a clear edge

CXS chemical dry vacuum pumps

EDWARDS

Vacuum science... product solution.

a clear edge

however extreme, always reliable

Simple to install and use
Integral controller and safety systems for ‘Plug and Pump’, flexible operation

High reliability
Cutting edge screw technology for corrosion-free operation and robust liquid and solids handling

Low cost of ownership
Best in class installation and running costs with up to 5 years between service

Environmentally friendly
Smooth, quiet running, <64 dB(A), no effluent generation and low utilities consumption

Edwards expertise
Global application engineering and service support

CXS chemical dry vacuum pump

Edwards is synonymous with vacuum. Having over 90 years experience and over 150,000 dry pumps installed worldwide, our high quality products and application know-how are renowned in the world of vacuum technology.

CXS is Edwards most advanced chemical dry pump featuring new tapered-screw technology for exceptional energy efficiency and performance. It offers high reliability and effluent-free pumping even in the most difficult of harsh chemical and pharmaceutical processing applications.

The CXS pumps up to one litre of liquid per minute continuously or up to 25 litre-slugs without stopping, and provides an ultimate vacuum down to 10^{-2} mbar. CXS is available in two sizes, with capacities of 160 m^3h^{-1} and 250 m^3h^{-1}.

Applications

You can be assured Edwards has the application expertise and the CXS pump or integrated system solution to meet your needs.

- Drying
- Degassing
- Deodorisation
- Distillation
- Reactor service
- Solvent recovery
- House or central vacuum
- Evaporation
- Polymerisation
- Ethylene oxide sterilisation
- Hydrogenation
- Corrosive gases
- Flammable gases
- Pervaporation
- Absorption and desorption
- Crystallization
- Filtration
- Oil treatment

The Edwards CXS Chemical Dry Vacuum Pump can successfully handle:

- Acetates
- Adhesives
- Aldehydes
- Alcohols
- Amines
- Aromatics
- Ammonia
- Benzene
- Biofuels
- Bromides
- Chlorides
- Dimethyl Sulphide
- Diols
- Esters
- Ethers
- Ethylene Dichloride
- Ethylene Oxide
- Fatty acids and alcohols
- Glycerides
- Halides (HCl, HBr, HF)
- Hexane
- Hydrocarbons
- Hydrogen
- Isocyanates
- Ketones
- Mineral acids
- MEK (Methyl Ethyl Ketone)
- Nitric Acid
- Organic Acids
- Paraffins
- Pentane
- Phenol
- Phosgene
- Phosphoric Acid
- Polycarbonates
- Polyglycols
- Sulphides
- Sulphuric Acid
- Siloxanes
- Thionyl Chloride
- Toluene
- Triethylamine
- Tetrahydrofuran
- Water
- Xylene

Edwards new chemical dry pump sets the standards

Performance

- Continuous vacuum from atmosphere to 10^{-3} mbar
- Integral temperature control
- Pumps corrosive vapours without deterioration
- Excellent liquid and solids handling
- Deeper vacuum than traditional technologies - not limited by seal fluid or cooling water temperature

Environment

- Cleanest vacuum available - no effluent generated
- Efficient solvent recovery possibly
- Quiet operation: < 64 dB(A) with exhaust silencer

Low maintenance

- Up to 5 years between services
- High reliability and long design life (min 25 years)
- Multiple return to hub or on site service options

Low cost of ownership

- Simple installation requirements
- Low use of power and other utilities
- Green Mode to conserve utilities when not required
- Low maintenance costs

Simple to use

- Integral controller and inverter for 'Plug and Pump' operation
- Balanced rotors supported at both ends
- No compression plate to trap solids
- Pre-engineered modules
- Multiple communications and control options

