales support

Go to the *Service and Support Portal* to access manuals, certificates and further information concerning service & support.



Device information and history

Serial number specific product information for installed devices

Additional features



Personalize

Register in order to customize the application to your personal needs.



PIA Mobile

Use the product *selection, configuration and device information and history* with the version optimized for mobile devices.
www.siemens.com/piamobile



Product details

Find all relevant product information at a single glance: commercial and technical data, certificates, images and documents etc.

More information

PIA Life Cycle Portal
Ostliche Rheinbrückenstraße 50
76187 Karlsruhe, Germany
Tel.: +49 (721) 595 2114
E-Mail: support.pia-portal@siemens.com
www.siemens.com/pia-portal

Information and Ordering Options on the Internet and DVD

The Future of Manufacturing on the Internet



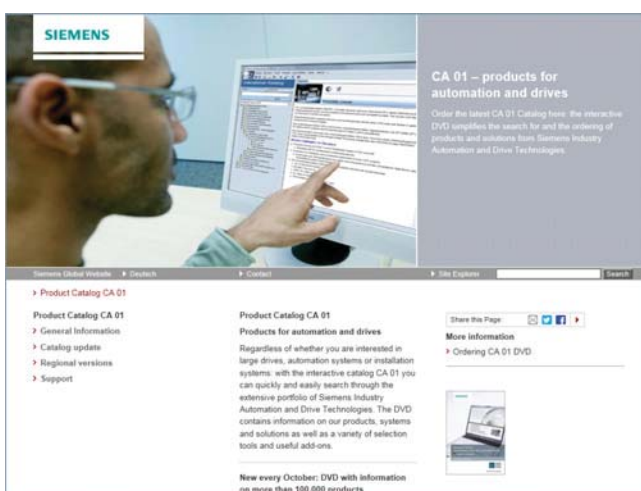
Detailed knowledge of the range of products and services available is essential when planning and engineering automation systems. It goes without saying that this information must always be as up-to-date as possible.

Industry is on the threshold of the fourth industrial revolution as digitization now follows after the automation of production. The goals are to increase productivity and efficiency, speed, and quality. In this way, companies can remain competitive on the path to the future of industry.

You will find everything you need to know about products, systems and services on the internet at:

www.siemens.com/industry

Product Selection Using the Interactive CA 01 Automation and Drives Catalog



Detailed information together with user-friendly interactive functions:

The CA 01 interactive catalog covers more than 100,000 products, thus providing a comprehensive overview of the product range provided by Siemens.

You will find everything you need here for solving tasks in the fields of automation, switching, installation and drives. All information is provided over a user interface that is both user-friendly and intuitive.

You can order the CA 01 product catalog from your Siemens sales contact or in the Information and Download Center:

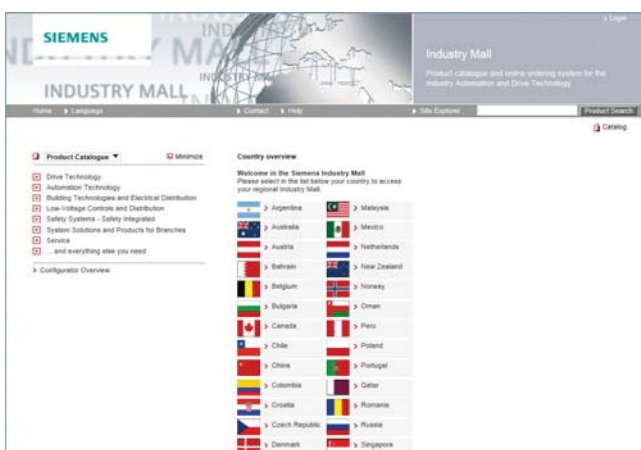
www.siemens.com/industry/infocenter

Information about the CA 01 interactive catalog can be found on the Internet at:

www.siemens.com/automation/ca01

or on DVD.

Easy Shopping with the Industry Mall



The Industry Mall is the electronic ordering platform of Siemens AG on the Internet. Here you have online access to a huge range of products presented in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure, from selection through ordering to tracking and tracing, to be carried out online. Availability checks, customer-specific discounts and bid creation are also possible.

Numerous additional functions are provided for your support. For example, powerful search functions make it easy to select the required products. Configurators enable you to configure complex product and system components quickly and easily. CAx data types are also provided here.

You can find the Industry Mall on the Internet at:

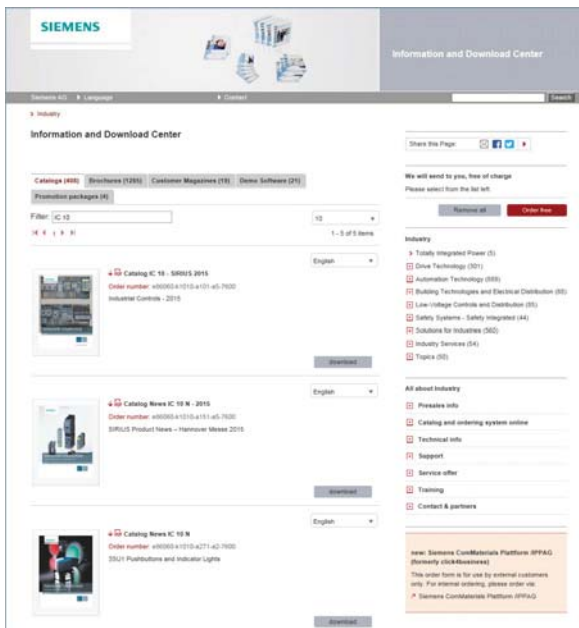
www.siemens.com/industrymall

Appendix

Online Services

Information and Download Center, Social Media, Mobile Media

Downloading Catalogs



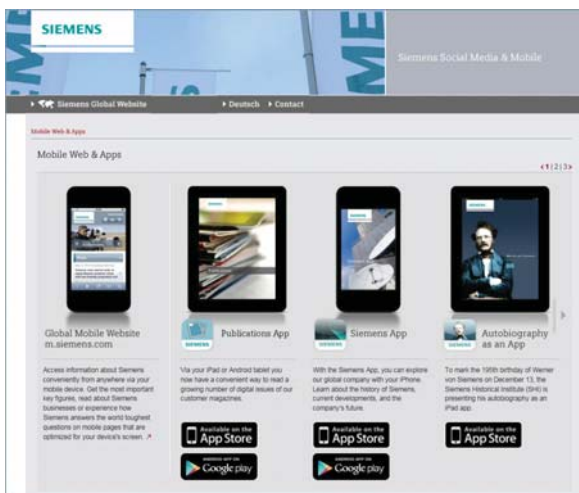
In addition to numerous other useful documents, you can also find the catalogs listed on the back inside cover of this catalog in the Information and Download Center. You can download these catalogs in PDF format without having to register.

The filter dialog above the first catalog displayed makes it possible to carry out targeted searches. If you enter "MD 3" for example, you will find both the MD 30.1 and MD 31.1 catalogs. If you enter "IC 10", both the IC 10 catalog and the associated news or add-ons are displayed.

Visit us at:

www.siemens.com/industry/infocenter

Social and Mobile Media



Connect with Siemens through social media: visit our social networking sites for a wealth of useful information, demos on products and services, the opportunity to provide feedback, to exchange information and ideas with customers and other Siemens employees, and much, much more. Stay in the know and follow us on the ever-expanding global network of social media.

