

EDWARDS PUMPS FOR SILICON CRYSTAL GROWING



Edwards has over 90 years of experience in harsh process vacuum applications, including dust and process contaminants handling, with more than 150,000 dry pumps installed worldwide. The latest dry pump from Edwards, the GXS, addresses the challenges and vacuum considerations associated with the creation of crystalline silicon. Delivering ease of use, low noise and incredibly low vibration the pump is designed to work with both the Czochralski (CZ) crystal puller and the Bridgman furnace (directional solidification of silicon), and can accept an argon purge for easy integration into a customer's argon recycling system. Incorporating innovative, patented design features, environmentally conscious customers will find that the low utility consumption and small footprint of the GXS pump makes it an ideal pump for the silicon crystal growing furnace.



INNOVATIVE TECHNOLOGY

Bearing and lubrication

- Oil lubricated gears eliminate grease and the need for periodic maintenance.
- Uses advanced quality bearings and special purpose oil with low vapour pressure for application compatibility and greatly improved life.

Advanced shaft sealing technology

- Non-contacting long-life seals with integral oil blocking labyrinth seal provides for highly effective sealing.
- * Combined with a four litre per minute seal purge the gearbox is protected from contamination and the vacuum space is kept free of oil.

Double ended shaft support

- Non-cantilever design provides secure rotor support for extremely low vibration and superior starting reliability, especially on harsh processes.
- Superior liquid and powder handling. Tests demonstrate a five litre water slug and one kilogram fine powder slug handling capability.

World leading motor and drive technology

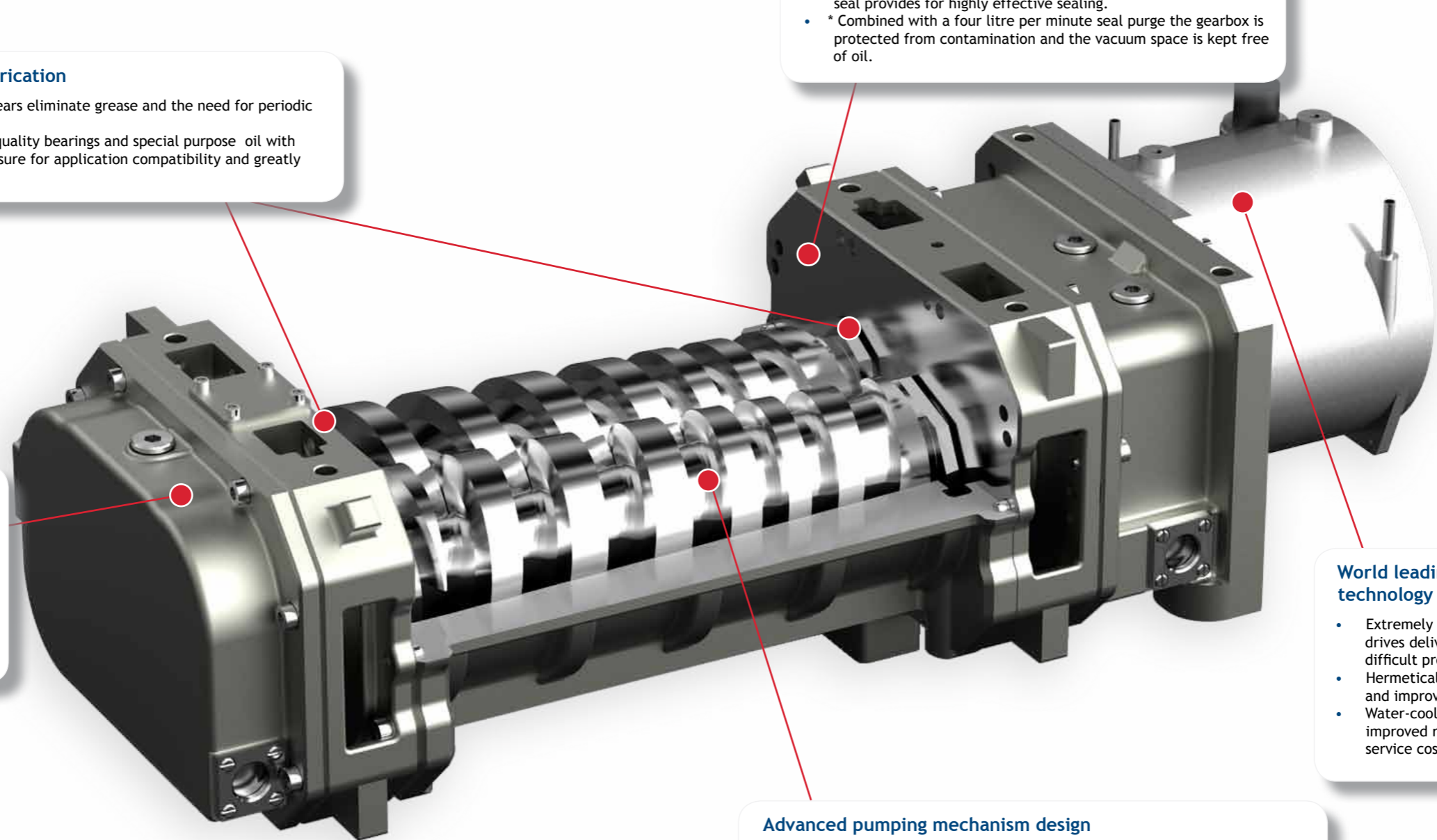
- Extremely high efficiency motors with electronic drives deliver maximum torque performance for difficult processes.
- Hermetically sealed motor eliminates oil leaks and improves pump reliability.
- Water-cooled motors and drives provide for improved reliability and long life to reduce service costs.

