



Industrial Dry Vacuum Pumps EDS 200, EDS 300, EDS 480

INSTRUCTION MANUAL

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You must use this product as described in this manual. Read the manual before you install, operate, or maintain the product. For manual enquiries, email manuals@edwardsvacuum.com.

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1. Safety and compliance

For safe operation from the start, read these instructions carefully before you install or commission the equipment and keep them safe for future use. Read all the safety instructions in this section and the rest of this manual carefully and make sure that you obey these instructions.

The instruction manual is an important safety document that we often deliver digitally. It is your responsibility to keep the instruction manual available and visible while working with the equipment. Please download the digital version of the instruction manual for use on your device or print it if a device will not be available.

1.1 Definition of Warnings and Cautions

NOTICE:



For safe operation from the start, read these instructions carefully before you install or commission the equipment and keep them safe for future use.

Read all the safety instructions in this section and the rest of this manual carefully and make sure that you obey these instructions. The equipment must only be operated and maintained by trained personnel in the proper condition and as described in this instruction manual.

Obey local and state requirements and regulations. If you have any questions about safety, operation or maintenance of the device, please contact our nearest subsidiary.



DANGER:

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Important safety information is highlighted as warning and caution instructions. Obey these instructions.



WARNING:

If you do not obey a warning, there is a risk of injury or death. Different symbols are used according to the type of hazard.



CAUTION:

If you do not obey a caution, there is a risk of minor injury, damage to equipment, related equipment or process.



NOTICE:

Information about properties or instructions for an action which, if ignored, will cause damage to the equipment.

We reserve the right to change the design and the stated data. The illustrations are not binding.

Keep the instructions for future use.

1.2 Trained personnel









For the operation of this equipment “trained personnel” are:

- skilled workers with knowledge in the fields of mechanics, electrical engineering, pollution abatement and vacuum technology and
- personnel specially trained for the operation of vacuum pumps

1.3 Safety symbols

The safety symbols on the products show the areas where care and attention is necessary.

The safety symbols that we use on the product or in the product documentation have the following meanings:

	<p>Warning/Caution</p> <p>Risk of injury and/or damage to equipment. An appropriate safety instruction must be followed or a potential hazard exists.</p>
	<p>Warning - Automatic start up</p> <p>Risk of injury. The equipment can be started remotely and without warning.</p>
	<p>Warning - Dangerous voltage</p> <p>Risk of injury. Identifies possible sources of hazardous electrical shock.</p>
	<p>Warning - Hot surfaces</p> <p>Risk of injury. Identifies a surface capable of inflicting burns through contact.</p>
	<p>Warning - Moving parts present</p> <p>Risk of injury. Identifies moving parts that may cause injury or damage to equipment.</p>
	<p>Warning - Trip hazard</p> <p>Risk of injury. Identifies spilled liquids, trailing cords, pipes and other low-lying objects that may result in slipping, tripping or falling.</p>
	<p>Warning - Burst hazard</p> <p>There is a risk of bursting due to excessive pressure.</p>
	<p>Warning - Risk of explosion</p> <p>There is a risk of explosion when you do the task.</p>

2. Important safety information

2.1 Mechanical hazards



CAUTION: LOSS OF STABILITY DURING TRANSPORT

Uncontrolled movement due to incorrect attachment / lifting / carrying / rolling or movement of the vacuum pump. Only use the attachment points and conveying means described in this manual for vertical and horizontal conveying.



WARNING: EJECTION OF PARTS

Ejection of parts through bursting of vacuum system due to excessive pressure caused by incorrect direction of rotation. Pressure build-up in the vacuum system or in vacuum chambers. Check the direction of rotation of the vacuum pumps before each start-up, after each motor change and after each electrical connection change.

Ejection of parts through bursting of vacuum system as a result of excessive pressure caused by clogged or constricted exhaust. Pressure build-up in the vacuum system or exhaust pipes. Do not start up or operate the vacuum system with the outlet closed or throttled.

Ejection of parts through bursting of vacuum system due to excessive pressure, caused by faulty function at the gas inlet into the vacuum system. Pressure build-up in the vacuum system or inlet lines. Check correct connection of inlet and outlet flanges before commissioning. The inlet pressure at the suction port of the vacuum system must not exceed atmospheric pressure. If seal gas or gas-ballast from pressure vessels is used, secure the supply in such a way that no overpressure can occur in the vacuum system in the event of a fault or power interruption.

Ejection of parts through bursting of vacuum system as a result of excessive pressure caused by the pump running backwards after it has been switched off under vacuum. Danger of overpressure in the inlet lines and recipients as well as uncontrolled backward running of rotors. In the event of a fault or during service, separate the vacuum pumps from the vacuum vessel and connecting lines before the inlet by means of suitable valves.



WARNING: RISK OF CUTTING AND CRUSHING

Risk of cutting and cutting off by contact with moving parts such as couplings, shafts and rotors.

Risk of cutting and crushing when reaching into open flanges or covers.

Do not operate the vacuum pump with open flanges or covers. When installing, first mechanically connect the inlets and outlets, close the covers of rotating parts and then make the electrical connections. Disconnect the vacuum pump from the power supply before servicing. Only use trained service personnel.

WARNING: UNEXPECTED RESTART



Failure or malfunction of the central control system (unexpected start-up) or danger of a pump restarting automatically after switching off due to a fault.

Risk of crushing, cutting or cutting off by touching moving parts due to recurring start command or power supply.

Before carrying out maintenance or service work, disconnect the pump from the power supply, secure it against being switched on again, determine that it is de-energised, ground and short-circuited and cover / isolate adjacent live parts.

CAUTION: RISK OF INJURY



Pulling in of body parts and objects into the vacuum through open flanges. Do not operate the vacuum pump with open flanges. When installing the vacuum pump, first mechanically connect the inlets and outlets and then make the electrical connections.

CAUTION: HIGH PRESSURE GAS



Danger due to incorrect connection of the pump to the system to be pumped out. Pressure build-up in the vacuum system.

Check correct connection of inlet and outlet flanges before commissioning. When using the pump with seal gas, protect the seal gas supply so that no overpressure can occur in the pump system in the event of a malfunction or power interruption.

CAUTION: TRIP HAZARD



Slipping, tripping or falling as a result of oil leaking from the pump. Oil can escape from the vacuum pump during pumping or depending on the work process. Risk of falling on oil spills. Check the vacuum pump regularly for oil leaks. Take the appropriate safety measures

2.2 Electrical hazards

DANGER: ELECTRICAL SHOCK



Risk of electrical shock caused by direct or indirect contact with live parts. Electrical shock due to faulty electrical connection and possible residual voltage up to 5 minutes after disconnection from the mains. The electrical connection may only be carried out by a trained person. Observe the national regulations in the user country, e.g. for Europe EN 50110 - 1. Prior to servicing, disconnect the vacuum pump from the power supply.

Risk of electrical shock due to interruption of the protective conductor system. In the event of a fault, life-threatening voltages may be present on electrically conductive components. Before commissioning, check the resistance of the earthing cable and the suitability of the assigned overcurrent protection device.



DANGER: LIGHTNING STRIKE

Risk of fire and injury from lightning strike. The operator is responsible for assessing the hazard potential when used outside of buildings.

2.3 Thermal hazards

CAUTION: HOT SURFACES

Burning of fingers, hands or arms on hot surfaces. Handle the pump only when ventilated and cooled down. Wear suitable protective equipment.



Scalding by contact with hot equipment or lubricants. Danger of scalding when opening the hot pump with hot operating fluid or cooling-water. Only open the outlet or inlet port for operating media if the operating medium has adapted to the room temperature. Wear suitable protective equipment.

A barrier must be placed around the pump to prevent accidental contact with hot surfaces. The barrier must not only consist of barricade tapes or warning signs. The barrier must be reliable and require tools (such as screwdriver or allen key) for removal.