To find out more about Siemens' current social media activities, visit us at:

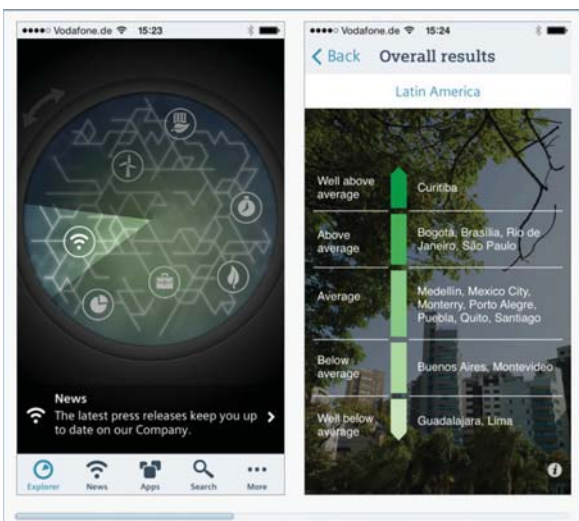
www.siemens.com/socialmedia

Or via our product pages at:

www.siemens.com/automation or www.siemens.com/drives

Connect with Siemens Industry at our central access point to read all the news on the future of manufacturing, watch current videos and inform yourself about all the latest industry developments:

www.siemens.com/future-of-manufacturing



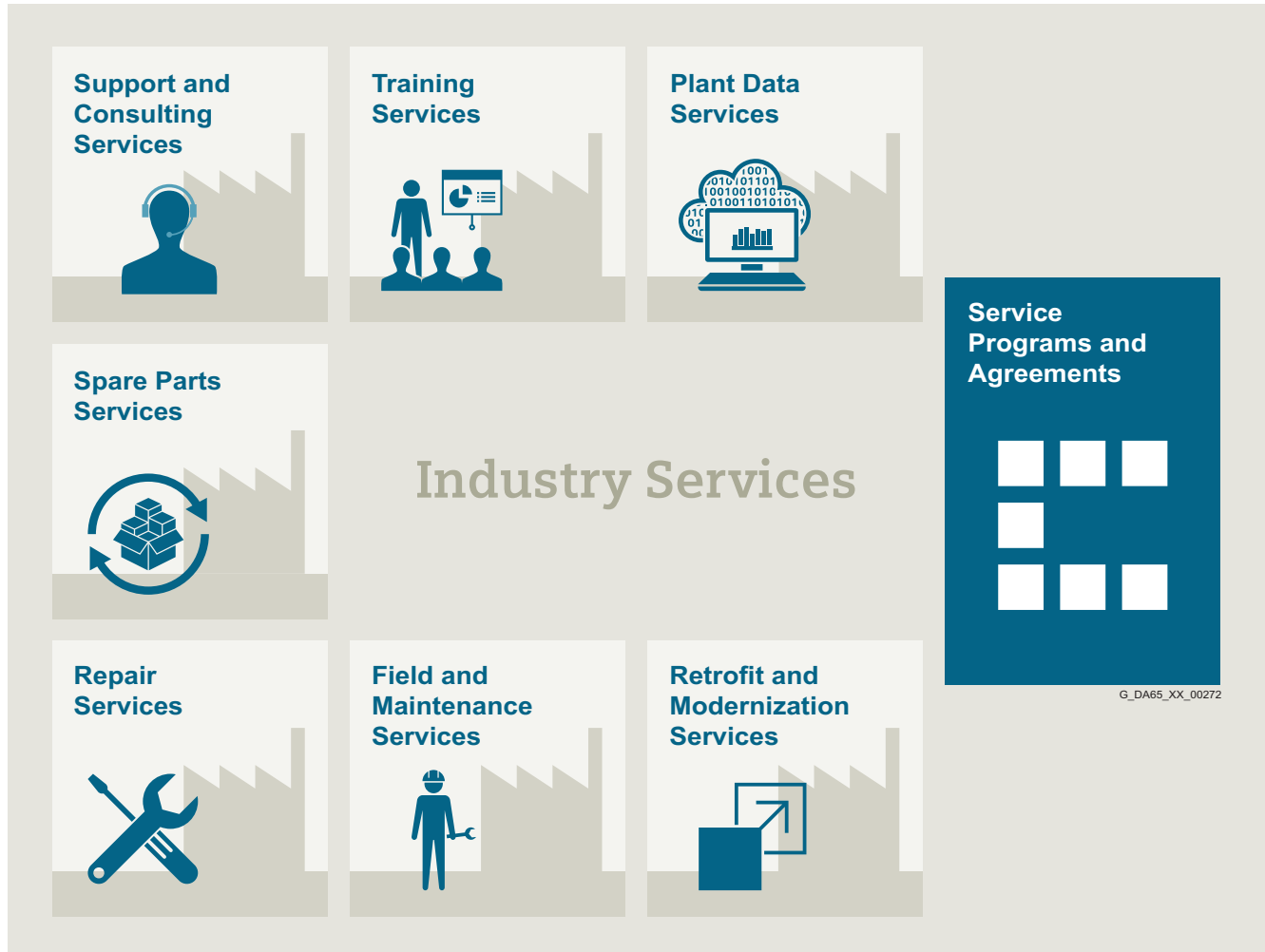
Discover the world of Siemens.

We are also constantly expanding our offering of cross-platform apps for smartphones and tablets. You will find the current Siemens apps at the App Store (iOS) or at Google Play (Android):

<https://itunes.apple.com/en/app/siemens/id452698392?mt=8>

<https://play.google.com/store/search?q=siemens>

The Siemens app, for example, tells you all about the history, latest developments and future plans of the company – with informative pictures, fascinating reports and the most recent press releases.

Overview
Unleash potential – with services from Siemens

Increase your performance – with Industry Services

Optimizing the productivity of your equipment and operations can be a challenge, especially with constantly changing market conditions. Working with our service experts makes it easier. We understand your industry's unique processes and provide the services needed so that you can better achieve your business goals.

You can count on us to maximize your uptime and minimize your downtime, increasing your operations' productivity and reliability. When your operations have to be changed quickly to meet a new demand or business opportunity, our services give you the flexibility to adapt. Of course, we take care that your production is protected against cyber threats. We assist in keeping your operations as energy and resource efficient as possible and reducing your total cost of ownership. As a trendsetter, we ensure that you can capitalize on the opportunities of digitalization and by applying data analytics to enhance decision making: You can be sure that your plant reaches its full potential and retains this over the longer lifespan.

You can rely on our highly dedicated team of engineers, technicians and specialists to deliver the services you need – safely, professionally and in compliance with all regulations. We are there for you, where you need us, when you need us.

Appendix

Industry Services

Industry Services – Portfolio overview

Overview

Plant Data Services



Make your industrial processes transparent to gain improvements in productivity, asset availability, and energy efficiency.

Production data is generated, filtered and translated with intelligent analytics to enhance decision-making.

This is done whilst taking data security into consideration and with continuous protection against cyber attack threats.

www.industry.siemens.com/services/global/en/portfolio/plant-data-services/Pages/index.aspx

Support and Consulting Services



Industry Online Support site for comprehensive information, application examples, FAQs and support requests.

Technical and Engineering Support for advice and answers for all inquiries about functionality, handling, and fault clearance.

Information & Consulting Services, e.g. SIMATIC System Audit; clarity about the state and service capability of your automation system or Lifecycle Information Services; transparency on the lifecycle of the products in your plants.

www.industry.siemens.com/services/global/en/portfolio/support-consulting/Pages/index.aspx

Training Services



From the basics and advanced to specialist skills, SITRAIN courses provide expertise right from the manufacturer – and encompass the entire spectrum of Siemens products and systems for the industry.

Worldwide, SITRAIN courses are available wherever you need a training course in more than 170 locations in over 60 countries.

www.industry.siemens.com/services/global/en/portfolio/training/Pages/index.aspx

Spare Parts Services



Are available worldwide for smooth and fast supply of spare parts – and thus optimal plant availability. Genuine spare parts are available for up to ten years. Logistic experts take care of procurement, transport, custom clearance, storage and order management. Reliable logistics processes ensure that components reach their destination as needed.