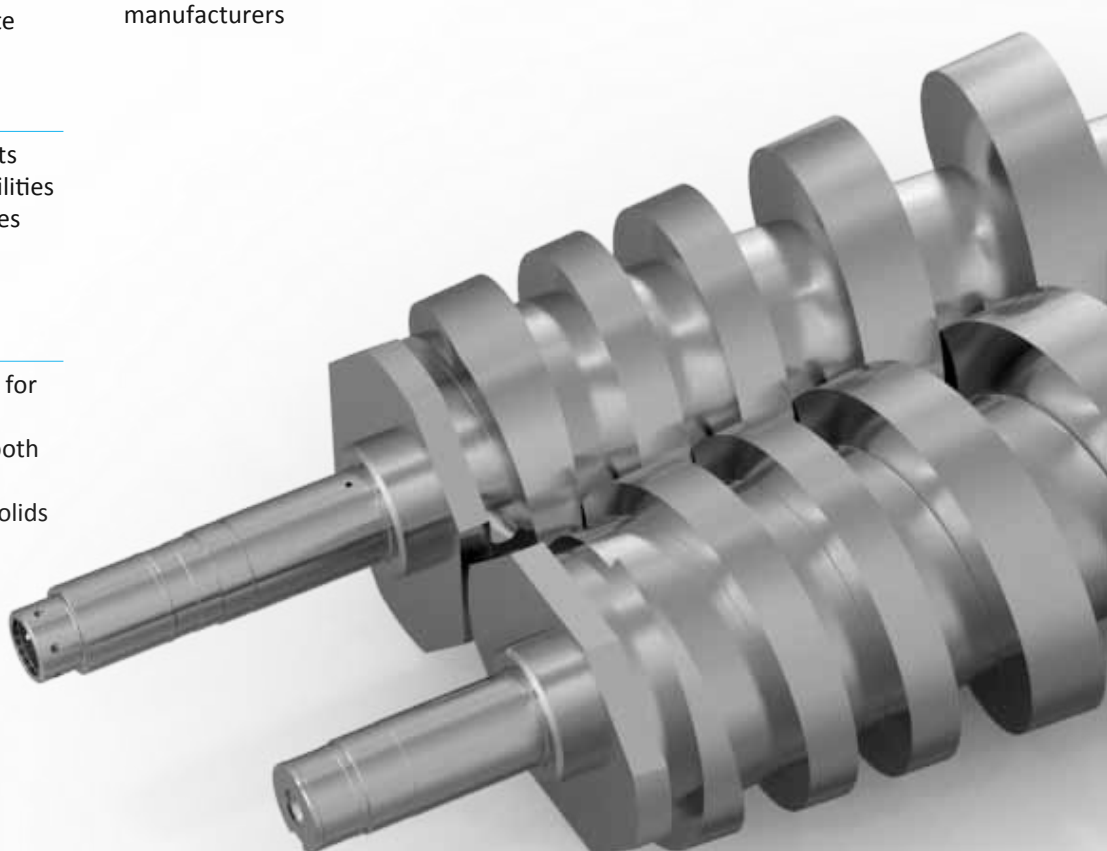
Safety

- Tested and certified by independent authorities
- Pumps explosive mixtures safely
- Fully ATEX compliant for T4 IIB3 gases
- Non-contacting mechanism
- Temperature and pressure protection
- IP65, (dust-tight and water jets) ingress protection

Edwards experience

- Edwards pioneered chemical industrial dry pumping in 1986
- Designed for harsh chemical industry applications
- More than 150,000 dry pumps sold worldwide
- Edwards supplies all 15 of the world's biggest and best known chemical and pharmaceutical manufacturers

up to 5 years between services



Innovative screw technology

Advanced screw technology

- Edwards tapered screw technology results in smooth, gradual compression along the length of the rotor for improved thermal control and optimised pumping at all inlet pressures
- The cooling system and compression technology deliver outstanding performance and active temperature control protects the pump from thermal shocks, condensation and corrosion
- Advanced machining techniques and design features eliminate the need for rotor coatings while maintaining superb ultimate vacuum performance

Reliability

- Repeatable vacuum
- Excellent liquid handling (up to 25 litre slugs)
- Excellent solids handling (up to 1 kg slugs)
- No end-compression plate to trap solids and jam rotors or cause hydraulic locks
- Can flush with solvents, water or steam, online or offline
- Configurable pump parameters for system optimisation
- Special start-up and shutdown modes to free the rotors or avoid cold seizures, if required
- No interstage condensers to create the potential for corrosion