2.4 Danger through materials and substances



DANGER: HAZARDOUS GASES

Danger due to a rapid increase in pressure due to the decomposition of pumped gases. Uncontrolled emission of process gases by reaction products within the pump. The pumping of reactive gases, vapours or gas mixtures is generally prohibited. The operator is responsible for assessing the hazard potential of the process media or mixtures.

Danger of escaping or emitting pumped hazardous gases, vapours or substances. Pumped process gases may escape from the exhaust and leaks in the vacuum system. The pumping of pyrophoric/radioactive/oxidising gases or gas mixtures, as well as the pumping of oxygen of more than atmospheric concentration (21%) is generally prohibited. The operator is responsible for assessing the hazard potential of the process media or mixtures.

WARNING: HAZARDOUS MATERIAL AND SUBSTANCES

Some pumps use perfluoropolyether (PFPE) as lubricant. When handling PFPE you should observe the following:



During thermal decomposition at temperatures over 290 °C toxic and corrosive gases are released. When handling PFPE keep it away from open fires. Do not smoke with PFPE on your fingers.

Touch the inner sections of the pumps only while wearing clean gloves and use clean tools.

Do the necessary work in clean and dry rooms. After having removed the pump from its packaging, start it up as quickly as possible, as cleaning agents solvents based on hydrofluorether compounds may be used.

Fluoropolymers are used as sealants (FKM) and as lubricants (PFPE) in the pumps. In case the pump suffers a severe mechanical failure, the possibility of hazardous substances being released owing to their thermal decomposition cannot be excluded. The hazards caused by such decomposition are described in the Material Safety Data Sheets for the materials, for example.

2.5 Explosion hazard

DANGER: INTERNAL EXPLOSION



The pump is suitable for use with internal and external flammable atmospheres as defined by the pump marking. There is a risk of internal explosions within the pump, or ignition sources externally, if the pump is operated outside of the limits of operation.

2.6 Noise hazard

CAUTION: HIGH NOISE LEVELS



The operating conditions can cause higher noise levels than specified in the technical data. Take suitable hearing protection measures.

Pressure values in bar or mbar are absolute pressures, unless expressly stated otherwise (e.g. bar(g)).

3. ATEX certification

DANGER: INTERNAL EXPLOSION



The EDS dry pump is designed to pump gas and/or vapours. Ensure that the pump temperatures are sufficient to prevent condensation forming which may otherwise lead to corrosion and loss of explosion protection. The use of seal purges and correct warm-up and shut-down procedures are necessary to prevent the formation of condensation. If in any doubt, consult us.

Shaft-seal purge must be maintained in order to ensure long term reliability of shaft-seals and the zoning/protection concept.

If blockages of the exhaust are possible, exhaust pressure should be monitored, otherwise excessive back-pressure can occur, leading to high temperatures and risk of explosion.

The EDS ATEX Category 3 dry pump uses the protection strategy of constructional safety for internal atmospheres and satisfies the requirements for ATEX Category 3.

Constructional safety relies on there being no ignition sources inside the pump. EDS dry pumps are manufactured and tested to show that running clearances are maintained in the pump during extremes of normal operation and at trip points of pump safety instruments. For Category 3 pumps, ignition hazards inside the pump are prevented from occurring in normal operation. When using constructional safety as the protection concept ensure that no process deposits are formed inside the pump which could potentially create an ignition source. This can be achieved either by process control or by the use of solvent flush. In such systems the solvent flush operation is safety critical and suitable safeguards must be put in place to ensure that solvent flow is maintained to the prescribed regime. The gearbox of the EDS pump is classified one zone lower than the pumping chamber; the high-integrity seal in combination with seal purge ensures zone separation.

The EDS is capable of pumping a potentially explosive atmosphere that is likely to occur occasionally in normal operation and therefore satisfies the essential requirements identified in Annex II of the ATEX Directive 2014/34/EU for Category 3 equipment.


3.1 Classification and marking of the pump

The pump is marked as follows:

	<p>II 3/- G Ex h IIC T3 Gc/- $5\text{ °C} \leq T_a \leq 40\text{ °C}$ (internal atmospheres only)</p>
	<p>or</p> <p>II 3/- G Ex h IIC T3 Gc/- X $5\text{ °C} \leq T_a \leq 40\text{ °C}$ (internal atmospheres only)</p>

Modifying the supplied pump, voids the CE and ATEX Declaration of Conformity.

Table 1 Key to the Symbols

	ATEX logo
h	The code letter “h” is valid for all non-electrical devices.
IIC	Explosion group
T3	Temperature class. Pumps belonging to temperature class T3 must only be operated with gases or vapours which exhibit an ignition temperature of over 200 °C.
X	Special operating conditions needs to be obeyed. The special conditions and notes provided in the operating instructions will be applicable.

3.2 Conditions of safe use

The EDS pump must be operated in accordance with the definitions of normal use and operational limits as specified within this manual.

Accessories and additional parts fitted to the EDS pump must fulfill the requirements of the ATEX Directive 2014/34/EU regarding the equipment group and category and they must be applicable for use in explosive atmospheres of the respective gas group and temperature class. Accessories and additional parts should be approved by us otherwise they may have a detrimental effect on the pump performance and safety.

The mandatory safety instruments specified in this manual must be used and must not be replaced with alternatives from other manufacturers without consultation with us.

Only processes which fulfill the conditions of the normal operation as specified in this manual must be used.

EDS pumps must only be used on processes if their materials resist the mechanical and/or chemical influences and corrosion, under the respective operating conditions, so that the explosion protection is always maintained.

Means for preventing back-flow of the pumped media must be used if back-flow can result in process hazards.

Opening the EDS pump is only permitted with the pump switched off, isolated from the electrical supply and in the absence of an explosive atmosphere.

Process limits

Table 2 Limits for category 3 inside pumps

Parameter	EDS 200	EDS 300	EDS 480
Temperature class	T3	T3	T3
Power consumption (kW)	5.5 (7.5 for Asia)	7.5	11
Rotor speed (maximum)	6600	7500	7500
Internal explosive atmosphere	IIC		
Inlet gas temperature (°C) at inlet pressure \geq 150 mbar(a)	\leq 80		

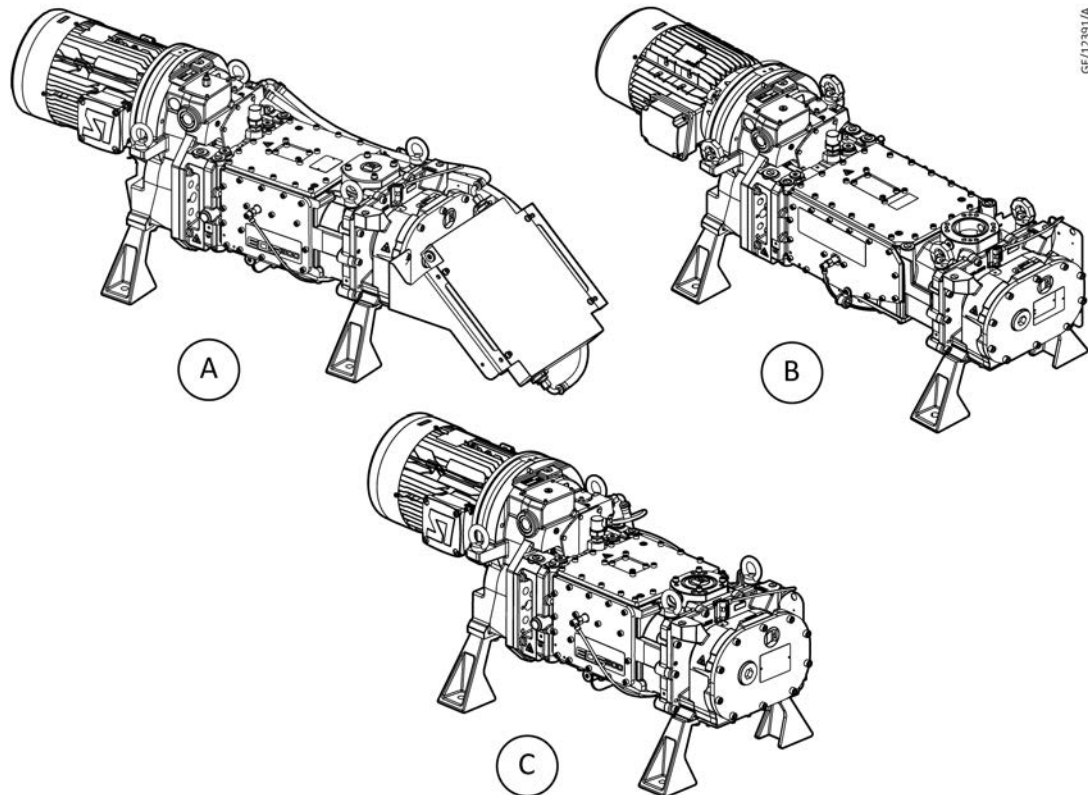
Parameter	EDS 200	EDS 300	EDS 480
Inlet gas temperature (°C) at inlet pressure < 150 mbar(a)	≤ 110		
Pump exhaust gas temperature (°C)	≤ 165	≤ 165	≤ 135
Pump case temperature (°C)	≤ 90	≤ 90	≤ 65
Pump exhaust pressure (mbar(a))	≤ 1190	≤ 1190	≤ 1100
Ambient temperature (°C)	5 to 40		
Water flow (l/min)	≥ 4	≥ 4	≥ 8
Water inlet temperature (°C)	≤ 35	≤ 35	≤ 30