Asset optimization services help you design a strategy for parts supply where your investment and carrying costs are reduced and the risk of obsolescence is avoided.

www.industry.siemens.com/services/global/en/portfolio/spare_parts/Pages/index.aspx

Overview (continued)

Repair Services


Are offered on-site and in regional repair centers for fast restoration of faulty devices' functionality.

Also available are extended repair services, which include additional diagnostic and repair measures, as well as emergency services.

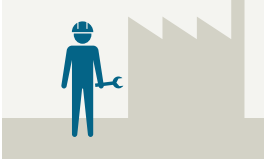
www.industry.siemens.com/services/global/en/portfolio/repair_services/Pages/index.aspx

Retrofit and Modernization Services


Provide a cost-effective solution for the expansion of entire plants, optimization of systems or upgrading existing products to the latest technology and software, e.g. migration services for automation systems.

Service experts support projects from planning through commissioning and, if desired over the entire extended lifespan, e.g. Retrofit for Integrated Drive Systems for an extended lifetime of your machines and plants

www.industry.siemens.com/services/global/en/portfolio/retrofit-modernization/Pages/index.aspx

Field and Maintenance Services


Siemens specialists are available globally to provide expert field and maintenance services, including commissioning, functional testing, preventive maintenance and fault clearance. All services can be included in customized service agreements with defined reaction times or fixed maintenance intervals.

www.industry.siemens.com/services/global/en/portfolio/field_service/Pages/index.aspx

Service Programs and Agreements


A technical Service Program or Agreement enables you to easily bundle a wide range of services into a single annual or multi-year agreement.

You pick the services you need to match your unique requirements or fill gaps in your organization's maintenance capabilities.

Programs and agreements can be customized as KPI-based and/or performance-based contracts.

www.industry.siemens.com/services/global/en/portfolio/service_programs/Pages/index.aspx

Appendix

Industry Services

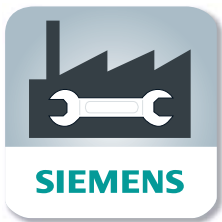
Online Support

Overview



Online Support is a comprehensive information system for all questions relating to products, systems, and solutions that Siemens has developed for industry over time. With more than 300,000 documents, examples and tools, it offers users of automation and drive technology a way to quickly find up-to-date information. The 24-hour service enables direct, central access to detailed product information as well as numerous solution examples for programming, configuration and application.

Online Support App



Using the Online Support app, you can access over 300,000 documents covering all Siemens industrial products – anywhere, any time. Regardless of whether you need help implementing your project, fault-finding, expanding your system or are planning a new machine.

You have access to FAQs, manuals, certificates, characteristic curves, application examples, product notices (e.g. announcements of new products) and information on successor products in the event that a product is discontinued.

Just scan the product code printed on the product directly using the camera of your mobile device to immediately see all technical information available on this product at a glance. The graphical CAx information (3D model, circuit diagrams or EPLAN macros) is also displayed. You can forward this information to your workplace using the e-mail function.

The search function retrieves product information and articles and supports you with a personalized suggestion list. You can find your favorite pages – articles you need frequently – under “mySupport”. You also receive selected news on new functions, important articles or events in the News section.

The content, in six languages, is increasingly multimedia-based – and now also available as a mobile app. Online support’s “Technical Forum” offers users the opportunity to share information with each other. The “Support Request” option can be used to contact Siemens’ technical support experts. The latest content, software updates, and news via newsletters and Twitter ensure that industry users are always up to date.

www.siemens.com/industry/onlinesupport

Scan the QR code
for information on
our Online Support
app.



The app is available free of charge from the Apple App Store (iOS) or from Google Play (Android).

<https://support.industry.siemens.com/cs/ww/en/sc/2067>



Your benefit from practical training directly from the manufacturer

SITRAIN – Training for Industry – provides you with comprehensive support in solving your tasks.

Training directly from the manufacturer enables you to make correct decisions with confidence.

Increased profits and lower costs:

- Shorter times for commissioning, maintenance and servicing
- Optimized production operations
- Reliable configuration and startup
- Shorten commissioning times, reduce downtimes, and faster troubleshooting
- Exclude expensive faulty planning right from the start.
- Flexible plant adaptation to market requirements
- Compliance with quality standards in production
- Increased employee satisfaction and motivation
- Shorter familiarization times following changes in technology and staff

Contact

Visit our site on the Internet at:
www.siemens.com/sitrain

or let us advise you personally. You can request our latest training catalog from:

SITRAIN – Training for Industry
SITRAIN Customer Support Germany:

Tel.: +49 911 895-7575
 Fax: +49 911 895-7576

Email: info@sitrain.com

Your benefits with SITRAIN – Training for Industry

Certified top trainers

Our trainers are skilled specialists with practical experience. Course developers have close contact with product development, and pass on their knowledge to the trainers and then to you.

Practical application with practice

Practice, practice, practice! We have designed the trainings with an emphasis on practical exercises. They take up to half of the course time in our trainings. You can therefore implement your new knowledge in practice even faster.

300 courses in more than 60 countries

We offer a total of about 300 classroom-based courses. You can find us at more than 50 locations in Germany, and in 62 countries worldwide. You can find which course is offered at which location at:

www.siemens.com/sitrain

Skills development

Do you want to develop skills and fill in gaps in your knowledge? Our solution: We will provide a program tailored exactly to your personal requirements. After an individual requirements analysis, we will train you in our training centers near you or directly at your offices. You will practice on the most modern training equipment with special exercise units. The individual training courses are optimally matched to each other and help with the continuous development of knowledge and skills. After finishing a training module, the follow-up measures make success certain, as well as the refreshment and deepening of the knowledge gained.

Appendix

SITRAIN – Training for Industry

Course offer for Process Instrumentation

Course offer

	Course suitable for			Duration/ Medium	Course code
	Planning	Realization	Operation		
Basis Service Training for Process Instruments	✓	✓	✓	5 days	SC-PI-BST
Introduction into Process Instrumentation and Process Analytics (for Siemens employees)	✓	✓	✓	2 days	SC-TP-GS1
Advanced Trainings Pressure, Temperature and Positioner (for Siemens employees)	✓	✓	✓	3.5 days	SC-PI1-ADV
Pressure, Temperature Measurement and Electropneumatic Positioners - Technology and Sales	✓	✓	✓	4.5 days	SC-PI1-T1S
Flow Measurement - Technology and Sales	✓	✓	✓	4 days	SC-PI3-T1S
Advanced Service Training Communication		✓	✓	1 day	AST-COM
Advanced Service Training MASS		✓	✓	1 day	AST-FC
Advanced Service Training FC430		✓	✓	1 day	AST-FC400
Advanced Service Training MAG		✓	✓	1 day	AST-FM
Advanced Service Training MAG 8000		✓	✓	1 day	AST-FM8000
Advanced Service Training Transmag		✓	✓	1 day	AST-FMT
Advanced Service Training ClampOn		✓	✓	1 day	AST-FUC
Advanced Service Training SONO Inline		✓	✓	1 day	AST-FUI
Advanced Service Training SONOKIT		✓	✓	1 day	AST-FUK
Advanced Service Training Vortex		✓	✓	1 day	AST-FX
Level Measurement - Technology and Sales	✓	✓	✓	4.5 days	SC-PI2-T1S
Combining Engineering and Operation of SIMATIC PCS 7 with PI Process Instrumentation Devices	✓	✓	✓	2 days	SC-PI-PCS7
Service for SIMATIC PDM and Process Periphery		✓	✓	3 days	SC-PI-PDM
Recorder SIREC D		✓	✓	1 day	SC-PI-SIRE
Origination, Description, Execution and Evaluation of Diagnostic Tests of the SIPART PS2 Positioner		✓	✓	1 day	SC-PS2-DIA
Siemens Weighing Technology Basic Training (for Siemens employees)	✓	✓	✓	2 days	SC-WT-BAS
Static Weighing Technology	✓	✓	✓	3 days	SC-WT-STAT
Introduction in Weighing Electronics WP251		✓	✓	3 days	SC-WT-WP25
Dynamic Weighing Technology	✓	✓	✓	3 days	SC-WT-DYN
SIWAREX Sensor System and Electronics FTC-L		✓	✓	3 days	SC-WT-FTCL
Weighing Technology, Belt Scales, Weighfeeder		✓	✓	3 days	SC-WT-BELT

Custom and tailor-made training

Additionally to our standard technical, industry and sales training we offer our customers the possibility of custom and tailor-made training out of our broad range of options.

