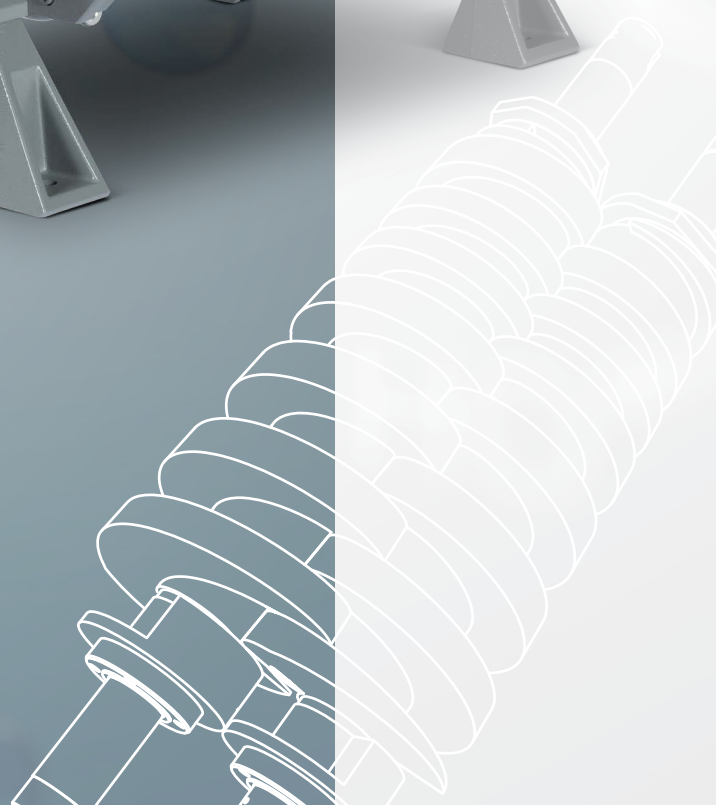
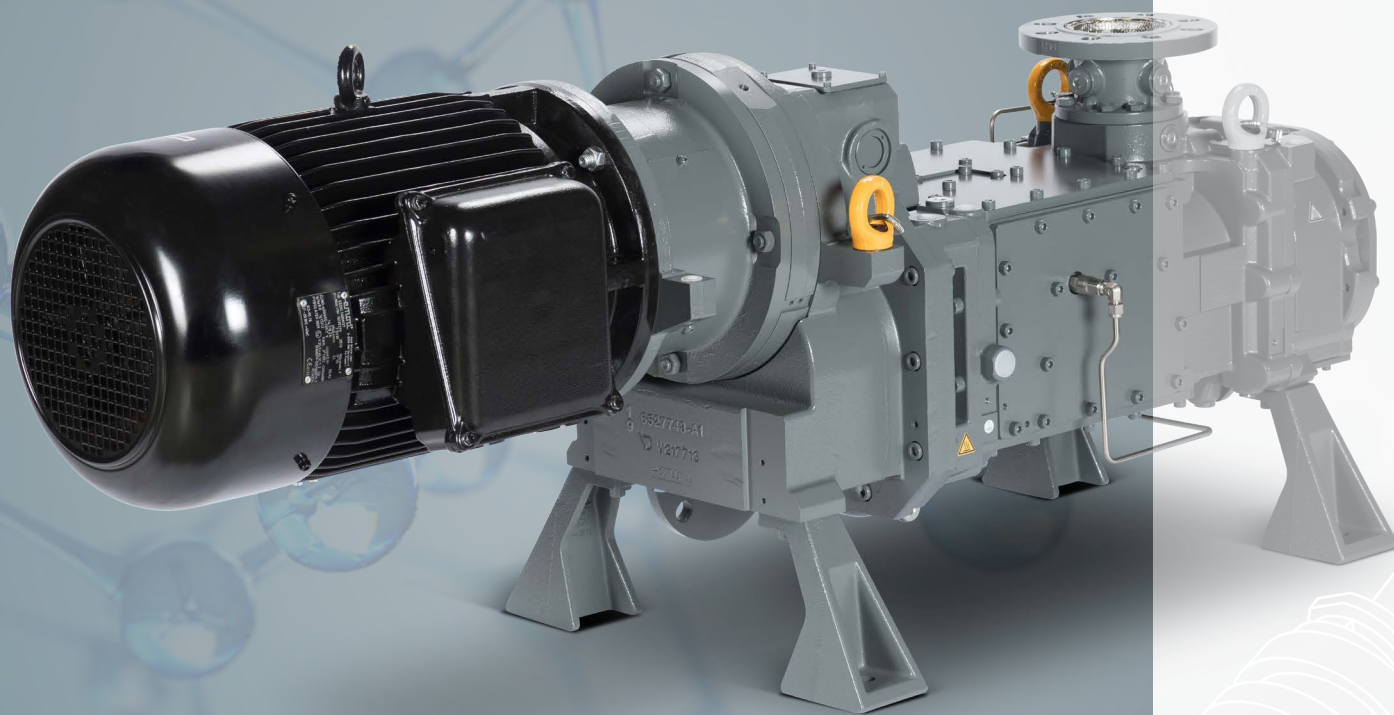


EDS CHEMICAL DRY SCREW VACUUM PUMPS





EDWARDS THE PARTNER OF CHOICE

Edwards is a world leader in the design, technology and manufacture of vacuum pumps for industrial applications with over 100 years' history.

We believe in delivering results that bring value to our customers by using our breadth of industry experience to identify and apply solutions. Using the most innovative and up-to-date modelling techniques, we can optimise the pumping configuration for customers to provide a system design giving the maximum performance in the most reliable and cost-effective way.

CLEAN, ENERGY-EFFICIENT VACUUM SOLUTIONS FOR CHEMICAL PROCESS INDUSTRIES

Edwards installed its first dry pump for a pharmaceutical application in 1988. It is yet to be replaced. This is testament to the highest quality, safety and service standards. Our combination of applications expertise, diverse product portfolio, engineering strength and global presence puts us in a unique position to be able to design and maintain the best solution for Chemical Process Industries. Our latest offering, the EDS Dry Screw chemical vacuum pump offers the latest screw technology to provide a clean, effluent-free vacuum specifically for the chemical, pharmaceutical and petrochemical industries.

With rapid advances in technology, chemical processing industries place increasingly challenging demands on vacuum systems. Vacuum pumps need to handle increasingly complex chemicals, solvents and compounds in a reliable and safe, way while ensuring control and reduction of environmental pollution at a low cost of ownership.

It is crucial for systems to be “plug and play” with minimum setup or have configurable options available when required to suit specific chemical processes. The EDS Dry Screw chemical vacuum pump with its strong focus on the fine chemical and pharmaceutical markets serves a wide range of chemical applications.

PUMP TECHNOLOGY



SIMPLE

Industry leading state-of-the-art screw vacuum technology simply packaged

- **Trouble-free peace of mind:** Ease of installation, systemisation, support and service
- **Pumping:** Designed to be reliable



PROCESS CAPABLE

Mechanism proven in the most demanding applications

- **Extended MTBS:** Purge protection options to prolong life on harsh processes
- **Increased Process Uptime:** Survives process mishaps and contaminant ingestion



FASTER

Extra performance to meet modern day technologies

- **Quick pump down times:** Higher roughing speeds get the job done quicker
- **High pumping speeds:** Gives more throughput where it matters



ROBUST

Built for challenging chemical installations

- **Installation options:** Highly tolerant water-cooled standard products
- **Protection:** High IP ratings



FLEXIBLE

Designed for a changing global market

- **Safe and compliant:** Easily configured for hazardous area installations
- **Engineer To Order:** Basic modular building blocks for special pumping systems



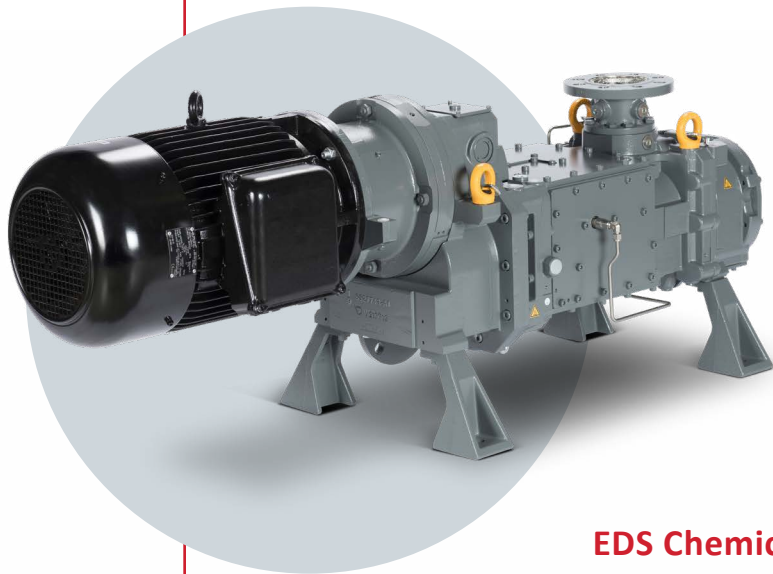
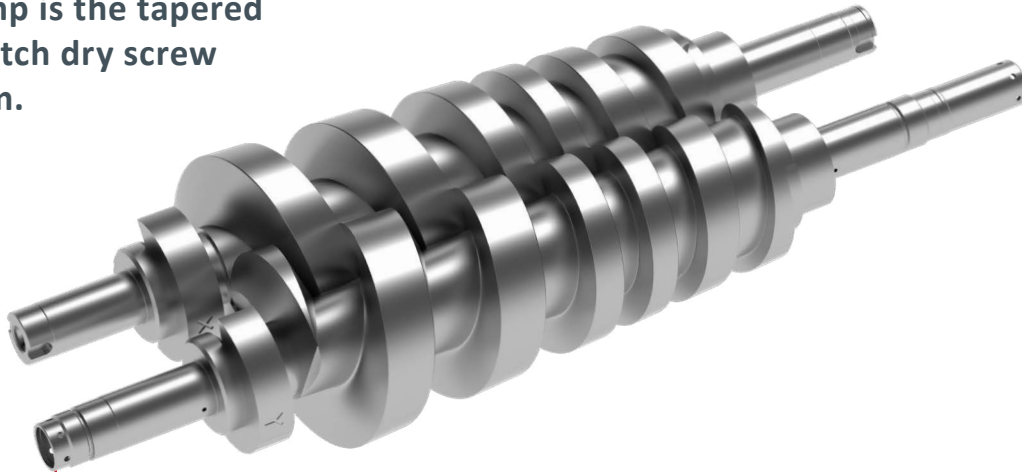
ATEX COMPLIANT

Safe for hazardous area installations

- **Designed to be capable of handling gases:** From a potentially explosive atmosphere
- **Certified:** Under the ATEX directive 2014/34/EU
- **Global compliance:** Flexible to adapt to all global explosion proof standards

EDS CHEMICAL SYSTEM AT A GLANCE

At the heart of the EDS Dry Screw pump is the tapered variable pitch dry screw mechanism.



Direct and Indirect shell and tube heat exchanger cooling options

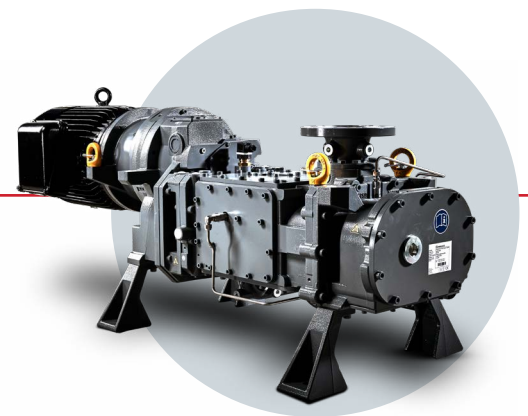


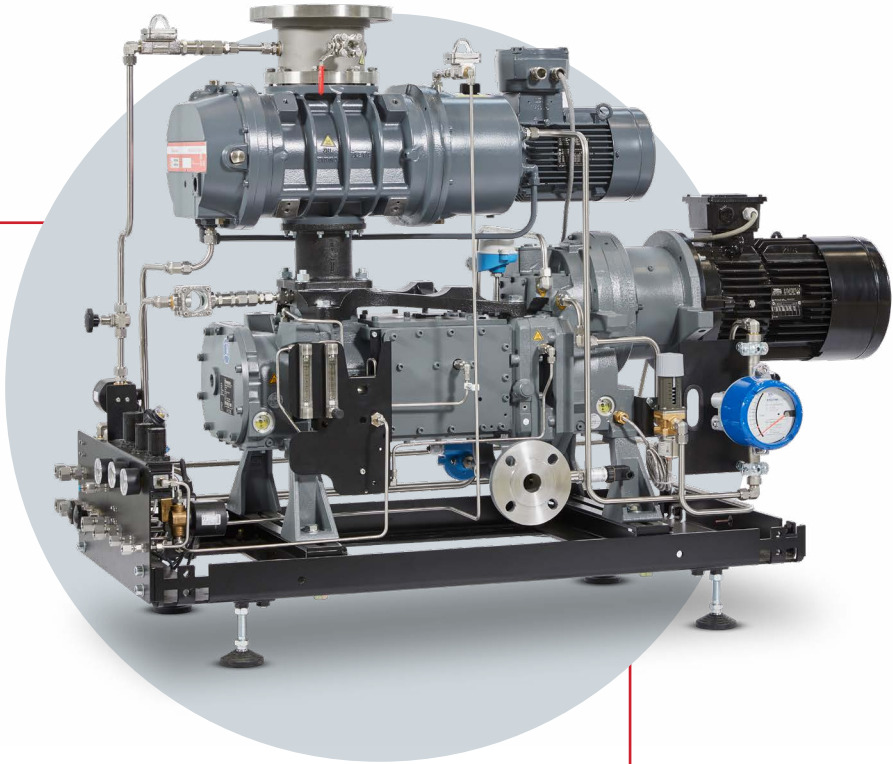
ATEX Cat 1 and Cat 2 standard variants to meet T3 and T4 temperature classes



Bare-shaft variants available for flexibility to meet any global Ex Proof standards

EDS Chemical (ATEX)





EDS Chemical System



Wide range of standard accessories available

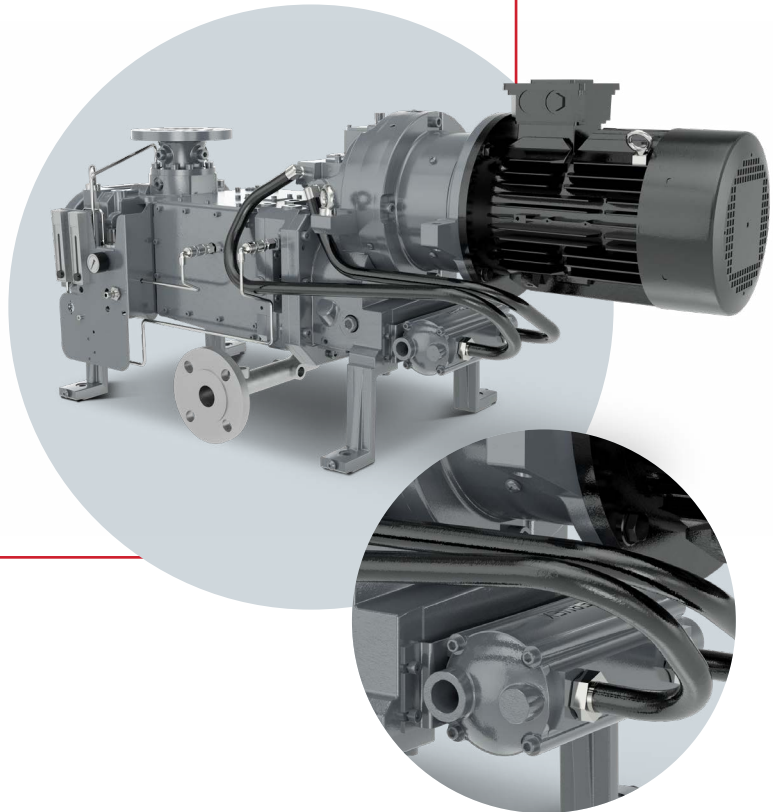


Purge flow rotameters as standard



Compressed air gas ballast

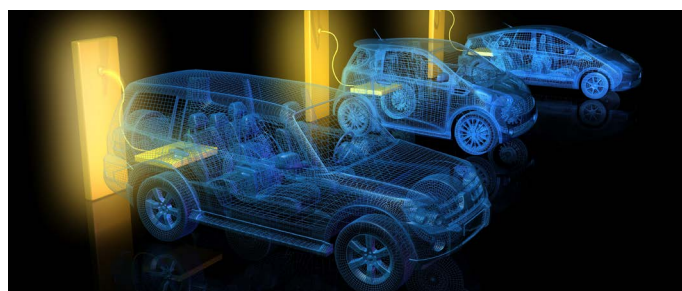
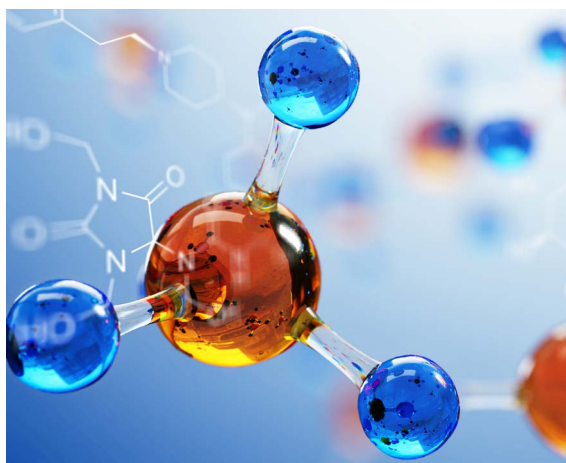
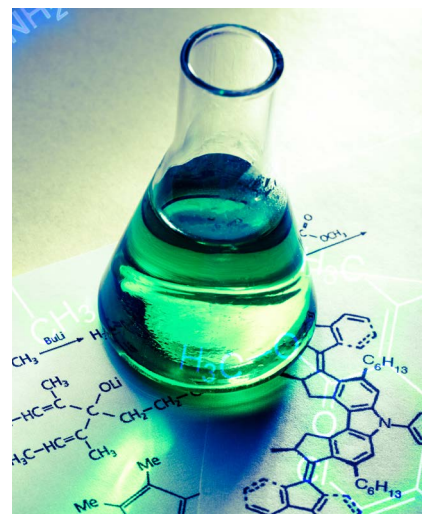
Compact Heat Exchanger for indirect cooling options



APPLICATIONS

The EDS range is suitable for a wide range of chemical applications including:

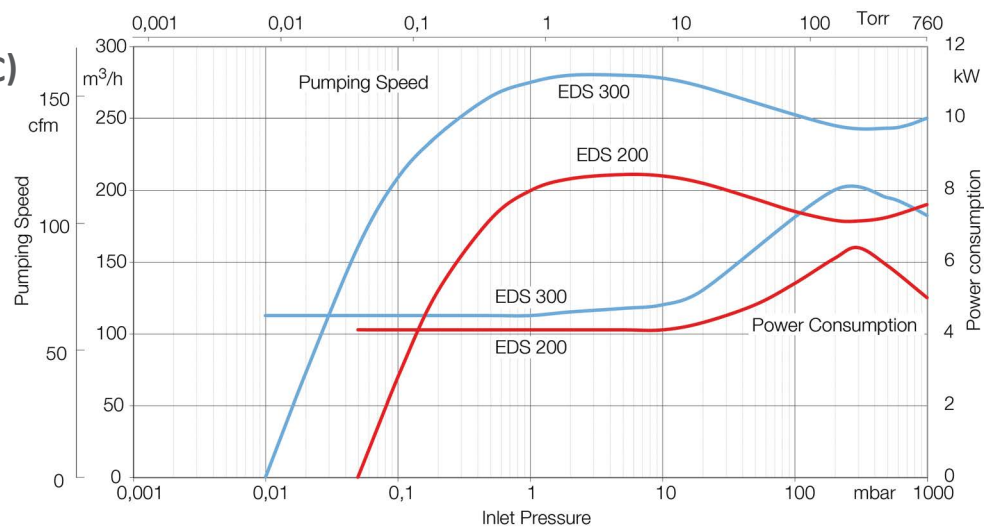
- Lithium Ion batteries
- Distillation applications
- Solar crystal pulling
- Fine Chemicals
- Oil treatment plants
- Pharmaceuticals
- Petrochemicals
- Flammable & corrosive gases
- Degassing
- Dewatering & Filtration
- Polymers & Plastics production



For a complete list of chemical applications and processes, please contact your local Edwards representative.

PERFORMANCE CURVES

EDS 200 and 300 (IMPERIAL AND METRIC)

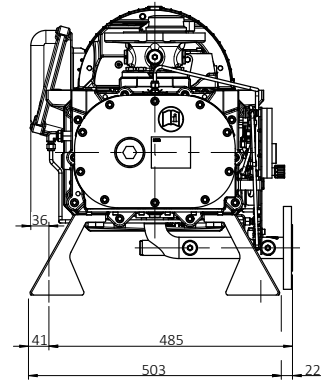
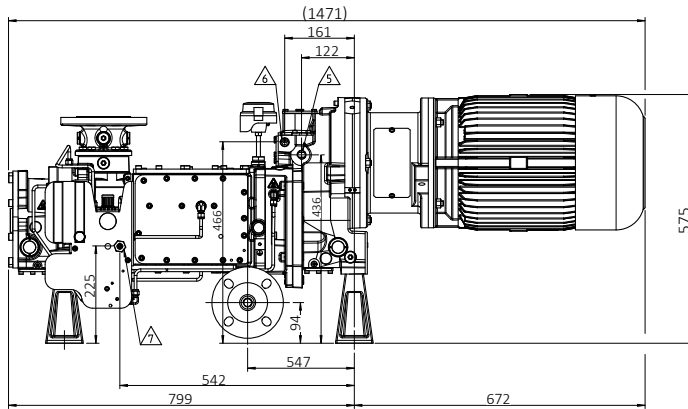
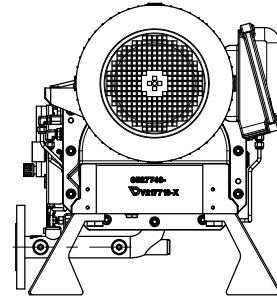
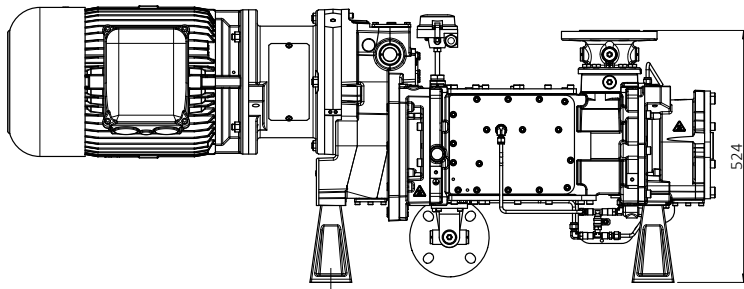


TECHNICAL SPECIFICATIONS

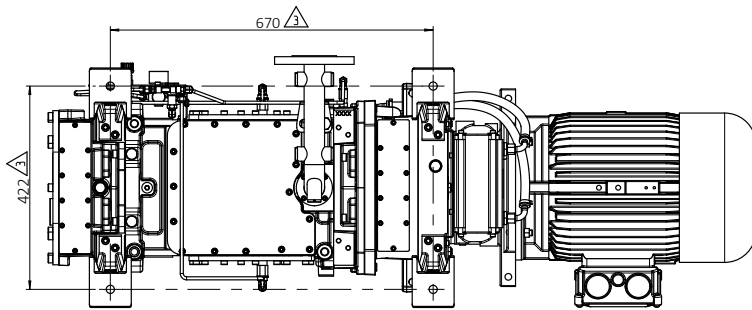
			Metric		Imperial		
			Chemical		Chemical		
			200	300	200	300	
Performance	Peak Pumping Speed	m ³ h ⁻¹	210	>280	CFM	124	>165
	Ultimate Pressure	mbar	<0.05	<0.01	Torr	<0.04	<0.008
Full Load Power	@ ultimate pressure	kW	4.1	4.5	hp	5.5	6
	@ peak pumping load	kW	6.4	8.2	hp	8.6	11
Vacuum Connections	Inlet connection		DIN80/3"ANSI		DIN80/3"ANSI		
	Exhaust connection		DIN50/2"ANSI		DIN50/2"ANSI		
Cooling Water	Connection		G1/2" female		G1/2" female		
	Flow	L/min ⁻¹	<8		Gal/min ⁻¹		<2.1
	Supply pressure (max)	bar	7		psig		100
	DP across pump (min)	bar	0.5		psig		7.25
	Temperature	°C	5-40		°F		41-104
Purge Gas	Connection		G1/4" female threads		G1/4" female threads		
	Pressure	bar	2.5-6.9		psig		36-100
	SSP flow	lmin ⁻¹	<12		lmin ⁻¹		<12
	Gas Ballast flow*	lmin ⁻¹	0-50		lmin ⁻¹		0-50
Operating data	Noise	dB(A)	<76		dB(A)		<76
	Operating Temperature	°C	-20 to +40		°F		-4 to +104
	Exhaust Back Pressure (Max)**	mbar	1200		psia		17.4
	System IP rating		IP54				IP54
	Lubrication (as supplied)		Extend 110				Extend 110

DIMENSIONS

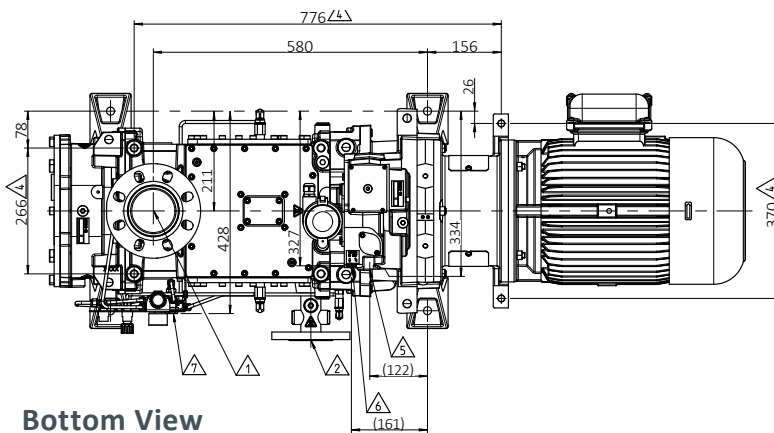
EDS Chemical Direct



Side View

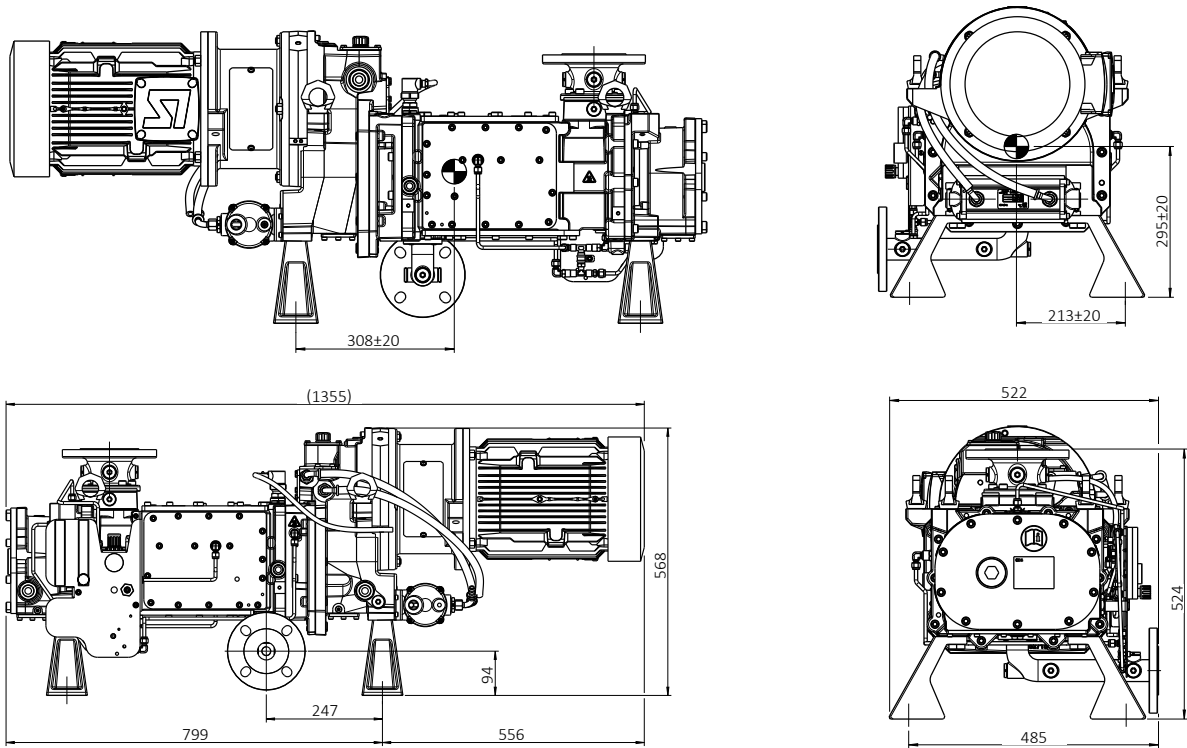


Top View

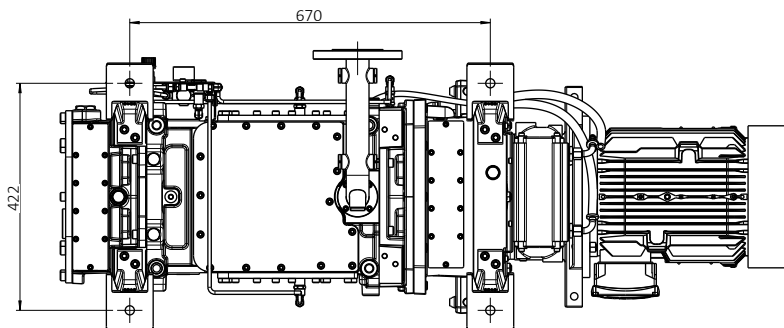


Bottom View

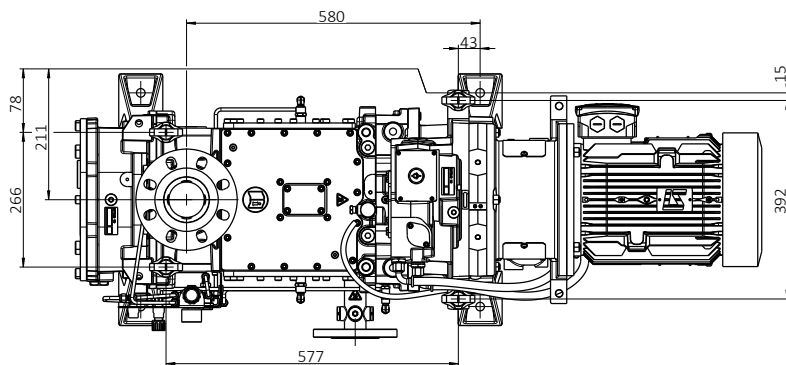
EDS Chemical Indirect



Side View



Top View



Bottom View

ORDERING INFORMATION

Part Number	Size	Cooling	Motor Voltage	Motor Desc.	Freq
A41822945	200	Direct Water	230/400V 50Hz	ATEX IIC T3	50Hz
A41824945	200	Indirect Water	230/400V 50Hz	ATEX IIC T3	50Hz
A41823945	200	Direct Water	230/400V 50Hz	ATEX IIC T4	50Hz
A41825945	200	Indirect Water	230/400V 50Hz	ATEX IIC T4	50Hz
A41826945	200	Direct Water	230/400V 50Hz	ATEX IC T3, T4	50Hz
A41827945	200	Indirect Water	230/400V 50Hz	ATEX IC T3, T4	50Hz
A41824985	200	Indirect Water	B/S	IEC ready	50Hz
A41824986	200	Indirect Water	B/S	NEMA ready	60Hz
A41832945	300	Direct Water	230/400V 50Hz	ATEX IIC T3	50Hz
A41834945	300	Indirect Water	230/400V 50Hz	ATEX IIC T3	50Hz
A41833945	300	Direct Water	230/400V 50Hz	ATEX IIC T4	50Hz
A41835945	300	Indirect Water	230/400V 50Hz	ATEX IIC T4	50Hz
A41836945	300	Direct Water	230/400V 50Hz	ATEX IC T3, T4	50Hz
A41837945	300	Indirect Water	230/400V 50Hz	ATEX IC T3, T4	50Hz
A41834985	300	Indirect Water	B/S	IEC ready	50Hz
A41832985	300	Direct Water	B/S	IEC ready	50Hz
A41834986	300	Indirect Water	B/S	NEMA ready	60Hz

ACCESSORIES

Part Number	Accessories	Pump Compatibility
A41890000	TCV Kit Direct Cooled	All direct cooled EDS pumps
A41890001	TCV Kit Indirect Cooled	All indirect cooled EDS pumps
A41891001	Solenoid Valve Accessory	All EDS pumps
A41893000	EDS to EH 1200/2600/4200 Connection Kit	All EDS pumps
A41893001	EDS to EH500 Connection Kit	All EDS pumps
A41894000	Exhaust Pressure Transmitter	All EDS pumps
A41895000	Pt100 Stator Temperature Transmitter	All EDS pumps
A41895001	Pt100 Exhaust Temperature Transmitter	All EDS pumps
A41897000	BoV plug Kit	All EDS pumps

SERVICE AND SUPPORT

To ensure your EDS Dry Screw vacuum pump maintains optimal performance and reliability, we offer a wide range of service solutions, tailored to meet your needs. From Field Service intervention, Managed Maintenance agreements and Overhaul service in our Service Technology Centres (STC), we will take care of your pump to ensure that it continues to deliver clean, consistent, efficient performance, with lower running costs and optimum total cost of ownership for its operating life.