Control

- Integral PID pressure control with in-built inverter
- Flexible communications options
- No complex programming required
- Customisable for enhanced process optimisation
- Data monitoring via onboard communications options
- High torque motor ‘jogging’ to prevent seizure

Efficient motor & inverter drive system

- Compact, high speed, water-cooled encapsulated motor
- 110 Hz operation for smaller footprint and lower noise
- High start torque for maximum restart capability
- Reduced bearings temperatures for longer life
- Matched inverter drive for increased efficiency
- Water-cooled inverter means lower temperature electronics, hence longer life

On-board intelligence features can save up to 10000 Euros or more on external control equipment which may otherwise be needed.

ATEX certification

CAT 1/2 systems

The CXS dry vacuum pump, certified as an ATEX Category 1 machine relying on constructional safety and containment, is safe to pump gases from gas group IIB3.

CAT 2 systems

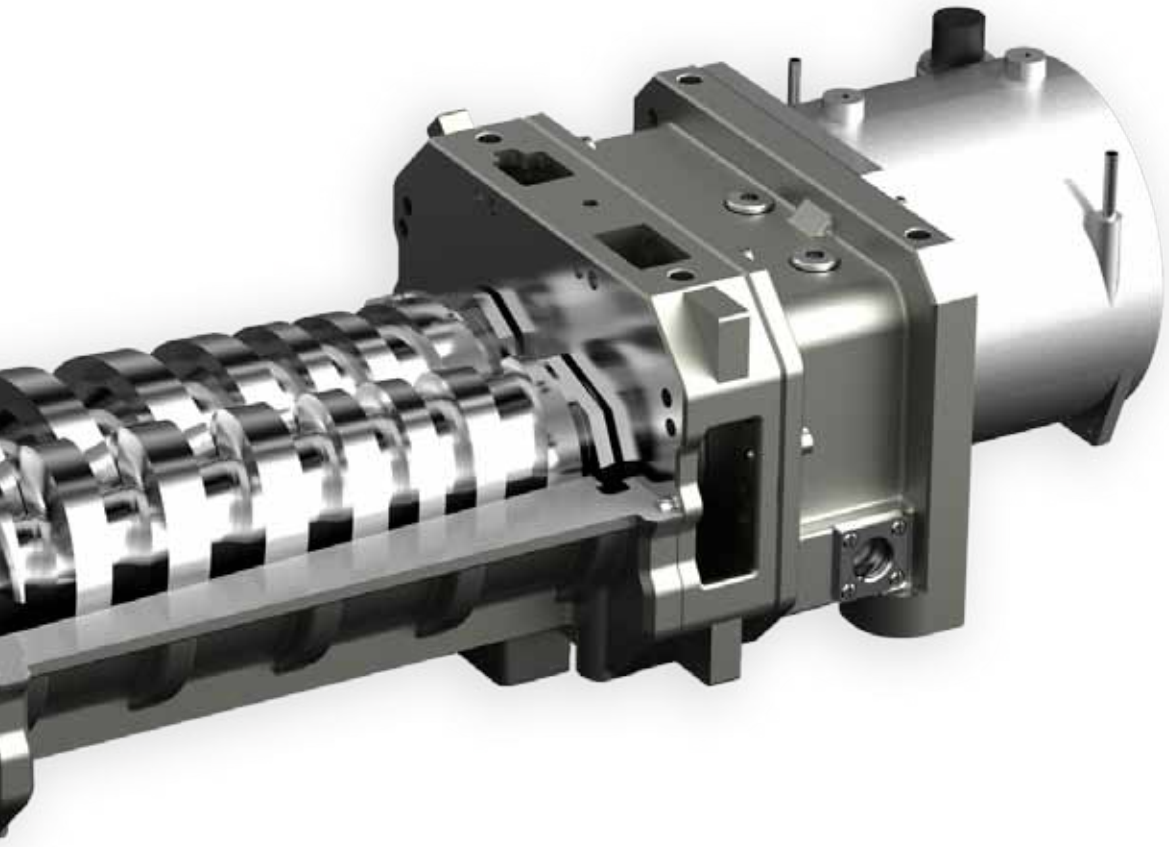
The standard protection concept for CXS ATEX Category 2 pump systems is ‘Constructional Safety’. Solvent flush options if necessary can ensure constructional safety is maintained. CAT 2 containment options are also available.