We deliver training worldwide either in one of our training centers around the world or at a custom location on-site.

Be it a service training delivering the needed skills for commissioning, diagnosing, or repairing parts of our product portfolio, a general introduction into our portfolio including showcasing applications, use cases and serviced industries, or a deep dive into specific technologies with experts that know every nut, bolt and screw of our products and their applications - it is your wishes and needs we want to serve!

Feel free to contact us with your wishes!

More information

You will find further information on the Internet at:

<http://sitrain.automation.siemens.com/DE/sitrain/CatalogDetail.aspx?dataKey=BAAAGIF>

Overview



Fast Delivery Time

Our devices are anything but products off the rack. Numerous customer requirements can be taken into account when configuring any of our products. This results in large variety.

In the selection and ordering data, we show you how to use various identifiers to locate the products from our standard portfolio and stock items.

Quick Ship Program

Selection and Ordering data		Article No.
Pressure transmitters for absolute pressure from gauge pressure series, SITRANS P DS III with HART		7 MF 4 2 3 3 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Inert liquid	grease-free to cleanliness level 2	3
Measuring span (min. ... max.)		
8.3 ... 250 mbar a	(0.12 ... 3.62 psia)	D
43 ... 1300 mbar a	(0.62 ... 18.85 psia)	F
0.16 ... 5 bar a	(2.32 ... 72.5 psia)	G
1 ... 30 bar a	(14.5 ... 435 psia)	H
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for diaphragm seal		Y
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Stainless steel oval flange with process connection (Oval flange has no female thread)		
- Mounting thread 7/16"-20 UNF to EN 61518		2
- Mounting thread M10 to DIN 19213		3
- Mounting thread M12 to DIN 19213		4
• Male thread M20 x 1.5		5
• Male thread ½-14 NPT		6
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3



Ordering options with the  identifier refer to products from our Quick Ship Program. If you combine only ordering options that are marked with a , these product variants can be produced and delivered within 5 to 15 days in limited quantity.

Contact

If you have questions about delivery time or the Quick Ship program, please contact your Siemens sales representative.

Stock Items

Selection and Ordering data		Article No.	Order code
SIPART PS2 electropneumatic positioner in enclosure made of Makrolon, aluminum and stainless steel		6 DR 5	
Version			
2-wire (4 to 20 mA)			
• Without HART		0	
• With HART, <u>not</u> explosion-protected		1	
2-, 3-, 4-wire (0/4 to 20 mA)			
• With HART, explosion-protected		2	
• Without HART, <u>not</u> explosion-protected		3	
PROFIBUS PA connection		5	
FOUNDATION Fieldbus connection		6	
For actuator			
Single-acting		1	
Double-acting		2	
Enclosure			
Makrolon		0	
Aluminum; only single-acting		1	
Stainless steel (without window)		2	
Explosion protection			
Without			N
In type of protection (ATEX/IECEX/FM/CSA)			E
• intrinsic safety			
With protection type (ATEX/IECEX) ¹⁾			D
• Non-sparking			
• Dust protection via enclosure			

Ordering options with the  identifier refer to stock items. If you combine only ordering options that are marked with a , such a combination can be ordered from stock. If your order quantity is available from stock, your order usually leaves the warehouse within one day.

Appendix

Product documentation

Documentation in shipped products, QR Code, SIOS

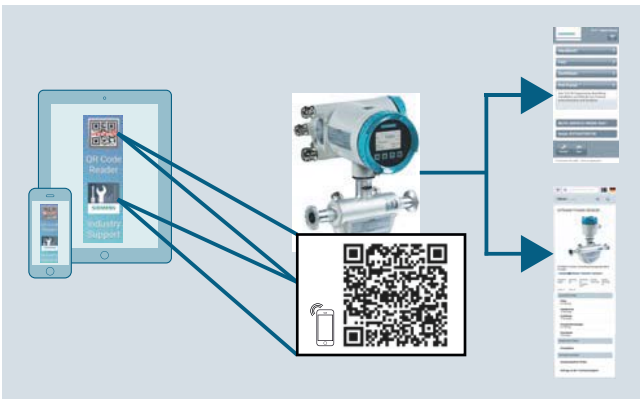
Documentation in shipped products



Siemens products for process instrumentation will be delivered with a multi-language **Safety note** and a **Mini DVD** „**Process Instrumentation and Weighing Systems**“.

On the DVD, customers can find many important operating instructions and certificates of our Siemens portfolio for process instrumentation and weighing systems. As well, product or order-specific print material may be part of the delivery.

QR Code – Easy access to product information

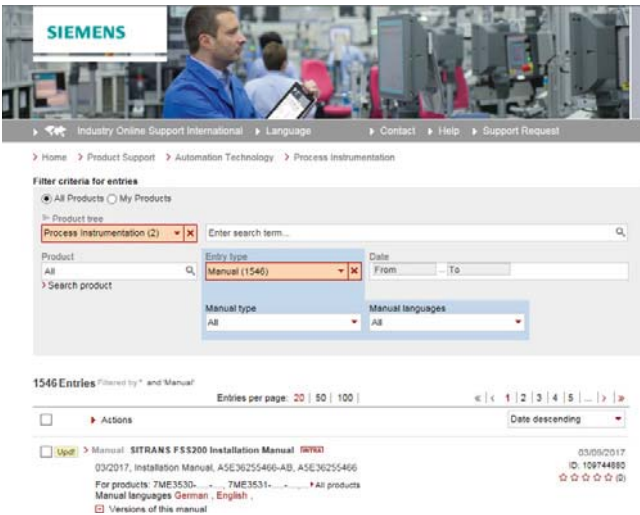


For easy identification, our devices are fitted with a QR code which can be read with the Siemens Industry Support App or any other QR code reader.

This not only enables simple access to article and serial numbers, it also provides you with a direct link to the product documentation, certificates, FAQs and videos.

You can find the Siemens Industry Support App or other QR code reader in your App Store for iOS, Android or Windows mobile.

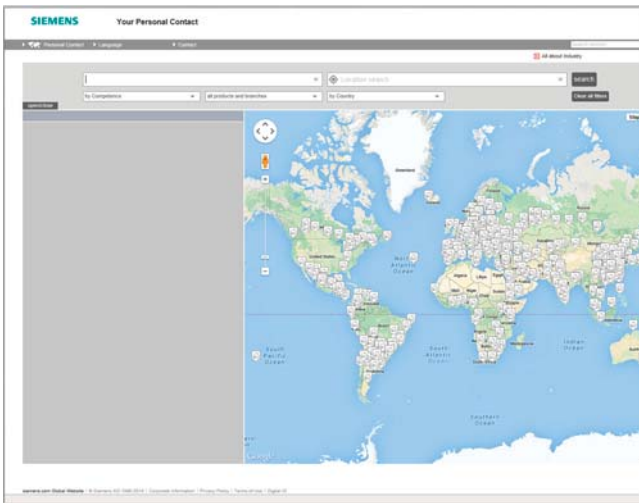
Siemens Industry Online Support Portal (SIOS)



For the complete portfolio, customers can download product documentation for free using the following links to our Siemens Industry Online Support Portal (SIOS):

<http://www.siemens.com/processinstrumentation/documentation>

By entering the product names as **Search term** and selecting the field **Entry type**, you can find all operating instructions, certificates, product software (EDDs, calculation tools), product notes and other useful information.