3.3 Special conditions X for EDS 480 ATEX Category 3

Make sure that once the pump is shut-down, do not restart it within 20 minutes.

4. Description

Figure 1 EDS pump models



GE/12391/A

EDS 200 and EDS 300 look the same, they differ only in their performance.

- A. EDS 200/300 Air blast B. EDS 480
C. EDS 200/300

4.1 Design

The EDS dry pump range has been developed to meet the demanding requirements for pumping solutions in industrial and chemical applications. The EDS pumps in general are designed for general vacuum use only and operation in rough and fine vacuum to evacuate vessels and to pump gas mixtures.

The pump is a dry, positive displacement screw vacuum pump in which pairs of intermeshing, non-contacting screw rotors are turning contrawise in phase by timing-gears. The screw rotors are driven by an asynchronous electrical motor. Blow-off valves within the mechanism minimise pumping power at high pressures and allow the pump to be started direct-on-line. The rotational speed of screw rotors is increased by transmission gears. Gears and bearings are lubricated with synthetic oil or PFPE.

 **Note:**

If synthetic oil and PFPE come into contact with each other they will emulsify. So the pump must only be operated with the type of lubricant specified for the pump. If you want to change the type of lubricant, contact us.

The EDS pumps are supplied with different motors concerning main voltage and supply frequencies.

Cooling system

The motor is air cooled by an integrated cooling fan. The EDS pump itself is water or air cooled.

Water cooled: cooling water circulates around the pump body and then passes out of the pump. The cooling system is open-loop and unregulated such that the cooling water flow rate and temperature will directly affect the temperature of the pump.

Air cooled: glycol/water mixture circulates around the pump body and through the air cooled heat exchanger via an integrated water pump. The cooling system is closed-loop.

The pumps have a thermal snap-switch on the pump body for temperature monitoring.

The output of the thermal snap-switch has two connections: one will open the circuit when the temperature of the pump body is higher than 90 °C. Use this output to provide a warning of high temperature. The second output will open the circuit when the temperature of the pump body is higher than 110 °C. Use this output to shut down the pump when it is too hot.

Gas system

The EDS pumps have a shaft-seal purge system and a gas-ballast system.

The shaft-seal purge delivers the supplied gas, for example, dry compressed air or nitrogen, to the internal shaft seal system to protect it and ensure lifetime and functionality. Shaft-seal purge ensures that the shaft-seals are maintained at a positive pressure gradient to the pumping chamber during pump operation. Therefore it prevents the entry of corrosive or toxic process vapours into the pump gearbox, prevents contamination of the process gases by pump oil, prevents damage to shaft-seals by debris.

As supplied, the gas-ballast system can deliver ambient air to the pump gas-ballast inlet. Gas-ballast use depends on your application and can, for example, reduce temperature load or increase water vapour capability. The air flow is filtered and is controlled by a valve. A check valve in the system prevents the escape of process gases out of the gas ballast. If required for your application, it is possible to connect dry nitrogen supplies to the pump, to deliver nitrogen gas ballast and nitrogen shaft-seal purge instead of air.

4.2 Supplied equipment

1. Pump as described in [Design](#) on page 16 and [Pumps](#) on page 18.
2. The pumps are filled with lubricant: Ultragrade® Endurance Extend 110 and Drynert 25/6
3. The pump flanges have been blanked off with a sealing cap
4. 4x crane eyes M16
5. Inlet diffuser
6. For EDS 200/300 - NW 40 clamping ring and O-ring for exhaust, O-ring for inlet
7. For EDS 480 - NW 63 blank flanged for exhaust, O-ring for inlet
8. Pump body thermal snap switch.

4.3 Ordering information

4.3.1 Pumps

Table 3 Pumps ordering information

EDS	Electrical supply	Part No.	ATEX
EDS 200 water cooled	200/400 V 50 Hz	A41820945	Ex II 3/-G Ex h IIC T3 Gc/- 5 °C ≤ Ta ≤ 40 °C (internal atmospheres only)
	230/460 V 60 Hz	A41820946	
	200/380 V 50 Hz (7.5 kW)	A41820934	
	200/380 V 60 Hz (7.5 kW)	A41820936	
	575 V 60 Hz	A41820957	
	230/460 V 60 Hz PFPE	A41820046	
EDS 200 air cooled	200/400 V 50 Hz	A41821945	
	230/460 V 60 Hz	A41821946	
	200/380 V 50 Hz (7.5 kW)	A41821934	
	200/380 V 60 Hz (7.5 kW)	A41821936	
	575 V 60 Hz	A41821957	
EDS 300 water cooled	200/400 V 50 Hz	A41830945	
	230/460 V 60 Hz	A41830946	
	200/380 V 50 Hz	A41830934	
	200/380 V 60 Hz	A41830936	
	575 V 60 Hz	A41830957	
EDS 300 air cooled	200/400 V 50 Hz	A41831945	
	230/460 V 60 Hz	A41831946	
	200/380 V 50 Hz	A41831934	
	200/380 V 60 Hz	A41831936	
	575 V 60 Hz	A41831957	
EDS 480 water cooled	200/400 V 50 Hz	A41840945	Ex II 3/-G Ex h IIC T3 Gc/- X 5 °C ≤ Ta ≤ 40 °C (internal atmospheres only)
	230/460 V 60 Hz	A41840946	
	200/380 V 50 Hz	A41840934	
	200/380 V 60 Hz	A41840936	
	575 V 60 Hz	A41840957	