Selecting original spare parts, maintenance kits and oil means that every critical part performs as it was intended. Our services engineers only fit 100% genuine parts to ensure you receive the best result from each service.



Our Preventative Maintenance service packages include:

- **Health Check and Routine Service Check** - Various flexible service to keep your pump running in an optimal condition for your application, including visual inspections, pump vitals checks and replacement/cleaning of components.
- **Overhaul** - The overhaul service includes multiple service options to ensure high performance and minimal downtime.
 - » **Complete Remanufacturing** including full decontamination of the pump, replacement of consumables and components tested to factory specifications.
 - » **Clean and Overhaul** including cleaning of pump interior, repair/replacement of pipework, replacement of consumables and reassembly.
 - » **Module Exchange** including removal and assembly of motor, gearbox, gas and water systems onto replacement pump module.
 - » **Pump Exchange** includes exchange of whole pump (including motor, gear box, gas and water systems) replaced with remanufactured pump.





GLOBAL CONTACTS

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VACUUM SOLUTIONS FOR CHEMICAL PROCESS INDUSTRIES

 **EDWARDS**



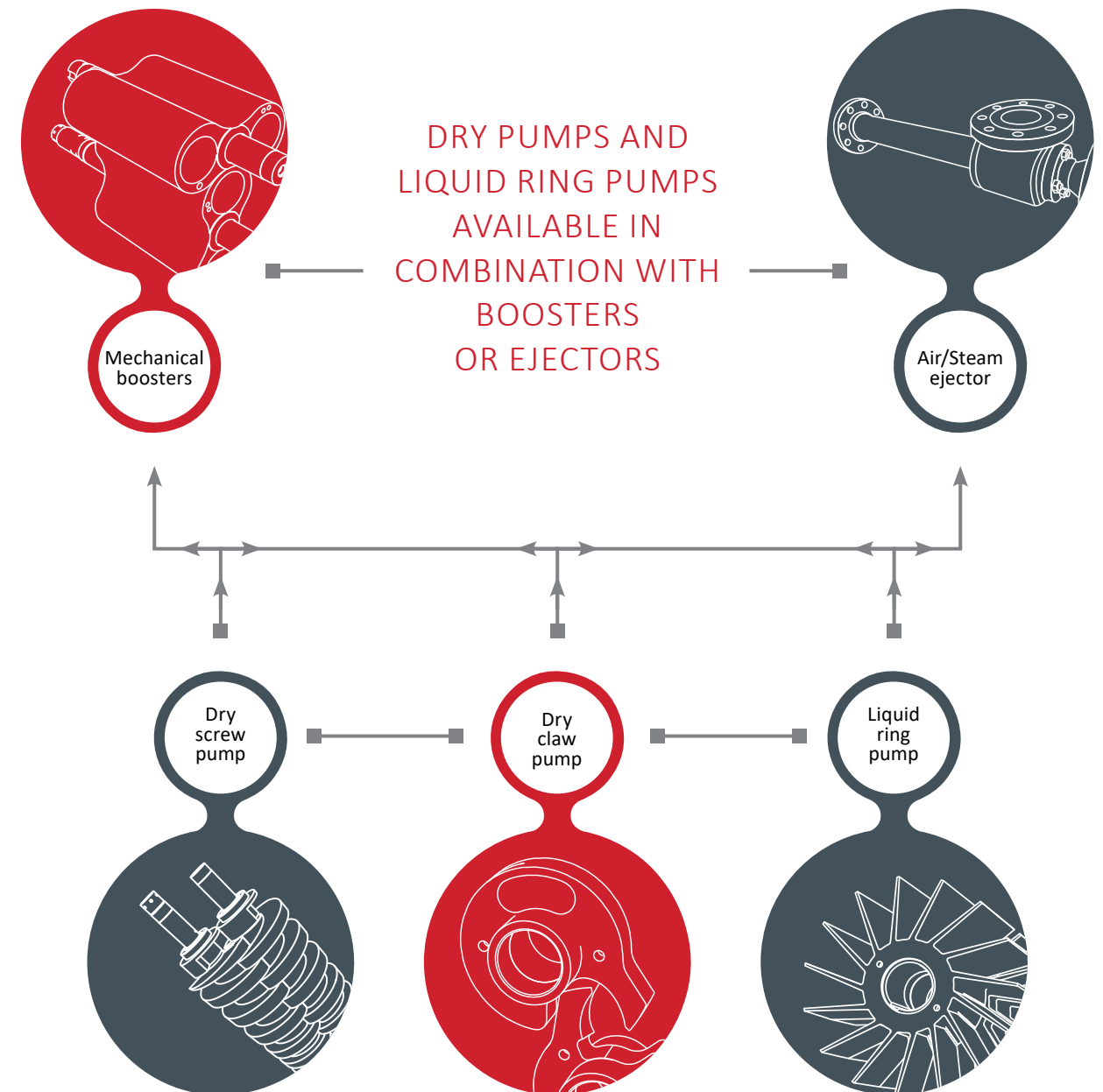
EDWARDS THE PARTNER OF CHOICE

Edwards, a world leader in vacuum solutions and innovator in vacuum pump design and manufacturing, has been delivering solutions that bring value to manufacturing industries for more than 100 years.

We believe in delivering results that bring value to our customers by using our breadth of industry experience to identify and apply solutions to your problems. Using the most innovative and up-to-date modelling techniques, we optimise the pumping configuration for customers to provide a system design giving the maximum performance in the most reliable and cost-effective way.

MORE THAN PUMPS, COMPLETE VACUUM SYSTEMS AND SOLUTIONS

Edwards is a world leader in the design, technology and manufacture of vacuum pumps. For the chemical industry, Edwards offers a wide range of vacuum pumps and systems to meet the demanding process applications in the base and fine chemicals, specialty chemicals and pharmaceutical applications.

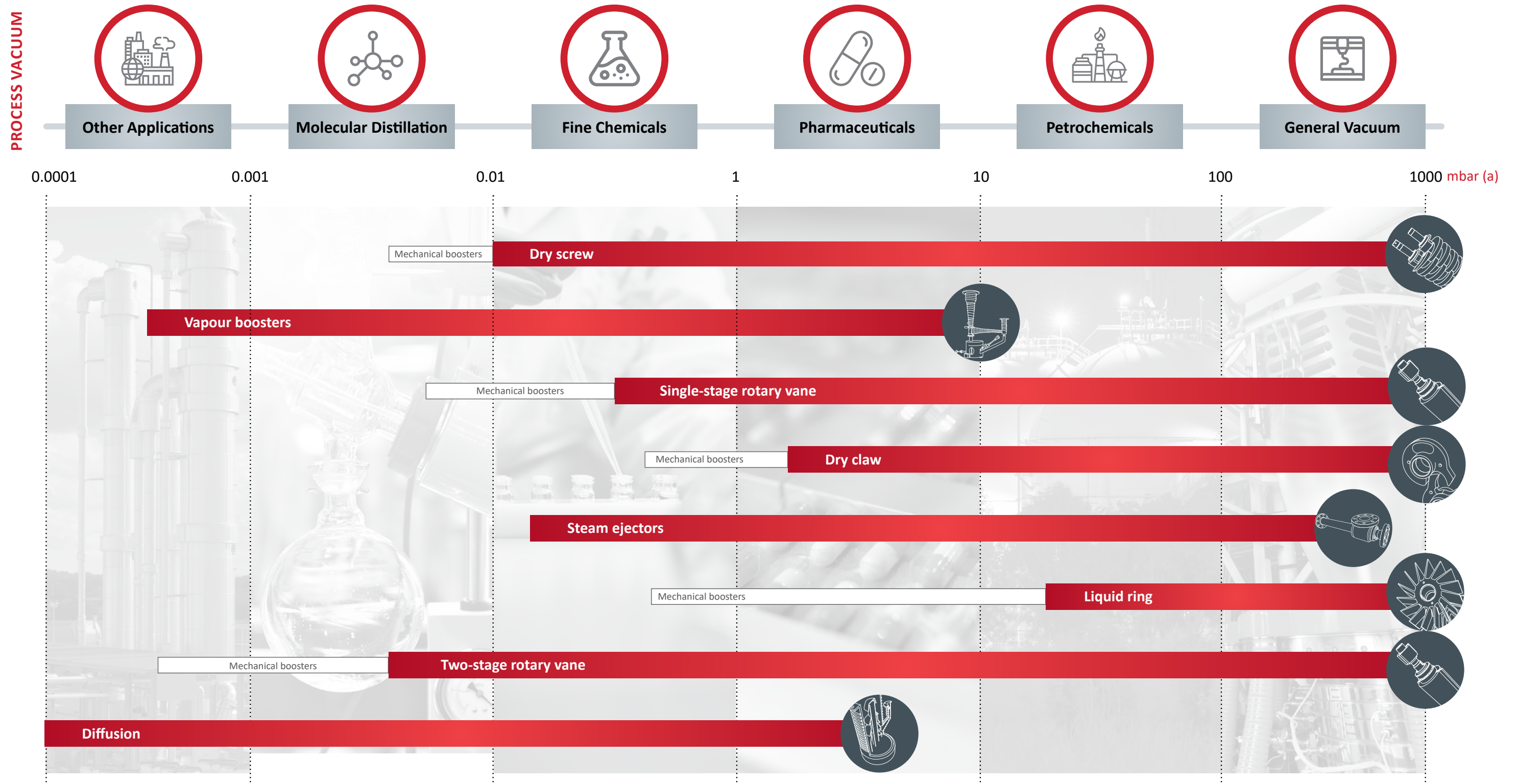


TECHNOLOGY INTRODUCTION

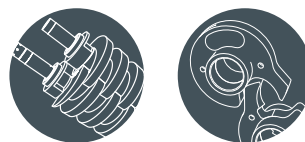
With rapid advances in technology, chemical processing industries place increasingly challenging demands on vacuum systems. As a leader in vacuum technology, Edwards has an entire portfolio of world-leading pumping technology vacuum products to meet the demanding applications in process industries.

ENABLING QUALITY PRODUCTION

APIs | Adhesives | Aromatics | Basic chemical processing | Biofuels | Detergents
 Fertilisers and pesticides | Fibre production | Flavours and fragrances | Olefins | Oleochemicals
 Pharma end products | Pigments and paints | Refinery VDU | Resin and polymer production



DRY PUMPS SYSTEMS



EDP system

Edwards, a world leader in dry vacuum pump technology, successfully pioneered the use of environment-friendly dry vacuum pumps in the early 1980s to meet the highest safety and performance standards. Featuring an award-winning reverse claw mechanism and patented tapered screw technologies, Edwards delivers exceptional performance and energy efficiency with our dry pumps and combinations customised for chemical applications.

Our dry vacuum pumps are capable of handling increasingly complex chemicals, solvents and compounds in a reliable and safe way while ensuring the control and reduction of environmental pollution at a low cost of ownership.

- EDP, EDS, CXS, CDX
- Up to 40,000 m³/h in combination with boosters
- Ultimate vacuum up to 0.001 mbar(a) with boosters

LIQUID RING PUMPS SYSTEMS



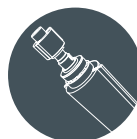
LRP system

The Edwards liquid ring pump (LRP) range includes single- and two-stage machines enabling optimum efficiency for processes operating across the process vacuum range. Pump capacities up to 40,000 m³/h are available in single-stage and 7,500 m³/h in two-stage models.

The Edwards LRP range of vacuum pumps is available as standard packages of once through, partial and total re-circulation operation. Liquid ring pumps offer significant advantages when pumping wet gases and vapours or when used for applications requiring special construction materials for corrosion resistance. LRPs can operate with different seal liquids, enabling operations with a liquid compatible with the process.

- HR, LR1A, LR1B, LR1C, LR1D series
- Up to 40,000 m³/h
- Ultimate vacuum up to 0.1 mbar(a) with boosters

ROTARY VANE PUMPS SYSTEMS



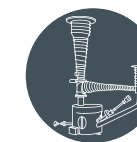
nES EX

E2M/EH Booster Combination

Our Ex series of single-stage and two-stage rotary vane pumps has been specifically designed to handle gases from potentially explosive atmospheres and to operate in environments where a potentially explosive atmosphere can be present. Designed for reliable, long-term operation, our oil-sealed rotary vane pumps are renowned for achieving high ultimate vacuum and rapid pumping speeds, with quiet operation and exceptional reliability.

- nES EX - Upto 3300 m³/h
- E2M - Upto 2800 m³/h
- Ultimate vacuum up to 4x10⁻³ mbar
- Ultimate vacuum up to 4x10⁻⁴ mbar

VAPOUR BOOSTERS



18B4B

30B5M

When higher pumping speeds are needed, our vapour booster pumps are the ideal solution. Field-proven in various industries for more than 60 years, they provide benefits ranging from ease of use, inherent reliability, ease of maintenance and tolerance to a wide variety of inlet and exhaust pressures.

Special variants for applications, such as short path and molecular distillation of fish oils, vegetable oils and vitamins, deodorisation and refining of oils and waxes, and purification of crop protection chemicals, have been created in combination with our vacuum pumps for chemical applications.

- 18B4B, 30B5M
 - Capacities up to 15,000 l/sec
 - Up to 1x10⁻⁴ mbar(a) ultimate pressure
- ATEX available on demand.

MECHANICAL BOOSTERS



EH Boosters

HV Boosters



Stokes 6" Boosters

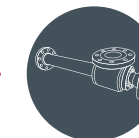
GMB40K Boosters

When coupled with our wide range of vacuum pumps, mechanical boosters increase pumping speed at working pressures, significantly reducing the pump downtime.

- EH boosters, HV boosters
- 250–40,000 m³/h
- GMB40K boosters, Stokes 6" mechanical booster

Edwards dry vacuum systems, liquid ring pump systems and EH boosters are ATEX certified up to Zone 0 while other mechanical boosters are certified up to Zone 1.

EJECTORS



Multi stage ejector system



Steam ejector

Edwards has been instrumental in the development of steam ejectors from the original crude single-stage devices to the highly efficient multi-stage systems currently in use.

Edwards offers single-stage ejector systems and multi-stage systems, providing improved energy efficiency and the capability to handle high vapour loads without the risk of cavitation. They are available in various materials of construction such as carbon steel, stainless steel and a variety of corrosion-resistant alloys with a relatively low capital cost, providing an attractive return on investment.

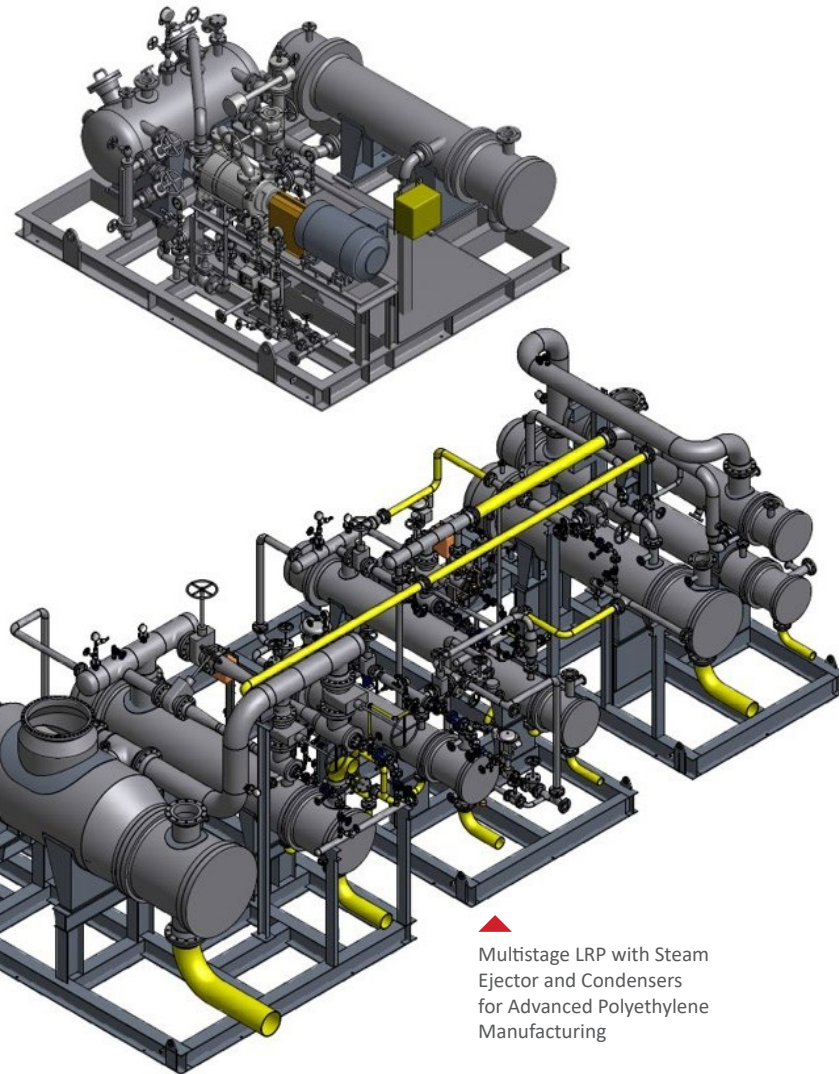
- Pressure range
 - 1 Stage 120 mbar(a),
 - 2 Stage 25 mbar(a),
 - 3 Stage 7 mbar(a),
 - 4 Stage 1 mbar(a),
 - 5 Stage 0.1 mbar(a)
- Capacity range
 - 25 mm to 2,500 mm inlet pipes
 - Up to 1,500,000 m³/hr inlet gas flows
- Multiple elements for increased capacity
 - Standard sizes up to 1,000 mm inlet pipe

HYBRID SYSTEMS

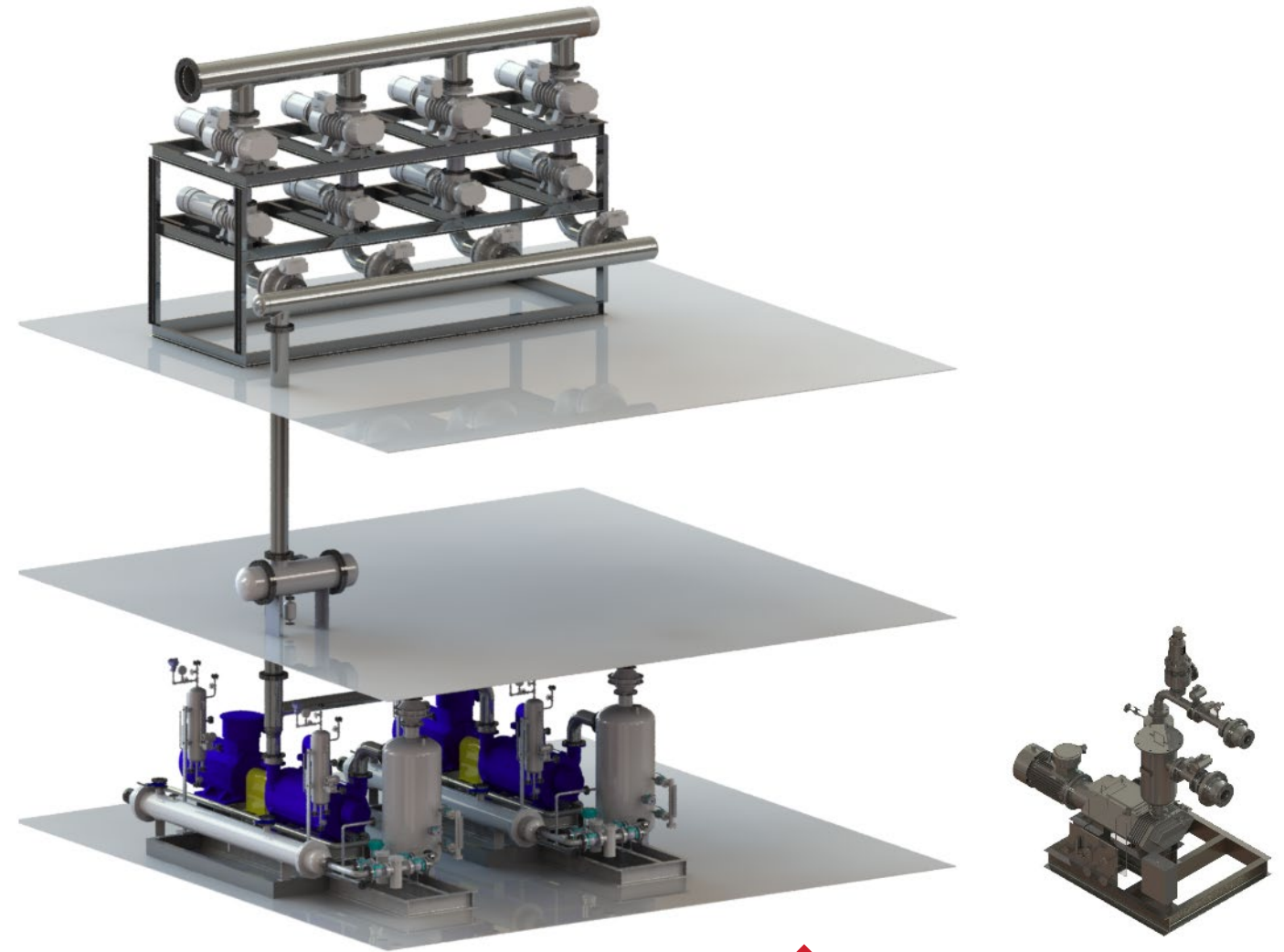
END-TO-END TURNKEY PROJECTS FOR PROCESS IMPROVEMENT

We have developed and delivered state-of-the-art technologies in various combinations to provide the most reliable and customised system solutions for our process customers. Our applications knowledge and vacuum expertise make it possible for us to provide the best combination of dry pumps, liquid ring pumps, mechanical boosters and steam ejectors with the lowest cost of ownership and highest reliability.

VARIETY OF DRY PUMP AND LIQUID RING PUMP COMBINATIONS TO PROVIDE THE MOST RELIABLE SYSTEM FOR YOUR PROCESS



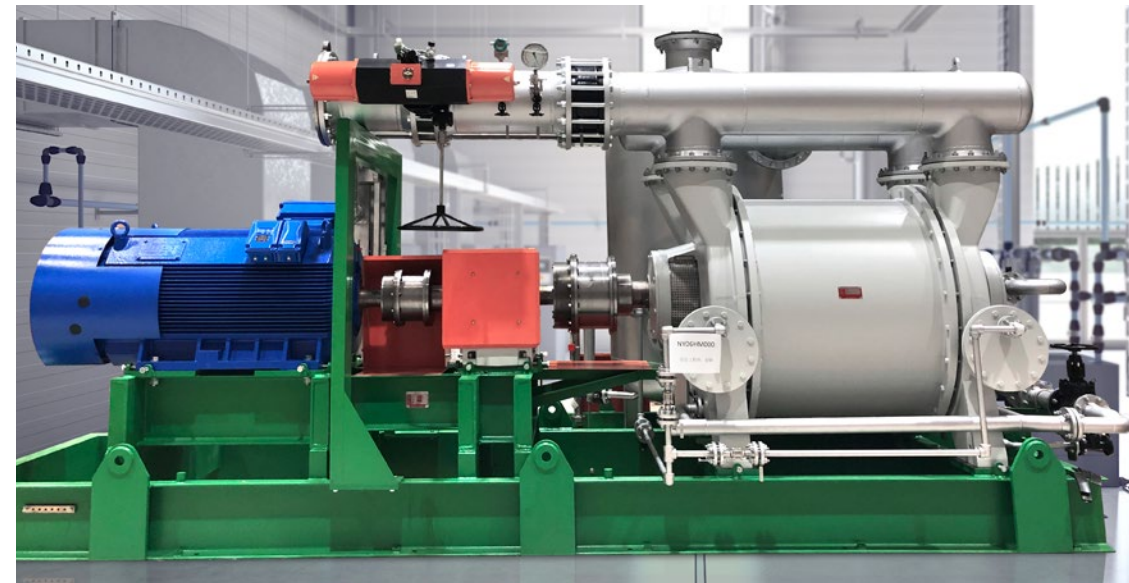
▲ Multistage LRP with Steam Ejector and Condensers for Advanced Polyethylene Manufacturing



▲ Hybrid system with Stokes Booster, CDX Dry screw pump and Liquid Ring Pump combination for DPC Polycarbonate application



▲ CDX100 Dry screw pump with EH2600 Booster package for chemical application



▲ Single-stage Liquid Ring Package



▲ Double Stage LRP for Condenser Air Extraction

APPLICATION ENGINEERING, DESIGN AND SYSTEMISATION

Edwards' application expertise and in-depth knowledge of the chemical process industry, based on thousands of installations, enable a comprehensive package of design and systemisation solutions.

- **Optimisation of vacuum system design**
- **Focus on safety, reliability, durability, efficiency and environmental considerations**
- **Equipment selection, specification and integration into the process plant**
- **Compliance with user requirements and specifications**
- **Vacuum system integration with user control systems**
- **Supervision of commissioning, installation and operator training**

Our highly experienced team of Application and Proposal Engineers, located in regions close to our customers, will assist with the selection, sizing and design of your vacuum pumping system to meet your vacuum needs. Meanwhile, our Engineers in the product companies will handle the order execution of your vacuum system from the receipt of order to the design, assembly and testing. Further, our team of Commissioning Engineers can support the installation on site.

EXPLOSION-PROOF COMPLIANCE

Edwards offers a wide range of products for use in and with explosive atmospheres certified for ATEX, relevant American and other applicable global standards.

ATEX certification has been achieved for all of Edwards' Chemical range vacuum pumps up to Zone 1, and with a wide range of pumps going up to Zone 0. By using constructional safety as a protection strategy combined, wherever appropriate, with flame arresters on the inlet and outlet of the pump, the Edwards chemical pumps achieve a very high level of safety (Zone 0) suitable for the most demanding applications.

For the American market, electrical components such as valves and motors for hazardous locations to suit the customer requirements can be chosen and combined with the Edwards chemical pump range to achieve compliance with NEC500 and NEC505. In addition, the pumps used are designed and manufactured to the same high requirements as demanded by the ATEX directive.

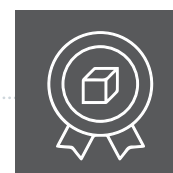
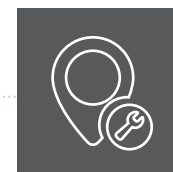


SERVICE SOLUTIONS

Edwards understands the importance of local support. We have a number of major service facilities located around the world, each location supported by an extensive team of engineers and technicians to provide local, rapid response and great value service.

- **Comprehensive service**
- **Extended warranties**
- **Repair**
- **Managed maintenance**
- **Certified products**

All our service operations are conducted at the highest international standards in accordance with ISO 9001 (quality), ISO 14001 (environmental) and OHSAS 18001 (workplace safety).





GLOBAL CONTACTS

Publication Number: 3602 510 0 01

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CXS DRY PUMPS OVERVIEW

CXS INTRODUCTION

Chemical processes present special challenges when it comes to vacuum. Equipment often has to operate in damp, dusty, corrosive, flammable or explosive environments.

Whatever your process requirements, Edwards can provide an innovative and economic solution that is safe, flexible and reliable.

Building on our long experience of vacuum applications, CXS range provides all the advantages of dry pumps while setting new standards for reliability, performance, control and economy.

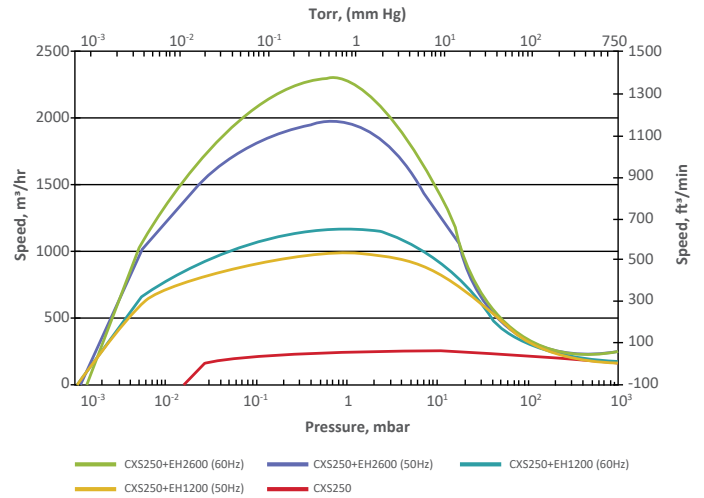
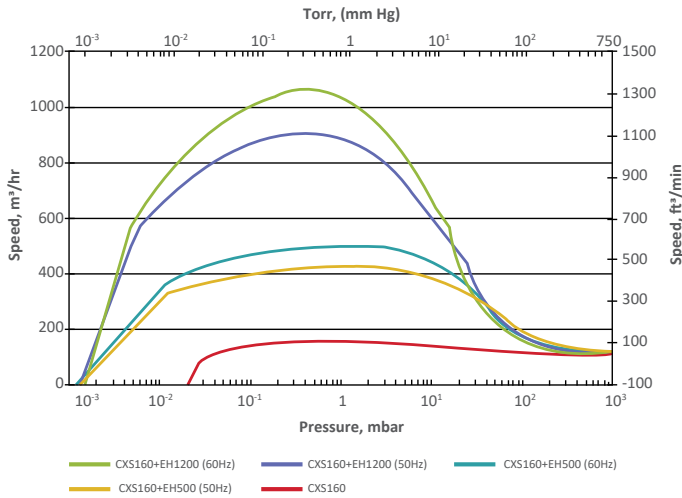
CXS chemical dry pumps are ideally suited to even the harshest chemical and pharmaceutical processes and provide optimum performance in a wide range of applications, including distillation, drying, evaporation, reactor service, house vacuum, solvent recovery, sterilisation, fatty acid deodorisation and filtration.