At Siemens we are resolutely pursuing the same goal: long-term improvement of your competitive ability. We are committed to this goal. Thanks to our commitment, we continue to set new standards in automation and drive technology. In all industries – worldwide.

At your service locally, around the globe for consulting, sales, training, service, support, spare parts ... on the entire Digital Factory and Process Industries and Drives.

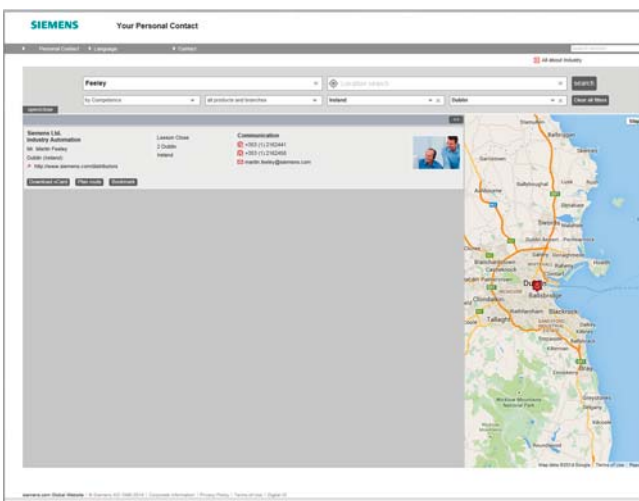
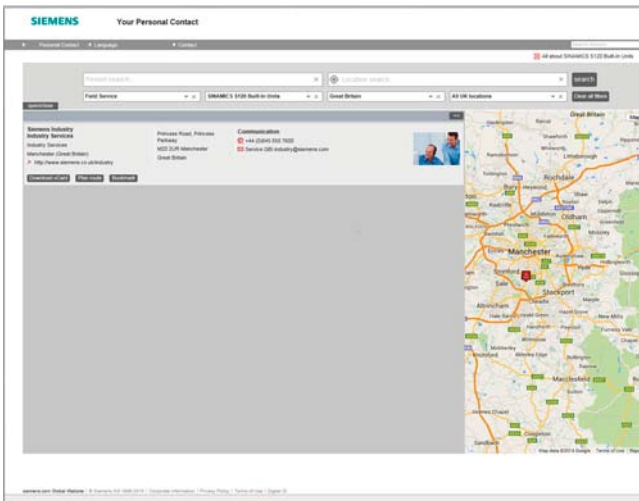
Your personal contact can be found in our Contacts Database at: www.siemens.com/automation-contact

You start by selecting

- the required competence,
- products and branches,
- a country,
- a city

or by a

- location search or
- person search.



Appendix

Partner at Industry

Siemens Partner Program

Overview

Siemens Solution und Approved Partners



Highest competence in automation and drive technology as well as power distribution

Siemens works closely together with selected partner companies around the world in order to ensure that customer requirements for all aspects of automation and drives, as well as power distribution, are fulfilled as best as possible – wherever you are, and whatever the time. It is for this reason that we systematically train and keep our partners well prepared, in addition to certifying them in specific technologies. It is our declared intention and goal to train and prepare our partners to the same standards as our own employees.

This approach is based on contractually agreed quality criteria as well as optimum support for our partners by providing clearly defined processes. This ensures that they possess all the qualities to meet customer requirements optimally. The partner emblem is the guarantee and indicator of proven quality.

Solution Partners and Approved Partners

The Siemens Partner Program distinguishes between Solution Partners and Approved Partners.

At present we are working with more than 1,400 Solution Partners worldwide. They represent countless tailored and future-proof automation and drive solutions in the most diverse industries.

With their extensive technical product knowledge, Siemens Approved Partners offer a combination of goods and services that include specialist technologies, customized modifications and the provision of high-quality system and product packages. They also provide qualified technical support and assistance

Partner Finder



In the Siemens global Solution Partner program, customers are certain to find the optimum partner for their specific requirements - with no great effort. The Partner Finder is basically a comprehensive database that showcases the profiles of all our solution partners.

Easy selection:

Set filters in the search screen form according to the criteria that are relevant to you. You can also directly enter the name of an existing partner.

Skills at a glance:

Gain a quick insight into the specific competencies of any particular partner with the reference reports.

Direct contact option:

Use our electronic query form:

www.siemens.com/partnerfinder

Additional information on the Siemens Solution Partner Program is available online at:

www.siemens.com/partner-program

General

The pressure equipment directive **2014/68/EU** applies to the alignment of the statutory orders of the European member states for pressure equipment. Such equipment in the sense of the directive includes vessels, pipelines and accessories with a maximum permissible pressure of more than **0.5 bar** above atmospheric.

Classification according to hazard potential

The classification of the devices according to the pressure equipment directive takes place according to the hazard potential (medium/pressure/volume/nominal width) in the categories I to IV or article 4 paragraph 3.

The following criteria are decisive for assessing the hazard potential; they are also listed in diagrams 1 to 4 and 6 to 9:

• Fluid group	Group 1 or 2
• Aggregate state	Liquid, gaseous
• Type of pressurized equipment	
- Vessel	Product of pressure and volume (PS * V [barL])
- Pipeline	Nominal diameter, pressure or product of pressure and nominal diameter (PS * DN)

The fired or otherwise heated pressure equipment is listed separately in diagram 5.

Note:

Liquids according to Article 4 are those liquids whose steam pressure is **not** more than **0.5 bar** above standard atmospheric pressure (1013 mbar) at the maximum permissible temperature.

The **maximum permissible temperature** for the used liquids is the maximum process temperature which can occur, as defined by the user. This must be within the limits defined for the equipment.

Classification of the media (liquid/gas) into fluid groups*

"Fluids" are gases, liquids and vapors in pure phase as well as their mixtures; fluids can include a suspension of solid matter; fluids are classified into the following fluid groups according to article 13 of the pressure equipment directive 2014/68/EU.

Paragraph a

Group 1

Group 1 consisting of substances and mixtures, as defined in points 7 and 8 of article 2 of Regulation (EC) No. 1272/2008, that are classified as hazardous in accordance with the following physical or health hazard classes laid down in parts 2 and 3 of annex I to that Regulation:

- i) unstable explosive substances/mixtures or explosive substances/ mixtures of divisions 1.1, 1.2, 1.3, 1.4 and 1.5
- ii) flammable gases, categories 1 and 2
- iii) oxidizing gases, category 1
- iv) liquids, category 1 and 2
- v) flammable liquids, category 3 where the maximum permissible temperature is above the flash point
- vi) flammable solids, category 1 and 2
- vii) self-reactive substances and mixtures, type A to F
- viii) pyrophoric liquids, category 1
- ix) pyrophoric solids, category 1
- x) substances and mixtures which in contact with water emit flammable gases, category 1, 2 and 3

- xi) oxidizing liquids, category 1, 2 and 3
- xii) oxidizing solids, category 1, 2 and 3
- xiii) organic peroxides, types A to F
- xiv) acute oral toxicity, category 1 and 2
- xv) acute dermal toxicity, category 1 and 2
- xvi) acute inhalation toxicity, category 1, 2 and 3
- xvii) specific target organ toxicity - single exposure, category 1

Group 1 comprises also substances and mixtures in pressure equipment with a maximum allowable temperature TS which exceeds the flash point of the fluid.

Paragraph b

Group 2

All fluids that are not included in Group 1.

* from: „DIRECTIVE 2014/68/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment (recast)“

Conformity assessment

Pressure equipment of category I to IV must meet the safety requirements set out in annex II and carry a CE marking.