Our experienced applications team are trained to provide expert advice on choosing the correct pumping system.

Applications knowledge

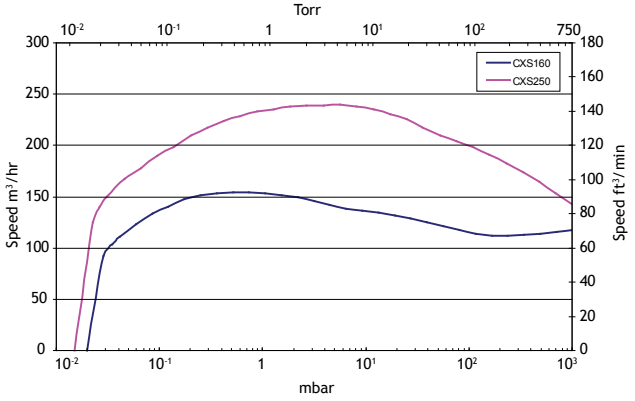
Expert applications engineering is central to Edwards’ success. We always provide solutions to customer problems. This can involve:

- Process design
- Equipment selection
- Integration into the plant control philosophy
- Safety considerations (e.g. HAZOPs)
- Advice at start-up, commissioning and training

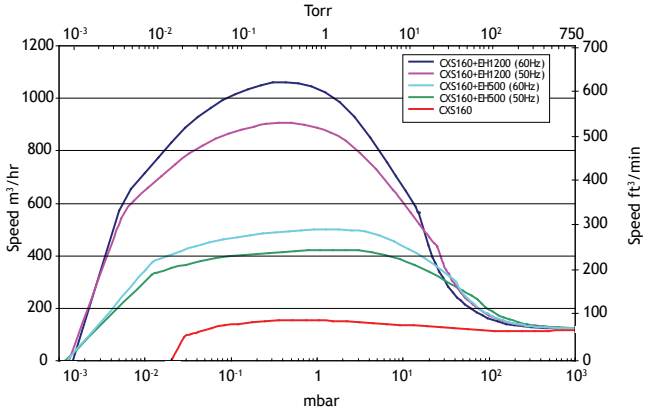


Performance

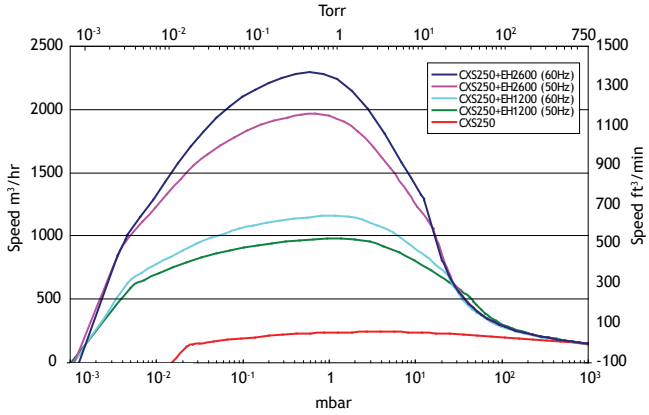
CXS160/250



CXS160 combinations



CXS250 combinations



Technical data

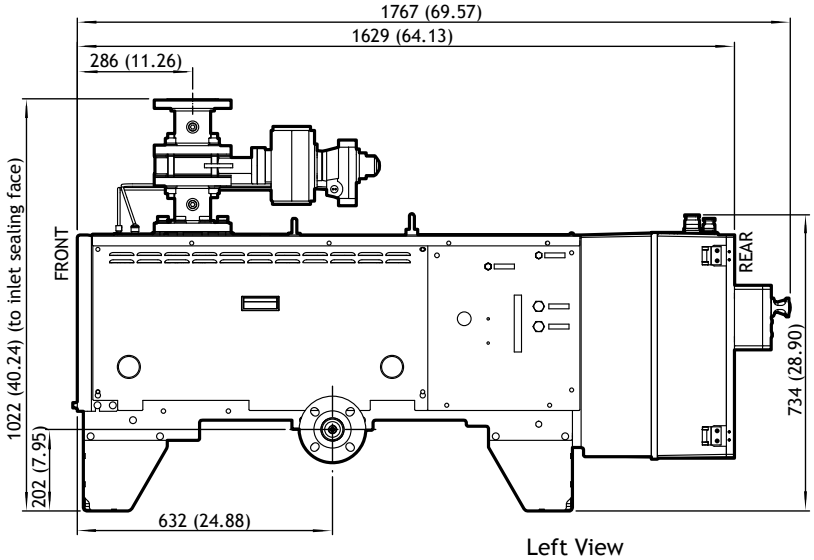
Specification	Units	CXS160	CXS250
Maximum pumping speed	m^3h^{-1}	160	250
	ft^3min^{-1}	95	148
Capacity at 10 mbar (7.5 Torr)	m^3h^{-1}	132	230
	ft^3min^{-1}	78	135
Ultimate vacuum	mbar	<0.02	<0.015
	Torr	<0.015	<0.011
Maximum back pressure - standard	mbar	1,200	1,200
	psig	2.7	2.7
Power consumption at 10 mbar (7.5 Torr)	kW	3.6	3.8
	hp	4.8	5.1