Advanced pumping mechanism design

- Enhanced screw-type rotor design results in smooth, gradual compression along the length of the rotor for improved thermal control and optimised pumping at all inlet pressures.
- Integrated heat management and unique rotor and stator design features provide argon gas pumping capability at full concentration.
- Advanced machining techniques and design features eliminate the need for rotor coatings while maintaining superb ultimate vacuum performance.
- Improved manufacturing technology and design contributes to low vibration and extremely quiet running of <64 dB(A) without a silencer.

Built-in control panel

- All pumps are fitted with a built-in control panel for direct local control of the pump.
- Full start / stop control with indication of running mode and state of the pump with a connector for an optional Pump Display Terminal (PDT) for improved diagnostic and configuration capability.



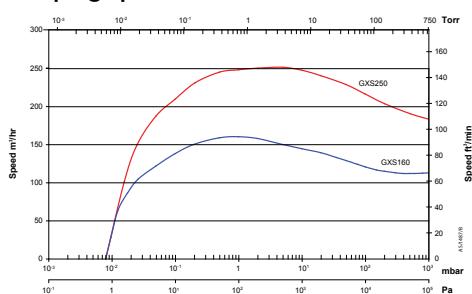
TECHNICAL DATA

		Unit	GXS160	GXS250	GXS160/1750	GXS250/2600
Peak Pumping Speed		m ³ /hr (cfm)	160 (94)	250 (147)	1200 (706)	1925 (1133)
Ultimate Pressure		mbar (Torr)	<1x10 ⁻² (<7.5x10 ⁻³)		<1x10 ⁻³ (<7.5x10 ⁻⁴)	
Full Load Power		kW (hp)	5.8 (7.6)	7.7 (10.3)	6.7 (9)	8.5 (11.4)
Electrical	Supply options		200-230V 3Ø 50/60Hz or 380-460V 3Ø 50/60Hz			
	Connection		Harting Han K 4/4-F			
Vacuum Couplings	Inlet		ISO63		ISO100	ISO160
	Exhaust		NW40			
Cooling Water	Flow	l/min (gal/min)	4 (1)		7 (1.85)	
	Supply pressure (max)	bar (psig)	6.9 (100)			
	DP across pump (min)	bar (psig)	1 (15)			
	Temperature	°C (°F)	5-40 (41-104)			
	Connection		3/8" BSP Female (G 3/8")			
Purge Gas*	Pressure	bar (psig)	3-10 (45-145)			
	Light Duty	sl/min	4			
	Medium Duty	sl/min	10-44			
	Connection		Swagelok® Ø 1/4" tube with olive			
Dimensions	L x W x H	mm (in)	1092x390x568 (43x15.4x22.4)		1092x390x830 (43x15.4x32.7)	
	Footprint	m ² (ft ²)	0.43 (4.63)			
Mass		Kg (lbs)	350 (772)		510 (1124)	550 (1213)
Noise		dB(A)	<64			
Operating Temperature		°C (°F)	5-40 (41-104)			
Exhaust Back Pressure (MAX)		mbar (psia)	1400 (20)			
System IP rating	Standard		31			
Lubrication	Type		PFPE Drynert® 25/6			
	Volume	l (gal)	0.7 (0.2)		1.4 (0.4)	
Monitoring & Control	Standard	Control	Front panel "Dashboard"			
			Serial - RS232			
		Monitoring	Ethernet Webserver			
	Option	Control	Parallel I/O - MicroTim			
		Control/Monitoring	Profibus DP			
		Monitoring	Pump Display Terminal (PDT)			
			FabWorks®			

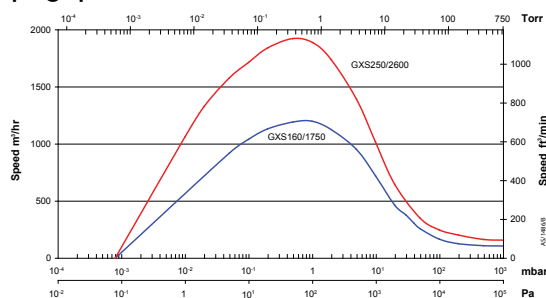
* Purge Gas information
 Light duty - shaft seal purge only
 Medium duty - Shaft seal purge, inlet purge, variable gas ballast & exhaust purge (with exhaust pressure sensor)

Performance curves

Pumping Speed Curves for GXS160 & GXS250



Pumping Speed Curves for GXS160/1750 & GXS250/2600



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