They must meet a conformity assessment procedure set out in annex III of the Directive.

Pressure equipment to article 4 paragraph 3 shall be designed and manufactured in accordance with the sound engineering practice of a Member State and must not have a CE marking (CE markings from other Directives are not affected).

Siemens has (as long as the device is not subject to article 4 paragraph 3) conducted a conformity assessment for its products, given a CE marking and provided a declaration of conformity.

Monitoring of the design, dimensioning, testing and production takes place according to module H (full quality assurance).

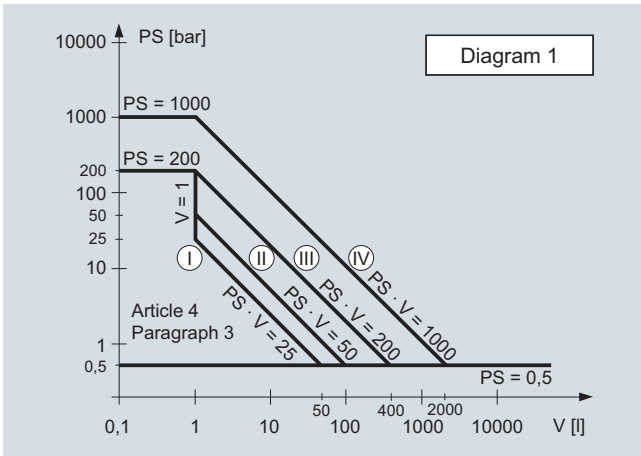
Notes:

- Equipment designed for media with a high danger potential (e.g. gases of fluid group 1) may also be used for media with a lower danger potential (e.g. gases of fluid group 2, or liquids of fluid groups 1 and 2).
- The pressure equipment directive according to Article 1 Paragraph 2 does not apply to equipment such as e.g. mobile offshore plants, ships, aircraft, water supply and waste water networks, nuclear plants, rockets and pipelines outside industrial plants.

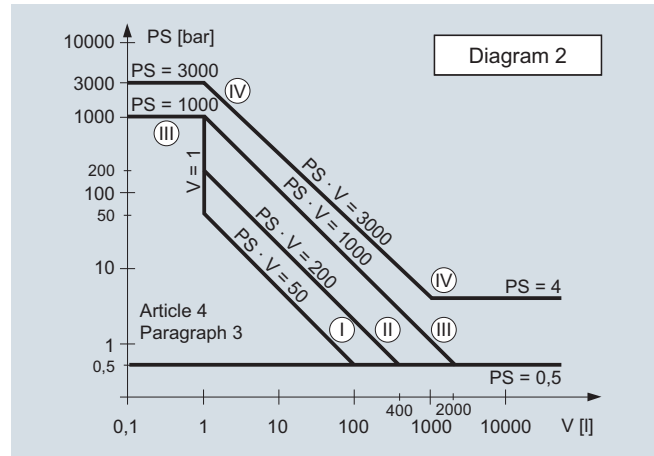
Appendix

Pressure Equipment Directive (2014/68/EU)

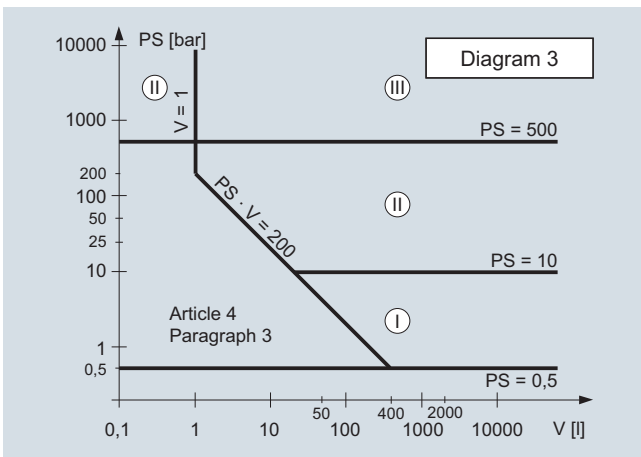
Diagrams



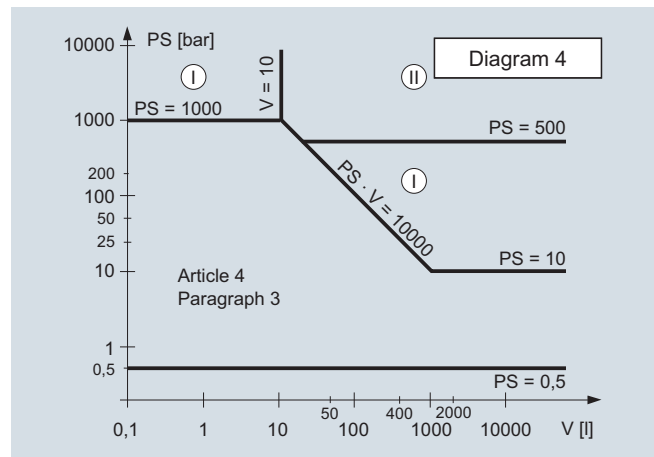
- Gases of fluid group 1
- Vessels in accordance with article 4 paragraph 1 letter a number i first dash
- Exception: unstable gases belonging to Categories I and II must be included in Category III.



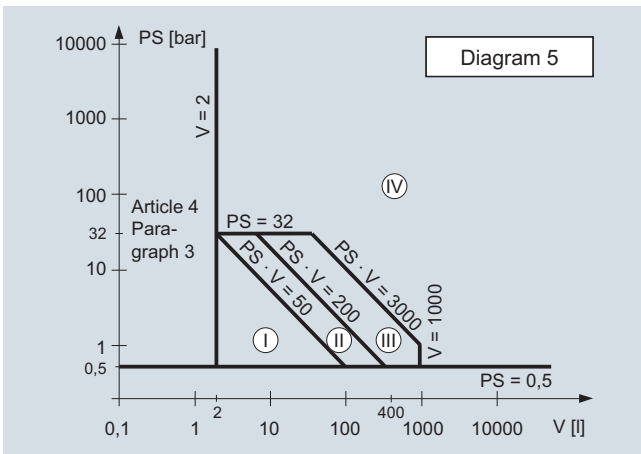
- Gases of fluid group 2
- Vessels in accordance with article 4 paragraph 1 letter a number i second dash
- Exception: fire extinguishers and bottles for breathing apparatus: at least Category III.



- Liquids of fluid group 1
- Vessels in accordance with article 4 paragraph 1 letter a number ii first dash



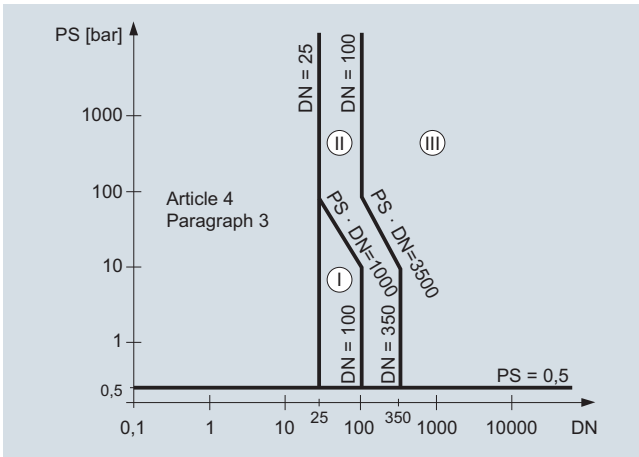
- Liquids of fluid group 2
- Vessels in accordance with article 4 paragraph 1 letter a number ii second dash
- Exception: modules for producing warm water



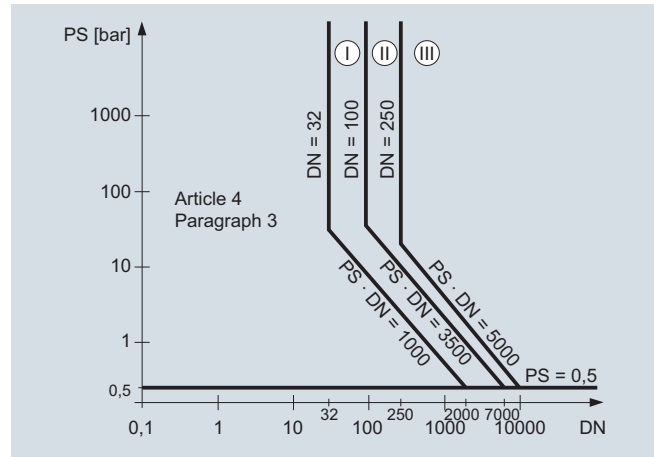
- Fuelled pressure equipment or equipment heated in another manner above 110 °C and liable to overheating.
- Pressure equipment in accordance with article 4 paragraph 1 letter b
- Exception: pressure cooker, test procedure at least according to Category III.