5. Technical data

Table 4 Technical data

EDS	200	300	480
Pumping speed without gas-ballast	> 210 m ³ /h	> 280 m ³ /h	> 460 m ³ /h
Ultimate partial pressure	< 0.05 mbar	< 0.01 mbar	< 0.01 mbar
Maximum permissible inlet pressure	1013 mbar		
Maximum permanent discharge pressure (absolute pressure)	1200 mbar (for ATEX Category 3 pump, refer to Conditions of safe use on page 14)		
Swept volume maximum pressure rating	11 bar		
Integral leak rate	< 10 ⁻⁴ mbar l/s		
Water vapour capacity without condensation between 10 – 50 mbar	1.5 - 7 kg/h	2 - 10 kg/h	3 - 12 kg/h
Permissible ambient temperature	5 to 40 °C		
Storage temperature	-30 to +50 °C		
Typical continuous A-weighted sound pressure level at ultimate pressure (without silencer but with long exhaust line)	≤ 71 dB(A)		
Relative atmospheric humidity	Maximum 90%		
Installation location	Up to 2000 m (m ASL)*		
Cooling	Water and water/ glycol mixture		
Mains voltage	200 - 230 V or 380 - 460 V a.c. ± 10% or 575 V ± 10% [†]		
Frequency	50/60 Hz		
Phases	3-phase		
Motor rating (mechanic)	5.5 kW (7.5 HP) 7.5 kW (10 HP) - for Asia	7.5 kW (10 HP)	11 kW (15.4 HP)
Current rating (200 – 230 V systems) at full load	24.1 A	29 A	39 A
	Inrush current or up to 8x full load for EDS 200 ^{2) 3)} or up to 7x full load for EDS 300 ^{2) 3)}		12 x
Current rating (380 – 460 V systems) at full load	13.5 A	14.5 A	19.5 A
	Input current or up to 8x full load for EDS 200 ^{2) 3)} or up to 7x full load for EDS 300 ^{2) 3)}		12x

EDS	200	300	480
Recommended branch circuit fuse:			
UL (200 – 230 V systems)	32 A		50 A
IEC (200 – 230 V systems)	32 A		50 A
UL (380 – 460 V systems)	16 A		32 A
IEC (380 – 460 V systems)	16 A		32 A
UL (575 V systems)	16 A		25 A
IEC (575 V systems)	16 A		25 A
Minimum cable size for:			
200 – 230 V systems	6 mm ²		10 mm ²
380 – 460 V systems	4 mm ²		6 mm ²
575 V systems	4 mm ²		6 mm ²
Power consumption at ultimate pressure	4.1 kW (5.5 HP)	4.5 kW (6.0 HP)	4.5 kW (6.0 HP)
Over voltage category	3		
Contamination grade	2		
Input supply voltage unbalance	Should not exceed 2% when assessed over any one minute period		
Second protective earth (ground) conductor	Must be fitted with the cross-sectional area at least equal to phase conductor size		
Cooling fan for heat exchanger			
Supply voltage 1-phase	24 V d.c.		-
Nominal current consumption	4 A (characteristic m)		-
Pump body thermal snap switch			
Supply voltage 1-phase	maximum 48 V d.c./a.c. 1 A		-
Rotor speed	6600 rpm	7500 rpm	
Minimum permissible motor speed ¹⁾	1200 rpm		
Vibration velocity	2 mm/s		
Protection class			
Water cooled	IP 54 Type 1 (UL50E)		
Air cooled	IP 20 Type 1 (UL50E)		
Pollution level	2 (for all sizes)		
Approximate warm-up time to a temperature of 40 °C (stator), with a cooling-water flow of 4 l·min ⁻¹ at 20°C	60 minutes		
Oil filling	Ultragrade® Endurance Extend 110 / Drynert® 25/6		
Oil quantity			
Drive (gearbox)	1250 ml		
Inlet side	250 ml		
Inlet flange	ISO 63		
Exhaust flange	NW 40		ISO 63
Materials			

EDS	200	300	480
Rotors, Stators	Cast SG Iron		
Seals	PTFE and fluoroelastome		
Materials in general	Cast grey iron, steel, aluminium, brass, rubber		
Timing gears	Steel		
Materials in the cooling circuit of the pump	Grey cast iron, Stainless steel, Polyester/silicone, aluminium, PBT, FKM, galvanised components, cathodic dip coating		
Closed water circuit filling	Drystar water mixture 50:50		
Oil filling	Synthetic / PFPE	Synthetic	
Weight (approximate)	420 kg		520 kg
Water			
Water connection	G1/2" female threads		
Water supply temperature	5 °C - 35 °C (for ATEX Category 3 pump, refer to Conditions of safe use on page 14)		
Required water pressure differential (to achieve minimum 8 l/min)	0.2 bar		
Maximum supply pressure	7 bar(g)**		
Primary cooling circuit volume (Drystar water mixture volume in case of variant with indirect cooling)	6 l		
Purge			
Connection	G1/4" female thread		
Purge gas supply pressure range	4 to 10 bar(g)		
Purge gas regulated pressure	> 2.2 bar(g)		
Purge gas supply quality	< 5 µm		

EDS	200	300	480
Seal purge flow rate	12 slm total		
Gas-ballast flow rate	0 to 50 slm (adjustable)		0 to 150 slm (adjustable)

* Current must be limited to 1% per 100 m above 1000 m (e.g. 2000 m = 10%).

**bar(g): bar (gauge) is the overpressure, i.e. atmospheric pressure = 0 bar(g).

† Refer [Pumps](#) on page 18 to identify your mains voltage.

1) The minimum permissible speed is relevant for the oil lubrication of bearings and gears. Operating the pump at less than the minimum speed for more than 1 hour can cause damage to the pump due to a lack of lubrication.

2) With undervoltage the starting current and time increase.

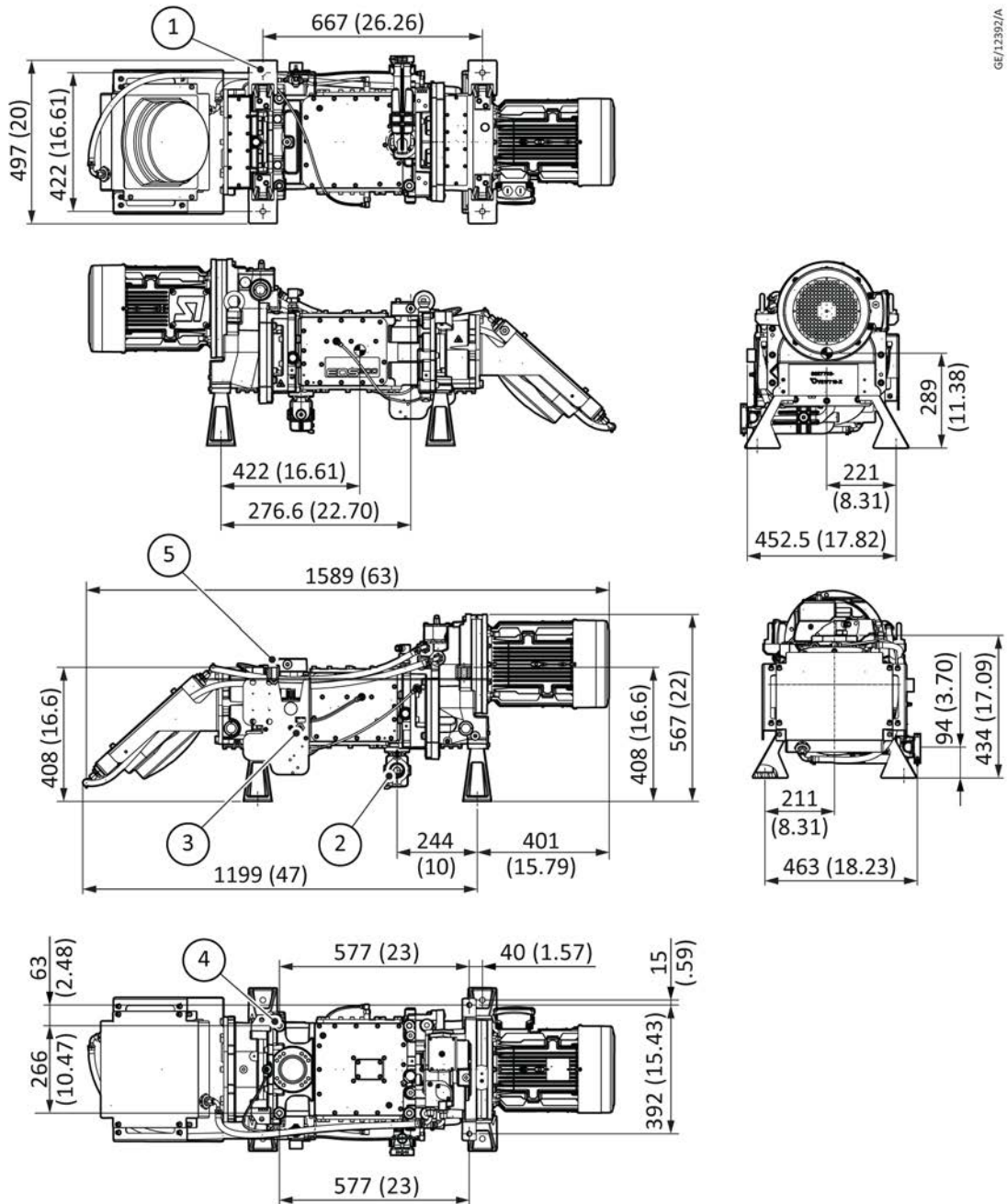
3) Be sure you have a matching fuse. 2/2.5x the full load current with a IEC 60898 Class D or similar.

