



Case study 4. Energy Saving Turbo Blower

Compare energy savings

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Turbo Blower cost comparison resulting from the application (compared to Roots blower)						
Contents	Roots Blower 		Turbo Blower 		Results	
Specification	For use	Aeration	For use	Quantity[per unit] Air Aeration	Energy saving ratio 27% (±5%)	
	Quantity[per unit]	1	flow[m^3/min]	1		
	Air flow[m^3/min]	46.26	Dis'Pressure[mmAq] Shaft	46.26		
	Dis'Pressure[mmAq]	4'000	Power[HP]	4'000		
	Shaft Power[HP]	79	Power Consumption [kW]	51		
	Power Consumption [kW]	55.9	Total Amount (per unit)	41.0		
Cost (Initial investment)	Total	฿350'000	Total power consumption[kW]	฿872'000	Compressor + motor + control panel + soundproof equipment	
	Amount (per unit)	฿350'000	Year Power Ratio	฿872'000		
Power Ratio (years)	Total power consumption[kW]	55.9		41.0	Savings Cost (years) ฿521'384 (24 hours operation / day)	
	Year Power Ratio	฿1'958'959		฿1'437'574		
Year power cost = Total power consumption*4฿/kw/h*24*365						
Maintenance costs (years)	Total Cost	฿50'000	Total Cost	฿17'280	Savings Cost (years) ฿32'720	
	Maintenance information	V Belts / Pulleys		Maintenance information		Suction filter replacement
		Bearing / Oil Seal				
		main shaft sleeve				
		Timing Gear				
O/Haul						
Flow Control	VVVF Control	Add extra cost of the control panel	Built-in Inverter (Integration and Separation)	No additional costs		
Noise Prevention	Extreme noise	Noise prevention equipment of the need to separate	85dB or below	No need for separate equipment		
Total savings Power Ratio + Maintenance (years)						
Initial investment payback period (years)	Additional initial investment (Turbo - Roots) =			฿522'000	฿54'104 Payback Period (years) 0.9	
	Initial investment payback period = Initial investment / year savings					
Remarks	1. Vibration: vibration requires additional equipment to		1. Vibration: 0.1mm/sec or below (based 2.0mm/sec)			
	2. Noise: 90dB or more		2. Noise: 85dB or below			
	3. Additional equipment: vibration, sound equipment		3. No additional equipment required			
	4. Backwash air inlet of the oil concerns		4. NO OIL SYSTEM (Air bearing)			
	5. Unfiltered contaminated air inlet		5. High Efficiency Filters			
	6. High power consumption		6. Energy-saving products (inverters used)			
	7. Requires regular maintenance		7. Maintenance: The Filter replacing			
	8. Power and drive of the external exposur		8. Eco-friendly compact design			