10

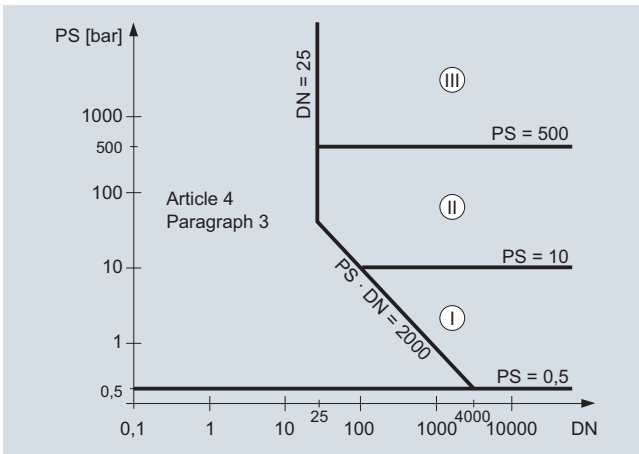
Appendix Pressure Equipment Directive (2014/68/EU)



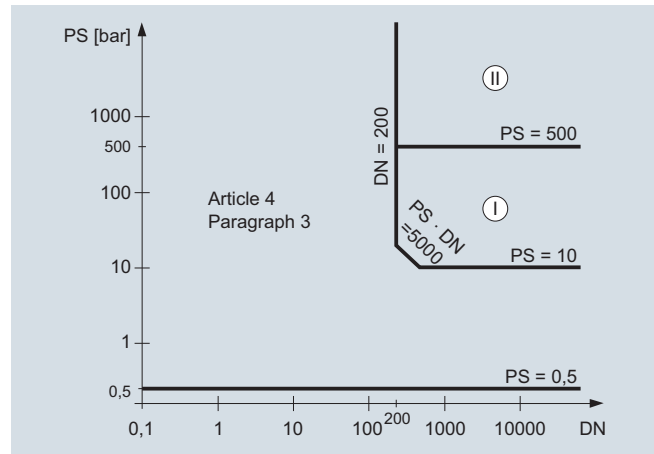
- Gases of fluid group 1
- Piping in accordance with article 4 paragraph 1 letter c number i first dash
- Exception: unstable gases belonging to Categories I and II must be included in Category III.



- Gases of fluid group 2
- Piping in accordance with article 4 paragraph 1 letter c number i second dash
- Exception: liquids at temperatures > 350 °C belonging to Category II must be included in Category III.



- Liquids of fluid group 1
- Piping in accordance with article 4 paragraph 1 letter c number ii first dash



- Liquids of fluid group 2
- Piping in accordance with article 4 paragraph 1 letter c number ii second dash

Appendix

Functional safety

Overview



Functional safety

Functional safety is a strong tradition at Siemens. Werner von Siemens realized as early as 1880 that safety in automated processes is not only a human obligation, it also makes economic sense. In the process industry, hazards for humans, plants and the environment must be minimized without affecting the production process. With Safety Integrated for Process Automation from Siemens, you benefit from a comprehensive product and service offering for safe, fault-tolerant applications.

What is the Safety Integrity Level (SIL)?

The Safety Integrity Level is a term from the field of functional safety. It helps you assess electrical/electronic/programmable electronic systems in terms of the reliability of their safety functions. The goal is to minimize the risk of malfunction of the system and thereby increase the protection of the employed personnel, the environment and property.

The international standard IEC 61508 describes the type of risk assessment as well as measures for designing appropriate safety functions ranging from sensors, logic processing and extending to actuators. The requirements for the process industry are further specified in IEC 61511-1.

Since the standards IEC 61508 and IEC 61511 for functional safety have been in effect, the demand for process instrumentation equipment conforming to SIL classification has continually increased. For this reason, the product portfolio is constantly expanded to include devices that meet the SIL standard.

You will find the current list of SIL devices from Siemens for process instrumentation available today at:

www.siemens.com/SIL

Additional information

Brochure: "Functional Safety in Process Instrumentation with SIL Rating"

http://w3app.siemens.com/mcms/infocenter/dokumentcenter/sc/pi/InfocenterLanguagePacks/Functional%20safety%20in%20process%20instrumentation%20with%20SIL%20rating/SIL-Broschuere_en.pdf

Website: "Functional Safety"

<http://www.industry.siemens.com/topics/global/en/safety-integrated>

Overview

Software types

Software requiring a license is categorized into types. The following software types have been defined:

- Engineering software
- Runtime software

Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.

Data generated with engineering software and executable programs can be duplicated for your own use or for use by third parties free-of-charge.

Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.

The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.

You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.

Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery can be found in the readme file supplied with the relevant product(s).

License types

Siemens Industry Automation & Drive Technologies offers various types of software license:

- Floating license
- Single license
- Rental license
- Rental floating license
- Trial license
- Demo license
- Demo floating license

Floating license

The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started.

A license is required for each concurrent user.

Single license

Unlike the floating license, a single license permits only one installation of the software per license.

The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per instance, per axis, per channel, etc.

One single license is required for each type of use defined.

Rental license

A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific period of time (the operating hours do not have to be consecutive).

One license is required for each installation of the software.

Rental floating license

The rental floating license corresponds to the rental license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Demo license

The demo license support the "sporadic use" of engineering software in a non-productive context, for example, use for testing and evaluation purposes. It can be transferred to another license. After the installation of the license key, the software can be operated for a specific period of time, whereby usage can be interrupted as often as required.

One license is required per installation of the software.

Demo floating license

The demo floating license corresponds to the demo license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

Certificate of license (CoL)

The CoL is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Downgrading

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

Delivery versions

Software is constantly being updated. The following delivery versions

- PowerPack
- Upgrade

can be used to access updates.

Existing bug fixes are supplied with the ServicePack version.

PowerPack

PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.

A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade

An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.

The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.

A separate upgrade must be purchased for each original license of the software to be upgraded.

Appendix

Software Licenses

Overview

ServicePack

ServicePacks are used to debug existing products. ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key

Siemens Industry Automation & Drive Technologies supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Software Update Service (SUS)

As part of the SUS contract, all software updates for the respective product are made available to you free of charge for a period of one year from the invoice date. The contract will automatically be extended for one year if it is not canceled three months before it expires.

The possession of the current version of the respective software is a basic condition for entering into an SUS contract.

You can download explanations concerning license conditions from www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

Appendix

Conditions of sale and delivery

1. General Provisions

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following Terms and Conditions of Sale and Delivery (hereinafter referred to as "T&C"). Please note that the scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following T&C apply exclusively for orders placed with Siemens Aktiengesellschaft, Germany.

1.1 For customers with a seat or registered office in Germany

For customers with a seat or registered office in Germany, the following applies subordinate to the T&C:

- the "General Terms of Payment"¹⁾ and,
- for software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or Registered Office in Germany"¹⁾ and,
- for other supplies and services, the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"¹⁾.