Example for fuse: Eaton FAZ-D....

Motor protection should have class 30 (For Europe PKZM.... , For US: Schneider electric LR9D....)

5.1 Dimension drawings

Figure 2 EDS 200/300 with air cooling

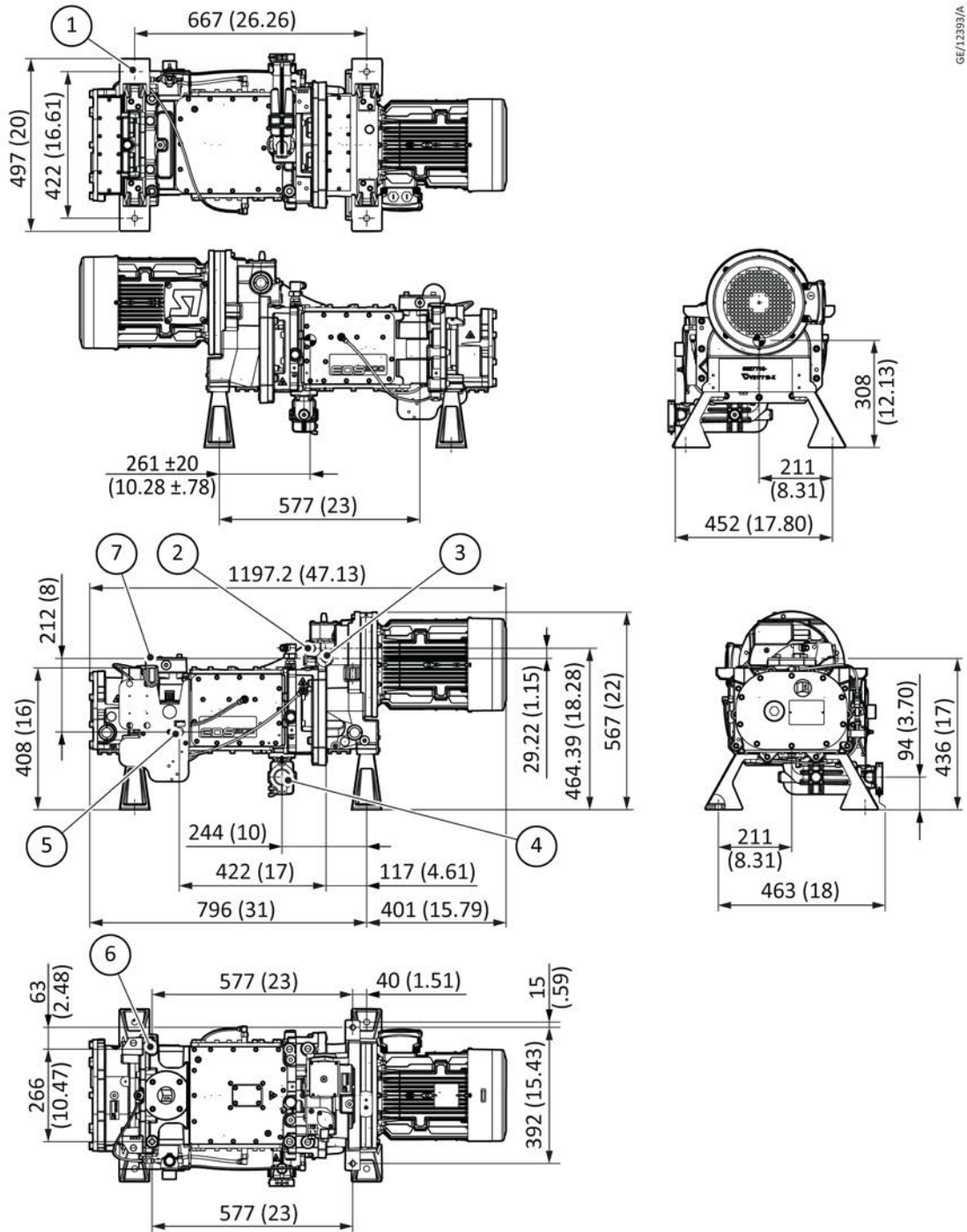


GE/12392/A

All dimensions given are in mm (inch).

- | | |
|-------------------------|------------------|
| 1. 4 x 17 diameter | 2. Exhaust NW 40 |
| 3. G1/4 Purge gas inlet | 4. 4 x M16 |
| 5. Inlet ISO 63 | |