Standard motor (200 - 230V ±10%, 3 ph, 50/60 Hz)	kW	7.5	7.5
Standard motor (380 - 460V ±10%, 3 ph, 50/60 Hz)	hp	10	10
Cooling water flow rate, (adjustable)	l min^{-1}	4 - 10	4 - 10
	gal min^{-1}	1.1 - 2.6	1.1 - 2.6
Cooling water temperature * 5 - 25 °C (41 - 77 °F) for T160 set-ups	°C	5 - 35*	5 - 35*
	°F	41 - 95*	41 - 95*
Maximum cooling water supply pressure	barg	6.9	6.9
	psig	100	100
Cooling water supply differential pressure	bar	1.6 - 5.5	1.6 - 5.5
	psi	23 - 80	23 - 80
Seal purge flow (maximum)	std l min^{-1}	12	12
	std ft^3 min^{-1}	0.424	0.424
Seal purge supply pressure, (minimum - maximum)	barg	2.5 -6.9	2.5 -6.9
	psig	36 - 100	36 - 100
Noise (maximum) with silencer	dB(A)	64	64
Weight (with frame and standard motor)	kg	470	470
	lbs	1,034	1,034
Process connection, inlet	ANSI/DIN	3"/DN80	3"/DN80
Process connection, outlet	ANSI/DIN	2"/DN50	2"/DN50

** consult Edwards*

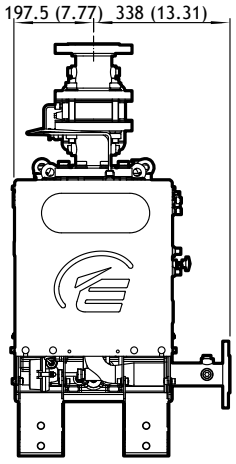
Pump dimensions - CXS160/250

Standard CXS pump

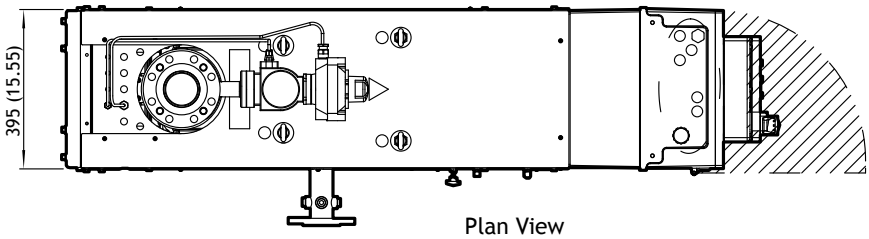
Dimensions in mm (inch)