CXS BENEFITS

- **Low cost of ownership**
 - » With low energy usage and utility costs
 - » No routine service and major service intervals of up to five years
- **Simply reliable**
 - » Even in harsh environments
 - » Excellent liquid and solids handling
- **Environmentally friendly**
 - » No contamination of the process stream or cooling water
 - » No effluent generation
- **Safety assured**
 - » ATEX certified for use in hazardous environments
 - » Pumps corrosive vapours without corroding
 - » Explosion-proof to ensure safe pumping of flammable gases
- **Flexible**
 - » Can be combined with booster pumps to provide deep and flexible vacuum down to 10^{-3} mbar
- **Outstanding support from a global company**
 - » Famed for its best-in-class technology and applications expertise

PERFORMANCE CURVES

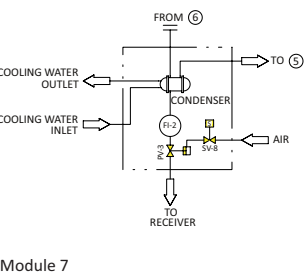
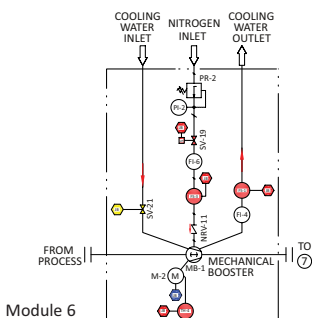
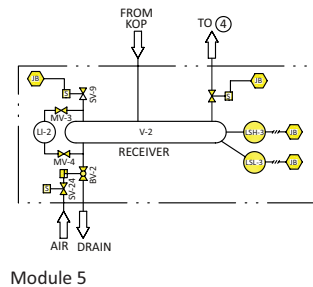
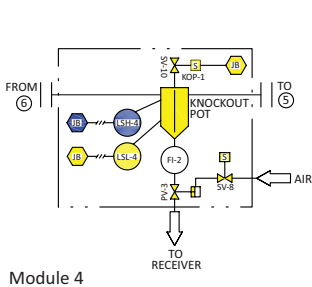
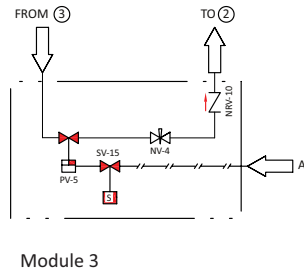
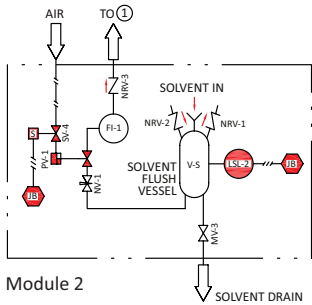
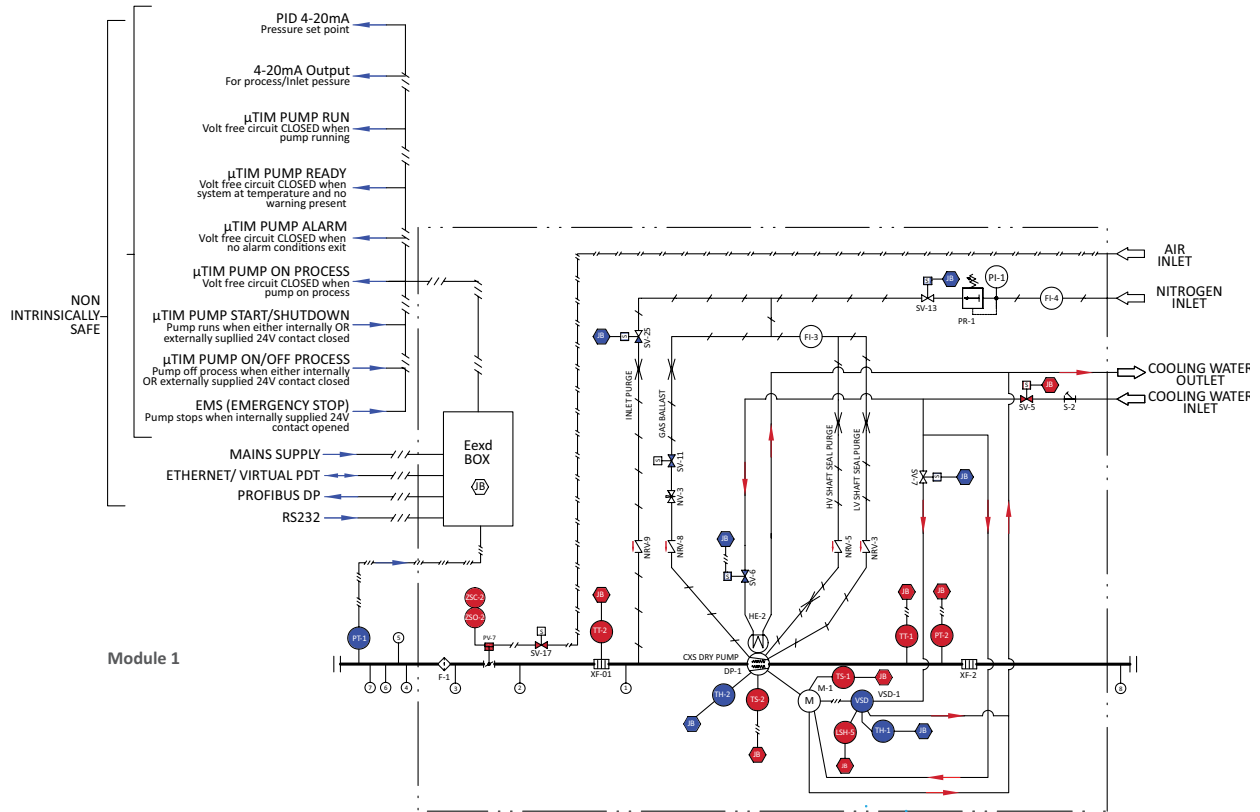


KEY APPLICATIONS

	Chemical Dry Pump	Mechanical Booster	Rotary Piston Pump	Rotary Vane Pump	Liquid Ring Pump	Steam Ejector
Distillation, normal	✓✓	✓✓	✓	✓	✓✓	✓✓
Short path distillation	✓✓	✓✓	✓	✓		✓✓
Molecular distillation	✓✓	✓✓	✓	✓	✓	✓✓
Reactor service	✓✓	✓✓	✓		✓✓	✓
Central vacuum (flammables & corrosives)	✓✓	✓✓			✓✓	
Fatty acid deodorisation, Biofuels	✓✓	✓✓			✓✓	✓✓
Drying, evaporation, crystallisation, concentration	✓✓	✓✓	✓	✓	✓	✓
Gas recovery/recirculation	✓✓	✓✓				
Degassing	✓	✓	✓	✓✓	✓	✓
Absorption, Adsorption, Desorption	✓✓	✓✓			✓✓	
Pervaporation	✓✓	✓✓			✓✓	
Solvent recovery	✓✓	✓✓			✓	
Isocyanates production	✓✓	✓✓		✓	✓✓	✓✓
Impregnation	✓✓	✓✓	✓✓	✓✓	✓✓	
Polymers and plastics production	✓✓	✓✓	✓	✓	✓✓	✓✓
Paints, pigments, coatings and ink production	✓✓	✓✓	✓	✓✓	✓	✓
Soaps/detergents production	✓✓	✓✓	✓			✓✓
Ethylene Oxide sterilisation	✓✓	✓✓		✓✓		
Oil treatment plants	✓✓	✓✓	✓✓	✓	✓	✓
Dewatering and filtration	✓				✓✓	
Flammable and corrosive gases	✓✓	✓✓		✓	✓✓	✓✓

Preferred technology or widespread use ✓✓
 Some applications ✓

Lowest cost of ownership, typically ●
 High cost of ownership, typically ●
 Highest cost of ownership, typically ●



CXS Module options:

- Module 1:** CXS Pump with Purges, Inlet and Outlet Flame Arresters, Inlet Valve, Inverter, Controller & Safety Interlocks
- Module 2:** Solvent Flush Package
- Module 3:** Inlet Valve By-pass Line
- Module 4:** Inlet KOP with Level Control
- Module 5:** Inlet Receiver with Auto-drain
- Module 6:** EH Mechanical Booster
- Module 7:** Exhaust Condenser & Receiver

Additional Module Options:

- Exhaust Silencer
- Dust Filter
- Pressure Control Valve
- Other Control Options
- Additional Mechanical Boosters
- Documentation Packages
- System Skid

- EXTERNAL CONTROLLER
- MAIN ONBOARD SAFETY CIRCUIT
- SAFETY CIRCUIT, EXTERNAL CONTROLLER
- PUMP CONTROLLER

LINE DESIGNATION :-	
PROCESS	—————
ELECTRIC SUPPLY/SIGNAL	———/———
INSTRUMENT AIR	———/———/———
NITROGEN SUPPLY	———/———/———/———
WATER SUPPLY	———/———/———/———/———
EDWARDS SCOPE OF SUPPLY	—————

CXS FEATURES

- CXS chemical dry pumps feature cutting-edge tapered screw technology. Smooth, gradual compression along the length of the rotor results in improved thermal control and optimised performance at all inlet pressures.
- An advanced temperature management system maintains the pump temperature at programmable levels for optimal, repeatable process performance.
- The innovative design uses high efficiency air-gap potted motors.
- Integral drive and control systems further help to lower the cost of ownership.
- The pump mechanisms are smooth and quiet running, with noise levels as low as 64 dB(A).
- They can pump up to one litre of liquid per minute continuously and slugs of up to 25 litres without stopping. CXS chemical dry pumps are designed to be good at handling solids and easy to restart.
- An integral controller, PID pressure control and safety systems allow for 'plug and pump' operation. Pumps can be linked to any external control system via a variety of interfaces including Ethernet and Profibus DP.
- CXS chemical dry pumps have a long service interval of up to five years and require minimal maintenance over their life expectancy of more than 25 years.

SYSTEMISATION

CXS chemical dry pumps are available as stand-alone pumps or complete systems, including mechanical boosters for higher pumping capacities, and can be enhanced with a range of standard accessories such as valves, flame arresters, condensers, knock-out pots and filters.

Two models are available, the CXS160 and CXS250, which give nominal capacities of 160 m³h⁻¹ and 250 m³h⁻¹ respectively.



GLOBAL CONTACTS

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CXS CHEMICAL DRY VACUUM PUMPS

 **EDWARDS**





EDWARDS THE PARTNER OF CHOICE

Edwards is a world leader in the design, technology and manufacture of vacuum pumps with over 95 years' history.

Edwards believes in delivering results that bring value to our customers by using our breadth of industry experience to identify and apply solutions to your problems. Using the most innovative and up-to-date modelling techniques, we can optimise the pumping configuration for customers to provide a system design giving the maximum performance in the most reliable and cost-effective way.

EDWARDS' CXS CHEMICAL DRY VACUUM PUMPS

Edwards is synonymous with vacuum. Having hundreds of thousands of dry pumps installed worldwide, our high quality products and application know-how are renowned in the world of vacuum technology.

Featuring advanced tapered-screw technology for exceptional performance and energy efficiency, CXS vacuum pumps and combinations are at the cutting edge of chemical pump design

Simple – integral controller and safety system

- **Reduced installation costs:** easy integration with other systems

Reliable – cutting edge screw technology for corrosion-free operation and robust liquid and solids handling

- **Increased productivity:** longer intervals between services and no unplanned downtime

Economical – affordable capital investment and low cost of ownership

- **Reduced service costs:** minimal maintenance required
- **Substantial savings:** low utilities and energy costs

Environmental – dry, quiet-running technology

- **Comfortable workplace:** low vibration, quiet-running
- **Kinder on the environment:** no contaminated or dirty oil to dispose of



Simply Reliable

Performance

- Continuous vacuum from atmosphere to 10^{-3} mbar for a robust, repeatable process
- Deeper vacuum than traditional technologies and not limited by seal fluid or cooling water temperature

Control

- Integral PID pressure control with in-built inverter for consistent operation
- Data monitoring via on-board communication controller
- Special start-up and shutdown modes to free the rotors or avoid cold seizures, if required

Safety

- Explosion tested and certified by independent authorities to meet strict safety standards
- ATEX compliant for T4 IIB/IIB3 gases

Reliability

- No end-compression plate to create potential for trapped solids, jammed rotors and hydraulic locks
- No interstage condensers to create the potential for corrosion

Edwards' experience

- Hundreds of thousands of dry pumps installed worldwide
- Edwards supplies all 15 of the world's biggest and best known chemical and pharmaceutical manufacturers

Innovative screw technology

- Tapered-screw technology for improved thermal stability 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

Efficient motor and inverter drive system

- Compact, high-speed motor with smaller footprint and lower noise
- High start torque for maximum restart capability and reduced bearings temperatures for longer life

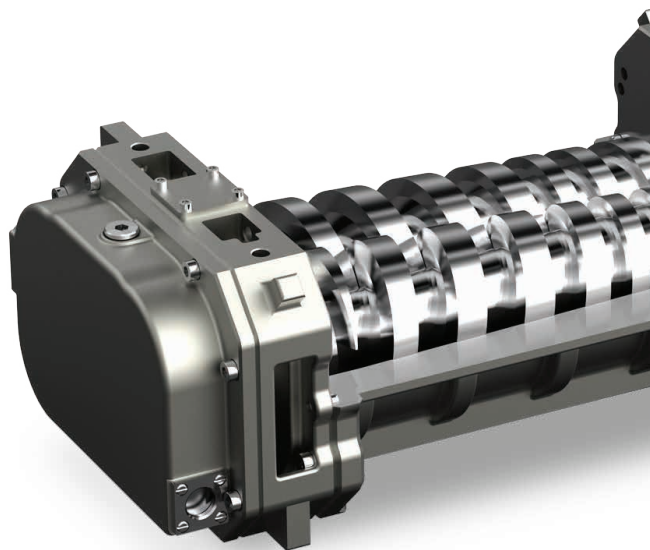
ATEX Certification/Explosion Proof Certified

The CXS dry vacuum pump is ATEX certified, relying on constructional safety and containment for pumping gases from groups IIB/IIB3.

Solvent flush options, if necessary, can ensure constructional safety is maintained.

EXP systems

North American variants are suitable for Hazardous Locations Class 1, Groups C&D, Division 1 Environments. These variants are certified to NEC standards for Hazardous Areas.



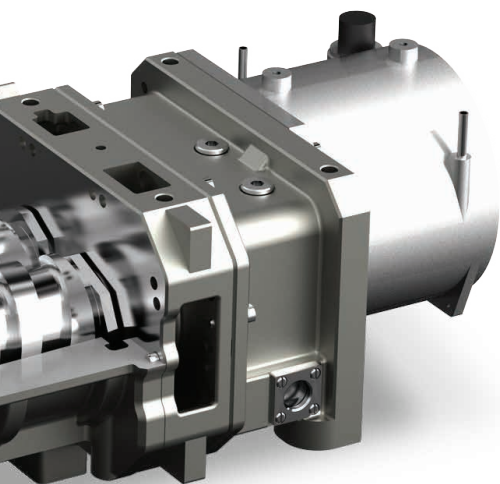
Applications

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

- Drying
- Distillation
- Evaporation
- Polymerisation
- Reactor service
- House or central vacuum
- Flammable gases
- Corrosive gases
- Ethylene oxide sterilisation
- Degassing
- Deodorisation
- Solvent recovery
- Hydrogenation
- 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



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
- Advice at start-up, commissioning and training

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

Technical data

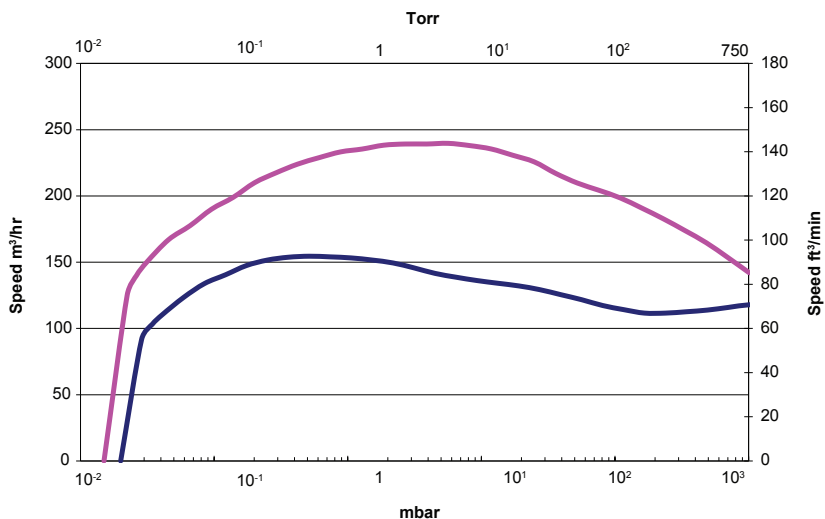
Specification	Units	CXS160	CXS250
Maximum pumping speed	m ³ h ⁻¹	160	250
	ft ³ min ⁻¹	95	148
Capacity at 10 mbar (7.5 Torr)	m ³ h ⁻¹	132	230
	ft ³ min ⁻¹	78	135
Ultimate vacuum	mbar	<0.02	<0.015
	Torr	<0.015	<0.011
Maximum back pressure - standard	mbar	1,200	1,200
	psig	2.7	2.7
Power consumption at 10 mbar (7.5 Torr)	kW	3.6	3.8
	hp	4.8	5.1
Standard motor (380 - 460V ±10%, 3 ph, 50/60 Hz)	kW	7.5	7.5
	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	°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	0.6 - 1.7	0.6 - 1.7
	psi	9 - 24	9 - 24
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

Performance

CXS160 and CXS250



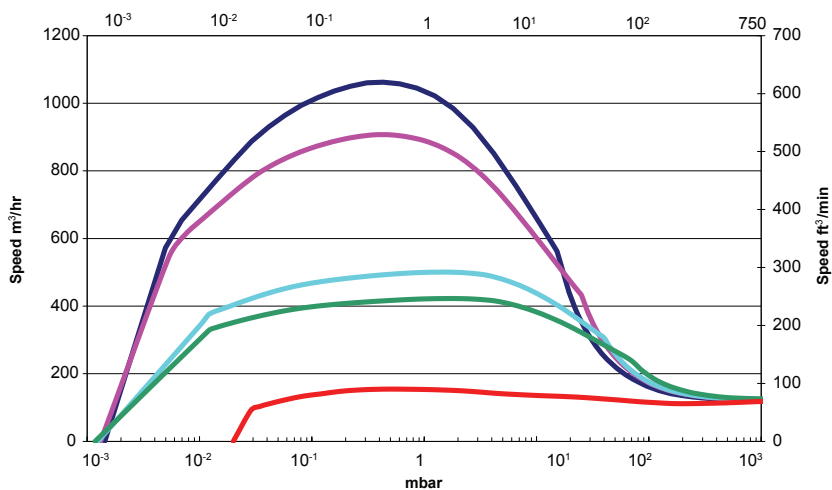
- CXS160 (50/60Hz)
- CXS250 (50/60Hz)



CXS160 combinations



- CXS160+EH1200 (60Hz)
- CXS160+EH1200 (50Hz)
- CXS160+EH500 (60Hz)
- CXS160+EH500 (50Hz)
- CXS160 (50/60Hz)

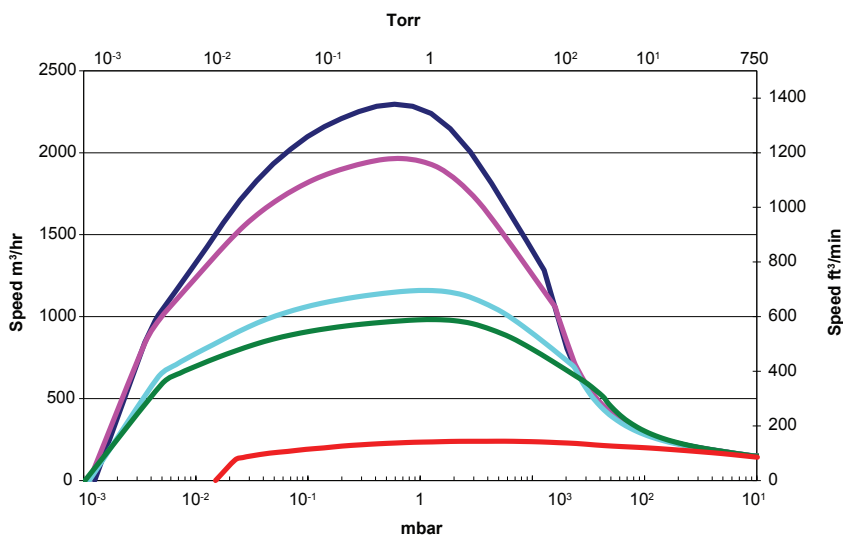


*Without booster gearbox purge; mandatory for ATEX compliance

CXS250 combinations

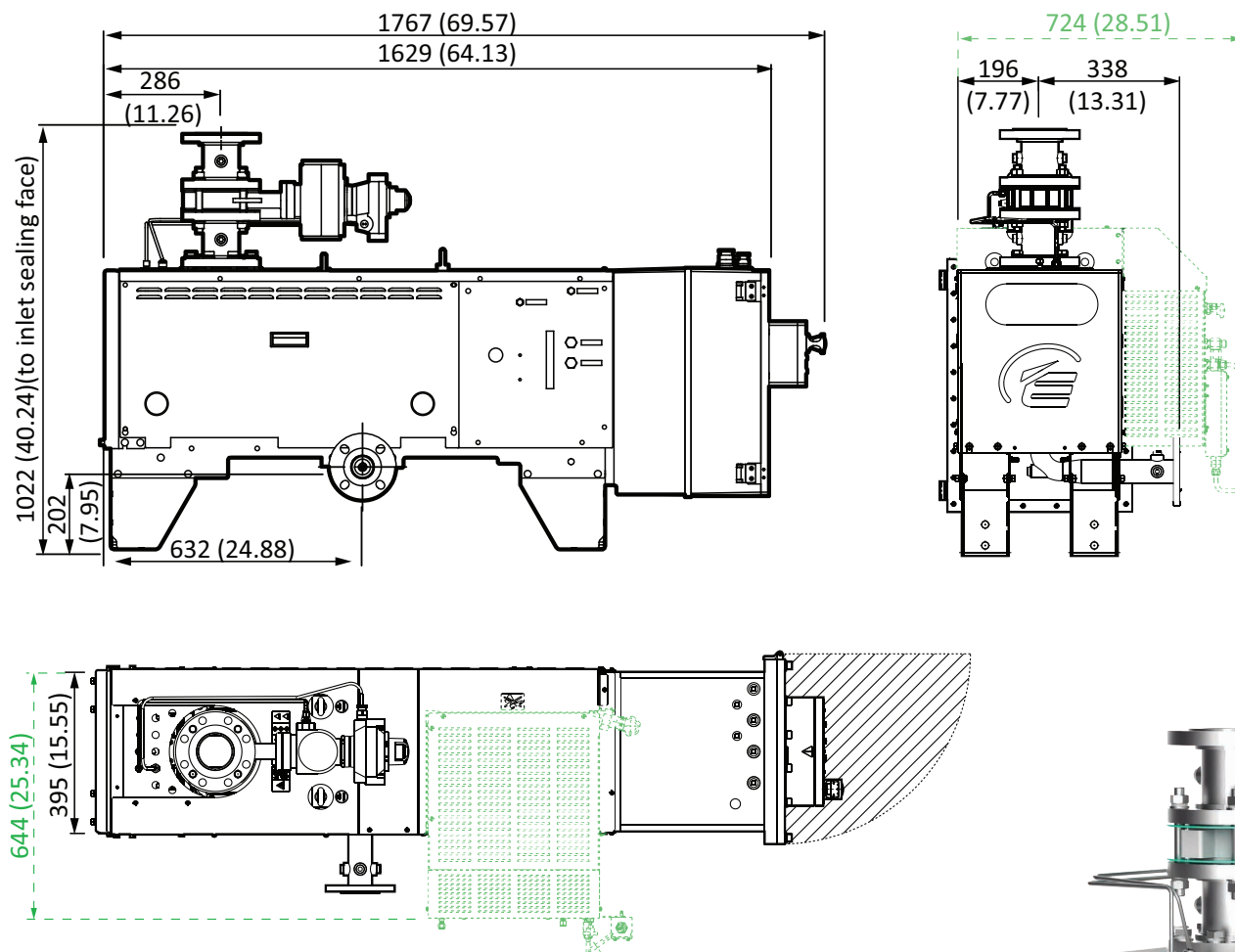


- CXS250+EH2600 (60Hz)
- CXS250+EH2600 (50Hz)
- CXS250+EH1200 (60Hz)
- CXS250+EH1200 (50Hz)
- CXS250



Pump dimensions - CXS160/250

Standard CXS pump

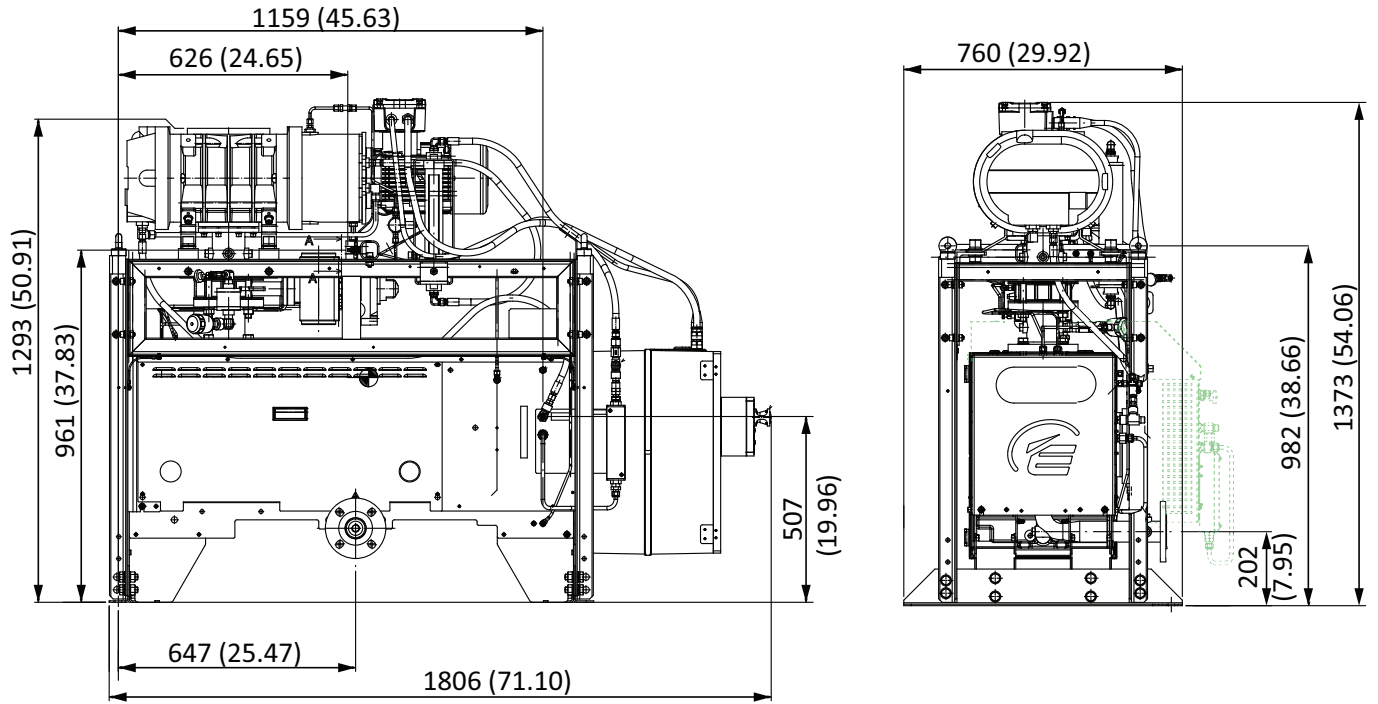


Dimensions in mm (inch)

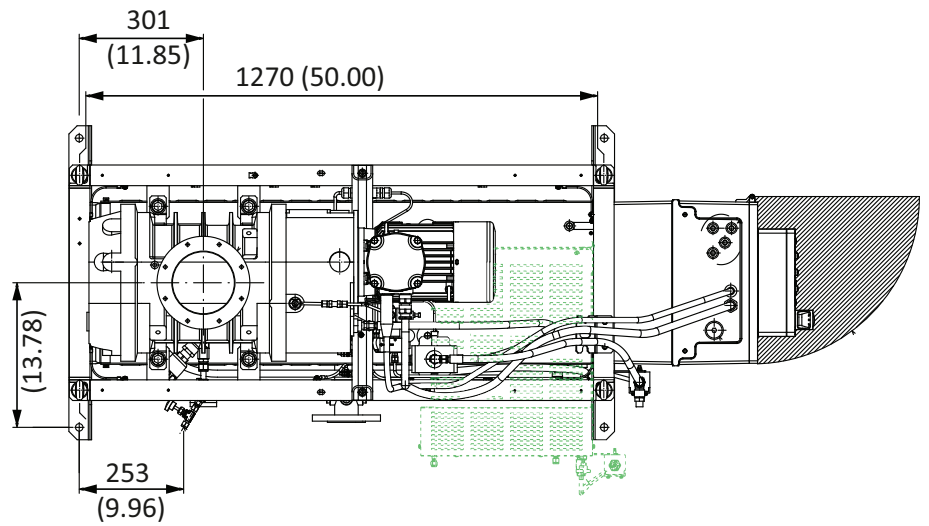


ATEX version drawings shown. Portions & dimensions in green denote the Americas variant differences

CXS pump with booster combinations



Dimensions in mm (inch)



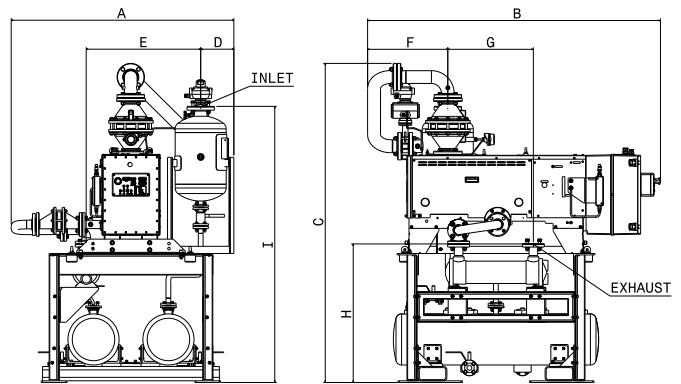
ATEX version drawings shown. Portions & dimensions in green denote the Americas variant differences

CXS systemisation

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

Systemisation is simple with CXS pumps:

- Multiple applications for one single design
- Shorter lead time
- Quick assembly of complex systems
- Reduced engineering costs



Configuration	Connections		Dimensions (mm)								
	INLET	OUTLET	A	B	C	D	E	F	G	H	I
CXS 160/250	3" ANSI/DN80	2" ANSI	1360	2045	1830	235	800	560	600	970	1590
CXS 160/250 + Flame Arrestor Option	3" ANSI/DN80	2" ANSI	1555	2045	2225	235	800	560	600	970	1930

Configuration	Connections		Dimensions (mm)								
	INLET	OUTLET	A	B	C	D	E	F	G	H	I
CXS 160/250 +EH1200	ISO160	2" ANSI	1360	2045	2275	720	315	560	600	970	2200
CXS 160/250 +EH1200+ Flame Arrestor Option	ISO160	2" ANSI	1555	2045	2670	720	315	560	600	970	2595

Images not shown. Typical dimensions of booster combinations.

- Various flame arrestors available. These are representative drawings only. Please contact Edwards for detailed drawings.
- 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

Your business success depends on maximum equipment uptime and minimum total cost of ownership, and we constantly strive to support those objectives. As a global leader in vacuum technology and processes, we understand how vacuum pumps and systems perform in real life. Our wide portfolio of services is designed with you in mind: to help keep your processes and equipment running in the most economical and environmentally efficient manner.

Services include:

- Overhaul and repair using genuine Edwards OEM parts
- OEM spares and kits available for immediate despatch
- Remanufactured products available for cost-effective expansion and backups
- Global network of expert field service engineers available to respond quickly to unexpected equipment failures
- Extended warranty, to help manage the cost of the unexpected

Our Expert Advantage Service Plans provide you with the ongoing support necessary to continuously improve your operational efficiency and meet your business objectives. As service offerings may vary slightly from product to product, please contact your Edwards representative to discuss your specific requirements.

CXS ordering information

CXS Pump part numbers

CXS160 and EH Booster Combinations	
CXS160 ATEX CAT2 T3 Light Duty	CS2560000000
CXS160 ATEX CAT2 T3 Medium Duty +	CS2561005000
CXS160/EH1200 ATEX CAT2 Light Duty	CS6560000000
CXS160/EH1200 ATEX CAT2 Medium Duty +	CS6561005000
CXS160 CL1DIV1 T3 HV MD+	CS2511005000
CXS160 CL1DIV1 T3 HV FAE MD+	CS2511205000

CXS250 and EH Booster Combinations	
CXS250 ATEX CAT2 T3 Light Duty	CS9560000000
CXS250 ATEX CAT2 T3 Medium Duty +	CS9561005000
CXS250/EH1200 ATEX CAT2 T3 Light Duty	CSB5600000000
CXS250/EH1200 ATEX CAT2 T3 Medium Duty +	CSB561005000
CXS250/EH2600 ATEX CAT2 T3 Light Duty	CSD5600000000
CXS250/EH2600 ATEX CAT2 T3 Medium Duty +	CSD561005000
CXS250 CL1DIV1 T3 HV MD+	CS9511005000
CXS250 CL1DIV1 T3 HV FAE MD+	CS9511205000

CXS Accessories	
Order No.	Description
M52808600	Exhaust Manual Isolation Valve Kit
M52808300	Solvent Flush Assembly
M52808550	Exhaust Silencer Assembly
M52809280	CXS Exhaust temperature transmitter accessory kit
M52809200	CXS Inlet pressure transmitter
M52805170	CXS Gas purge flow meter accessory kit
M52808460	CXS Inlet pressure indicator accessory kit
M52808480	CXS Exhaust pressure indicator accessory kit
M52809160	CXS Inlet temperature indicator accessory kit
M52809170	CXS Exhaust temperature indicator accessory kit

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

Light Duty includes Shaft Seal Purges (SSP) only for clean applications.

Medium Duty + includes SSP, gas ballast, inlet purge, solvent flush and exhaust pressure monitoring for harsh processes.

These products are our offering for the majority of applications.

A comprehensive 'matrix' of CXS products are available including the following:

- Containment safety ATEX CAT2 products with integral Flame Arrestors
- Fully systemised ATEX CAT 1 external / CAT2 external products
- T160 and T4 products

Please consult your Edwards Sales or Applications specialist for assistance with the correct product selection.



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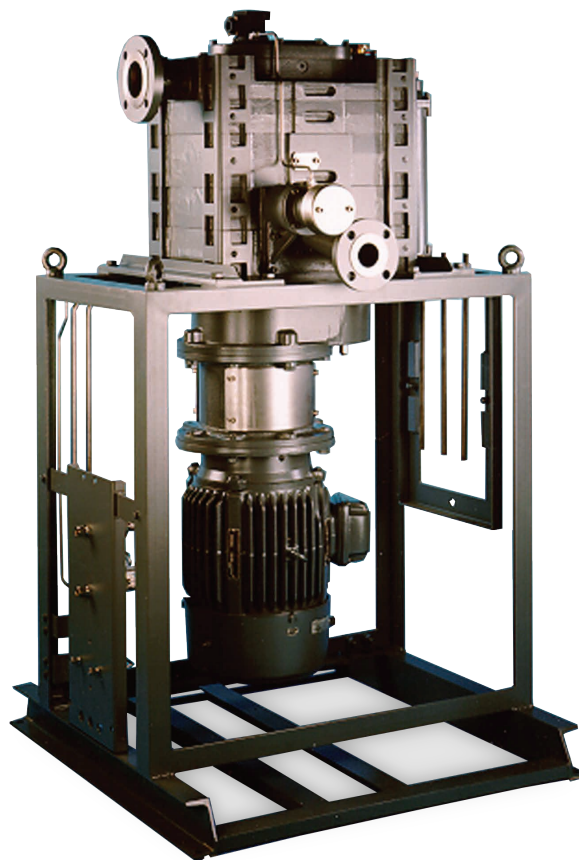
EDP CHEMICAL DRY VACUUM PUMP

edwardsvacuum.com

Edwards, a world leader in dry vacuum pump technology, successfully pioneered the use of environmentally friendly dry vacuum pumps in the early 1980s. With hundreds of thousands of systems installed worldwide, Edwards dry pumps create significant benefits for customers in many applications and industries.