1.2 For customers with a seat or registered office outside Germany

For customers with a seat or registered office outside Germany, the following applies subordinate to the T&C:

- the "General Terms of Payment"¹⁾ and,
- for software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or Registered Office outside of Germany"¹⁾ and
- for other supplies and/or services, the "General Conditions for Supplies of Siemens Industry for Customers with a Seat or Registered Office outside of Germany"¹⁾.

2. Prices

The prices are in € (Euro) ex point of delivery, exclusive of packaging.

The sales tax (value added tax) is not included in the prices. It shall be charged separately at the respective rate according to the applicable statutory legal regulations.

Prices are subject to change without prior notice. We will charge the prices valid at the time of delivery.

To compensate for variations in the price of raw materials (e.g. silver, copper, aluminum, lead, gold, dysprosium and neodym), surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. A surcharge for the respective raw material is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded.

The metal factor of a product indicates the basic official price (for those raw materials concerned) as of which the surcharges on the price of the product are applied, and with what method of calculation.

An exact explanation of the metal factor can be downloaded at: www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

To calculate the surcharge (except in the cases of dysprosium and neodym), the official price from the day prior to that on which the order was received or the release order was effected is used.

To calculate the surcharge applicable to dysprosium and neodym ("rare earths"), the corresponding three-month basic average price in the quarter prior to that in which the order was received or the release order was effected is used with a one-month buffer (details on the calculation can be found in the explanation of the metal factor).

3. Additional Terms and Conditions

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches apply only to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the individual pages of this catalog - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

4. Export regulations

We shall not be obligated to fulfill any agreement if such fulfillment is prevented by any impediments arising out of national or international foreign trade or customs requirements or any embargoes and/or other sanctions.

Export of goods listed in this catalog may be subject to licensing requirements. We will indicate in the delivery details whether licenses are required under German, European and US export lists. Goods labeled with "AL" not equal to "N" are subject to European or German export authorization when being exported out of the EU. Goods labeled with "ECCN" not equal to "N" are subject to US re-export authorization.

The export indications can be viewed in advance in the description of the respective goods on the Industry Mall, our online catalog system. Only the export labels "AL" and "ECCN" indicated on order confirmations, delivery notes and invoices are authoritative.

Even without a label, or with label "AL:N" or "ECCN:N", authorization may be required i .a. due to the final disposition and intended use of goods.

If you transfer goods (hardware and/or software and/or technology as well as corresponding documentation, regardless of the mode of provision) delivered by us or works and services (including all kinds of technical support) performed by us to a third party worldwide, you must comply with all applicable national and international (re-)export control regulations.

If required for the purpose of conducting export control checks, you (upon request by us) shall promptly provide us with all information pertaining to the particular end customer, final disposition and intended use of goods delivered by us respectively works and services provided by us, as well as to any export control restrictions existing in this relation.

The products listed in this catalog may be subject to European/German and/or US export regulations. Any export requiring approval is therefore subject to authorization by the relevant authorities.

Errors excepted and subject to change without prior notice.

1) The text of the Terms and Conditions of Siemens AG can be downloaded at www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

Further information can be obtained from our branch offices listed at www.siemens.com/automation-contact

Interactive Catalog on DVD Products for Automation and Drives	<i>Catalog</i> CA 01	Low-Voltage Power Distribution and Electrical Installation Technology	<i>Catalog</i>
Building Control GAMMA Building Control	ET G1	SETRON · SIVACON · ALPHA Protection, Switching, Measuring and Monitoring Devices, Switchboards and Distribution Systems	LV 10
Drive Systems SINAMICS G130 Drive Converter Chassis Units	D 11	Standards-Compliant Components for Photovoltaic Plants	LV 11
SINAMICS G150 Drive Converter Cabinet Units		Electrical Components for the Railway Industry	LV 12
SINAMICS GM150, SINAMICS SM150 Medium-Voltage Converters	D 12	TÜV-certified Power Monitoring System	LV 14
SINAMICS PERFECT HARMONY GH180 Medium-Voltage Air-Cooled Drives (Germany Edition)	D 15.1	Components for Industrial Control Panels according to UL Standards	LV 16
SINAMICS G180 Converters – Compact Units, Cabinet Systems, Cabinet Units Air-Cooled and Liquid-Cooled	D 18.1	3WT Air Circuit Breakers up to 4000 A	LV 35
SINAMICS S120 Chassis Format Units and Cabinet Modules	D 21.3	3VT Molded Case Circuit Breakers up to 1600 A	LV 36
SINAMICS S150 Converter Cabinet Units		<i>Digital: SIVACON System Cubicles, System Lighting and System Air-Conditioning</i>	LV 50
SINAMICS S120 and SIMOTICS	D 21.4	<i>Digital: ALPHA Distribution Systems</i>	LV 51
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LOHER VARIO High Voltage Motors Flameproof, Type Series 1PS4, 1PS5, 1MV4 and 1MV5 Frame Size 355 to 1000, Power Range 80 to 7100 kW	D 83.2	Motion Control SINUMERIK 840 Equipment for Machine Tools	NC 62
Three-Phase Induction Motors	D 84.1	SINUMERIK 808 Equipment for Machine Tools	NC 81.1
SIMOTICS HV, SIMOTICS TN		SINUMERIK 828 Equipment for Machine Tools	NC 82
High Voltage Three-phase Induction Motors	D 84.9	SIMOTION Equipment for Production Machines	PM 21
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Three-Phase Induction Motors SIMOTICS HV, Series H-compact	D 86.1	Power Supply SITOP Power supply	KT 10.1
Synchronous Motors with Permanent-Magnet Technology, HT-direct	D 86.2	Safety Integrated Safety Technology for Factory Automation	SI 10
DC Motors	DA 12	SIMATIC HMI / PC-based Automation Human Machine Interface Systems/ PC-based Automation	ST 80/ ST PC
SIMOREG DC MASTER 6RA70 Digital Chassis Converters	DA 21.1	SIMATIC Ident Industrial Identification Systems	ID 10
SIMOREG K 6RA22 Analog Chassis Converters	DA 21.2	SIMATIC Industrial Automation Systems Products for Totally Integrated Automation	ST 70
<i>Digital: SIMOREG DC MASTER 6RM70 Digital Converter Cabinet Units</i>	DA 22	SIMATIC PCS 7 Process Control System System components	ST PCS 7
SIMOVERT PM Modular Converter Systems	DA 45	SIMATIC PCS 7 Process Control System Technology components	ST PCS 7 T
SIEMOSYN Motors	DA 48	Add-ons for the SIMATIC PCS 7 Process Control System	ST PCS 7 AO
MICROMASTER 420/430/440 Inverters	DA 51.2	SIMATIC NET Industrial Communication	IK PI
MICROMASTER 411/COMBIMASTER 411	DA 51.3	SIRIUS Industrial Controls SIRIUS Industrial Controls	IC 10
<u>Low-Voltage Three-Phase-Motors</u> SIMOTOCS S-1FG1 Servo geared motors	D 41	<i>Digital: These catalogs are only available as a PDF.</i>	
SIMOTICS Low-Voltage Motors	D 81.1	Information and Download Center Digital versions of the catalogs are available on the Internet at: www.siemens.com/industry/infocenter There you'll find additional catalogs in other languages. Please note the section "Downloading catalogs" on page "Online services" in the appendix of this catalog.	
SIMOTICS FD Low-Voltage Motors	D 81.8		
LOHER Low-Voltage Motors	D 83.1		
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Get more information

All the latest information on field instruments for process automation can be found on the internet at www.siemens.com/processinstrumentation

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Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit <http://www.siemens.com/industrialsecurity>.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under <http://www.siemens.com/industrialsecurity>.