Figure 3 EDS 200/300 with water cooling

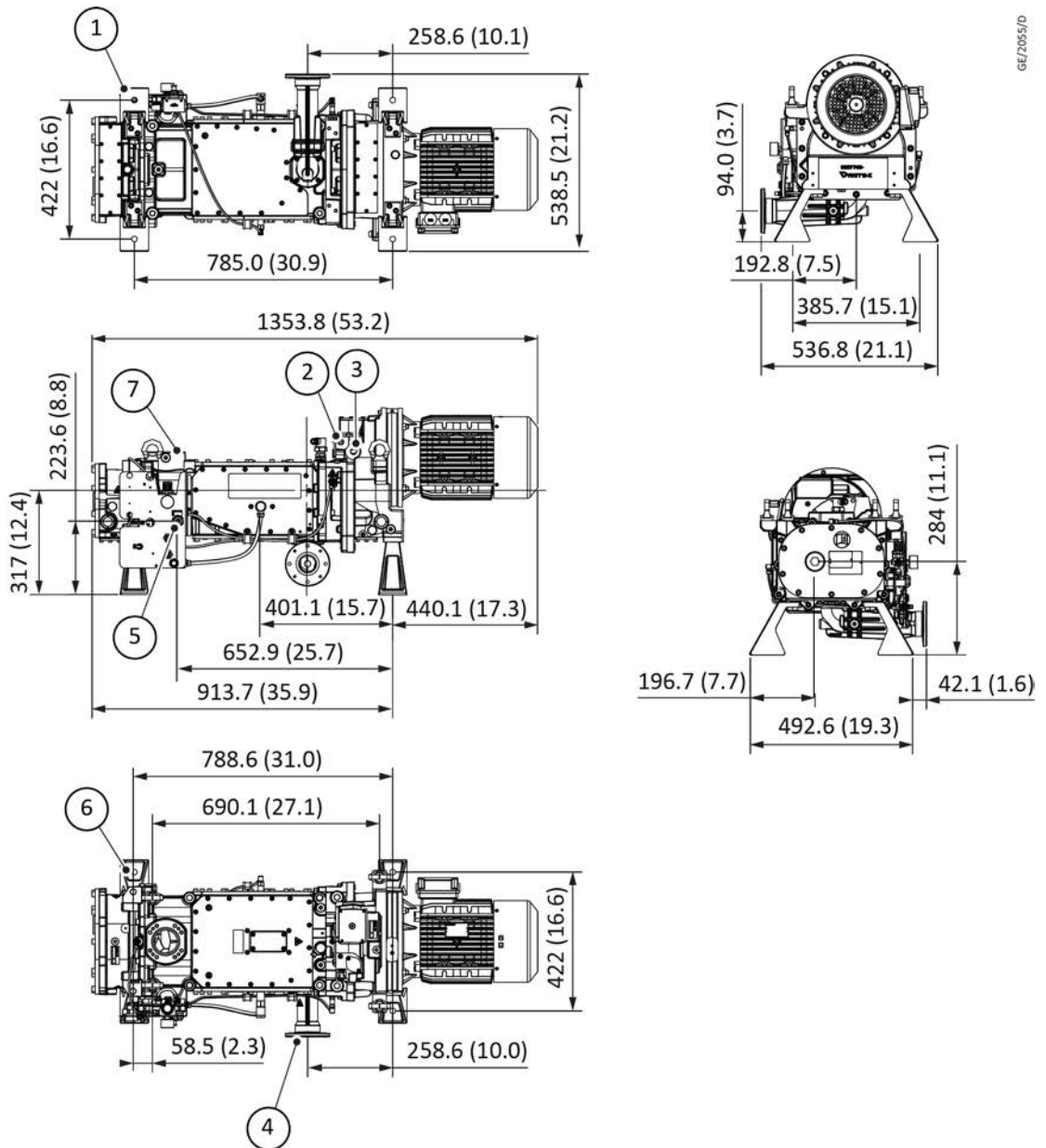


GE/13393/A

All dimensions given are in mm (inch).

1. 4 x 17 diameter
2. G1/2 Water inlet
3. G1/2 Water outlet
4. Exhaust NW 40
5. G1/4 Purge gas inlet
6. 4 x M16
7. Inlet ISO 63

Figure 4 EDS 480

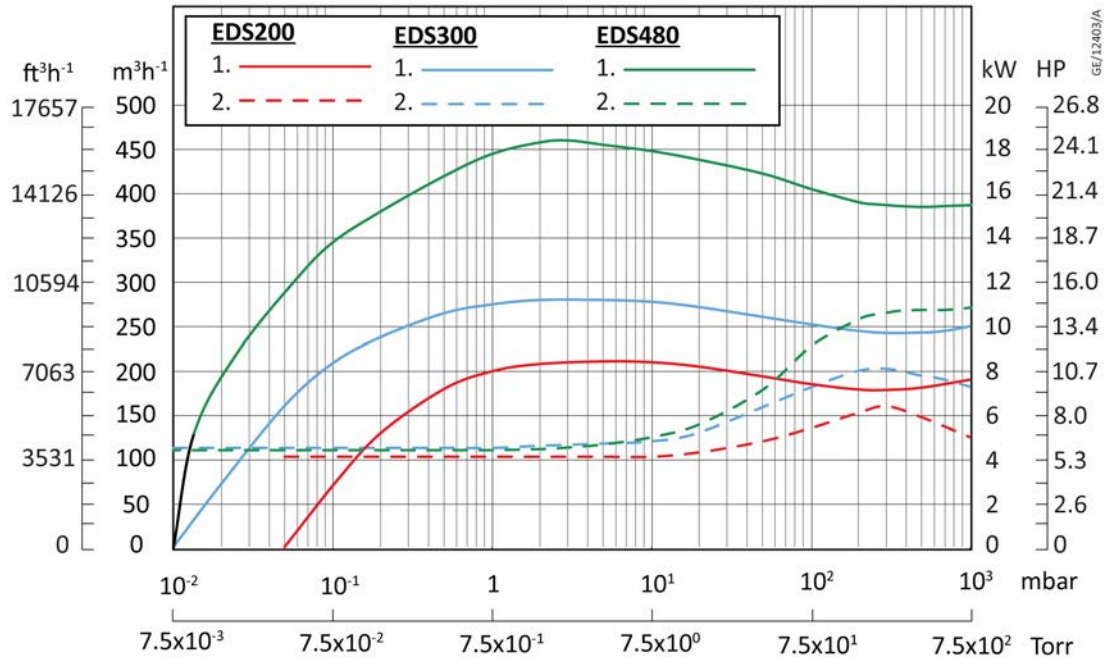


GE/2055/D

All dimensions given are in mm (inch).

- | | |
|-------------------------|--------------------------|
| 1. 4 x 17 diameter | 2. G1/2 Water inlet |
| 3. G1/2 Water outlet | 4. Exhaust DN 63 ISO-K-F |
| 5. G1/4 Purge gas inlet | 6. 4 x M16 |
| 7. Inlet ISO 63 | |

Figure 5 Pumping speed curves EDS 200, EDS 300 and EDS480



1. Pumping speed

2. Power consumption

6. Transportation

CAUTION: LOSS OF STABILITY DURING TRANSPORT



Uncontrolled movement due to faulty attaching/lifting/carrying/rolling or moving the vacuum pump. For vertical and horizontal transport, use only the attachment points and transport means described in this manual.

NOTICE:

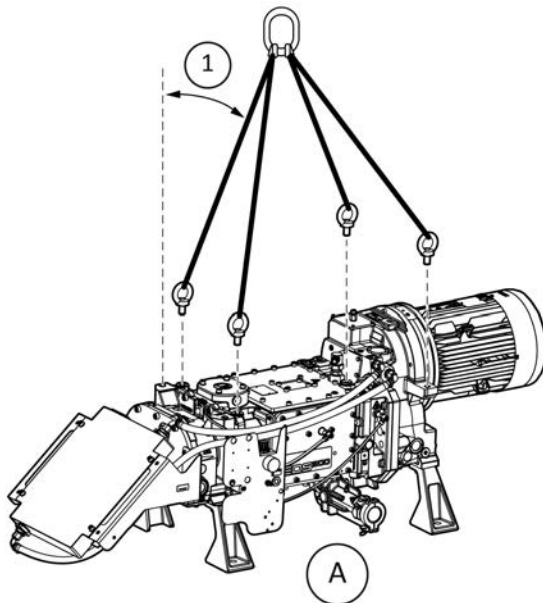


The pumps are supplied filled with synthetic oil or PFPE. For this reason they should, while being transported or shipped, not be subjected to much tilting (10° maximum). Store the pumps only horizontally standing on their feet.

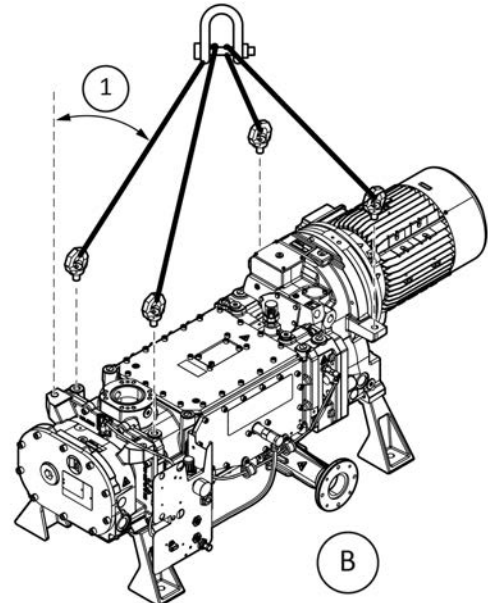
Use a suitable fork-lift truck or pallet truck to move the pump on its pallet, close to where you will install it.

Remove all packing materials.

Lift the pump at the crane eyes. Use all crane eyes. Ensure that it cannot trip over.



A. EDS 200 and EDS 300



B. EDS 480

1. Maximum 45°

GE/12394/A

7. Installation

WARNING: RISK OF CUTTING AND CRUSHING



Risk of cutting and cutting off by contact with moving parts such as couplings, shafts and rotors. Risk of cutting and crushing when reaching into open flanges or covers. Do not operate the vacuum pump with open flanges or covers. When installing, first mechanically connect the inlets and outlets, close the covers of rotating parts and then make the electrical connections. Disconnect the vacuum pump from the power supply before servicing. This work must only be performed by trained service personnel.