This expertise is incorporated in our chemical dry pumps to satisfy the demanding requirements of the chemical, petrochemical and pharmaceutical industries. We offer a range of four pumps with 80 - 400 m³h⁻¹ capacity, and ultimate vacuums of less than 1 mbar. Our chemical dry pumps meet the highest safety and performance standards.

EDP pumps are based on Edwards' oil-free, non-contacting, award-winning, reverse claw mechanism. They provide consistent vacuum at high efficiencies and low costs of ownership. Dry pumps completely eliminate all problems of process contamination and the creation of polluted effluent, which are experienced with traditional wet vacuum pump technologies.



Features and benefits

- 1 Industry proven, tried and tested
 - Specifically designed for chemical applications
- 2 Designed and tested for safety and reliability
 - Stable operation, even during process upsets
- 3 Low cost of ownership
 - Easy maintenance, low utilities consumption and no cooling gas injection required

PRODUCT DATA SHEET

Specifications

	Units	EDP80		EDP160		EDP250		EDP400	
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Maximum pumping speed	m ³ h ⁻¹	83	102	163	202	260	320	377	427
	ft ³ min ⁻¹	49	60	96	119	153	188	222	251
Capacity at 10 mbar (7.5 Torr)	m ³ h ⁻¹	75	102	153	198	255	315	377	422
	ft ³ min ⁻¹	44	60	90	117	150	185	222	248
Ultimate vacuum	mbar	0.5	0.3	0.5	0.3	0.5	0.2	0.4	0.2
	Torr	0.4	0.2	0.4	0.2	0.4	0.2	0.3	0.2
Maximum back pressure - standard (optional*)	mbar	1150 (1300*)		1150 (1300*)		1150 (1300*)		1150	
	psig	2.2 (4.4*)		2.2 (4.4*)		2.2 (4.4*)		2.2	
Power consumption at 10 mbar (7.5 Torr)	kW	3.3	4.0	4.9	4.9	6.0	6.0	7.0	7.0
	hp	4.4	5.4	6.6	6.6	8.0	8.0	9.4	9.4
Standard motor (380 - 400V, 3 ph, 50 Hz)	kW	5.5	5.5	7.5	11.0	11.0	15.0	18.5	25.0
Standard motor (200 - 460V, 3 ph, 60 Hz)	hp	7.5	7.5	10.0	15.0	15.0	20.0	25.0	30.0
Cooling water flow rate (adjustable)	l min ⁻¹	1 - 8	1 - 10	1 - 8	1 - 10	1 - 10	1 - 10	1 - 10	1 - 10
	gal min ⁻¹	0.3 - 2.1	0.3 - 2.6	0.3 - 2.1	0.3 - 2.6	0.3 - 2.6	0.3 - 2.7	0.3 - 2.6	0.3 - 2.7
Cooling water supply pressure	barg	2 - 10							
	psig	29 - 145							
Seal purge flow (maximum), regulated to 0.3 - 0.5 barg (5 - 7 psig)	l min ⁻¹	20							
	ft ³ min ⁻¹	0.7							
Seal purge supply pressure (minimum - maximum)	barg	2 - 10							
	psig	29 - 145							
Noise (max. with exhaust silencer)	dB(A)	73	73	77	78	79	79	82	82
	kg	648	650	747	756	848	860	918	960
Weight (with frame and standard motor)	lbs	1429	1433	1647	1667	1870	1909	2024	2116
	ANSI/DIN	2"/DN50		3"/DN80		3"/DN80		3"/DN80	
Process connection, inlet	ANSI/DIN	1.5"/DN40		1.5"/DN40		2"/DN50		2"/DN50	
Process connection, outlet	3 stage reversed claw								

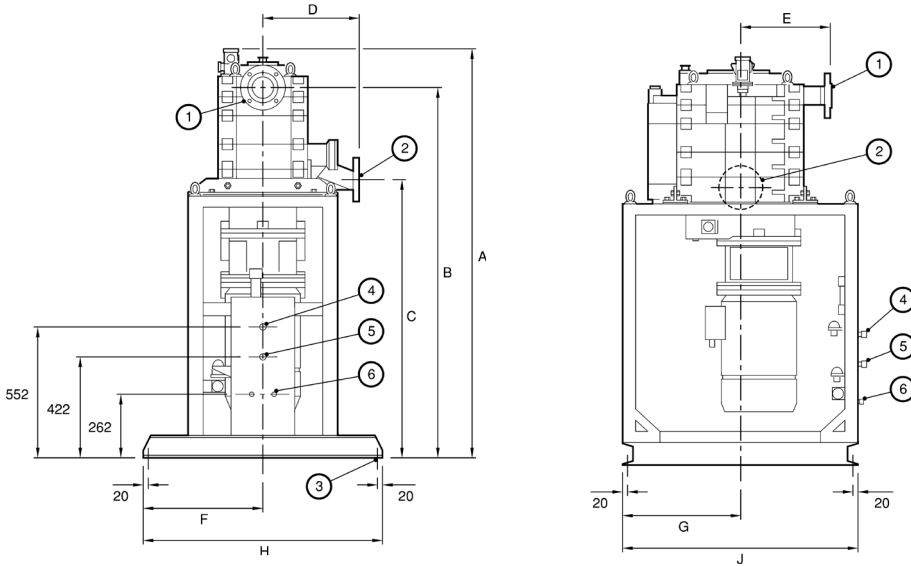
* Consult Edwards

Data shown here refers to dry pumps only. Higher capacities and deeper vacuum levels are available by combining one or more dry mechanical boosters with EDP pumps. A wide range of systemisation accessories is also available, including condensers for enhanced performance and a number of safety, instrumentation and control options.

Although every care has been taken in the preparation of data and dimensional drawings, please discuss your individual requirements with Edwards.

PRODUCT DATA SHEET

Dimensions - mm (inch)

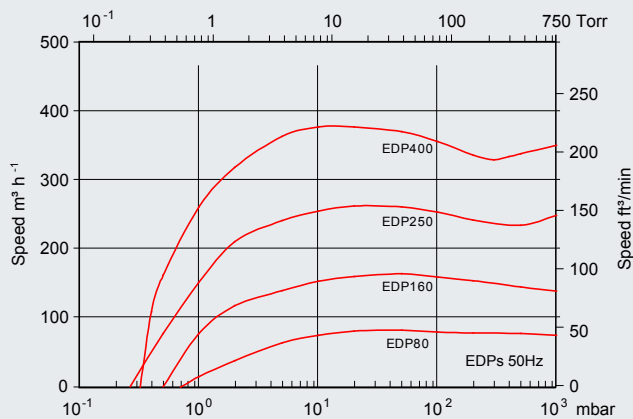


1. Pump inlet
2. Pump outlet
3. Fixing hole: Ø18 mm (4 off)
4. Cooling water outlet connection
5. Cooling water inlet connection
6. Nitrogen supply inlet connection

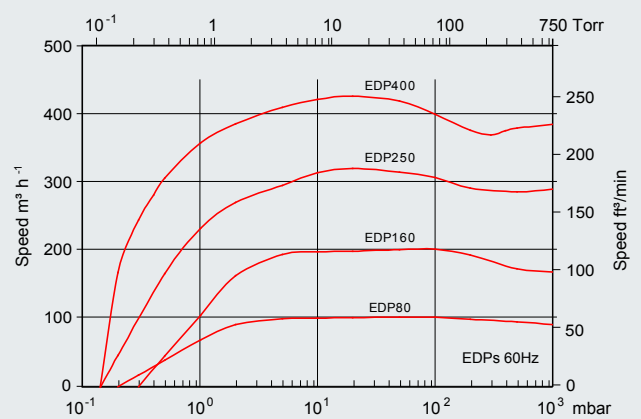
Key	EDP80	EDP160	EDP250	EDP400 50 Hz	EDP400 60 Hz
A	1423 (56.0)	1458 (57.4)	1681 (66.2)	1730 (68.1)	1721 (67.8)
B	1254 (49.4)	1289 (50.7)	1514 (59.6)	1562 (61.5)	1549 (61.0)
C	974 (38.3)	974 (38.3)	1148 (45.2)	1148 (45.2)	1149 (45.2)
D	353 (13.9)	353 (13.9)	377 (14.8)	377 (14.8)	349 (13.7)
E	443 (17.4)	448 (17.6)	359 (14.1)	359 (14.1)	362 (14.3)
F	350 (13.8)	350 (13.8)	500 (19.7)	500 (19.7)	476 (18.7)
G	350 (13.8)	350 (13.8)	475 (18.7)	475 (18.7)	476 (18.7)
H	700 (27.6)	700 (27.6)	1000 (39.4)	1000 (39.4)	997 (39.3)
J	850 (33.5)	850 (33.5)	950 (37.4)	950 (37.4)	946 (37.2)

Performance

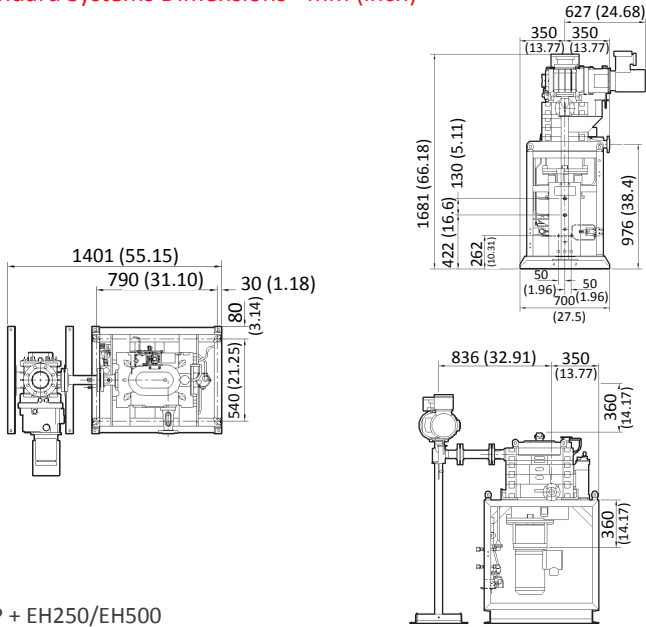
Performance curve - 50 Hz



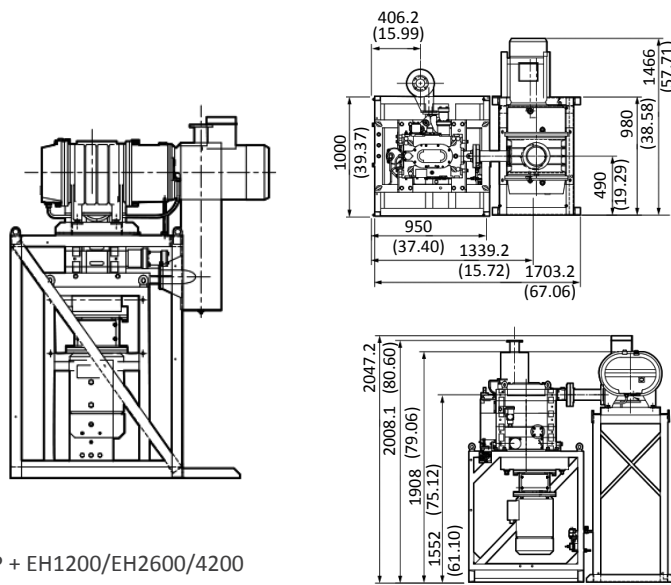
Performance curve - 60 Hz



Standard Systems Dimensions - mm (inch)



EDP + EH250/EH500



EDP + EH1200/EH2600/4200

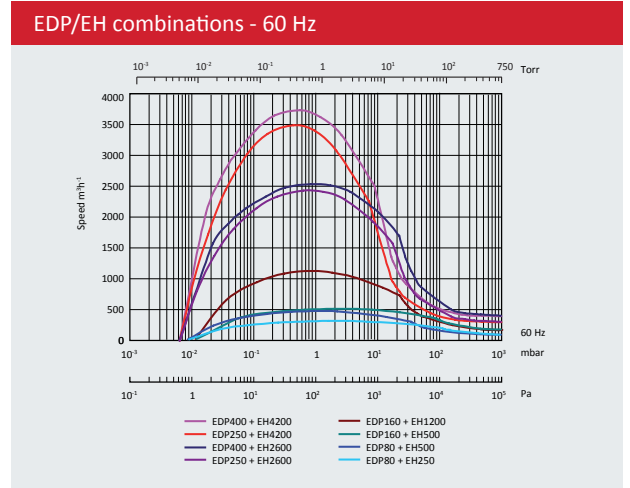
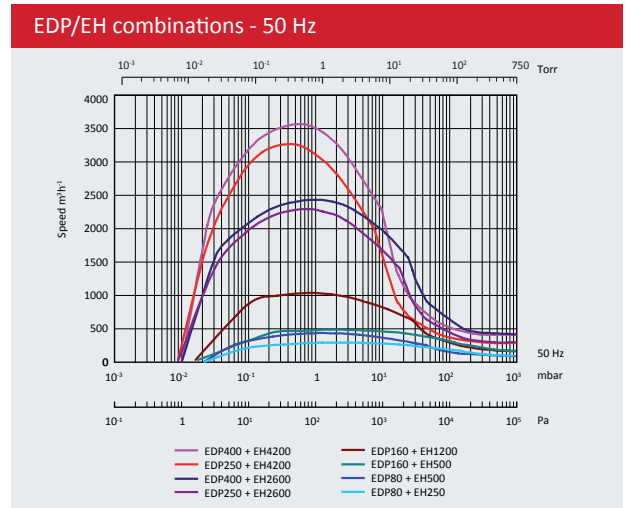
Other combinations available.
Height and width dimensions will differ if using larger or smaller boosters.

Systemisation

- Custom systemisation design and build service
- Pre-engineered modules
- Tailored applications support to match performance to process

For performance with booster combinations, please refer to data below:

Performance curves



GLOBAL CONTACTS

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EH MECHANICAL BOOSTER PUMPS

edwardsvacuum.com

The EH Mechanical Booster range gives our customers reassurance and peace of mind thanks to its large installed base, both in Industrial and Chemical markets. EH pumps, available in sizes from 250 to 4200 m³h⁻¹ displacement, feature the unique hydrokinetic drive, providing an efficient power transmission with benefits in economy, performance and compactness.



Increased productivity

The unique Hydro kinetic drive allows the pump to operate from atmospheric pressure leading to fast pump down times.



Simple installation

No need for pressure switches, bypass lines or variable frequency drives.



Reliability

Robust and safe operation - Automatic overload protection, reliable shaftseal design.



Reassurance

Peace of mind - Industry proven, with a large installed base.

Technical data

	Units	EH250	EH500	EH1200	EH2600	EH4200
Displacement 50 Hz	m ³ h ⁻¹ /cfm	310/185	505/300	1195/715	2590/1525	4140/2440
Displacement 60 Hz	m ³ h ⁻¹ /cfm	375/220	605/335	1435/845	3110/1830	4985/2935
Inlet connection		ISO63	ISO100	ISO160	ISO160	ISO250
Outlet connection						
Pressure differential across pump 50 Hz	mbar/torr	0-180/0-140	0-110/0-83	0-90/0-68	0-120/0-90	0-70/0-52
Pressure differential across pump 60 Hz	mbar/torr	0-150/0-115	0-90/0-68	0-75/0-56	0-67/0-50	0-50/0-38
Weight	kg/lb	69/152	106/233	149/328	401/882	481/1058
Dimensions (L, W, H)	mm	705, 305, 272	791, 305, 265	953, 380, 334	1156, 522, 479	1336, 522, 479
Motor Power 50 Hz	kW/hp	2.2/3	2.2/3	3.0/4	11.0/15	11.0/15
Motor Power 60 Hz	kW/hp	2.2/3	2.2/3	3.0/4	11.0/15	11.0/15
Oil capacity gear case	litre	N/A	N/A	1.25	3.5	3.5
Oil capacity coupling cover	litre	1.5	1.5	2.4	6.5	6.5
Oil capacity shaft seal reservoir	litre	0.125	0.125	0.125	0.15	0.15
Water cooling req	lhr ¹ /gal min ⁻¹	N/A air cooled	N/A air cooled	120/0.53	250/1.1	250/1.1
Recommended oil		Ultragrade® 20 Fomblin® Y16/6	Ultragrade® 20 Fomblin® Y16/6	Ultragrade® 20 Fomblin® Y16/6	Ultragrade® 20 Fomblin® Y16/6	Ultragrade® 20 Fomblin® Y16/6

Ordering information

Oil type	Voltage	EH250	EH500	EH1200	EH2600	EH4200
"Hydrocarbon oil (Oil supplied with pump)"	200V 50HZ IE3	A30105934	A30205934	A30505934	A30705934	A30905934
	380-400V 50HZ IE3	A30105945	A30205945	A30505945	A30705945	A30905945
	200V 60HZ, 380V 60HZ IE3	A30106934	A30206934	A30506934	A30706934	A30906934
	230 / 460V 60HZ IE3	A30106946	A30206946	A30506946	A30706946	A30906946
PFPE Prepared FX (Oil to be ordered separately)	200V 50HZ IE3	A30107934	A30207934	A30507934	A30707934	A30907934
	380-400V 50HZ IE3	A30107945	A30207945	A30507945	A30707945	A30907945
	200V 60HZ, 380V 60HZ IE3	A30108934	A30208934	A30508934	A30708934	A30908934
	230 / 460V 60HZ IE3	A30108946	A30208946	A30508946	A30708946	A30908946

For Chemical, ATEX versions, contact Edwards

Applications

- Semiconductor processing
- Vacuum distillation
- Vacuum packaging
- Steel degassing
- Thin film coating
- Vacuum metallurgy
- Low density wind tunnels
- Space simulation
- Vacuum impregnation
- Oil drying and degassing
- Pharmaceutical freeze drying
- CO₂ lasers

GLOBAL CONTACTS

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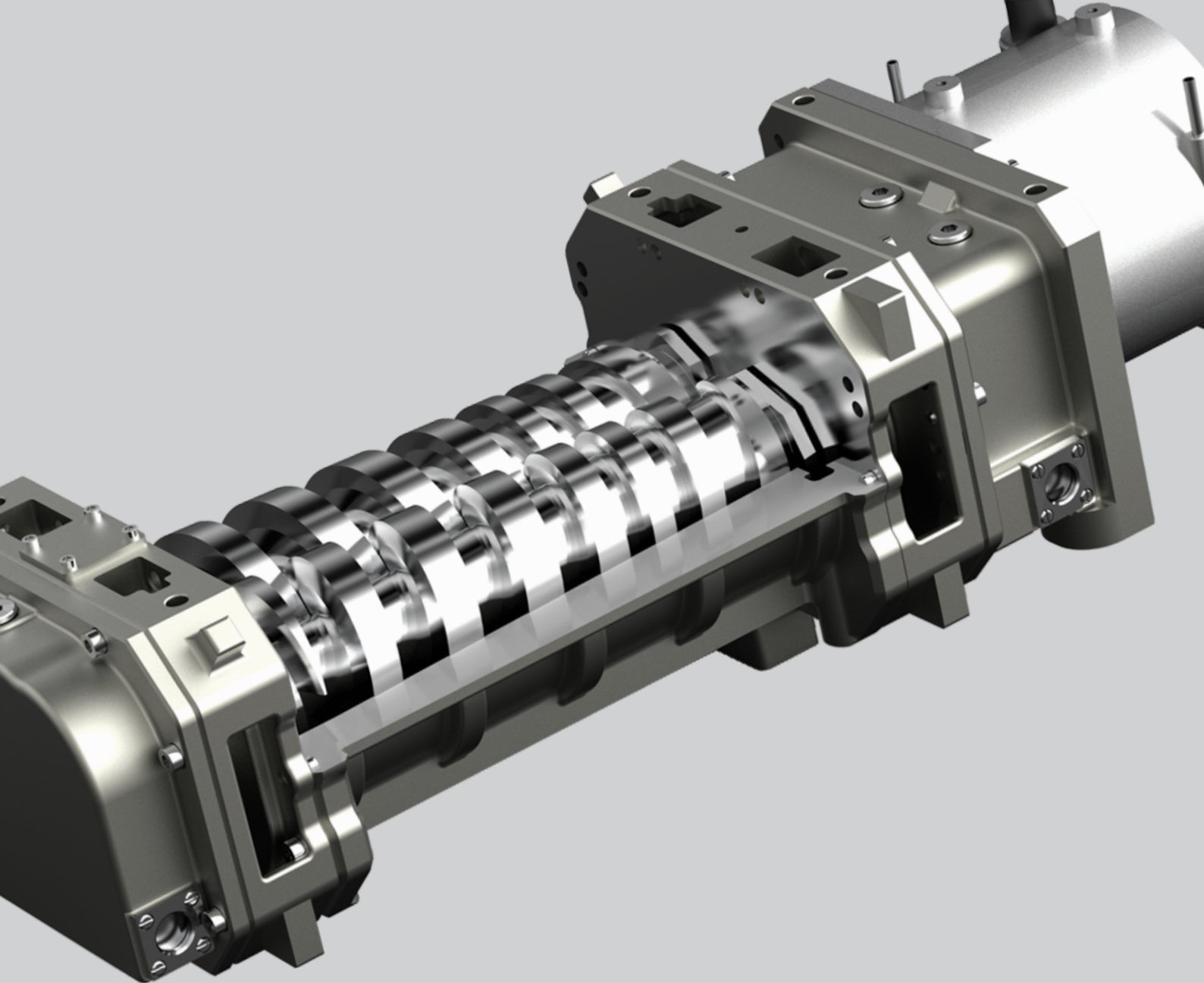
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GXS DRY SCREW VACUUM PUMPS





EDWARDS THE PARTNER OF CHOICE

Edwards is a world leader in the design, technology and manufacture of vacuum pumps with over 95 years' history and more than 75 years' manufacturing experience.

Edwards believes in delivering results that bring value to our customers by using our breadth of industry experience to identify and apply solutions to your problems. Using the most innovative and up-to-date modelling techniques, we can optimise the pumping configuration for customers to provide a system design giving the maximum performance in the most reliable and cost-effective way.

GXS DRY SCREW PUMPS AND COMBINATIONS

Our new GXS dry pumps take vacuum performance to the next level. With unique screw technology and world leading high efficiency drives, enabling advanced temperature control and long service intervals, you are guaranteed best-in-class pumping speeds and low running costs for many years to come.

Fast – *Reduced pump down times with ultimate vacuum of 5×10^{-4} mbar*

- **Increased productivity:** faster process
- **Improved product quality:** better ultimate vacuum

Robust – *Reliable operation even in harsh industrial applications*

- **Low maintenance cost:** no unplanned down-time
- **Increased productivity:** longer intervals between service

Intelligent – *On-board controller with extensive communication and automated control capabilities*

- **Reduced installation costs:** easy integration with other systems
- **Safe operation, consistent output:** automated control of your process

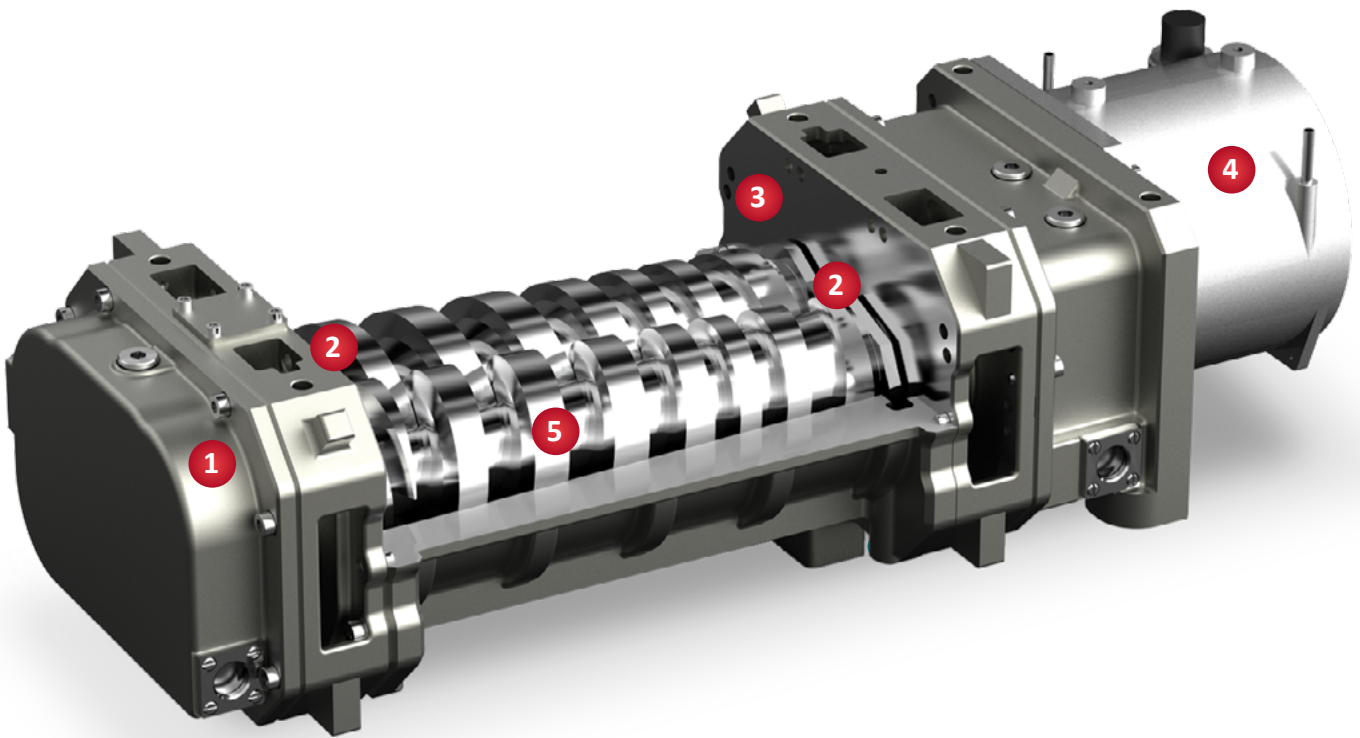
Economical – *Affordable capital investment and low cost of ownership*

- **Substantial savings:** low utilities and energy usage costs
- **Save on space:** small footprint

Environmental – *Smooth, quiet running with low power and utilities consumption*

- **Small carbon footprint:** low power and utilities usage
- **Easy on environment:** no contaminated or dirty disposable oil

GXS innovative screw technology



1

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

2

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

3

Advanced shaft sealing technology

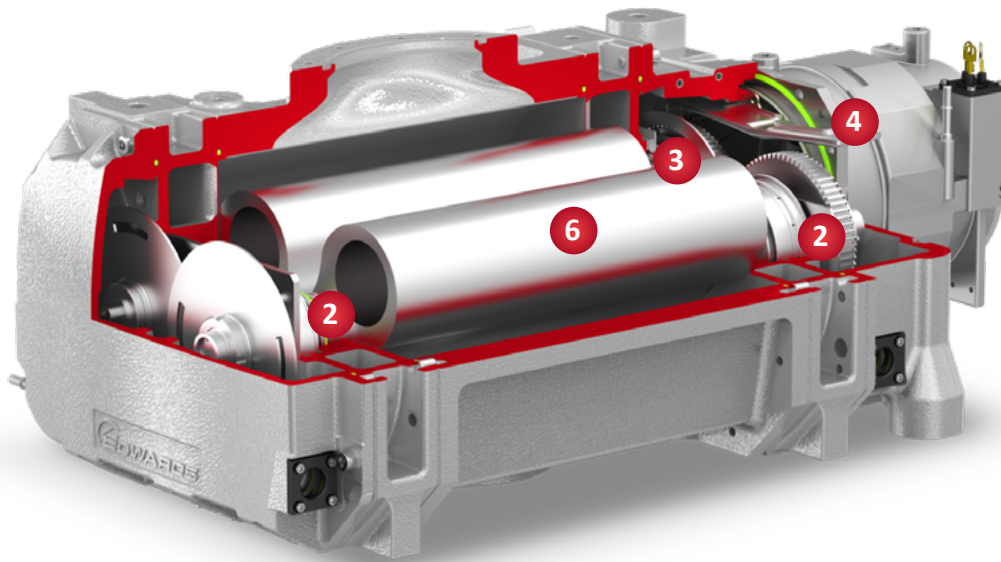
- Non-contacting long-life seals with integral oil blocking labyrinth seal provides for highly effective sealing
- Combined with a six litre per minute seal purge the gearbox is protected from contamination and the vacuum space is kept free of oil

Fully enabled intelligent on-board control panel

- Running mode and fault status indicator with soft button control
- True “plug and pump” capability for immediate operation
- Intelligently programmed with automatic start/stop routines, power saving, green mode AUC and self cleaning options
- Remote control and monitoring functionality through Ethernet and serial connectors (including Profibus, simple text control protocol, and discrete hard-wired I/O options)
- Optional Pump Display Terminal (PDT) for improved diagnostic and configuration capacity



GXS booster



4

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

5

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 without a silencer

6

Roots booster mechanism

- High efficiency vacuum booster design
- Optimised for maximum performance with automatic thermal management



Applications

Metallurgy

- Vacuum Brazing
- E-beam welding
- Nitro carburising
- Low pressure nitriding
- Low pressure carburising
- Carbon vapour impregnation
- Sintering
- Metal injection moulding
- Precision investment casting
- Electroslag remelting
- Vacuum induction melting
- Vacuum arc refining
- Steel degassing

Coating

- Roll web coating
- Hard coating (CVD/DLC)
- Surface activation
- Plasma spray
- Glass coating

Drying

- Freeze drying
- Bushing filling
- Transformer drying
- Pipeline drying
- Capacitor drying
- Lithium-Ion battery drying

Plasma processes

- Plasma welding
- Plasma nitriding

Solar

- Silicon crystal-pulling
- PV lamination

LED manufacture

Vacuum chamber evacuation

- Space simulation chambers
- Gas recovery/circulation
- Load lock chambers

Customised solutions for your application

Whether you require a single pump, pump and booster combination or complete vacuum system, we have a range of pumps designed to provide optimal performance in a wide range of applications.

Following are some typical applications where GXS is used. There are several other applications where GXS is suitable. For detailed advice and availability, please consult one of our application engineers.