Left View

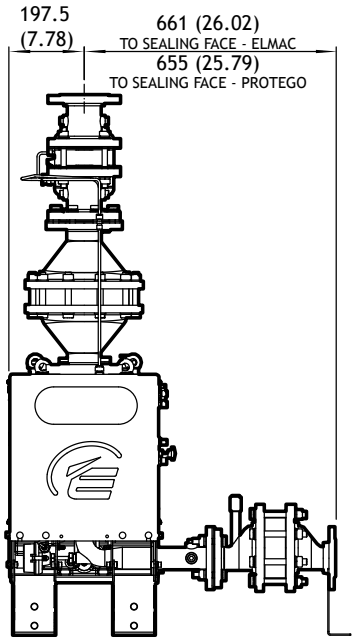


Front View

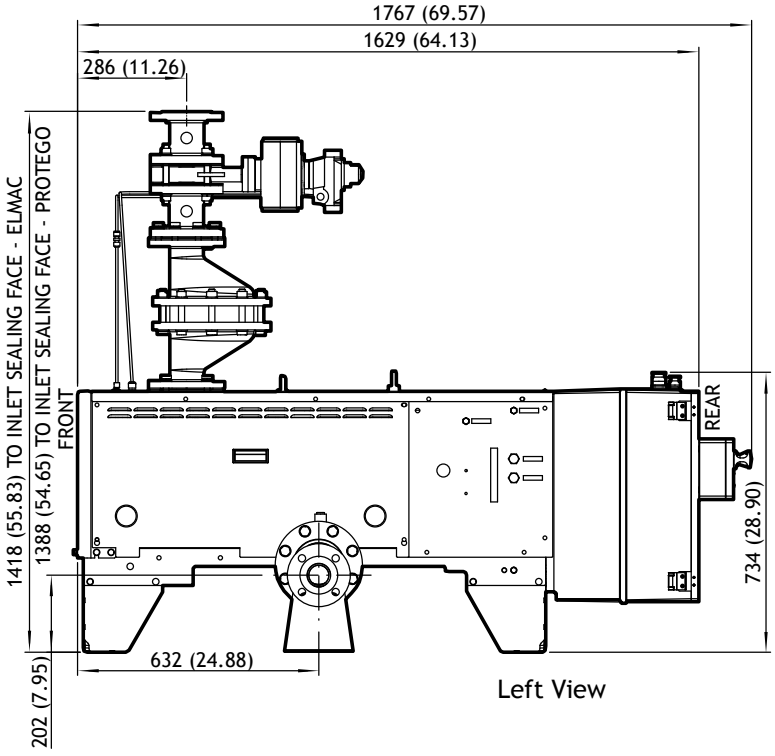


Plan View

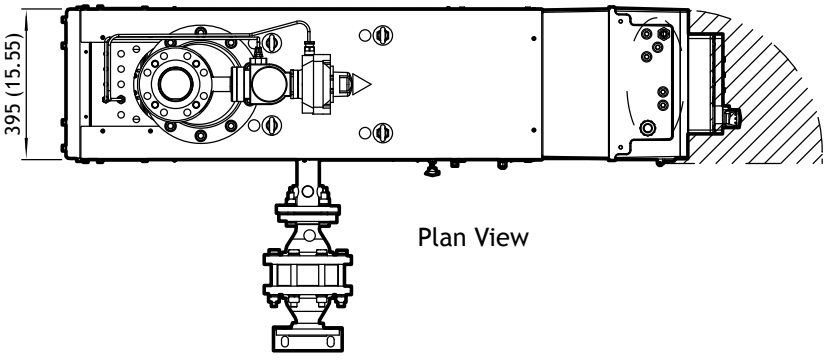
CXS pump with flame arrestor



Front View



Left View



Plan View

CXS systemisation

Using an extensive range of pre-engineered modules Edwards CXS offers the capability to match most customer application needs.