WARNING: EJECTION OF PARTS



Ejection of parts through bursting of vacuum system due to excessive pressure caused by incorrect direction of rotation. Pressure build-up in the vacuum system or in vacuum chambers. Check the direction of rotation of the vacuum pumps before each start-up, after each motor change and after each electrical connection change.

Ejection of parts through bursting of vacuum system due to excessive pressure, caused by faulty function at the gas inlet into the vacuum system. Pressure build-up in the vacuum system or inlet lines. Check correct connection of inlet and outlet flanges before commissioning. The inlet pressure at the suction port of the vacuum system must not exceed atmospheric pressure. If seal gas or gas-ballast from pressure vessels is used, secure the supply in such a way that no overpressure can occur in the vacuum system in the event of a fault or power interruption.

WARNING: RISK OF GAS LEAKAGE



The atmospheric shaft seal between the gearbox and atmosphere is a PTFE dynamic seal, which may, under wear-out conditions, lead to small leakage of gas. Ensure that purge gas is supplied continuously to the main pump shaft seals to prevent process gas entering the gearbox which could otherwise leak from the atmospheric shaft seal. Leakage of purge gas to atmosphere should also be considered; ensure the pump is in a well ventilated area.

CAUTION: HOT SURFACES



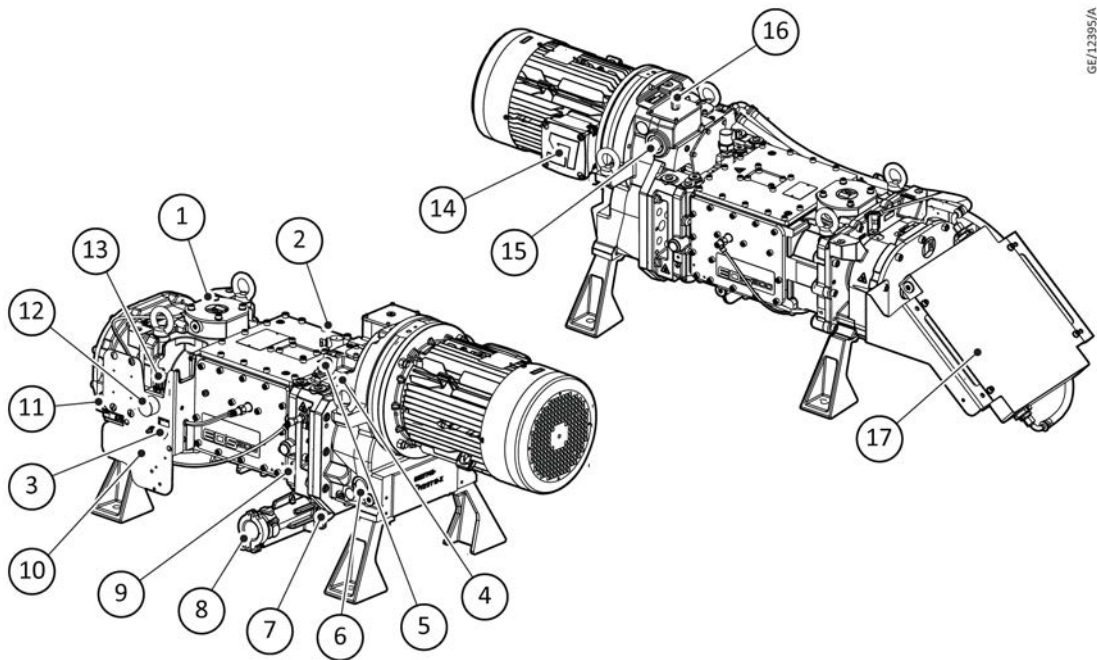
A barrier must be placed around the pump to prevent accidental contact with hot surfaces. The barrier must not only consist of barricade tapes or warning signs. The barrier must be reliable and require tools (such as screwdriver or allen key) for removal.

Only competent persons may install this EDS pump.

- Ensure that you comply with all local and national safety requirements when you install the pump.
- Do not operate the pump system unless the inlet and outlet are connected to your piping system.

- Disconnect the other components in the pumping system from the electrical supply so that they cannot be operated accidentally.
- Electrical, purge gas and water supplies are all potentially hazardous energy sources. Before carrying out any maintenance the supply of these sources should be locked and tagged out.
- Ensure that the cooling-air flow through the pump-motor cooling-fan cannot be obstructed.
- Ensure that all electrical cables, purge gas pipelines and cooling-water pipelines are safely positioned, secured and routed so that they do not present a trip hazard.

Figure 6 EDS 200/300 components

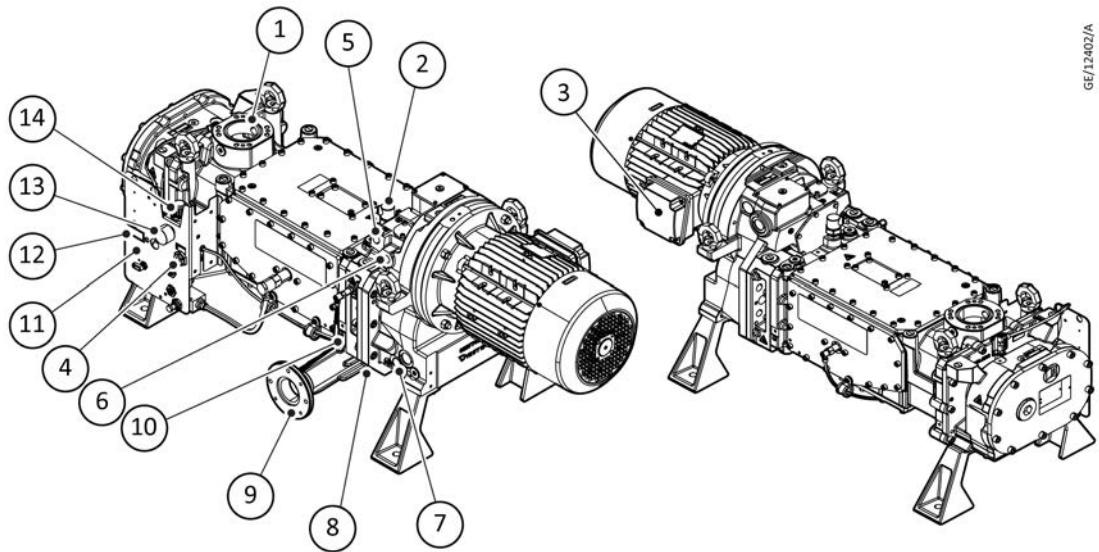


GE/12395/A

- | | |
|--------------------------------------|----------------------------------|
| 1. Inlet | 2. Pump body thermal snap switch |
| 3. Purge gas IN | 4. Cooling-water OUT |
| 5. Cooling-water IN | 6. Gearbox oil level glass |
| 7. Exhaust pressure transmitter port | 8. Exhaust |
| 9. Grounding connection M6 | 10. Gas panel |
| 11. HV end oil level glass | 12. Gas system pressure gauge |
| 13. Gas system pressure regulator | 14. Pump motor terminal box |
| 15. Cooling water level glass | 16. Relief valve* |
| 17. Heat exchanger | |

* The relief valve is applicable only for the air blast pump.

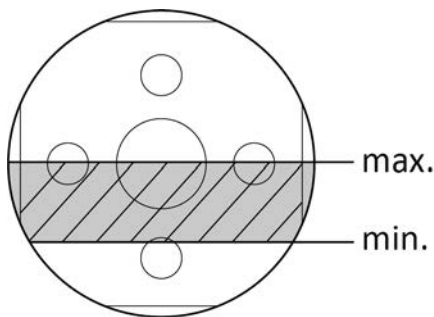
Figure 7 EDS 480 components



GE/12402/A

- | | |
|-------------------------------|--------------------------------------|
| 1. Inlet | 2. Pump body thermal snap switch |
| 3. Pump motor terminal box | 4. Purge gas IN |
| 5. Cooling-water IN | 6. Cooling-water OUT |
| 7. Gearbox oil level glass | 8. Exhaust pressure transmitter port |
| 9. Exhaust | 10. Grounding connection M6 |
| 11. Gas panel | 12. HV end oil level glass |
| 13. Gas system pressure gauge | 14. Gas system pressure regulator |

Figure 8 Oil level at pump standstill



CS/3055/C

7.1 Placement

Place the pump system on a flat and level surface.