Application	GXS Pump type					Recommended Accessories	
	LIGHT DUTY Shaft Seal Purge only	MEDIUM DUTY Shaft Seal Purge plus adjustable Gas Ballast. Inlet purge on start up and shut down	MEDIUM DUTY 450 / 750 As standard Medium duty + option of additional Gas Ballast	MEDIUM DUTY + As Medium Duty plus HIGH FLOW PURGE ONLY at shutdown	MEDIUM DUTY + High Flow Purge AND SOLVENT FLUSH at shutdown	INLET FILTER Metal mesh type	SILENCER Cleanable and drainable type
Annealing	✓						
CVI carbon vapour impregnation		✓	✓		✓	✓	✓
EB welding		✓				✓	
Gas quenching	✓						
LPC low pressure carburising		✓	✓		✓*	✓	✓
LPN low press. Nitriding	✓						
Sintering (Metal Injection Molding) & debinding		✓	✓		✓**		
Oil quenching		✓				✓	
PIC precision investment casting & fast cycling		✓		✓		✓	
Plasma nitriding (PN)	✓						
Tempering	✓						
Vacuum brazing		✓			✓	✓	
VAR		✓	✓	✓		✓	
VIM		✓	✓	✓		✓	

* use MD+ for LPC with propane

** use MD+ for waxy binders

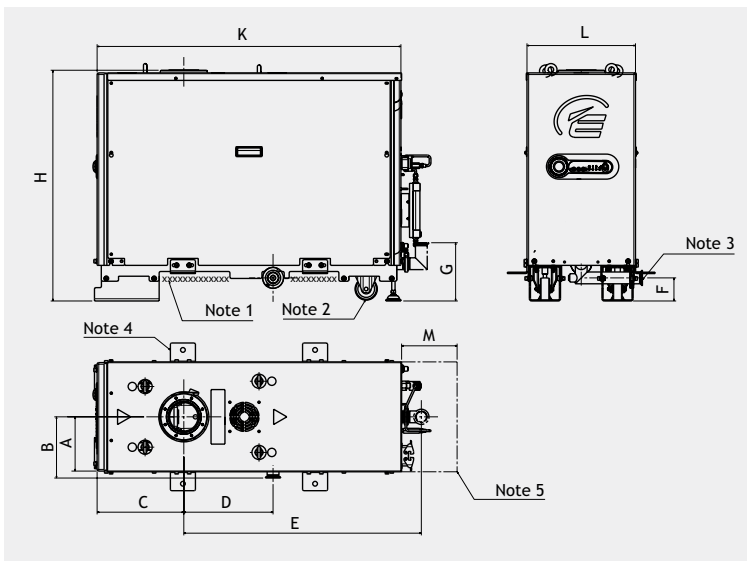
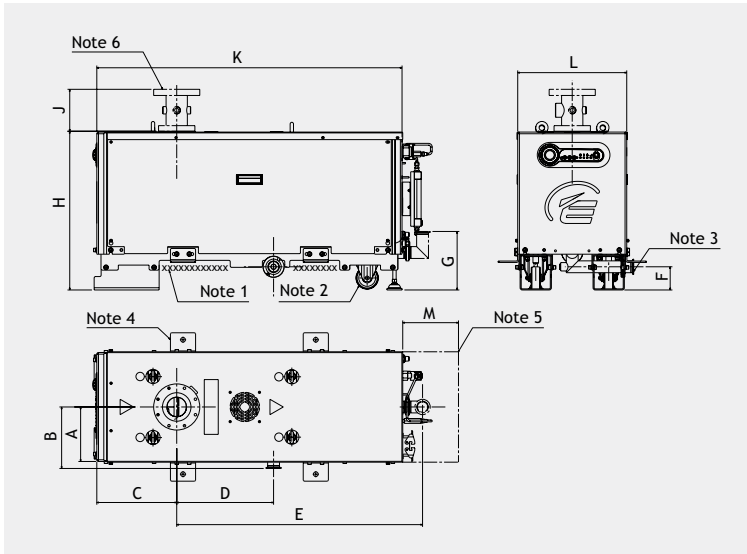
Technical data

		Unit	GXS160	GXS160/1750	GXS250	GXS250/2600
Peak Pumping Speed		m ³ /hr (cfm)	160 (94)	1200 (706)	250 (147)	1900 (1118)
Ultimate Pressure (without purge)		mbar (Torr)	7x10 ⁻³ (5.3x10 ⁻³)	7x10 ⁻⁴ (5.3x10 ⁻⁴)	4x10 ⁻³ (3.0x10 ⁻³)	5x10 ⁻⁴ (3.8x10 ⁻⁴)
Full Load Power	@ ultimate pressure	kW (hp)	3.8 (5.1)	5.1 (6.8)	4.0 (5.4)	5.3 (7.1)
	@ peak pumping load	kW (hp)	5.0 (6.7)	7.4 (9.9)	9.0 (12.1)	9.7 (13.0)
Electrical	Supply options	High volt	380-460V 3Ø 50/60Hz		380-460V 3Ø 50/60Hz	
		Low volt	200-230V 3Ø 50/60Hz		200-230V 3Ø 50/60Hz	
	Connection	High volt	Harting Han K 4/4-F		Harting Han K 4/4-F	
		Low volt				
Vacuum Couplings	Inlet		ISO63	ISO100	ISO63	ISO160
	Exhaust		NW40		NW40	
Cooling Water	Supply pressure (max)	bar (psig)	6.9 (100)		6.9 (100)	
	DP across pump (min)	bar (psig)	1.0 (14.7)		1.0 (14.7)	
	Flow @ min DP	l/min (gal/min)	4.0 (1.1)	7.0 (1.9)	4.0 (1.1)	7.0 (1.9)
	Temperature	°C (°F)	5-40 (41-104) All variants		5-40 (41-104) All variants	
	Connection		3/8" BSP Male (G 3/8")		3/8" BSP Male (G 3/8")	
Purge Gas*	Pressure	bar (psig)	2.5-6.9 (36-100)		2.5-6.9 (36-100)	
	Light Duty	sl/min	12		12	
	Medium Duty	sl/min	18-52		18-52	
	Connection		Swagelok® Ø ¼" tube with olive		Swagelok® Ø ¼" tube with olive	
High Flow Purge/ Solvent Flush	Supply pressure	bar (psig)	2.5-6.9 (36-100)		2.5-6.9 (36-100)	
	Control valve connection		Swagelok® Ø 3/8" tube with olive		Swagelok® Ø 3/8" tube with olive	
	Filter connection		½" NPT Male		½" NPT Male	
	Solvent connection		3/8" BSP Male (G 3/8")		3/8" BSP Male (G 3/8")	
Mass		Kg (lbs)	305 (672)	475 (1047)	305 (672)	515 (1035)
Noise (with suitable exhaust pipe)		dB(A)	<64		<64	
Operating Temperature		°C (°F)	5-40 (41-104)		5-40 (41-104)	
Exhaust Back Pressure (MAX)		mbar (psia)	1400 (20)		1400 (20)	
System IP rating	Standard		21D		21D	
Lubrication	Type		PFPE Drynert® 25/6		PFPE Drynert® 25/6	
	Volume	l (gal)	0.7 (0.2)	1.4 (0.4)	0.7 (0.2)	1.4 (0.4)
Monitoring & Control	Standard	Control	Front panel "Dashboard" Serial - RS232		Front panel "Dashboard" Serial - RS232	
		Monitoring	Ethernet Webserver		Ethernet Webserver	
	Option	Control	Parallel - MCM MicroTIM		Parallel - MCM MicroTIM	
		Control & Monitoring	Profibus DP Pump Display Terminal (PDT)		Profibus DP Pump Display Terminal (PDT)	
		Monitoring	FabWorks®		FabWorks®	
*Pump combinations	Light duty		Shaft Seal Purge only		Shaft Seal Purge only	
	Medium duty		Shaft Seal Purge, High Vac Purge, Inlet Purge, variable Gas Ballast & Exhaust Purge (with Exhaust Pressure Sensor)		Shaft Seal Purge, High Vac Purge, Inlet Purge, variable Gas Ballast & Exhaust Purge (with Exhaust Pressure Sensor)	
	Medium duty +		As Medium duty, plus High Flow Purge / Solvent Flush		As Medium duty, plus High Flow Purge / Solvent Flush	

* 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), Medium duty plus: As Medium duty, plus High Flow Purge/Solvent Flush

GXS450	GXS450/2600	GXS450/4200	GXS750	GXS750/2600	GXS750/4200
450 (265)	2200 (1295)	3026 (1781)	740 (436)	2300 (1354)	3450 (2031)
5×10^{-3} (3.8x10 ⁻³)	5×10^{-4} (3.8x10 ⁻⁴)		3×10^{-3} (2.3x10 ⁻³)	5×10^{-4} (3.8x10 ⁻⁴)	
7.2 (9.6)	8.8 (11.8)	9.4 (12.6)	10.0 (13.4)	11.1 (14.9)	11.5 (15.4)
17.3 (23.2)	20.0 (26.8)	21.1 (28.3)	37.0 (49.6)	40.0 (53.6)	40.0 (53.6)
380-460V 3Ø 50/60Hz			380-460V 3Ø 50/60Hz		
200-230V 3Ø 50/60Hz			200-230V 3Ø 50/60Hz		
Harting Han K 4/4-F		Harting Han 100A-F		Harting Han 100A-F	
				Harting Han 200A-F	
ISO100		ISO160		ISO100	
		NW50		NW50	
		6.9 (100)		6.9 (100)	
1 (15)		1 (15)		0.75 (11)	
10 (2.6)		12 (3.2)		15 (4)	
5-40 (41-104) All variants			5-40 (41-104) High Volt variants		
			5-30 (41-86) Low Volt variants		
1/2" BSP Male (G 1/2")			1/2" BSP Male (G 1/2")		
2.5-6.9 (36-100)			2.5-6.9 (36-100)		
12			12		
18-146			18-146		
Swagelok® Ø ¼" tube with olive			Swagelok® Ø ¼" tube with olive		
2.5-6.9 (36-100)			2.5-6.9 (36-100)		
Swagelok® Ø 3/8" tube with olive			Swagelok® Ø 3/8" tube with olive		
½" NPT Female			½" NPT Female		
3/8" BSP Male (G 3/8")			3/8" BSP Male (G 3/8")		
640 (1411)	860 (1996)	868 (1914)	640 (1411)	908 (2002)	953 (2101)
<64			<70		
5-40 (41-104)			5-40 (41-104)		
1400 (20)			1400 (20)		
21D			21D		
PFPE Drynert® 25/6			PFPE Drynert® 25/6		
1.8 (0.5)	2.5 (0.7)	3.6 (1.0)	2.4 (0.6)	3.1 (0.8)	4.2 (1.1)
Front panel "Dashboard" Serial - RS232			Front panel "Dashboard" Serial - RS232		
Ethernet Webserver			Ethernet Webserver		
Parallel - MCM MicroTIM			Parallel - MCM MicroTIM		
Profibus DP Pump Display Terminal (PDT)			Profibus DP Pump Display Terminal (PDT)		
FabWorks®			FabWorks®		
Shaft Seal Purge & High Vac Purge only			Shaft Seal Purge & High Vac Purge only		
Shaft Seal Purge, High Vac Purge, Inlet Purge, variable Gas Ballast & Exhaust Purge (with Exhaust Pressure Sensor)			Shaft Seal Purge, High Vac Purge, Inlet Purge, variable Gas Ballast & Exhaust Purge (with Exhaust Pressure Sensor)		
As Medium duty, plus High Flow Purge / Solvent Flush			As Medium duty, plus High Flow Purge / Solvent Flush		

Dimensions



Notes:

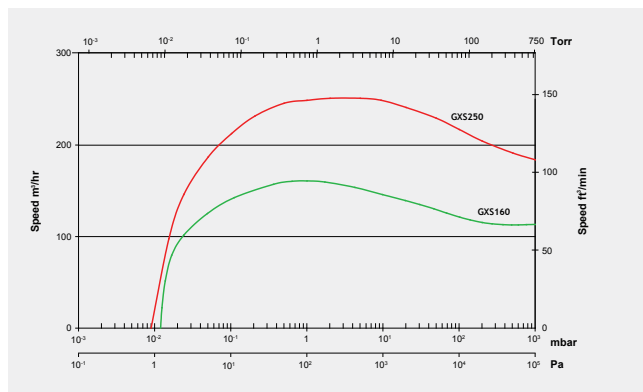
- xxxxxx indicate forklift/pallet truck access points.
- Pumps are available either with skids (side-exit exhaust) or castors (rear-exit exhaust). Both options are shown for clarity.
- Pumps supplied with side or rear exhaust only; both options shown in views. The side exhaust outlet direction is customer adjustable.
- Earthquake restraints are provided only for pumps with castors.
- Minimum required service area for access to the rear panel connections.
- The High-Flow Purge / Solvent Flush accessory is located outside of the pump enclosure for dry pump only. It is inside the enclosure for pump/booster combinations.

	A	B	C	D	E	F	G	H	J	K	L	M
GXS160			285.9 (11.26)	346.5 (13.64)	879.5 (34.63)			568 (22.36)	150 (5.9)			
GXS250	195 (7.68)	220 (8.66)					209.4 (8.24)			1092 (42.99)	390 (15.35)	250 (9.84)
GXS160/1750			311.6 (12.27)	320.8 (12.63)	853.8 (33.61)			829.5 (32.66)				
GXS250/2600												
GXS450			394 (15.51)	300 (11.81)	871.6 (34.31)					1186 (46.69)		
GXS750			576.4 (22.69)	413 (16.23)	1133.6 (44.63)	83 (3.27)		717 (28.23)	150 (5.9)	1622 (63.86)		
GXS450/2600	258.5 (10.18)	283.5 (11.16)					261.4 (10.29)				517 (20.35)	250 (9.84)
GXS450/4200			361.8 (14.24)		903.8 (35.58)					1186 (46.69)		
GXS750/2600				332.3 (13.08)				1030.5 (40.57)				
GXS750/4200			657.2 (25.87)		1052.8 (41.45)					1622 (63.86)		

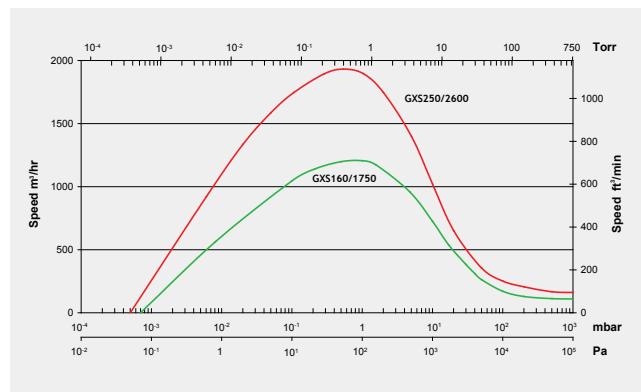
Key pump dimensions: mm (ins)

Performance curves

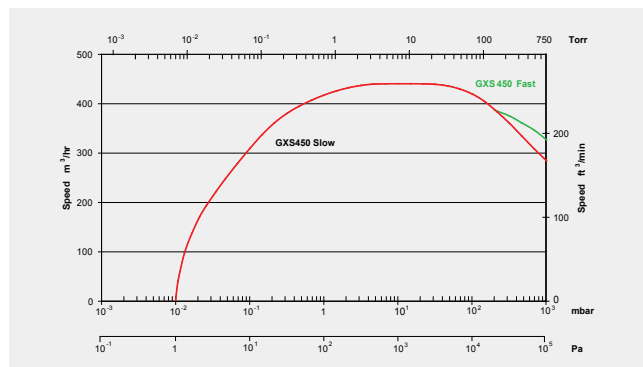
Pumping speed curves for GXS160 & GXS250



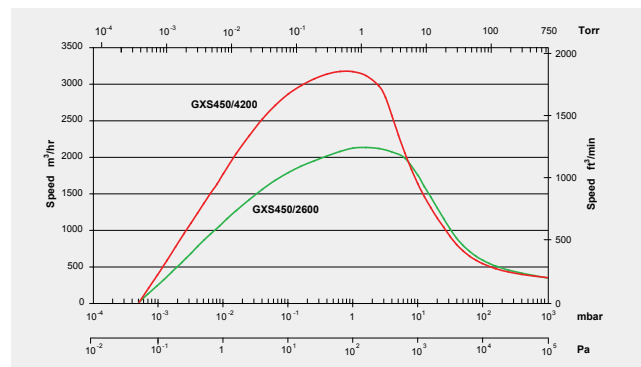
Pumping speed curves for GXS160/1750 & GXS250/2600



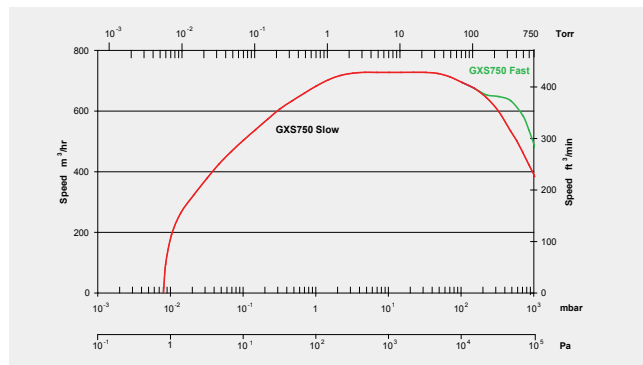
Pumping speed curves for GXS450



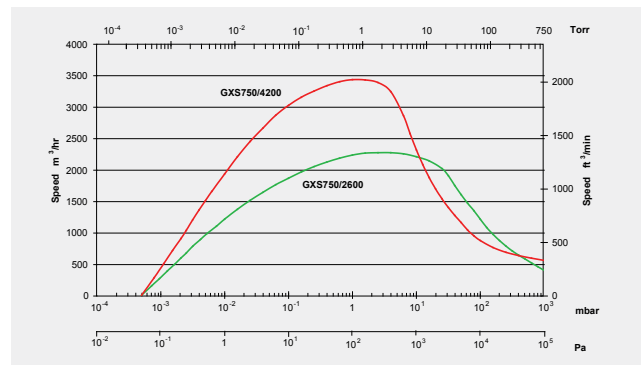
Pumping speed curves for GXS450/2600 & GXS450/4200



Pumping speed curves for GXS750



Pumping speed curves for GXS750/2600 & GXS750/4200



NOTE: Performance curves displayed are with purge.



Accessories

There are a range of accessories available with the GXS to suit a variety of applications. These provide reduced engineering and systemisation resulting in low cost of ownership. All accessories are fully integrated with GXS to provide an efficient and safe system.

Inlet and exhaust accessories

Inlet and exhaust accessories have been especially designed to match the pumping capacities of the GXS range and optimise performance.

- Foreline spool adapters for mounting instrumentation
- Fully integrated Inlet isolation valves
- Inlet filter housing with polyester or stainless steel elements
- Exhaust silencers with cleanable drainable options
- Exhaust check valves

Control and monitoring accessories

We have designed a range of control and monitoring accessories specifically for the GXS range to enable complete integration into your control systems.

- Hand held terminals
- Profibus / Digital interface modules
- Water / N₂ flow monitoring kits
- Pressure and temperature transmitters
- Visual pressure and temperature gauges

Inlet Vacuum Filters

The GXS range of pumps all have excellent powder handling capabilities and under fault conditions they will succeed where other dry vacuum pumps aren't designed to continuously pump solid material so on certain applications an inlet filter would dramatically extend the time between services.

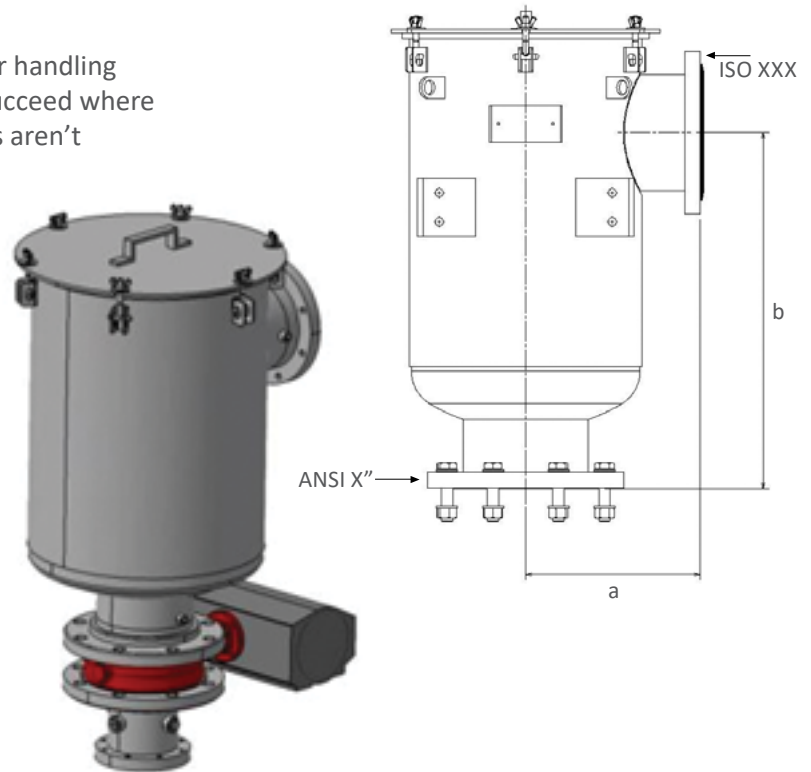
Specifications

Helium leak tested to 1×10^{-6} mbar/l/sec

- Polyester Elements: >99% efficient to $5 \mu\text{m}$
- Rugged carbon steel construction
- Large dirt holding capacity

Options

- Stainless steel housing construction
- Stainless steel mesh filter elements



Pump Type	Recommended Inlet Filter			Inlet Connection ISO Flange	Outlet Connection ANSI Flange	Dimensions	
	Size	CS Part No.	SS Part No.			a	b
All Pump only and 1750 booster combination	4"	M58808005	M58808137	100	4"	254 (10.0)	251 (9.9)
All 2600 booster combinations	6"	M5882805	M58828137	160	6"	305 (12.0)	521 (20.5)
All 4200 booster combinations	8"	M59848005	M59848137	200	8"	305 (12.0)	622 (24.5)

Element Construction	Replacement Filter Element			Particle Size	Efficiency
	4" Part Number	6" Part Number	8" Part Number		
Polyester / Galvanised	A22304363	A22304367	A22304371	5 micron	>99%
Polyester / Stainless Steel	A22304365	A22304369	A22304373	5 micron	>99%
Stainless Mesh	A22304366	A22304370	A22304374	300 micron	90%

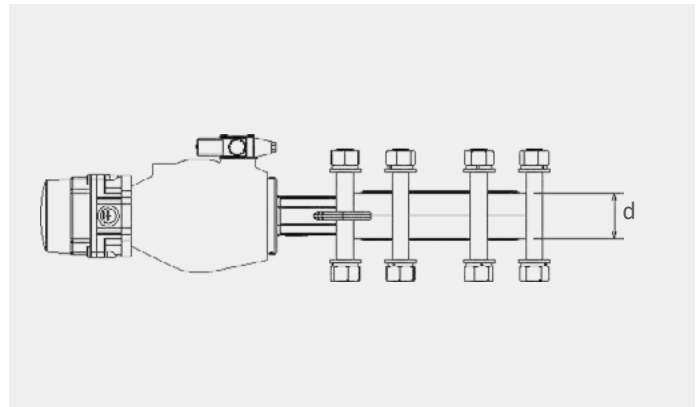
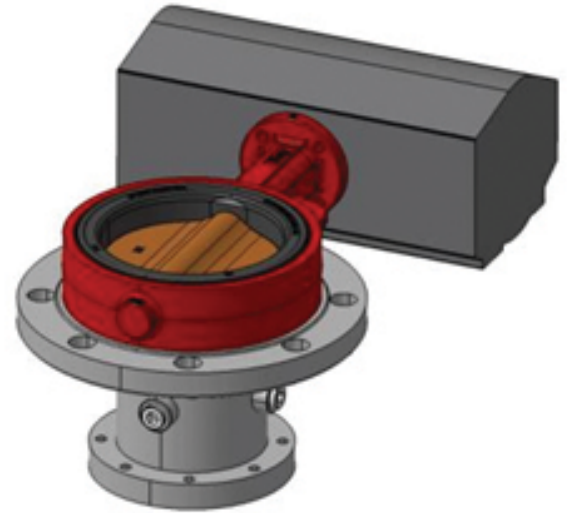
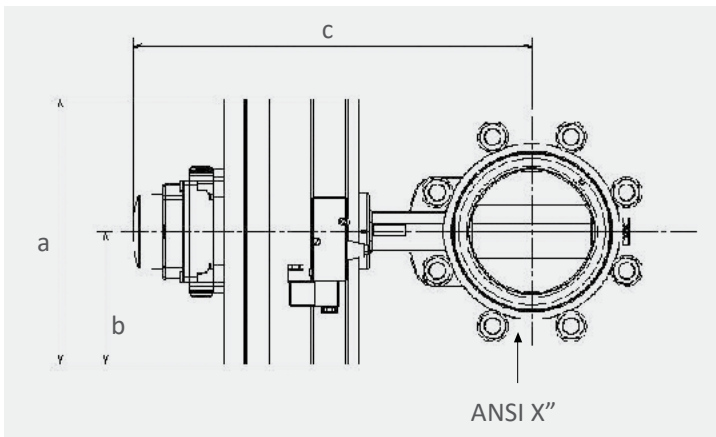
Automatic Inlet Isolation Valves

The automatic GXS isolation valve is designed to fully integrate into the GXS control system to protect the pump and your process.

The valve will close in the event of an alarm or power failure and will isolate the process when in green mode for energy saving between production batches.

Specifications

- Stainless steel and EPDM construction for corrosion resistance
- High CV, low pressure drop
- Pneumatic actuation with spring return
- Fully integrated to enable 'green' energy saving mode
- Protects pump by not allowing it to go online until it is up to operating temperature



Pump Type	Recommended Silencer		Connection ANSI Flange Pattern	Dimensions mm (inches)			
	Size	Part No.		a	b	c	d
All Pump only and 1750 booster combination	4"	M58808004	4"	302 (11.9)	152.5 (6.0)	424.4 (16.7)	51.2 (2.0)
All 2600 booster combinations	6"	M58828004	6"	313 (12.3)	156.5 (6.2)	470 (18.5)	55.3 (2.2)
All 4200 booster combinations	8"	M59848004	8"	452 (17.8)	228 (8.9)	595 (23.4)	59.3 (2.3)

Harsh Duty Exhaust Silencers

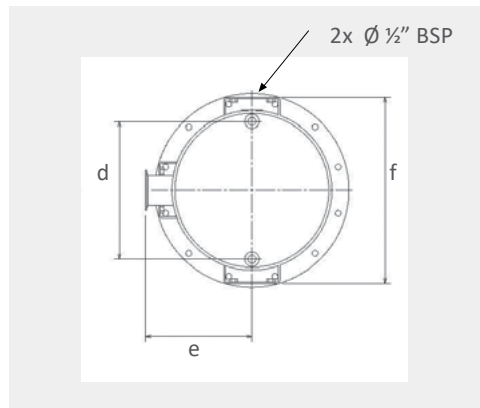
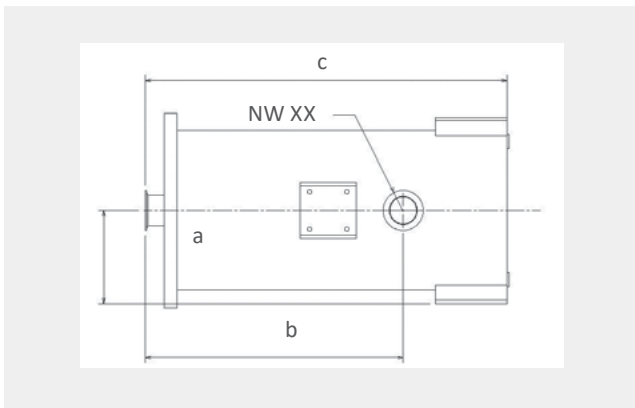
The GXS already has 'best in class' decibel ratings but in some tricky installations noise attenuation is essential. A range of silencers have a bespoke design tailored to the pumping capacity of the GXS high speed screw pumps.

Specifications

- Painted carbon steel or stainless steel construction
- Drainable and cleanable design for condensable / harsh processes
- Greater than 15 dBA noise reduction on some installations

Options

- Drain valve assembly
- Mounting kits



Pump Type	Recommended Silencer		Inlet and exhaust connection type	Dimensions mm (inches)					
	Carbon Steel	Stainless Steel		a	b	c	d	e	f
All GXS 160 and GXS 250	M58808161	M58808162	NW40	105 (4.1)	333 (13.1)	525 (20.7)	132 (5.2)	105 (4.1)	210 (8.3)
All GXS 450 and GXS 750	M59838161	M59838162	NW50	175 (6.9)	485 (19.1)	680 (26.8)	259 (10.2)	200 (7.9)	350 (13.8)

Silencer Mounting Kits



Rear Exhaust (RE)	
GXS 160 / 250 & booster combinations	M58808151
GXS 450 / 750 & booster combinations	M59808151

Side Exhaust (SE)	
GXS 160 / 250 & booster combinations	M58808009
GXS 450 / 750 & booster combinations	M59838009

* SE mounting kit raises pump to accommodate silencer.



Inlet Spools

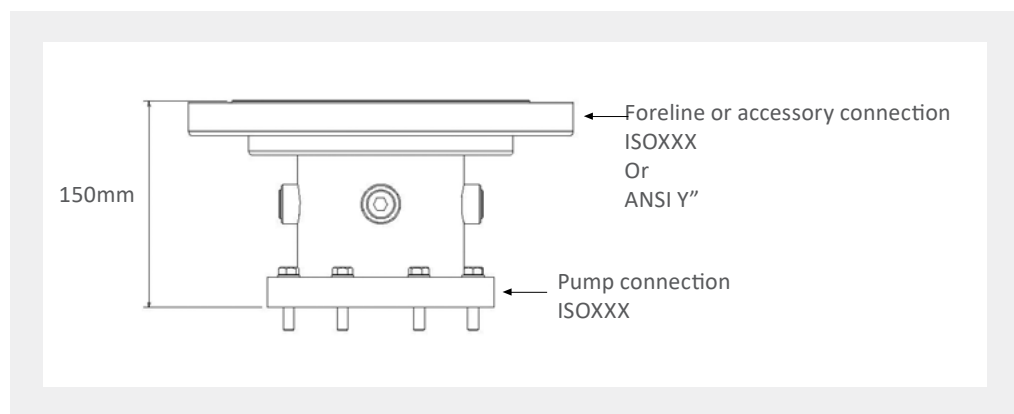
As every installation is different, a range of inlet spools are available for the GXS pumps. These are designed to mount our inlet valves and filters but also have instrumentation ports and the number of options ensure ease of connection to customers pipework.

Specifications

- Painted carbon steel or stainless steel construction
- ½" BSP ports to connect GXS accessories or other ancillary devices
- Sizes available for complete range of GXS pumps and accessories

Options

- Pressure gauge assembly
- Pressure transducer assembly (For PID control)
- Temperature transmitter assembly



Description	Part Number		Mass / Kg	Pump Connection	Foreline / Accessory Connection	Height /mm	Accessory Ports
	Carbon Steel	Stainless Steel					
Inlet spool ISO63 - ANSI 4 inch	M58808002	M58808134	10	ISO63	4 inch ANSI	150	1 x 1 inch BSP female 3 x ¾ inch BSP female
Inlet spool ISO100 - ANSI 4 inch	M59808002	M59808134	12	ISO100	4 inch ANSI	150	1 x 1 inch BSP female 3 x ¾ inch BSP female
Inlet spool ISO100 - ANSI 6 inch	M58938002	M58938134	16	ISO100	6 inch ANSI	150	4 x ¾ inch BSP female
Inlet spool ISO160 - ANSI 6 inch	M58858002	M58828134	20	ISO160	6 inch ANSI	150	4 x ¾ inch BSP female
Inlet spool ISO160 - ANSI 8 inch	M59848002	M59848134	25	ISO160	8 inch ANSI	150	4 x ¾ inch BSP female
Inlet spool ISO163 - ISO100	M58808138	M58808135	9	ISO63	ISO100	150	1 x 1 inch BSP female 3 x ¾ inch BSP female
Inlet spool ISO100 - ISO100	M59808138	M59808135	10	ISO100	ISO100		1 x 1 inch BSP female 3 x ¾ inch BSP female
Inlet spool ISO100 - ISO160	M58828003	M58828135	13	ISO100	ISO160	150	4 x ¾ inch BSP female
Inlet spool ISO160 - ISO160	M58938003	M58938135	15	ISO160	ISO160	150	4 x ¾ inch BSP female
Inlet spool ISO160 - ISO200	M59848003	M59848135	19	ISO160	ISO160	150	4 x ¾ inch BSP female

GXS ordering information

G S 1 0 0 0 0 0

Application

G Industrial

Pump Mechanism

S Screw

Pumps/Boosters

2 160 (7.5 kW)
 5 160 (7.5 kW) / 1750 (5.5 kW)
 7 250 (7.5 kW)
 A 250 (7.5 kW) / 2600 (5.5 kW)
 D 450 (11 kW)
 F 450 (11 kW) / 2600 (7.5 kW)
 G 450 (11 kW) / 4200 (7.5 kW)
 L 750 (22 kW)
 N 750 (22 kW) / 2600 (7.5 kW)
 P 750 (22 kW) / 4200 (7.5 kW)

Lubrication

1 PFPE (Drynert 25/6)

Electrical

2 Low volt 200-230 V 3Ø 50/60 Hz
 5 High volt 380-460 V 3Ø 50/60 Hz

Installation

0 Side exhaust & skids
 5 Rear exhaust & castors

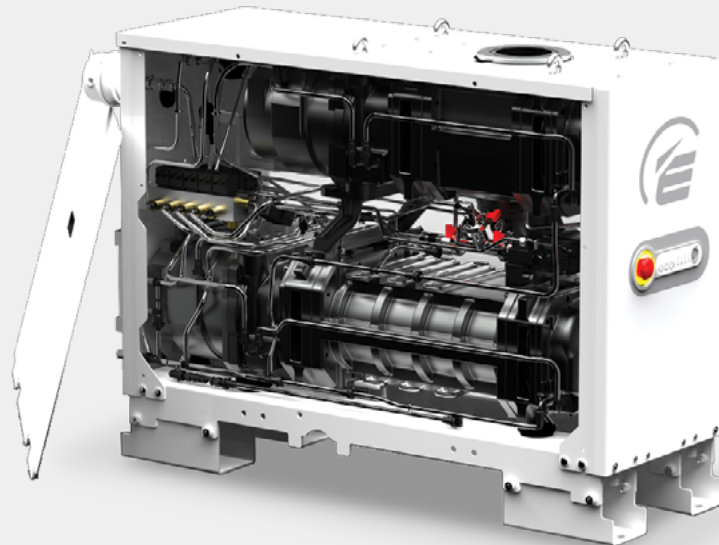
Pump Purges

0 Light Duty (SSP+HVP)
 3 Medium Duty (SSP+HVP+Inlet+GB+Exh PM)
 4 Medium Duty + High Flow Purge/Solvent Flush

SSP = Shaft seal purge,
 HVP = High vacuum gearbox purge
 Inlet = Inlet purge,
 GB = Gas ballast,
 Exh PM = Exhaust pressure monitor & purge
 GXS450 & GXS750 Medium Duty (MD) variants require optional
 PDT for operation
 All pump variants configured for Medium Duty + High Flow Purge /
 Solvent Flush (MD+) require optional PDT for operation

Cooling

0 TMS Standard (GXS160 and GXS250)
 2 TMS+ (GXS450 and GXS750)



Complementary accessories

Control & Communication	
Pump Display Terminal (PDT)*	D37280700
Virtual Pump Display Terminal (VPDT)	D37488500
MCM MicroTIM	D37360320
Connector kit for MCM MicroTIM	D37422802
Profibus® Module	D39753000
Equipment support toolkit	D37217090

Instrumentation	
Water flow monitoring	A50783000
N2 Flow Switch	
Standard - Up to and including GXS450 LD	A50633000
High Flow - GXS450 MD pumps and higher	A50634000
Pressure Indicator Assembly	M58808141
Pressure Transducer Assembly (ASG)	M58808152
Temp Trans Assy	
Pump only	M58808160
Combinations	M58828160

Ancillary Equipment	
3/8" SS quick connector for water	A50721000
3/8" BSPF to 3/8" NPTM Brass Adaptor	U30011199
3/8" BSPM to 3/8" NPTM Brass Adaptor	U30011200
Connector plug 06 IL CM XLR	D37207061
Holster pump display module	D37209800
GXS Auxiliary gauge cable (0-10V)	D37241017
GXS Pressure input cable (4-20mA)	D37241019
GXS Pressure input connector (4-20mA)	D37241023
Drynert 25/6 fluid 1 kg (528 ml)	H11312021
Drynert 25/6 fluid 5 kg (2646 ml)	H11312025



Service and Support

Your business success depends on maximum equipment uptime and minimum total cost of ownership, and we constantly strive to support those objectives. As a global leader in vacuum technology and processes, we understand how vacuum pumps and systems perform in real life. Our wide portfolio of services is designed with you in mind: to help keep your processes and equipment running in the most economical and environmentally efficient manner.