Systemisation is made easy with CXS pumps. The following items are available as factory fitted standard matrix options or simple 'Bolt On' accessories:

- EH mechanical boosters*
- Condensers
- Receivers
- Knockout pots
- Dust filters
- Solvent flush kits
- Flame arrestors
- Isolation and control valves
- Exhaust silencer
- Instruments
- Inlet by-pass line for finer pressure control
- PC interfaces for control and data monitoring
- Ethernet, MCMµTim and Profibus interfaces
- Valves
- Base skids
- Documentation packages

The requirement for these or other accessories is determined through expert applications engineering.

Standard CXS pumps and EH mechanical booster combinations

	EH500	EH1200	EH2600
CXS 160	•	•	
CXS 250		•	•

** Edwards EH series boosters feature our unique hydrokinetic drive which can have significant cost and performance advantages over direct drive machines. The hydrokinetic drive removes any need for pressure sensors or by-pass lines or inverters, and allows the booster to run from atmospheric pressure to ultimate vacuum, giving faster pumpdown and more flexible operation with less maintenance.*

Service and support

Our expertise, your advantage

Our expertise is in vacuum technology, we have been in the business since 1919 and our knowledge runs deep. We design, develop and manufacture vacuum equipment to the very highest standards.

But it's not just the technology. With a global installed base of 750,000 pumps, we understand how vacuum pumps and systems perform in real life. We know how to get the best from our products, whatever the application. We know how to look after them. That's why a large section of our expert workforce is dedicated to service and support.

Our service solutions come under three main headlines; on-site service, repairs and exchange, and quality spares. All built on our world-class technical know-how and backed by our sophisticated logistics and supply chain infrastructure.

CXS ordering information

C	S		5				0		0	0	0

Application

C Chemical

Pump Mechanism

S Screw

Pumps/Boosters

2 160 (7.5 kW 50/60 Hz)
6 160 (7.5 kW) / EH1200 (50 Hz)
9 250 (7.5 kW 50/60 Hz)
B 250 (7.5 kW) / EH1200 (50 Hz)
D 250 (7.5 kW) / EH2600 (50 Hz)