Services include:

- Overhaul and repair using genuine Edwards OEM parts
- OEM spares and kits available for immediate despatch
- ReManufactured products available for cost-effective expansion and backups
- Global network of expert field service engineers available to respond quickly to unexpected equipment failures
- Extended warranty, to help manage the cost of the unexpected

Our Expert Advantage Service Plans provide you with the on-going support necessary to continuously improve your operational efficiency and meet your business objectives. As service offerings may vary slightly from product to product, please contact your Edwards representative to discuss your specific requirements.





GLOBAL CONTACTS

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HV 8000 - MECHANICAL BOOSTER PUMP

edwardsvacuum.com

HV8000 feature a rugged design for robust and reliable operation in very large scale processes both in the industrial and chemical markets.



Performance

Stable process for consistent output - Suitable for continuous operation over wide pressure ranges.



Adaptability

Easy integration and safe - Optional water cooled exhaust gas after cooler, shaft seal safety purge, temperature monitoring and VFD available.



Reliability

No unplanned downtime - High performance water cooled mechanical shaft seal, large diameter shaft and large helical gears.



Flexibility

Configured to your needs - Can be supplied with standard motor or without motor to allow a local motor to be fitted. Horizontal or vertical flow to suit application and system design.

Technical Data

	Units	HV8000
Displacement 50 Hz	m ³ h ⁻¹ /CFM	7200/4241
Displacement 60 Hz	m ³ h ⁻¹ /CFM	8640/5089
Inlet/outlet connection		10" class 150 ASME B16.5
Inlet/outlet cooling water connection		Rp 1/2 ISO 7-1 (1/2 BSP)
End cover purge gas inlet		Rp 3/8 ISO 7-1 (3/8 BSP)
Pressure differential across pump 50 Hz	mbar/torr	190/143
Pressure differential across pump 60 Hz	mbar/torr	120/90
Max cooling water supply pressure	bar/psi	4.0/58
Max cooling water supply temp	°C/F	35/95
Cooling water flow rate	lmin ⁻¹ /US gal min ⁻¹	15/3.96
Noise level	dB(A)	82
Weight (without motor)	kg/lb	580/1279
Weight (with standard motor) kg	kg/lb	720/1587
Motor Power 50Hz	kW/hp	15/20
Motor Power 60Hz	kW/hp	18.5/25
Oil capacity (vertical gas flow)	litre/gal	8.3/2.18
Dimensions Horizontal flow L x W x H	mm	1737 x 530 x 820
Dimensions Vertical flow L x W x H	mm	1737 x 670 x 638

Ordering information

Product Description	Part Number
HV8000 VF 400 V 50 Hz 230/460 V 60 Hz 18.5 kW BOOSTER	A311-03-940
HV8000 VF 200 V 50 Hz 200/380 V 60 Hz 18.5 kW BOOSTER	A311-03-934
HV8000 VF BARESHAFT BOOSTER	A311-01-985
HV8000 HF 380/400 V 50 Hz 230/460 V 60 Hz 18.5 kW BOOSTER	A311-04-940
HV8000 HF 200 V 50 Hz 200/380 V 60 Hz 18.5 kW BOOSTER	A311-04-934
HV8000 HF BARESHAFT BOOSTER	A311-02-985

ATEX variants available on request

Applications

- Steel degassing
- Metallurgy
- Coating
- Process industry

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nXDS DRY SCROLL PUMPS





EDWARDS THE PARTNER OF CHOICE

Edwards is a world leader in the design, technology and manufacture of vacuum pumps with over 95 years' history and more than 75 years' manufacturing experience.

Edwards believes in delivering results that bring value to our customers by using our breadth of industry experience to identify and apply solutions to your problems. Using the most innovative and up-to-date modelling techniques, we can optimise the pumping configuration for customers to provide a system design giving the maximum performance in the most reliable and cost-effective way.

THE INTELLIGENT CHOICE

Edwards nXDS is the great new shape of dry vacuum pumping

The nXDS has taken scroll vacuum technology to the next level. Improved performance, exceptional pumping capability, quiet operation and extended service intervals make nXDS the ultimate dry choice.

Quiet operation

Better working environment

Hermetically sealed for a lubricant-free vacuum environment

Contamination free process and no oil to dispose of

Low power consumption

Low cost of ownership

Intelligent and easy to use controls

Flexibility of operation

Superior vapour handling

Wider range of applications

Long service intervals

Maximised up-time

Applications

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

Mass spectrometry

- GCMS, LCMS, ICPMS, MALDI, RGA, surface science, leak detectors

Electron microscopy

- TEM, SEM, sample coatiers

Sample preparation

- Gel dryers, glove boxes, rotary evaporators, centrifuges

Research and development

- Chamber evacuation, coating systems, turbopump backing

High energy physics

- Beam lines, accelerators, mobile pump carts, turbopump backing, laser evacuation

Industrial

- Gas recovery and recirculation, glove boxes, brake line and air conditioning evacuation, coating systems, freeze drying, gas bottle filling/emptying, refrigeration system manufacture, degassing/curing (oil, epoxy resin)

Chemical

- Gel dryers, glove boxes, rotary evaporators, centrifuges, solvent recovery, distillation/extraction/filtration

nXDS scroll pump sectional view

Optimum bearing placement for long lifetime and easy replacement

High efficiency radial air-gap motor for low power consumption

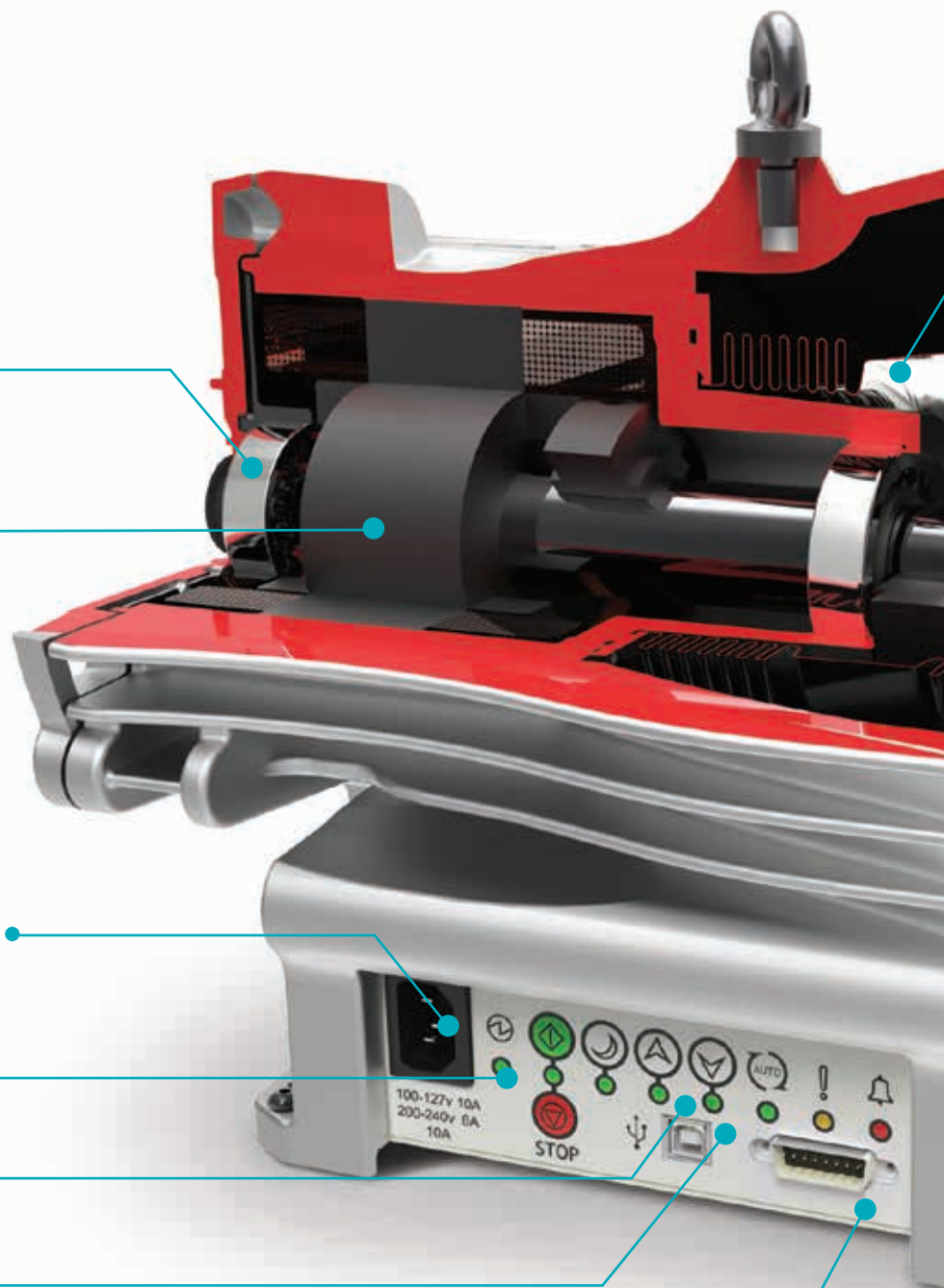
Wide range voltage input with automatic selection for simple operation

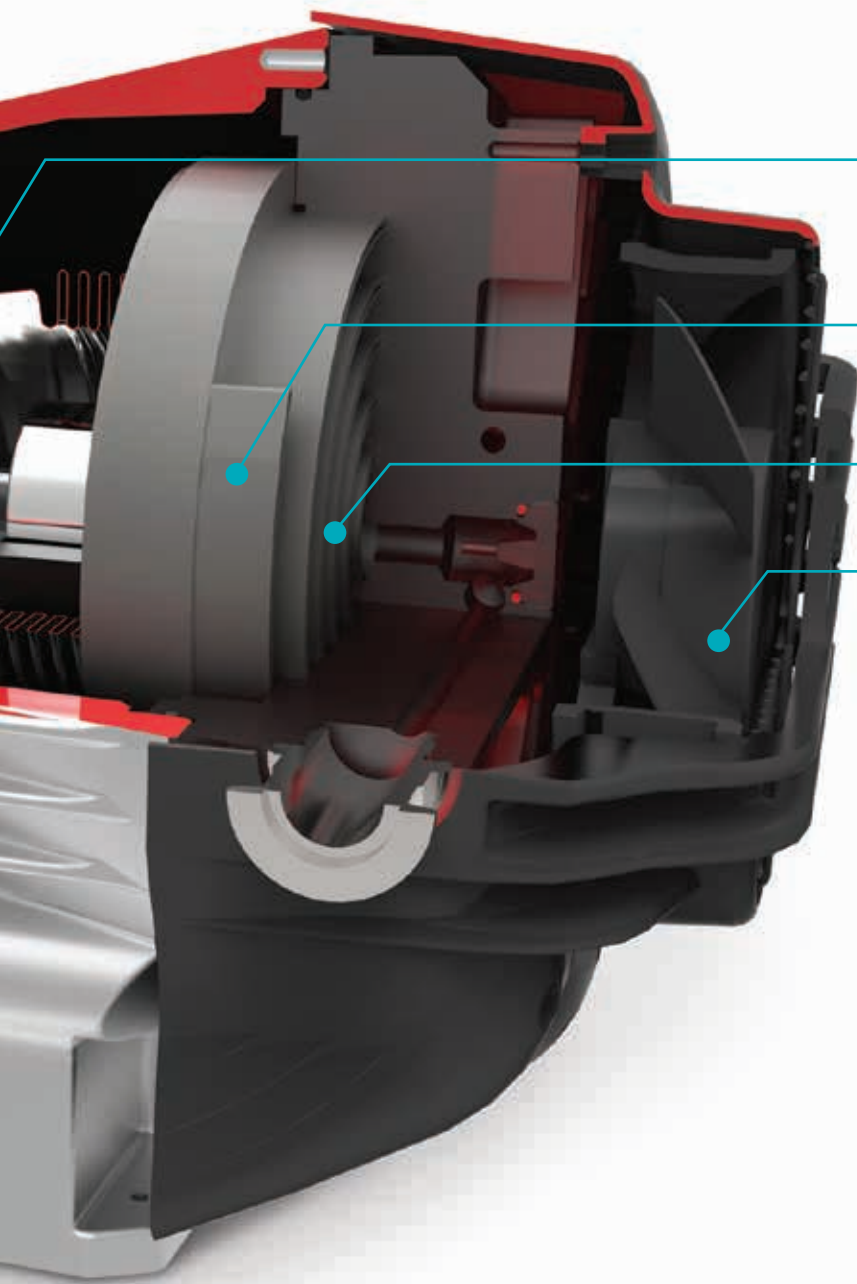
Easy to use manual control buttons

Standby speed control buttons for efficient processtuning

USB port for service use only

Remote control interface for convenience of operation





Hermetic bellows sealing for contamination free vacuum

Optimised scroll profiles for each model to maximise performance

Advanced tip-seal technology for long service lifetime

Thermally controlled fan for reduced noise



Performance

nXDS has been designed to combine the latest advances in scroll technology with an intelligent drive coupled with the long established, truly dry, hermetically sealed mechanism of the XDS series.

Class leading pumping speeds are an improvement over previous XDS models and, with the drive, are of course consistent worldwide. Likewise, ultimate vacuum pressures which are below 10^{-2} mbar are now comparable with those of oil-sealed rotary vane pumps – without the inconvenience of oil.

Hermetic sealing ensures that the vacuum environment is not contaminated by bearing lubricant and, conversely, the bearings are not contaminated by any process gas being pumped.

Quiet running

The modern laboratory is often a busy place with many other appliances running, all contributing to the background noise. With its low noise power level of 52 dB(A), the nXDS pump makes only a very small contribution to the total noise. This level is up to twenty times less than those of competitor products.

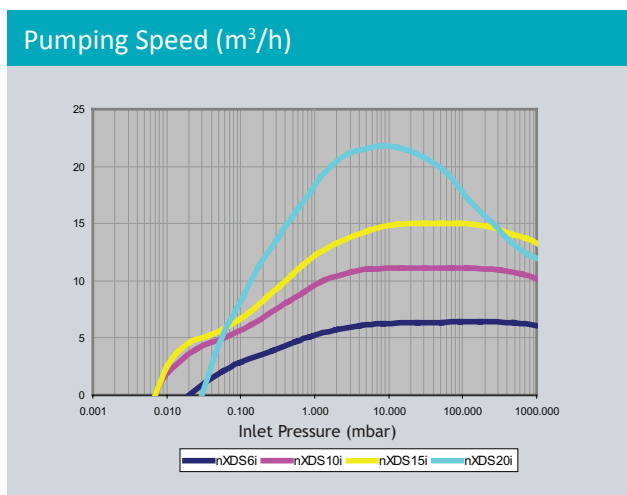
nXDS is available in four sizes:

- nXDS6i
- nXDS10i
- nXDS15i
- nXDS20i

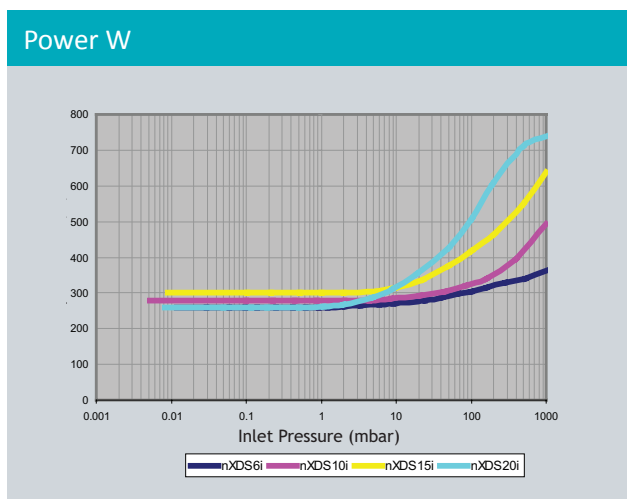
Other variants

For more aggressive applications, 'C' Variants are available which feature Chemraz® internal valves and stainless steel fittings for extra protection from the pumped media.

R variants are available for specialist applications such as gas recirculation, rare gas pumping and recovery or other applications where the dilution of the pumped gas is undesirable, or where sealing is integral to minimising potential gas loss.



Summary of pump speeds



Summary of input powers

Pump controller

The advanced controller allows for several modes of control:

Manual

Push button START, STOP and STANDBY. Accurate speed control of 1% of maximum running speed.

Parallel remote

From your own control system via the 15 way d-sub connector giving the same START, STOP and STANDBY with the option of analogue speed control.

Serial communication remote

Option of either RS232 or RS485 with a choice of Edwards' proprietary 'DX' protocol or industry standard Modbus protocol. A USB port has been included for service use only.

The pump controller is able to accept voltages from 100-127 and 200-240V (+/- 10%) without the need for intervention.



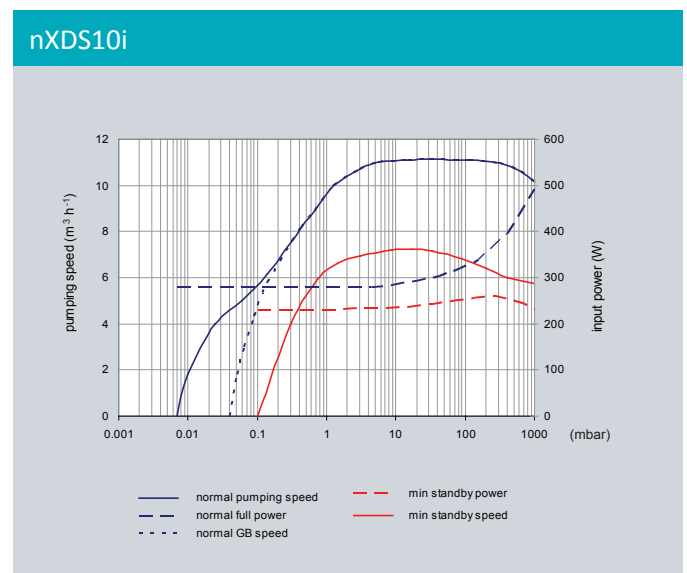
Technical data

		nXDS6i	nXDS10i	nXDS15i	nXDS20i
Nominal rotational speed		1800 rpm			
Displacement	m ³ h ⁻¹ (ft ³ min ⁻¹)	6.8 (4.0)	12.7 (7.5)	17.1 (10.1)	28.0 (16.5)
Peak pumping speed	m ³ h ⁻¹ (ft ³ min ⁻¹)	6.2 (3.6)	11.4 (6.7)	15.1 (8.9)	22.0 (13.0)
Ultimate vacuum (total pressure)	mbar (Torr)	0.020 (0.015)	0.007 (0.005)	0.007 (0.005)	0.030 (0.022)
Minimum standby rotational speed	rpm	1200			
Speed control resolution (percentage of full rotation speed)	%	1			
Max inlet pressure for water vapour	mbar	35	35	35	20
Max water vapour pumping rate	gh ⁻¹	110	145	240	220
Maximum continuous inlet pressure	mbar	200	200	200	50
Voltage input	V	100-127, 200-240 (+/-10%)			
Voltage frequency	Hz	50/60			
Motor power 1-ph*	W	260	280	300	260
Power connector 1-ph		IEC EN60320 C13			
Recommended fuse		10A, 250V a.c. rms			
Weight	kg (lb)	26.2 (58)	25.8 (57)	25.2 (56)	25.6 (56)
Inlet flange		NW25			
Exhaust flange		NW25			
Noise level**	dB(A)	52			
Vibration at inlet flange	mms ⁻¹ (rms)	< 4.5			
Leak tightness (static)	mbar ls ⁻¹	< 1x10 ⁻⁶			
Operating temperature range	°C (°F)	+5 to +40 (+41 to +104)			

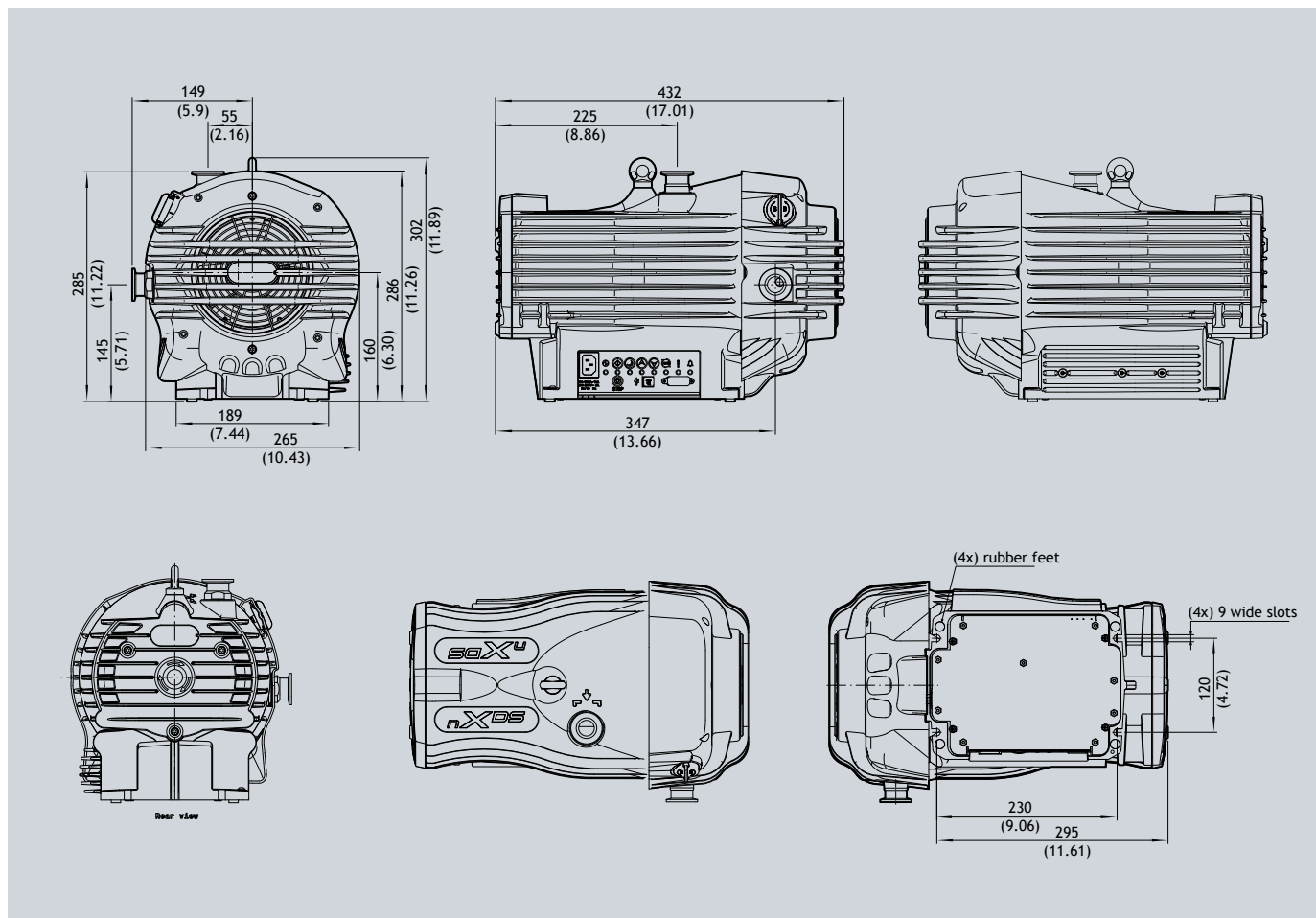
* Typical. See graphs on page 6.

** For low fan speed, typical at ultimate end when load/ambient conditions allow.

Pumping speed and power curves



Dimensions



All variants are the same Dimensions in mm (in)

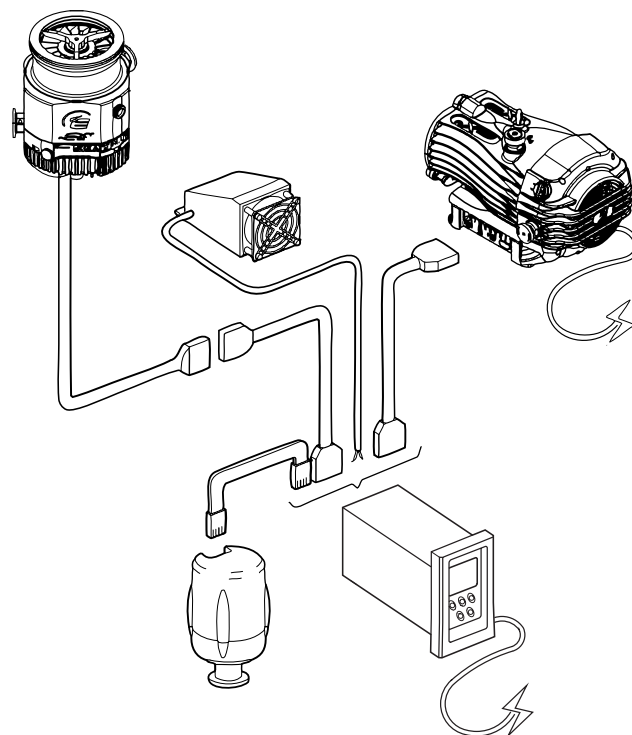


Controllers

The TIC (Turbo and Instrument Controller) automatically recognises the nXDS pump when connected to the backing pump connector as the controller adopts serial communications mode when connected to the nXDS. There is no need to use a relay box to interface to nXDS.

Speed control and pump run hours etc can be readily accessed from the display. The TIC can also control an nEXT turbopump plus, up to three gauges at the same time as a nXDS pump.

Customers already owning a TIC can upgrade their software to enable interfacing to nXDS.



Ordering information

Standard product		Corrosion resistant (C) variants		(R) Variants without gas ballast	
nXDS6i	A735 01 983	nXDS6iC	A735 02 983	nXDS6iR	A735 03 983
nXDS10i	A736 01 983	nXDS10iC	A736 02 983	nXDS10iR	A736 03 983
nXDS15i	A737 01 983	nXDS15iC	A737 02 983	nXDS15iR	A737 03 983
nXDS20i	A738 01 983	nXDS20iC	A738 02 983	nXDS20iR	A738 03 983

Spares and accessories

TIC (Turbo) 200W	D397 12 000
TIC (Turbo and Instruments) 200W	D397 22 000
Gas ballast adaptor blank (nXDS)	A735 01 806
Gas ballast adaptor (nXDS) 0.25 mm hole	A735 01 809
Gas ballast adaptor blank (nXDS) no restriction	A735 01 811
Silencer (NW25)	A505 97 000
Inlet/outlet filter 5µm (NW25/NW25)	A505 97 805
Tip seal service kit	A735 01 801
Bearing service kit	A735 01 802

nXDS exhaust and gas ballast kit	A735 01 803
Electrical supply cable 2m, UK	A505 05 000
Electrical supply cable 2m, North Europe	A505 06 000
Electrical supply cable 2m, North America/Japan	A505 07 000
Electrical supply cable 2m, no plug	A505 08 000
TIC interface cable 1.0m	D397 00 835
TIC interface cable 2.0m	D397 00 836
TIC interface cable 5.0m	D397 00 837

Service

Your business success depends on maximum equipment uptime and minimum total cost of ownership, and we constantly strive to support those objectives. As a global leader in vacuum technology and processes, we understand how vacuum pumps and systems perform in real life. Our wide portfolio of services is designed with you in mind: to help keep your processes and equipment running in the most economical and environmentally efficient manner.

Services include:

- Overhaul and repair using genuine Edwards OEM parts
- OEM spares and kits available for immediate despatch
- Remanufactured products available for cost-effective expansion and backups
- Global network of expert field service engineers available to respond quickly to unexpected equipment failures
- Extended warranty, to help manage the cost of the unexpected

Our Expert Advantage Service Plans provide you with the on-going support necessary to continuously improve your operational efficiency and meet your business objectives. As service offerings may vary slightly from product to product, please contact your Edwards representative to discuss your specific requirements.





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XDS35i DRY SCROLL PUMPS

edwardsvacuum.com

XDS35i and XDS35i Enhanced Family

The XDS35i family of scroll pumps offer proven dry, clean vacuum solutions for a wide range of applications, with smart drive technology to look after the pump and provide world wide performance.

Now, a combination of the patented double start scroll form technology and by-pass valves have enabled Edwards to offer the XDS35i Enhanced range of pumps to complement our original family.

Take another step.

With reduced peak power requirements at roughing pressures and continuous higher roughing speeds these enhanced pumps enable the user to take another step in terms of the performance envelope to address those special applications where roughing performance or the ability to evacuate a large volume is important.

XDS35i and XDS35i Enhanced pumps are available as standard pumps with gas ballast, versions of the pump with no Gas Ballast (well suited for rare gas recirculation and gas recovery applications) and the C versions of the pumps featuring Chemraz® internal valves and stainless steel fittings for extra protection from the pumped media.



Features and benefits

Bearing shield

ensures separation between process gases and bearing lubrication to ensure clean vacuum and no possibility of contamination to lubrication from process gases, which prolongs bearing life.

Smart motor drive

means consistent performance globally, pump overload protection and remote start/stop capability.

High flow gas ballast feature

allows pumping of vapours including water vapour at up to 240 gh⁻¹.

Simple single sided scroll design

allows maintenance to be done in minutes for low cost of ownership and maximum up-time.

Take another step

the Enhanced versions offer up to 20% lower peak power requirements during initial pump down which means it has the ability to pump down large volume chambers with no loss of performance and has up to 25% more pumping speed at these roughing pressures which helps on higher frequency cycling applications as well.

Technical data

	Units	XDS35i	XDS35i Enhanced
Peak pumping speed	m ³ h ⁻¹ (cfm)	35 (21)	
Ultimate vacuum ⁽¹⁾	mbar (Torr)	0.01 (0.008)	0.03 (0.02)
Ultimate vacuum with gas ballast 1	mbar (Torr)	0.02 (0.015)	0.04 (0.03)
Ultimate vacuum with gas ballast 2	mbar (Torr)	< 10 (7.5)	
Max inlet pressure for water vapour	mbar (Torr)	35 (23)	
Water vapour handling capacity GBII	gh ⁻¹	240	
Maximum continuous inlet pressure	mbar a (Torr a)	40 (30) ⁽²⁾	1000 (760) *
Maximum gas ballast/purge pressure	bar gauge (psig)	0.5 (7)	
Motor data			
Supply voltage	V	100-120/200-240 (+/- 10%)	
Supply frequency	Hz	50/60	
Nominal rotation speed	rpm	1750	
Power at ultimate	W	440	
Motor power	W	520	
Power connector		IEC EN60320 C19	
Recommended fuse, 230 V (115 V)	A	16 ⁽³⁾ (15)	
Physical data			
Weight	kg (lb)	48 (105)	
Inlet connection		NW40	
Exhaust connection		NW25	
Noise level at ultimate	dB(A)	57	
Vibration at inlet flange	mms ⁻¹ (rms)	< 4.5	
Leak tightness (static)	mbar ls ⁻¹	< 1 x 10 ⁻⁶	
Operating temperature range	°C (°F)	5 to 40 (41 to 104)	

* Use at higher inlet pressure speeds up tip seal wear

(1) measured as total pressure

(2) These pumps are designed to pump down from atmospheric pressure, but prolonged operation at inlet pressures higher than specified may reduce bearing life.

(3) for UK 240 V use 13 A fuse



Ordering information

Pumps:

	Order number
XDS35i 100-120/200-230V 1PH 50/60Hz	A73001983
XDS35i NGB 100-120/200-230V 50/60Hz	A73005983
XDS35iC 100-120/200-230V 1PH 50/60Hz	A73006983
XDS35iE 100-120/200-230V 1PH 50/60Hz Enhanced	A73003983
XDS35iE NGB 100-120/200-230V 50/60Hz Enhanced	A73007983
XDS35iCE 100-120/200-230V 1PH 50/60Hz Enhanced	A73008983

Extended warranty:

Product	2 year	3 year
XDS35i & E	EW2AA5005	EW3AA5005

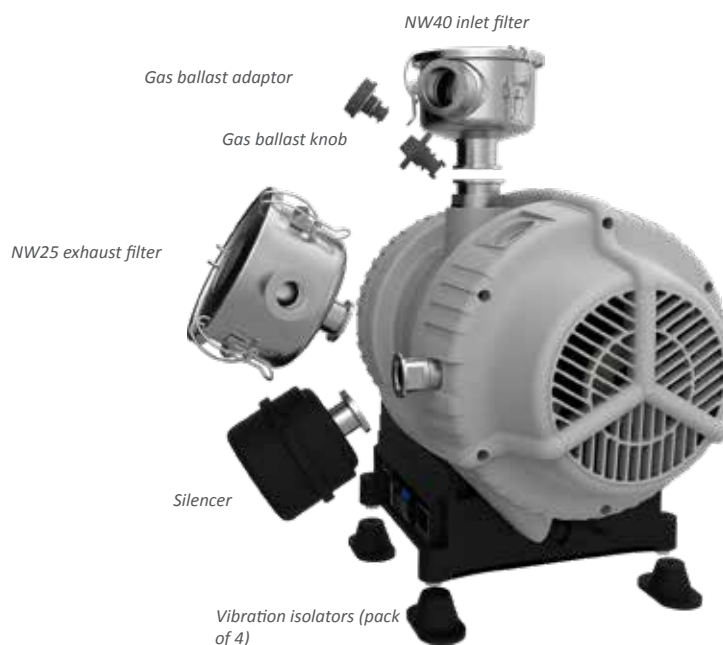
Accessories and spares:

	Product description	Order number
Accessories	Exhaust silencer XDS35i	A50597001
	Gas ballast adaptor with 0.25 mm restrictor	A50626801
	Gas ballast adaptor with no restrictor	A50502000
	Vibration isolator (pack of 4)	A24801408
	Inlet/exhaust filter NW25	A50597805
	Inlet/exhaust filter NW40	A50597806
	XDS acoustic enclosure 110-120 V	NRYS0C0000
	XDS acoustic enclosure 200-240 V	NRD797000
Spares	Silencer spares kit	A50597801
	XDS filter 5 micron element kit	A50597802
	XDS filter 1 micron element kit	A50597803
Cord sets	UK, three pin plug	A50505003
	North European plug	A50506003
	North America/Japan plug	A50507003
	No plug	A50508003

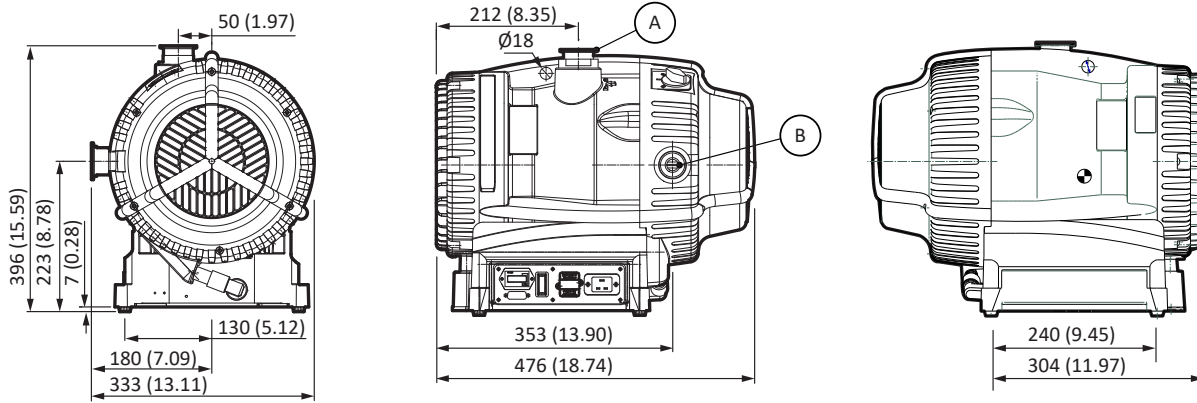
XDS35i Family Pump spares kits:

Product	Part number	XDS 35i	XDS 35iC	XDS 35i NGB	XDS 35iE	XDS 35iCE	XDS 35iE NGB
Tip seal & exhaust service kit XDS35i	A73001801	X	X	X	X	X	X
Exhaust valve kit (Chemraz®)	A73001814	-	X	-	-	X	-
Gas ballast kit XDS35i	A73001803	X	-	-	X	-	-
Gas ballast kit (Chemraz®)	A73001815	-	X	-	-	X	-
By-pass valve Kit 35iE	A73003804	-	-	-	X	-	X
By-pass valve Kit 35iEC (Chemraz®)	A73008804	-	-	-	-	X	-

Please remember to order appropriate valve and gas ballast kits as required



Dimensions

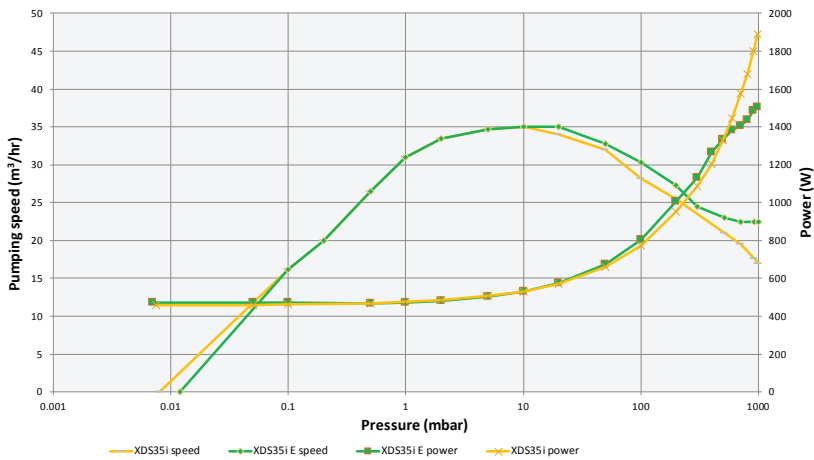


A. NW40
B. NW25

Performance

XDS35i

PUMPING SPEED AND POWER



The graph shows typical pump performance
Note that peak power for XDS35i is supplied for a short period of time before the intelligent drive reduces the power and speed
XDS35i Enhanced, with its bypass valves, is not limited and will pump down continuously at full speed

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Publication Number: 3601 0458 01

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XDS DRY SCROLL PUMPS

edwardsvacuum.com

XDS dry scroll pumps have become industry standard when dry pumping is essential, proving to be a robust and clean vacuum pump solution in a range of applications. The XDS35i pump has an innovative bearing shield that isolates the vacuum environment, making it not only lubricant-free but hermetically sealed.

XDS35i No Gas Ballast variant has had the gas ballast feature removed for applications such as rare gas recirculation and gas recovery.

The XDS46i shares many of the same features of the XDS35i but with a peak speed of $40 \text{ m}^3\text{h}^{-1}$. The pump has been optimised for maximum pumping speed at inlet pressures between 1 mbar and 10 mbar, making it well suited for backing turbomolecular pumps.

For more aggressive applications, 'C' variants are available which features Chemraz® internal valves and stainless steel fittings for extra protection from the pumped media.



Features and benefits

Bearing shield

ensures separation between process gases and bearing lubrication to ensure clean vacuum and no possibility of contamination to lubrication from process gases, which prolongs bearing life.

Smart motor drive

means consistent performance globally, pump overload protection and remote start/stop capability.

High flow gas ballast feature

allows pumping of vapours including water vapour at up to 240 gh^{-1} .

Axial air gap motor

reduces overall pump size and gives low power and noise.

Simple single sided scroll design

allows maintenance to be done in minutes for low cost of ownership and maximum up-time.

Technical data

	Units	XDS35i	XDS46i
Peak pumping speed	m ³ h ⁻¹ (cfm)	35 (21)	40 (23.5)
Ultimate vacuum ⁽¹⁾	mbar (Torr)	0.01 (0.008)	0.05 (0.04)
Ultimate vacuum with gas ballast 1	mbar (Torr)	0.02 (0.015)	0.08 (0.06)
Ultimate vacuum with gas ballast 2	mbar (Torr)	< 10 (7.5)	
Max inlet pressure for water vapour	mbar (Torr)	35 (23)	40 (30)
Water vapour handling capacity GBII	gh ⁻¹	240	
Maximum continuous inlet pressure ⁽²⁾	mbar a (Torr a)	40 (30)	
Maximum gas ballast/purge pressure	bar gauge (psig)	0.5 (7)	
Motor data			
Supply voltage	V	100-120/200-240 (+/- 10%)	
Supply frequency	Hz	50/60	
Nominal rotation speed	rpm	1750	
Power at ultimate	W	440	380
Motor power	W	520	
Power connector		IEC EN60320 C19	
Recommended fuse, 230 V (115 V)	A	16 ⁽³⁾ (20)	
Physical data			
Weight	kg (lb)	48 (105)	
Inlet connection		NW40	
Exhaust connection		NW25	
Noise level at ultimate	dB(A)	57	55.4
Noise level with acoustic enclosure	dB(A)	48	46.4
Vibration at inlet flange	mms ⁻¹ (rms)	< 4.5	
Leak tightness (static)	mbar ls ⁻¹	< 1 x 10 ⁻⁶	
Operating temperature range	°C (°F)	5 to 40 (41 to 104)	

(1) measured as total pressure

(2) These pumps are designed to pump down from atmospheric pressure, but prolonged operation at inlet pressures higher than specified may reduce bearing life.

(3) for UK 240 V use 13 A fuse



Ordering information

Pumps:

Product description	Order number	
Standard product	XDS35i	A73001983
	XDS35iC*	A73006983
	XDS46i	A73101983
	XDS46iC*	A73106983
Variants without gas ballast (NGB)	XDS35i	A73005983

* C variants

Extended warranty:

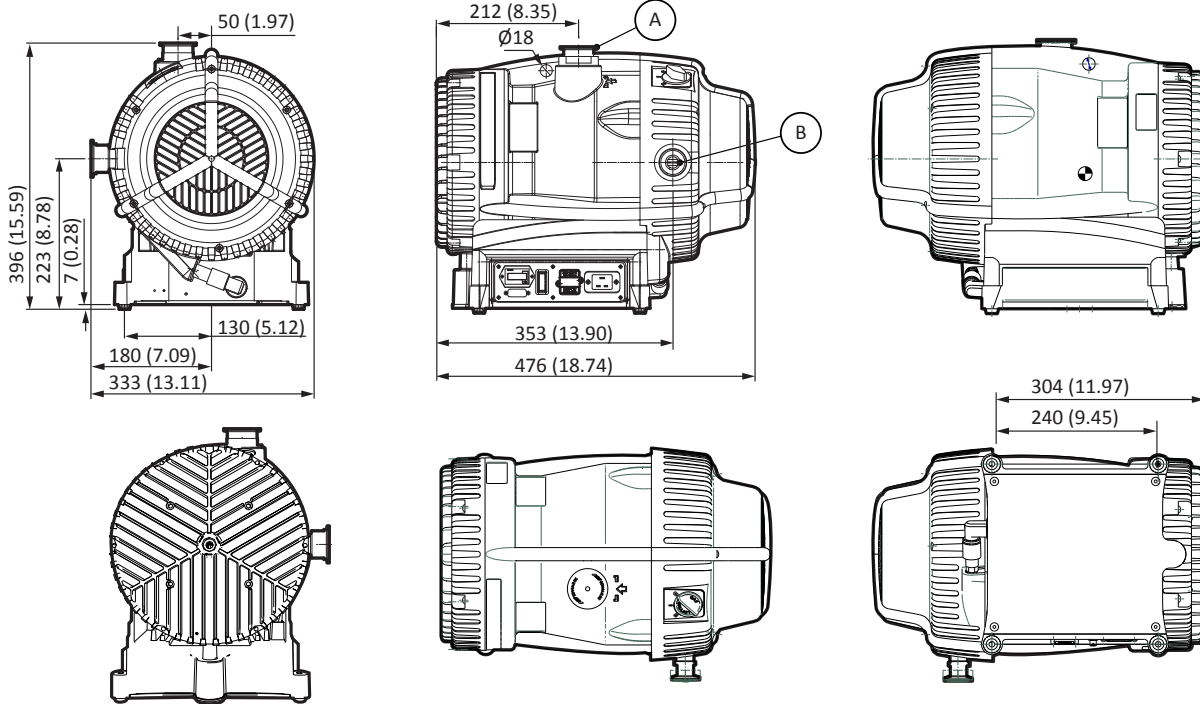
Product	2 year	3 year
XDS35i	EW2AA5005	EW3AA5005
XDS46i	EW2AA5006	EW3AA5006

Accessories and spares:

Product description	Order number	
Accessories	Exhaust silencer XDS35i	A50597001
	Gas ballast adaptor with 0.25 mm restrictor	A50626801
	Gas ballast adaptor with no restrictor	A50502000
	Vibration isolator (pack of 4)	A24801408
	Inlet/exhaust filter NW25	A50597805
	Inlet/exhaust filter NW40	A50597806
	XDS acoustic enclosure 110-120 V	NR5C0000
	XDS acoustic enclosure 200-240 V	NRD797000
Spares	Tip-seal kit XDS35i	A73001801
	Tip-seal kit XDS46i	A73101801
	Silencer spares kit	A50597801
	XDS filter 5 micron element kit	A50597802
	XDS filter 1 micron element kit	A50597803
Cord sets	UK, three pin plug	A50505003
	North European plug	A50506003
	North America/Japan plug	A50507003
	No plug	A50508003



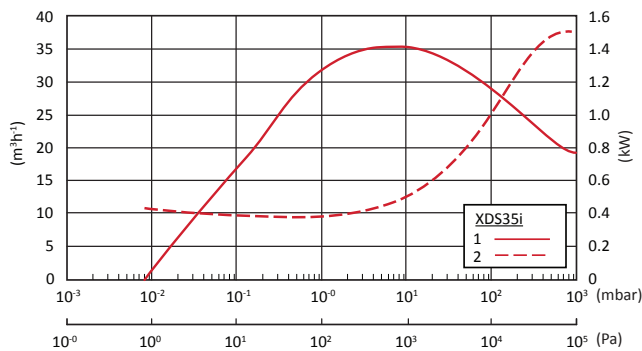
Dimensions



A. NW40
B. NW25

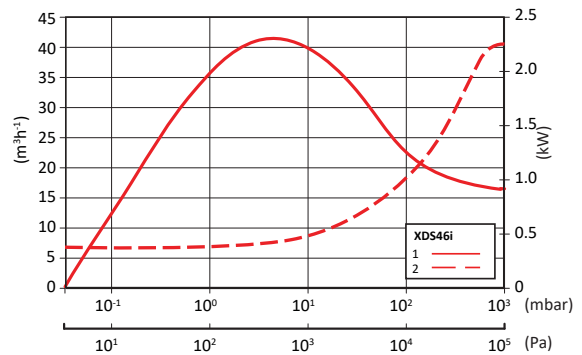
Performance

XDS35i



1. Speed
2. Power

XDS46i



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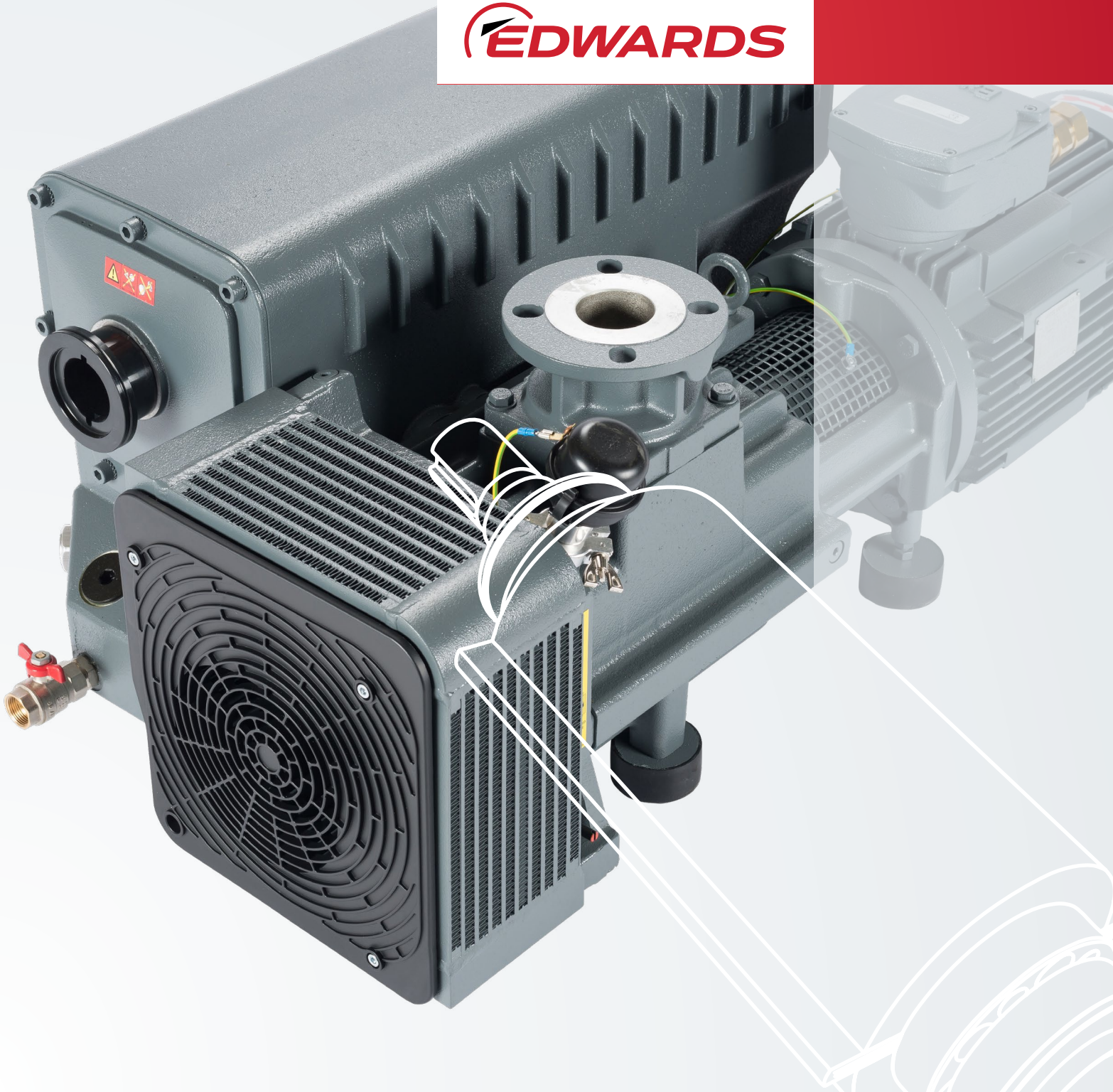
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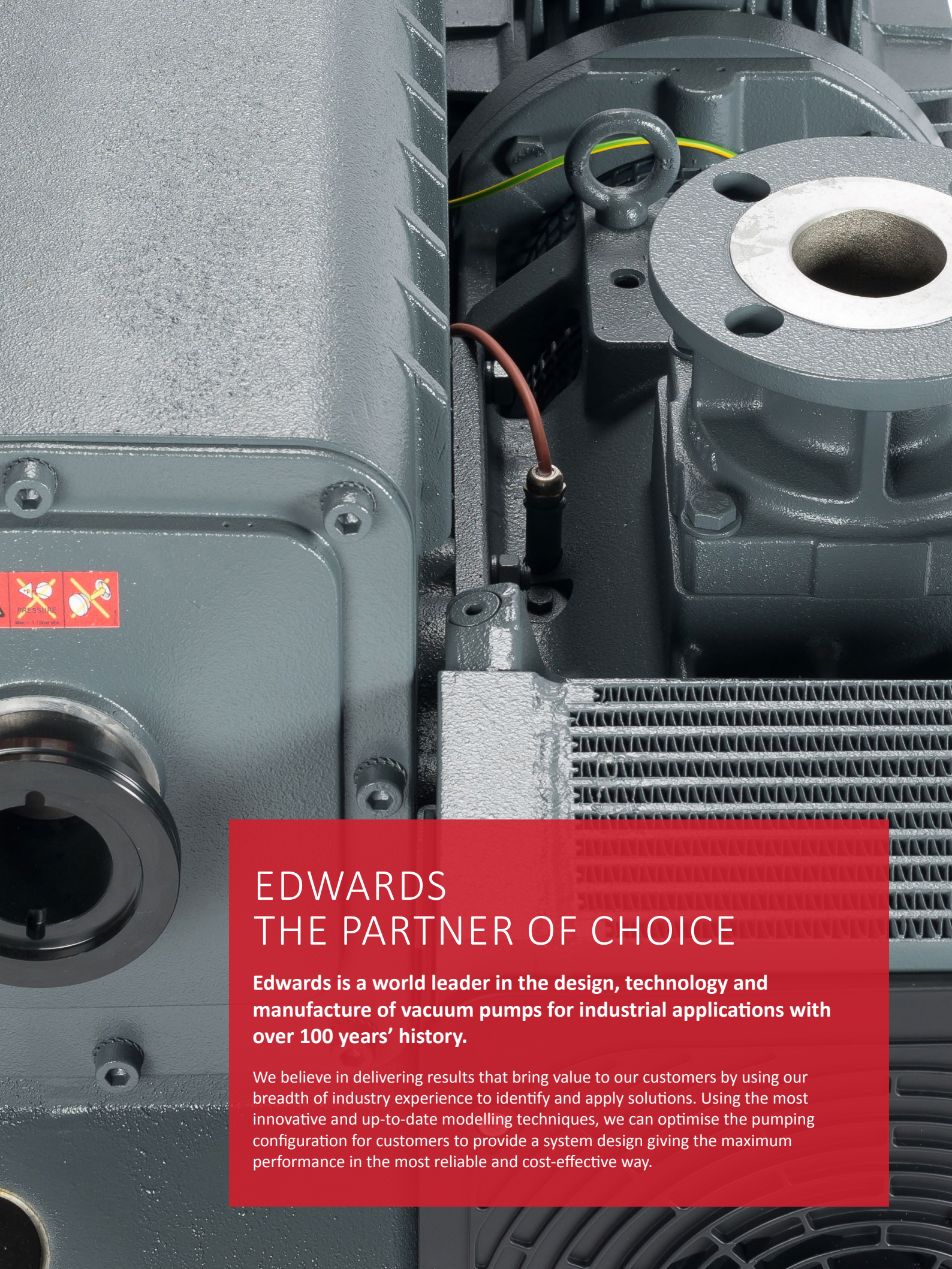
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nES SINGLE STAGE EX SERIES ROTARY VANE PUMPS FOR EXPLOSIVE ENVIRONMENTS





EDWARDS THE PARTNER OF CHOICE

Edwards is a world leader in the design, technology and manufacture of vacuum pumps for industrial applications with over 100 years' history.

We believe in delivering results that bring value to our customers by using our breadth of industry experience to identify and apply solutions. Using the most innovative and up-to-date modelling techniques, we can optimise the pumping configuration for customers to provide a system design giving the maximum performance in the most reliable and cost-effective way.

nES SINGLE STAGE EX SERIES

NEXT GENERATION SINGLE STAGE ROTARY VANE PUMPS

The Edwards nES single stage EX series represents the next advance in single stage oil sealed rotary vane vacuum pumps for use in explosive environments.

EXPLOSIVE ENVIRONMENTS

Edwards nES single stage EX series rotary vane pumps have been specifically designed to be capable of handling gases from a potentially explosive atmosphere and to operate in environments where a potentially explosive atmosphere can be present. Pumps have been certified under the ATEX directive 2014/34/EU.

nES single stage EX series pumps are equipped with a variety of sensors:



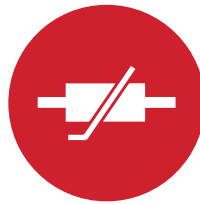
PUMP
TEMPERATURE



PRESSURE IN
OIL CASING



OIL LEVEL



PTC MOTOR
THERMISTORS

nES single stage EX series pumps are also supplied with:

- ATEX rated exhaust mist filter
- FPM seals
- Oil filter bypass
- ATEX rated motor and coupling
- Approved oil
- Gas ballast facility

BENEFITS

1. PROTECTION

Equipment with a range of sensors providing protection in-line in with ATEX directive 2014/34/EU.

2. INTERNAL MECHANISM

Designed for minimal hot spots ensuring lowest possible temperature class. The pump mechanism is designed with attention to detail that guarantees a class-leading ultimate vacuum level without the pressure fluctuations.

3. INTEGRATED OIL MIST FILTER

The improved integrated exhaust mist filter is effective in preventing oil mist from being exhausted into the environment. It is user serviceable and gives the pump a much cleaner operation with low maintenance.

4. AIR COOLING

The pump is provided with an efficient air flow management system that enables a low operating temperature and increased oil life, without the need for water cooling.

5. OIL RETURN SYSTEM

The enhanced oil return system gives an excellent vacuum stability. Use of Edwards Ultragrade Extend 110 Oil not only gives an improved vacuum performance but also enables the pump to withstand high operating temperatures without oil degradation thus extending intervals between oil changes.

6. INLET CONNECTION

Inlet connections are compatible with DN ISO and ANSI flanges providing the user with installation flexibility.

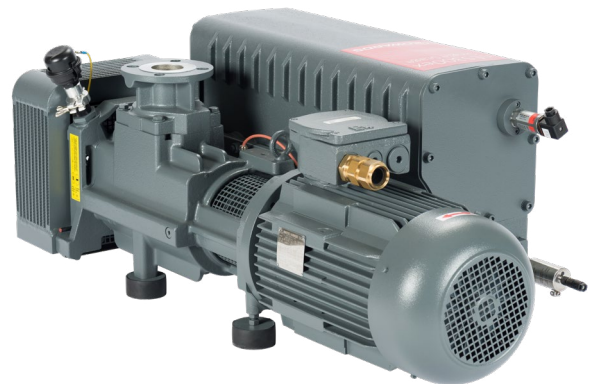
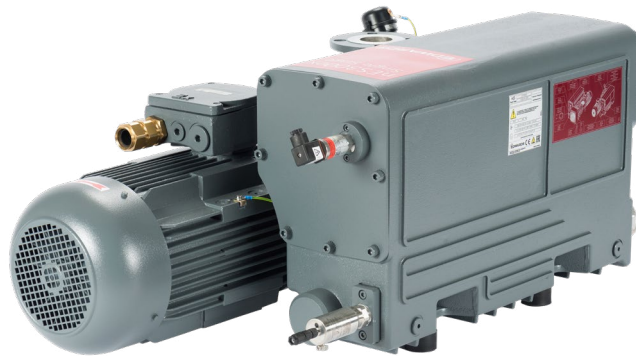
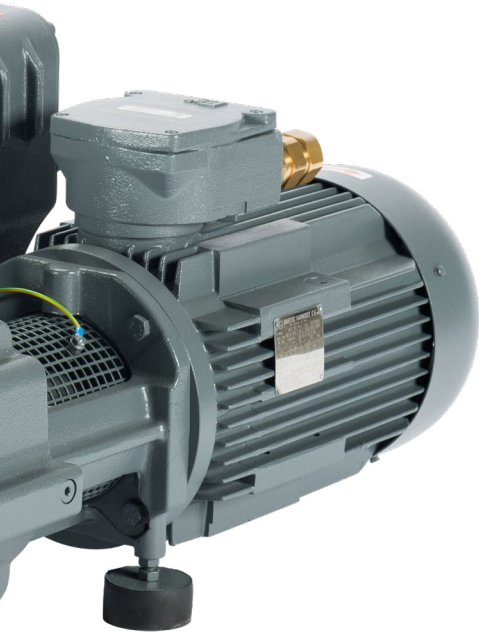
7. DIRECT DRIVE TECHNOLOGY

Motors are certified to ATEX directive 2014/34/EU. Variants are also available for the US market.



ADVANTAGES

- Built-in sensors and monitoring providing added protection
- Suitable for a wide range of applications
- High pumping speed at low pressures
- Stable vacuum performance with no pressure fluctuation
- Good condensable vapour handling capability with gas ballast
- High reliability through proven technology
- Low noise and vibration
- Space efficient through compact design
- Optimised oil return system and integrated exhaust mist filter
- Efficient air cooled motor
- Low and easy maintenance - therefore high productivity

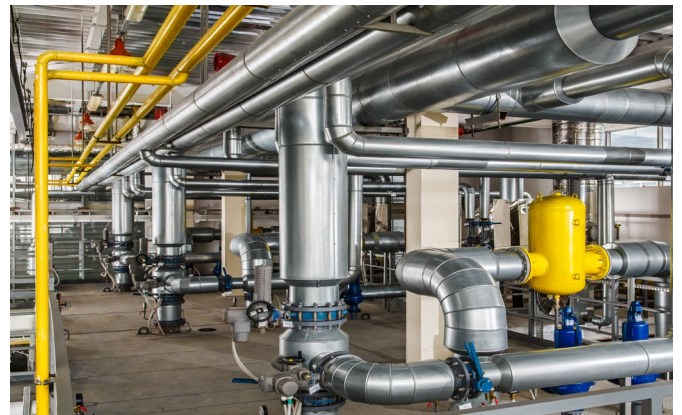
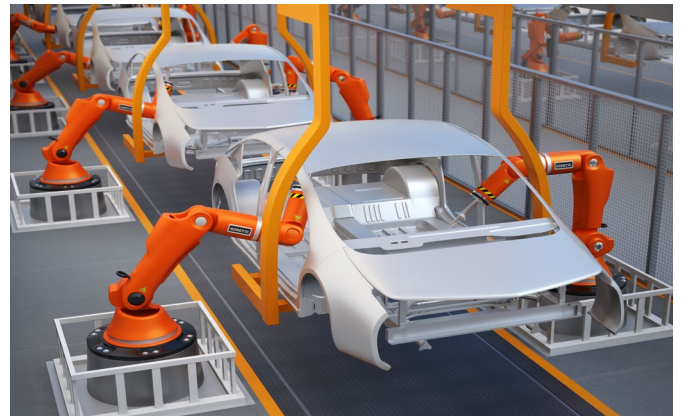


APPLICATIONS

The nES single stage EX series pumps are suitable for use in a broad range of applications where protection in explosive environments is required.