Electrical

5 High volt 380-460 V 3Ø 50/60 Hz

Temp classification

6 ATEX Temp class T3
7 ATEX Temp class T160
8 ATEX Temp class T4

Process Control Options

0 PID Pressure Control

Isolation

0 Configured for Inlet Isolation Valve + Valve fitted

Communications & Control

0 MCM uTIM

Pump Purges

0 Light Duty (SSP)
5 Medium Duty + (SSP+Inlet+GB + Solvent Flush)

Cooling

0 TMS Standard

Flame Arrestor type*

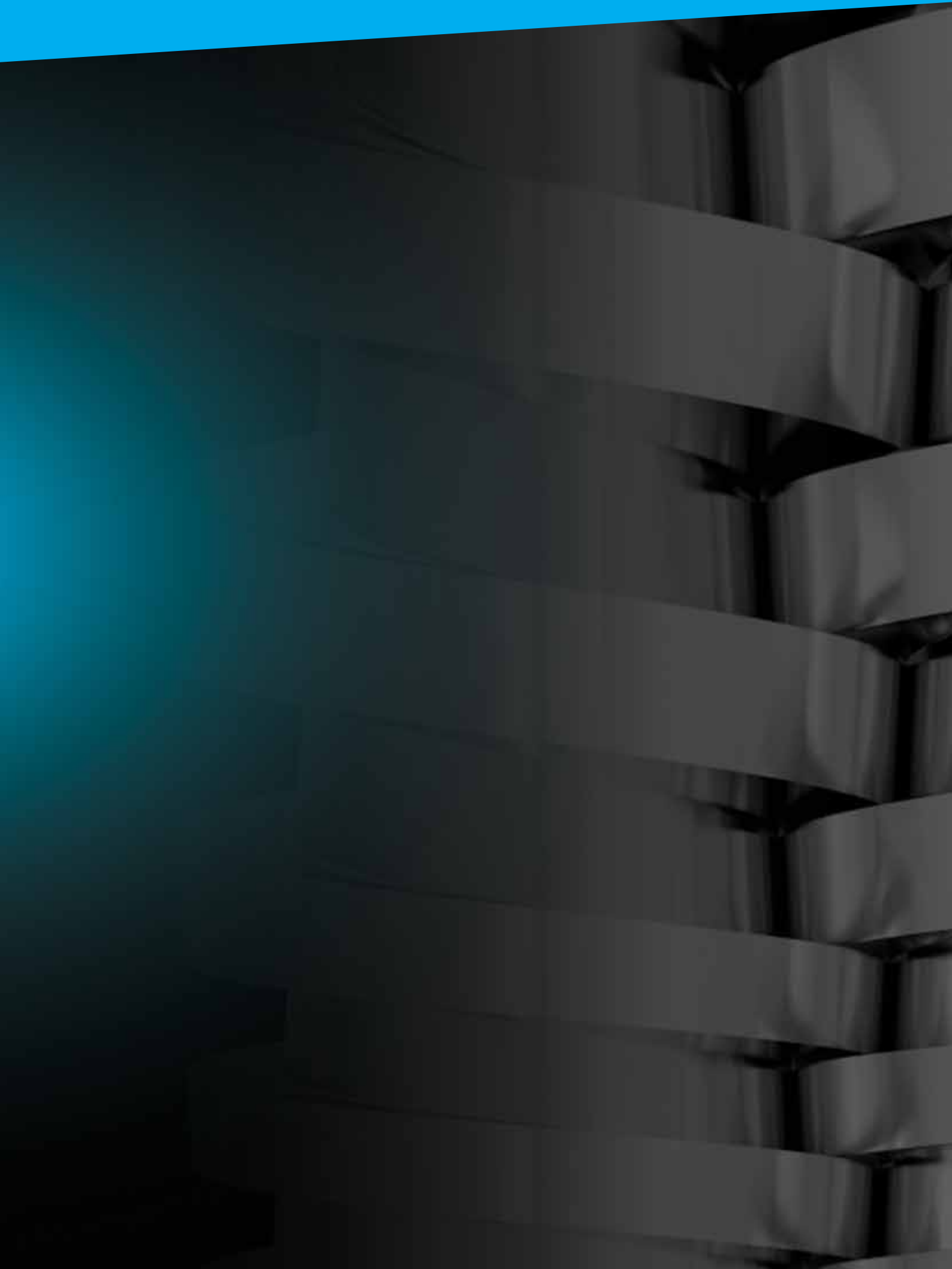
0 No flame arrestor fitted
2 Knitmesh (St St Inlet & Exh)
7 Protego (St St Inlet & Exh)

Safety Classification*

0 Cat 2&3
1 Cat 2&3 with exhaust pressure transmitter
6 Cat 1/2
7 Cat 1/2 with additional exhaust pressure transmitter

SSP - Shaft Seal Purge
Inlet - Inlet Purge
GB - Gas Ballast

* Please contact your local Edwards Applications Specialist for advice on safety classifications.



Global contacts

Belgium

Brussels +32 2 300 0730

Brazil

Sao Paulo +55 11 3952 5000

China

Shanghai (toll free) 400 111 9618

France

Paris +33 1 4121 1256

Germany

Munich 0800 000 1456

India

Pune +91 20 4075 2222

Israel

Qiryat Gat +972 8 681 0633

Italy

Milan +39 02 48 4471

Japan

Yachiyo +81 47 458 8831

Korea

Bundang +82 31 716 7070

Singapore

Singapore +65 6546 8408

Taiwan R.O.C.

Jhunan Town +886 3758 1000

United Kingdom

Crawley +44 1293 528844

UK (local rate) 08459 212223

United States

Niagara (toll free) 1 800 848 9800

www.edwardsvacuum.com/cxs

info@edwardsvacuum.com

Publication Number: M52800895, Issue D.