Few applications areas where an appropriate level of protection is required:

- Chemical
- Pharmaceutical
- Sterilising with ethylene oxide
- Recovery of air conditioning gases
- Degassing of power plant alternator oil
- Automotive
- Gas vapour recovery
- Gas bottle filling



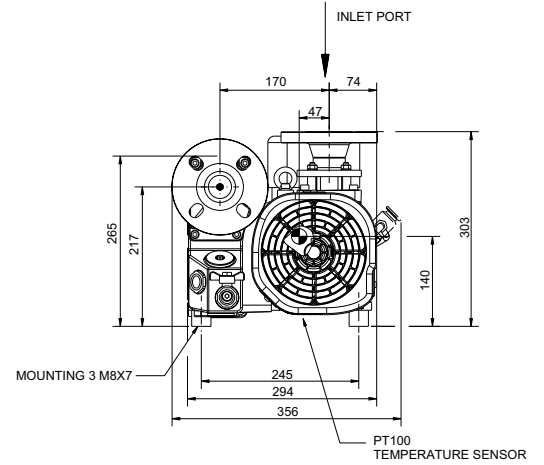
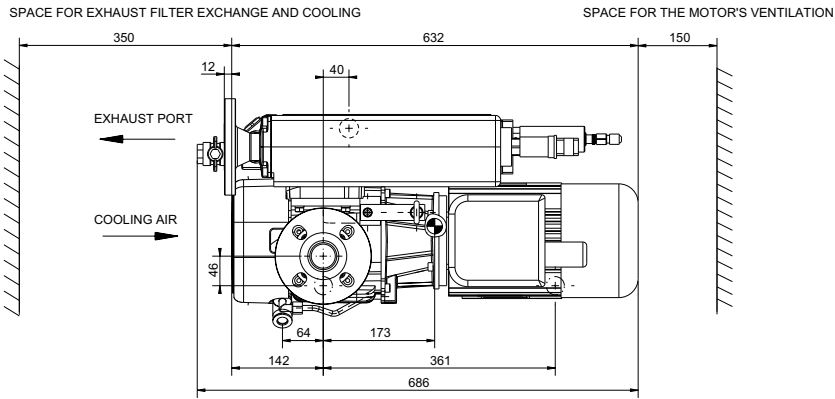
TECHNICAL DATA

	Units	nES40ex	nES65ex	nES100ex	nES200ex	nES300ex	nES630ex
Maximum displacement (50 Hz)	m ³ h ⁻¹ / cfm	44.0 / 25.9	59.0 / 34.8	98.0 / 57.4	180 / 106	280 / 165	700 / 412
Maximum displacement (60 Hz)	m ³ h ⁻¹ / cfm	53.0 / 31.2	71.0 / 41.8	117 / 68.9	220 / 130	340 / 200	-
Pumping Speed (50 Hz)	m ³ h ⁻¹ / cfm	38.5 / 22.7	54.0 / 31.8	87.5 / 51.5	170 / 100	240 / 141	640 / 377
Pumping Speed (60 Hz)	m ³ h ⁻¹ / cfm	47.0 / 27.7	64.0 / 37.7	105 / 61.8	200 / 118	290 / 171	-
Ultimate vacuum (total pressure) no gas ballast	mbar / torr	0.5 / 0.4	0.5 / 0.4	0.5 / 0.4	0.15 / 0.13	0.15 / 0.13	0.15 / 0.13
Ultimate vacuum (total pressure) with gas ballast	mbar / torr	1.5 / 1.1	1.5 / 1.1	1.5 / 1.1	0.7 / 0.5	0.7 / 0.5	0.7 / 0.5
Inlet connection	ISO / ANSI	DN40 / ANSI 1"1/2	DN40 / ANSI 1"1/2	DN40 / ANSI 1"1/2	DN50 / ANSI 2"	DN50 / ANSI 2"	DN100 ISO-K / ANSI 4"
Outlet connection	ISO / ANSI	DN40 / ANSI 1"1/2	DN40 / ANSI 1"1/2	DN40 / ANSI 1"1/2	DN50 / ANSI 2"	DN50 / ANSI 2"	DN100 ISO-K / ANSI 4"
Max permitted outlet pressure	bar (abs)	1.15	1.15	1.15	1.15	1.15	1.15
Max water vapour pumping rate (50 Hz)	kg h ⁻¹ / lb h ⁻¹	0.76 / 0.80	1.0 / 1.1	1.60 / 1.69	3.4 / 3.6	1.3 / 1.4	17 / 18
Max water vapour pumping rate (60 Hz)	kg h ⁻¹ / lb h ⁻¹	0.90 / 0.95	1.25 / 1.32	1.70 / 1.80	5.4 / 5.7	1.8 / 1.9	-
Dimensions (L, W, H)	mm	686 / 356 / 303	748 / 386 / 349	810 / 434 / 319	1084 / 535 / 435	1143 / 573 / 450	1568 / 989 / 740
Weight	kg / lb	67 / 148	86 / 190	104 / 230	142 / 313	244 / 539	695 / 1534
Motor Protection rating		IP55	IP55	IP55	IP55	IP55	IP65
Motor Power (50 Hz)	kW / hp	1.5 / 2.0	2.2 / 3.0	3.0 / 5.0	5.5 / 8	7.5 / 10	18.5 / 26
Motor Power (60 Hz)	kW / hp	1.8 / 3.0	2.6 / 4.0	3.6 / 6.0	6.6 / 10	9 / 13	-
Noise level (50 Hz)	dB(A)	58	60	61	69	72	72
Noise level (60 Hz)	dB(A)	60	64	64	73	76	-
Oil Refill Capacity	litre	1	2	2	5 - 9	8.5-11.5	20 - 23
Recommended oil	Ultragrade Endurance Extend 110						

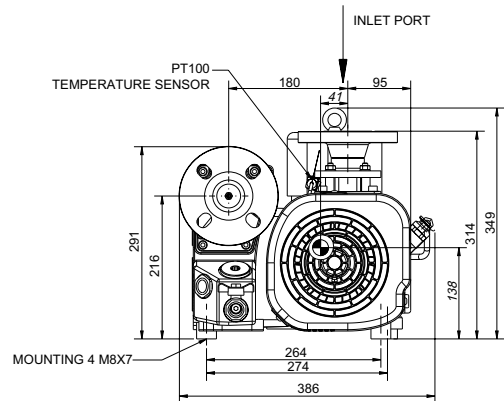
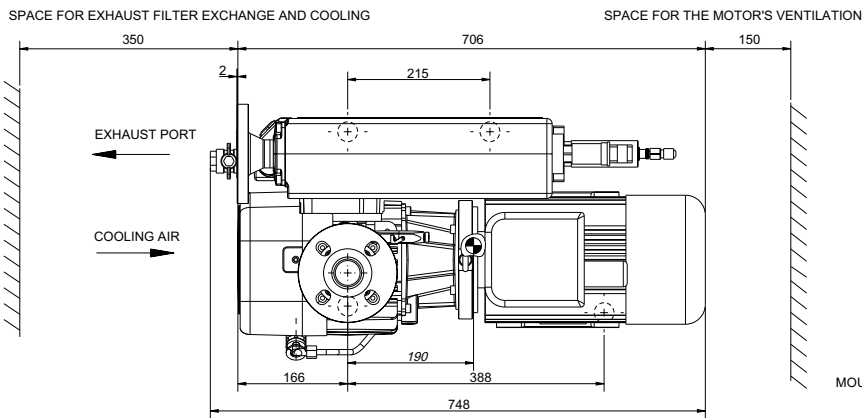


DRAWINGS AND DIMENSIONS

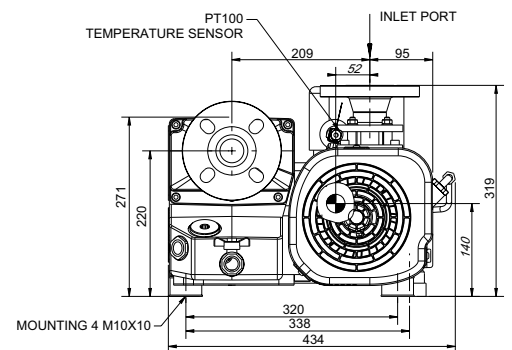
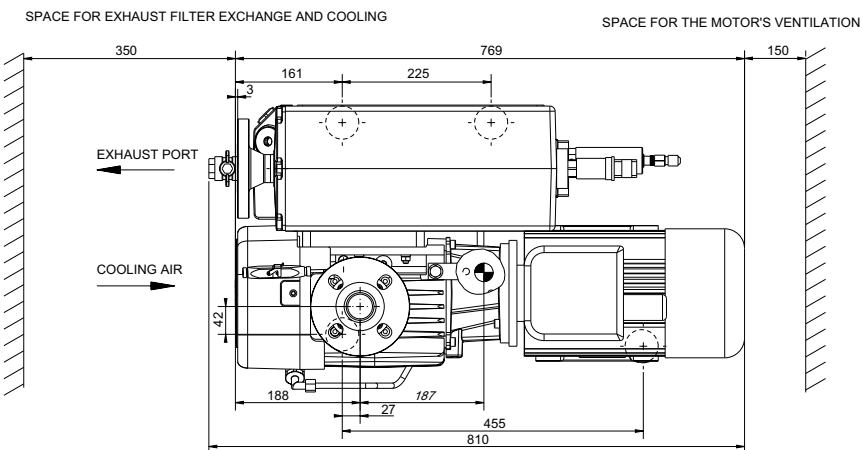
nES40ex



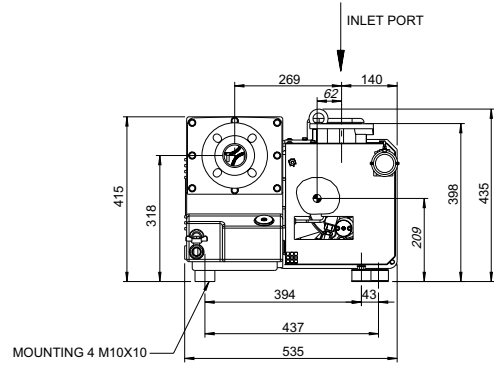
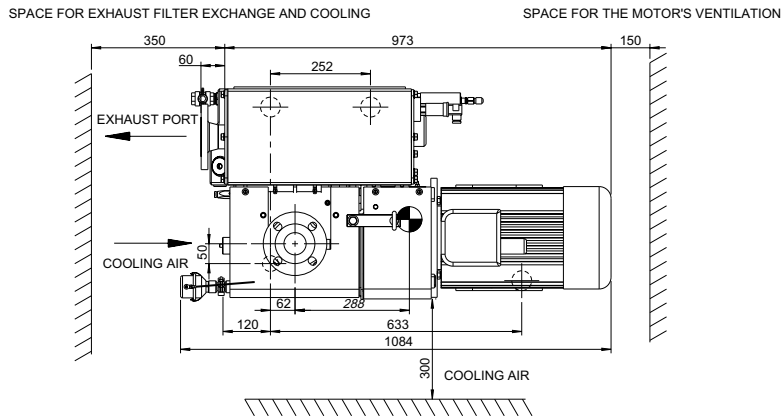
nES65ex



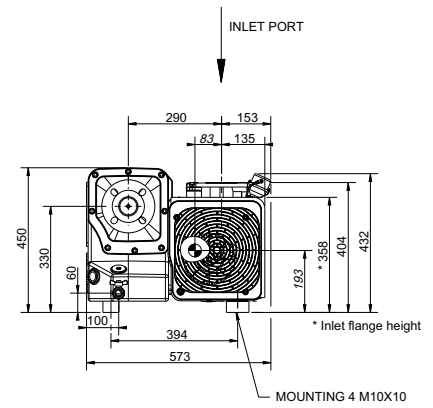
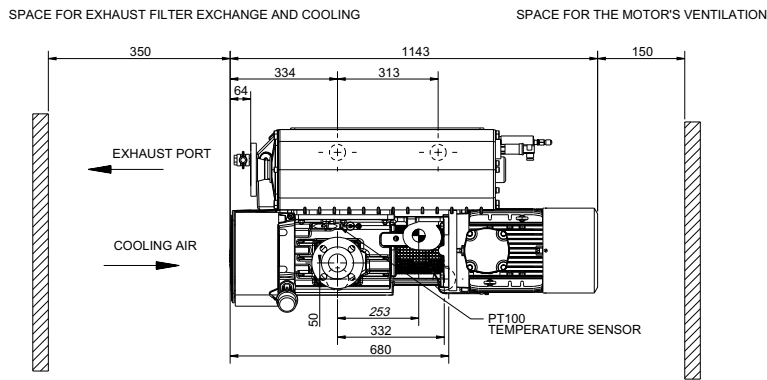
nES100ex



nES200ex

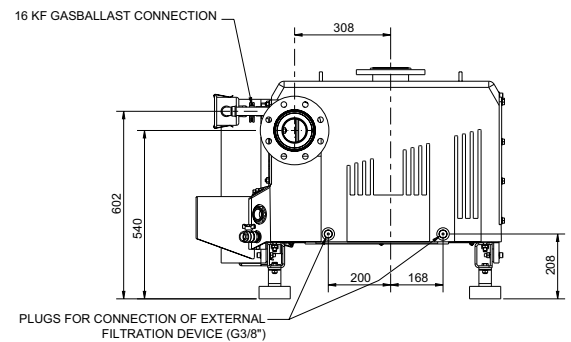
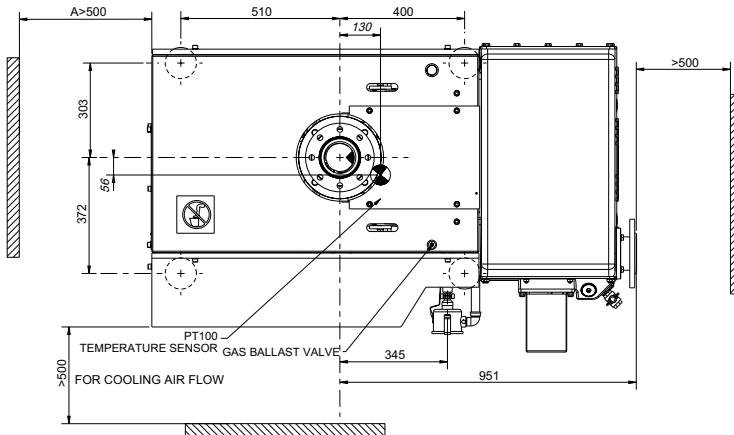


nES300ex



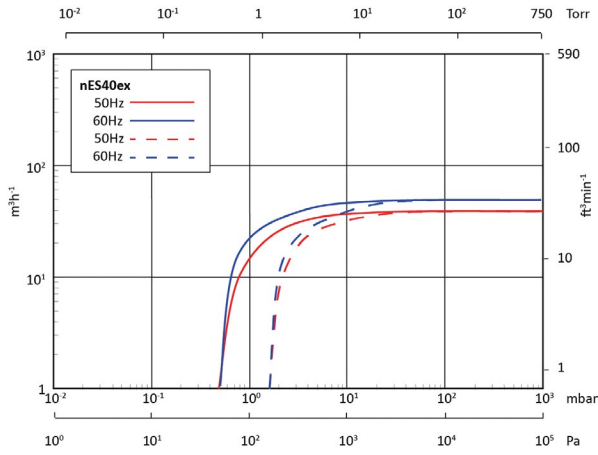
nES630ex

A: SPACE TO ACCESS TO ELECTRICAL CONNECTION

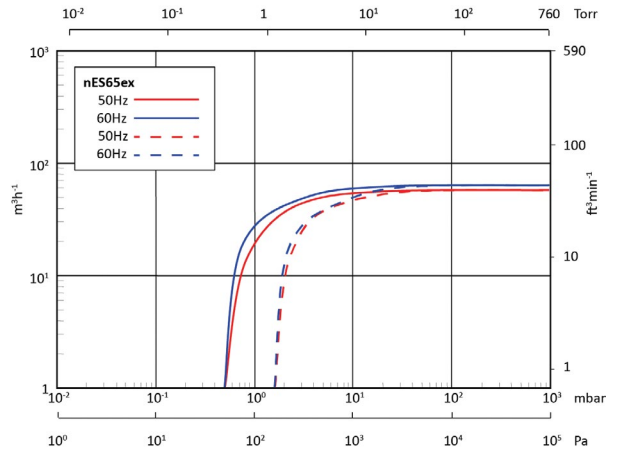


PERFORMANCE CURVES

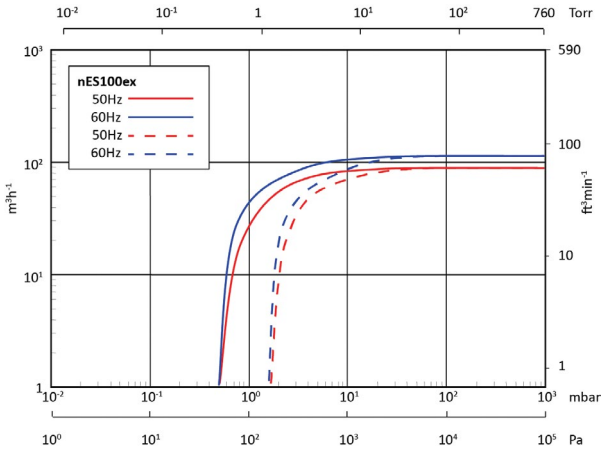
nES40ex



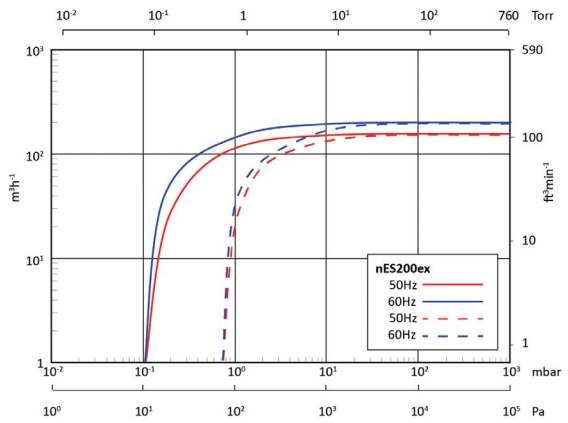
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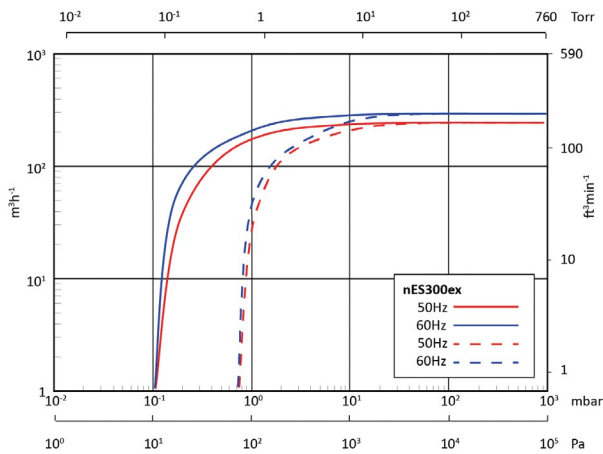
nES100ex



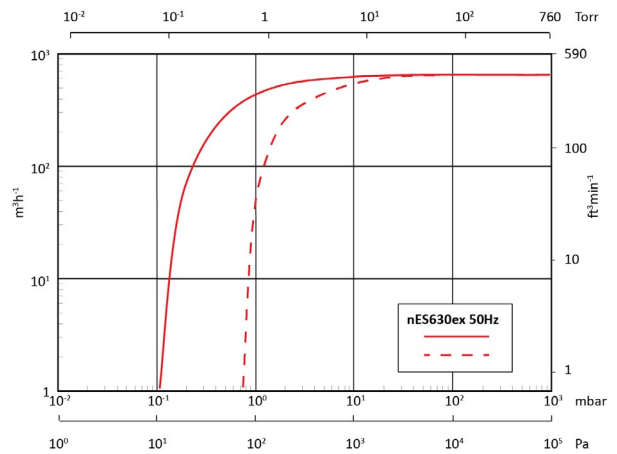
nES200ex



nES300ex



nES630ex



Without gas ballast



With gas ballast

SERVICE AND SUPPORT

nES single stage EX series pumps are designed with a number of features which enable both routine maintenance to be conducted with minimal specialised tooling and knowledge. Scheduled routine maintenance shall include activities deemed beneficial to the continued performance and longevity of the product. All work must be done by suitably trained ATEX personnel. Before any maintenance operations are carried out on the pump, it should be ensured that the pump and its surroundings are free from flammable atmospheres and dust deposits.

We provide the following fast and effective service solutions for nES single stage EX series pumps.

- Our field service teams carry out essential maintenance, repair and commissioning service at your site. We invest in the tools, training and inventory that enable our teams of service engineers to deliver quality service in a safe and consistent manner. We can assist site staff in performing routine maintenance or troubleshoot a specific problem.
- We also support module exchange to facilitate rapid and cost effective turnaround, and minimise disruption to installed and configured systems. We maintain comprehensive inventory of service exchange products. Every pump has been tested and is ready for immediate installation.
- Alternatively you can return the pump to Edwards STC for overhaul as required.

If you wish to conduct more complex maintenance or overhaul tasks it is necessary to be trained by fully qualified Edwards engineers and be supplied with the correct maintenance and inspection tooling.

- Dedicated spares kits containing everything required in one simple package for maintenance.
- Low cost dedicated tooling to perform removal and replacement of the critical bearing and shaft seals.

ORDERING INFORMATION

nES single stage EX series: ATEX Category 2

Compliant to ATEX Directive 2014/34/EU

Model	Motor rating	ATEX Category 2	Part Number
nES40ex	230 & 400 V +- 10 %; 50 Hz and 460 V +- 10 %; 60 Hz. Air cooled.	Ex II (internal) 2 G b IIB+H2 T3 / (external) 2 G IIC T4 (10 <Ta< 40 °C) X	A35118940
nES65ex	230 & 400 V +- 10 %; 50 Hz and 460 V +- 10 %; 60 Hz. Air cooled.	Ex II (internal) 2 G b IIB+H2 T3 / (external) 2 G IIC T4 (10 <Ta< 40 °C) X	A35318940
nES100ex	230 & 400 V +- 10 %; 50 Hz and 460 V +- 10 %; 60 Hz. Air cooled.	Ex II (internal) 2 G b IIB+H2 T3 / (external) 2 G IIC T4 (10 <Ta< 40 °C) X	A35418940
nES200ex	230 & 400 V +- 10 %; 50 Hz and 460 V +- 10 %; 60 Hz. Air cooled.	Ex II (internal) 2 G b IIB+H2 T3 / (external) 2 G IIC T4 (10 <Ta< 40 °C) X	A35518940
nES300ex	230 & 400 V +- 10 %; 50 Hz and 230 V +- 10 %; 60 Hz. Air cooled.	Ex II (internal) 2 G b IIB+H2 T3 / (external) 2 G IIC T4 (10 <Ta< 40 °C) X	A35618940
nES630ex	400 & 690 V +- 10 %; 50 Hz only. Air cooled.	Ex II (internal) 2 G b IIB+H2 T3 / (external) 3 G IIC T3 (T150 °C)(10 <Ta< 40 °C) X	A35818940

nES single stage EX series: Bare shaft

Edwards nES single stage EX series bare shaft pumps have the same pump protection features, excluding motor related components. Pumps are supplied ready for local motor fitting.

*Bare shaft IEC flange available on request.

*Bare shaft pumps are not ATEX compliant.

Bare shaft pump (Non ATEX compliant)	Motor mounting flange (NEMA)	Part Number
nES40ex - without motor	145TC	A35118986
nES65ex - without motor	145TC	A35318986
nES100ex - without motor	184TCH	A35418986
nES200ex - without motor	213TC	A35518986
nES300ex - without motor	215TC	A35618986



GLOBAL CONTACTS

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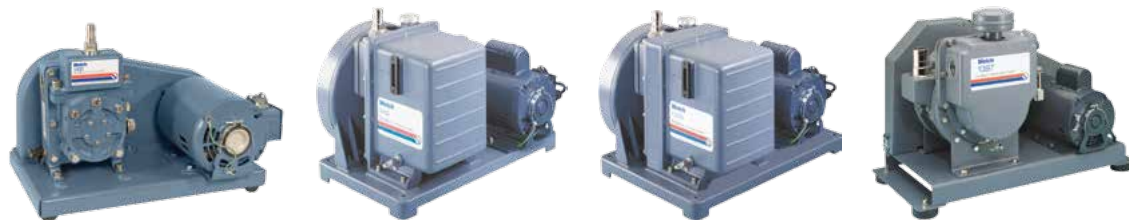
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Rugged Belt Drive Vacuum Pumps | DUOSEAL®



**Model
1400**

**Models
1405 / 1402**

**Model
1376**

**Models
1397 / 1374**

Specifications

Two-Stage Vacuum Pumps

Model	1400	1405	1402	1376	1397	1374
Free Air Displacement						
cfm	0.9	3.2	5.6	10.6	17.7	23
l/min.	25	90	160	300	500	650
Ult. Vac. Pressure, torr (mbar) ^{1,2}	1×10^{-4} (0.00013)	1×10^{-4} (0.00013)	1×10^{-4} (0.00013)	1×10^{-4} (0.00013)	1×10^{-4} (0.00013)	1×10^{-4} (0.00013)
Gas Ballast	Yes	Yes	Yes	Yes	Yes	Yes
Discharge Pressure (PSIG)	---	---	---	---	---	---
Pump RPM	580	525	525	525	400	510
Motor Horsepower (watts)	1/3 (250)	1/2 (370)	1/2 (370)	1 (750)	1 (750)	1-1/2 (1120)
Oil Capacity, qt.(liters)	0.62 (0.59)	2.25 (2.1)	2.25 (2.1)	2.5 (2.4)	1.25 (1.2)	1.25 (1.2)
Tubing Needed, I.D. in.	7/16 (11)	7/16 (11)	13/16 (21)	13/16 (21)	1-5/8 (41)	1-5/8 (41)
Intake, Nipple Thread	3/4-20	1-20	1-20	1-20	1.75-20	1.75-20
Exhaust, Thread Type	3/4-20	1-20	1-20	1-20	1.75-20	1.75-20
Weight, lbs. (kg)	58 (26)	112 (51)	112 (51)	156 (71)	205 (93)	220 (100)
Overall Dimensions LxWxH in.(cm)	17.8x9x12.6 (45.1x32.1x31.8)	20x12x15 (51x30.5x60)	20x12x15 (51x30.5x60)	20x14.1x15.4 (51x35.9x39)	26x13.7x18.8 (66x34.8x47.6)	26x13.7x18.8 (66x34.86x47.6)
Ship Weight, lbs. (kg)	70 (31.8)	132 (60)	132 (60)	180 (81.8)	213 (96.8)	215 (97.7)
Shipping Carton Dimensions LxWxH in.(cm)	20.5x13.8x14.5 (52.1x35.1x36.8)	22.5x15.5x19.5 (57.2x39.4x49.5)	22.5x15.5x19.5 (57.2x39.4x49.5)	22x18x19 (55.9x45.7x48.3)	27.3x18x22 (69.3x45.7x55.9)	27.3x18x22 (69.3x45.7x55.9)

Ordering Information^{3,4}

Wired for 115V, 60Hz, 1 Ph with N. American 115V Plug	1400B-01	1405B-01	1402B-01	1376B-01	1397B-01	1374B-01 ⁵
Wired for 230V, 60Hz, 1 Ph with N. American 230V Plug	1400C-01	1405C-01	1402C-01	---	---	---
Wired for 220V, 50Hz, 1 Ph w/Cont. Euro. (Schuko) Plug	1400C-02	1405C-02	1402C-02	1376C-03	1397C-03	---
Explosion Proof Motor, 115V, 60 Hz	1400W-01	1405W-01	1402W-01	---	---	---
3-Phase Motor 230V, 460V, 60Hz	---	---	1402M-01	1376M-01	1397M-01	1374M-01
Wired for 115V, 60Hz, 1 Ph with N. American 115V Plug, CSA	1400B-80	1405B-80	1402B-80	---	1397B-80	---

Applications

	page
1. Freeze Drying	17
2. Glove Box	26
3. Vacuum Manifold / Schlenk Line	11
4. Vacuum Ovens	23
5. Refrigeration Servicing	24 - 29

DuoSEAL Pumps

Rugged oil-seal pumps for a wide variety of vacuum needs, including Schlenk drying lines, freeze drying, degassing, concentrations, distillations, and more. Pulley drive enables low pump rpm operation - reduces friction, oil temperature, and oil degradation. Large oil reservoir minimizes contamination effects and extends maintenance intervals. Use of a cold trap is recommended to protect the pump and enhance vacuum levels.

Refrigeration Servicing Pumps

Special Welch DuoSEAL pumps are fitted with components designed to withstand refrigerant contact. Models 1402B-46 and 1397B-46 include integrated handles.



Notes:

- Two-stage pumps should not be operated continuously at pressures above 10 torr. Ultimate pressure measured with a trapped McCleod gauge.
- One-stage pumps should not be operated continuously at pressures above 50 torr.

Rugged Belt Drive Vacuum Pumps | DUOSEAL[®], CAPTURE



**Model
1399N**



**Model
1402B-46**



**Model
1376B-46**



**Model
CRR-1A**

One-Stage Vacuum Pumps w/o plate		One-Stage Vacuum Pumps w/bell jar plate	Refrigeration Servicing Pumps			CAPTURE Refrigerant Recovery
1399	1399N	1402B-46	1376B-46	1397B-46	CRR-1A	
1.2	1.2	5.6	10.6	17.7	10.6	
35	35	160	300	500	300	
1.5 x 10 ⁻² (0.019)	1.5 x 10 ⁻² (0.019)	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)	3x10 ⁻² (0.04)	
No	No	Yes	Yes	Yes	---	
---	---	---	---	---	30	
750	750	525	525	400	525	
1/3 (250)	1/3 (250)	1/2 (370)	1 (750)	1 (750)	1 (750)	
0.5 (0.47)	0.5 (0.47)	2.25 (2.1)	2.5 (2.4)	1.25 (1.2)	2.5 (2.4)	
7/16 (11)	7/16 (11)	13/16 (21)	13/16 (21)	1-5/8 (41)	---	
3/4-20	3/4-20	1-20	1-20	1.75-20	1 NPT	
3/4-20	3/4-20	1-20	1-20	1.75-20	1 NPT	
51 (23)	63 (28.6)	112 (51)	156 (71)	205 (93)	122 (55.4)	
17x9x10 (43.x22.9x25.42)	17x9x10 (43.x22.9x25.42)	20x12x15 (51x30.5x60)	20x14.1x15.4 (51x35.9x39)	26x13.7x18.8 (66x34.8x47.6)	19.25x12.3x11.1 (48.9x31.3x28.1)	
62 (28.2)	74 (33.6)	132 (60)	180 (81.8)	213 (96.8)	136 (61.8)	
20.5x13.8x14.5 (52.1x35.1x36.8)	20.5x13.8x14.5 (52.1x35.1x36.8)	22.5x15.5x19.5 (57.2x39.4x49.5)	22x18x19 (55.9x45.7x48.3)	27.3x18x22 (69.3x45.7x55.9)	22x14.8x18 (55.9x37.6x45.7)	
1399B-01	1399N-01	1402B-46	1376B-46	1397B-46	CRR-1A	
---	---	---	---	---	---	
1399C-02	---	1402C-46	1376C-46	1397C-46	CRR-1B	
---	---	---	---	---	---	
---	---	---	---	---	---	
---	1399B-80	---	---	---	---	

- All 115V and 230V single phase motors include thermal overload protection.
- Models 1400C-02, 1405C-02 and 1402C-02 provided with CE marking.
- Conduit wiring installation required. No cord, plug or switch provided.
- CSA approved models are 1400B-80, 1405B-80 and 1402B-80.

DuoSeal™ Vacuum Pump Oil
Tested to high vacuum levels, this oil meets rigid requirements for vapor pressure, stability and viscosity.

Size	CAT. No.
Quart	1407K-11
Gallon	1407K-15
5 Gallon	1407K-20



Exhaust Filter
A replaceable filter element captures oil mist from the exhaust port of the pump and reduces pump noise.



Pump	CAT. No.
1399, 1400	1417
1376, 1402, 1405	1417P-10
1397, 1374	1417P-20

For a Complete System

Component	page
• Traps	69
• Inlet / Exhaust Accessories	69 - 71
• Fittings / Hose	66 - 68
• Gauges	76 - 77
• Regulators / Controllers	75 - 76
• Service Kits	81
• Oil	72 - 73

Apply deep vacuum to your system in the toughest conditions. CHEMSTAR® pumps are built to withstand corrosive chemical vapor environments - durable performance over the long haul. CHEMSTAR® is designed to minimize the effects of harmful chemicals:

Rugged Rotary Vane Design

Built to the renowned performance standards of Welch DUOSEAL® pumps, CHEMSTAR® utilizes vapor contact components that are tough and chemical resistant. The belt-drive mechanism gears the pump down, enabling slow pump operation to reduce friction and keep operating temperatures low.

Lubrication System

The oil capacity is large for excellent dilution of contaminants. Oil is fed to the pump from the top of the reservoir, allowing sludge to settle without compromising lubrication. The recommended lubricant ("Gold Oil") is a synthetic oil designed to reduce chemically active sites. Use the nitrogen purge to drive elimination of corrosive gases.

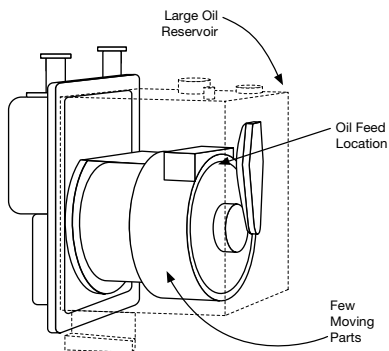
Key Accessories

Welch also provides the system add-ons that further protect your pump and your environment. Select the equipment that augments your vacuum system needs - traps, oil mist eliminators, and system components.

The Five Defining Features Needed For Pumping Corrosive Gases

1. High Contamination Tolerance

- Contaminants diluted
- Fewer moving parts
- Top oil feed for cleaner oil



2. Vital Parts Corrosion Resistant

- Fluoroelastomer seals and gaskets
- PTFE
- Stainless Steel
- Nickel Plated or Anodized
- Chemical Resistant Grade of Cast Iron

3. Reduced Frictional Wear

- Less than 580 RPM vs. typical 1750 RPM direct drive

4. Nitrogen Purge Standard

- Degasses and cools oil

5. Easy Attachment of Accessories

- Complete accessory package for corrosive gases

- HCl
- H₂SO₄
- HOAc
- Br₂
- H₂S
- CH₂O
- O₃
- HBr
- SO_x
- F₃CCO₂H
- Cl₂
- HNO₃
- SF₆, CF₄ fragments and other gases



Model 1402N

Specifications & Ordering - See Below

Specifications			
Model	1400N	1402N	1376N
Free Air Displacement			
cfm (l/min.)@60 Hz	0.9	5.6	10.6
m ³ /hr (l/min.)@50 Hz	25	160	300
Ultimate Pressure, torr(mbar) ¹	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)	1 x 10 ⁻⁴ (0.00013)
Gas Ballast	Yes	Yes	Yes
Pump RPM	580	525	525
Motor Horsepower (watts)	1/3 (250)	1/2 (370)	1 (750)
Oil Capacity, qt.(liters)	0.62 (0.59)	2.25 (2.1)	2.5 (2.37)
Tubing Needed, I.D. in.	7/16 (11)	13/16 (21)	13/16 (21)
ISO Exhaust & Intake Flange ⁵	NW 16	NW 25	NW 25
Overall Dimensions LxWxH in.(cm)	17.8x9x12.6 (45.2x22.9x32)	19.3x14.1x15.4 (49x35.3x39.1)	19.3x12.3x15.6 (49x31.2x39.6)
Weight, lbs.(kg)	58(26)	112(51)	156(71)
Ship Weight, lbs.(kg)	71(32.3)	133(60.5)	181(82.3)
Shipping Carton Dimensions LxWxH in.(cm)	20.5x13.8x14.5 (52.1x35.1x36.8)	22.5x15.5x19.5 (57.2x39.4x49.5)	22x18x19 (59.5x45x48)
Ordering Information ^{2, 4}			
Wired for 115V, 60Hz, 1 Ph w/N. American 115V Plug	1400N-01	1402N-01	1376N-01
Explosion Proof Motor 115V, 60Hz, 1 Ph	1400N-90 ³	1402N-90 ³	---
Wired for 230V, 60Hz, 1 Ph w/ N. American Plug	---	1402N-60	1376N-60
Wired for 220V, 50Hz, 1 Ph w/ Cont. Euro. (Schuko) Plug	1400N-50 ⁶	1402N-50 ⁶	1376N-49
Wired for 100V, 50/60Hz, 1 Ph for Japan	1400N-53	1402N-53	1376N-53

Notes:

1. CHEMSTAR pump should not be operated continuously at pressures above 10 torr. Ultimate pressure measured with a trapped McCleod gauge.
2. All single phase motors have overload protection.
3. Conduit wiring installation required. No cord, plug or switch provided.
4. Hinged clamp, centering ring assembly and hose adapter are included with all CHEMSTAR Pumps.
5. Standard filter option possible if the exhaust flange is removed, but not chemically resistant.
6. Units supplied with CE marking.