The pump is designed for operation in the building. We recommend leaving the crane eyes screwed in.

Remove blank flanges on the pump just before fitting the pump so that the assembly work can be performed under the cleanest conditions.

Check whether there is any desiccant present in the intake area and remove it.

The pumps are supplied filled with synthetic oil or PFPE. Nothing will have to be refilled. Check the oil levels through both oil level glasses.

If one of the oil levels is found to be incorrect, contact us.

Fit suitable bolts through the fixing holes in the mounting feet, to secure the pump in position.

7.2 Normal operation

The EDS pumps are suitable for a wide range of industrial and chemical applications. We have a dedicated team of applications engineers who can help you determine the best EDS system for your application.

If you use the system on an application for which it is not suitable, you may invalidate your warranties. If in doubt, contact us.

7.3 Abnormal operation



WARNING: UNPREDICTABLE FAILURES

Use of equipment in abnormal operations can lead to failures that result in injury or death. Misuse of the pump as described below is strictly prohibited.

- Use of the EDS as a positive displacement compressor.
- Operation outside the limits of operation further defined in this manual.
- Operation outside the limits of the ATEX marking.
- Reverse rotation of the EDS.
- Pumping gases and vapours for which the materials (see [Technical data](#) on page 19) of the pump are not suitable.
- Pumping of substances and mixtures (gases, liquids and solids) where the explosion hazard results exclusively from the presence of explosive substances.
- Pumping gases that tend to self-decompose, or that are chemically unstable.
- Use of the EDS dry pump with materials that have auto-ignition temperatures below the defined temperature rating.
- Operation such that dust and process deposits can build up inside the pump mechanism, blow-off valve and exhaust. This could lead to a loss of constructional safety and an ignition hazard.
- Operation such that the EDS dry pump inlet temperature falls below the dew point of a vapour being pumped. This could lead to condensate that can collect and lead to the risk of corrosion or an ignition hazard.
- Pumping of, or use of the EDS dry pump in the presence of, explosive dust atmospheres.
- Use of the EDS dry pump in a system or flammable process that causes the ingress of metallic particles into the pump.
- Pumping of liquids and solid particles.
- Pumping pyrophoric gases.
- Use with oxygen enriched atmospheres.
- Operation with the insufficient attachment of the pump.
- Conversion, manipulation, and maintenance by people not authorised by us.
- Use of accessories that are not suitable for the internal or external ATEX rating, or which are not permitted or approved by us.

WARNING: INTERNAL EXPLOSION



Incorporate safety devices to prevent operation of the pump when the exhaust pipeline is restricted or blocked. If you do not, the exhaust pipeline may become over-pressurised and may burst.

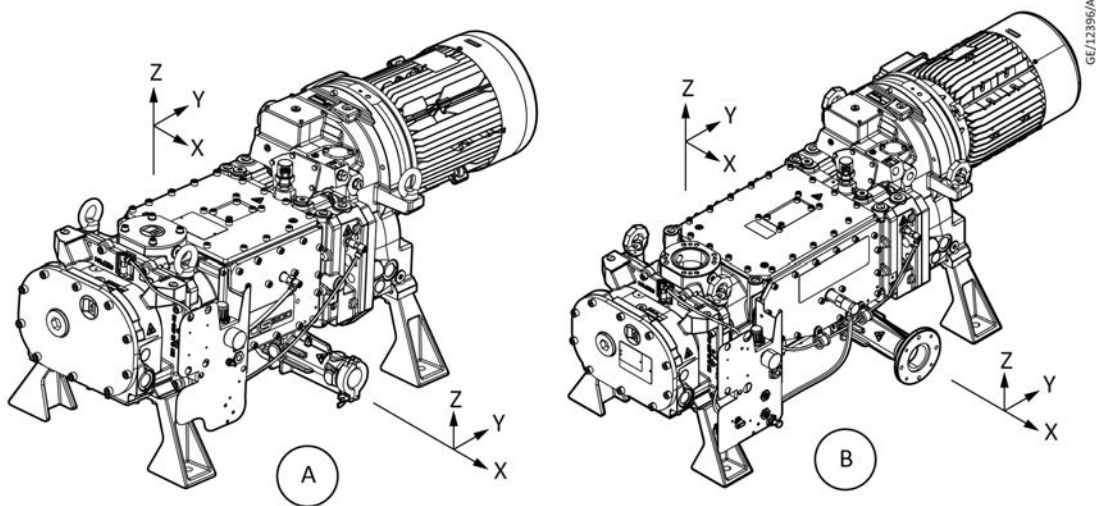
Do not operate the EDS dry pump with the exhaust pipeline blocked. If the exhaust pipeline is blocked, the pump can generate exhaust pipeline pressures of up to 12 bar.

Your exhaust pipeline system must be designed so that the pressure in the pipeline during operation is less than 1.2 bar absolute.

Incorporate flexible bellows in the exhaust pipeline to reduce the transmission of vibration and to prevent the loading of coupling joints, which can withstand pressure and maximum temperature of about 170 °C.

Remove the blanking cap from the pump outlet.

Use the NW 40 (for EDS 200 and EDS 300) or NW 63 (for EDS 480) clamping ring and trapped O-ring supplied in the fittings kit to connect the pump-outlet to your exhaust pipeline.



A. EDS 200 and EDS 300

B. EDS 480

Table 5 Maximum permissible flange load

Maximum force	EDS 200, EDS 300, EDS 480	
	Pump inlet	Pump outlet
F_X	±892 N	±446 N
F_Y	±1070 N	±356 N
F_Z	±1338 N	±290 N
F_R	±1931 N	±640 N

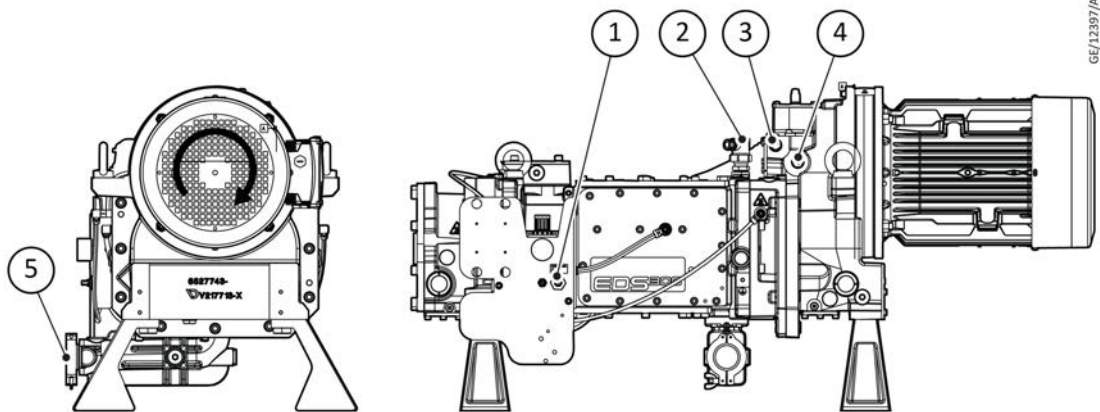
Maximum moment	EDS 200, EDS 300, EDS 480	
	Pump inlet	Pump outlet
M_X	± 476 Nm	± 115 Nm
M_Y	± 952 Nm	150 Nm
M_Z	± 721 Nm	150 Nm
M_R	± 1285 Nm	± 241 Nm

7.5 Connecting cooling-water

(Only for water cooled version)

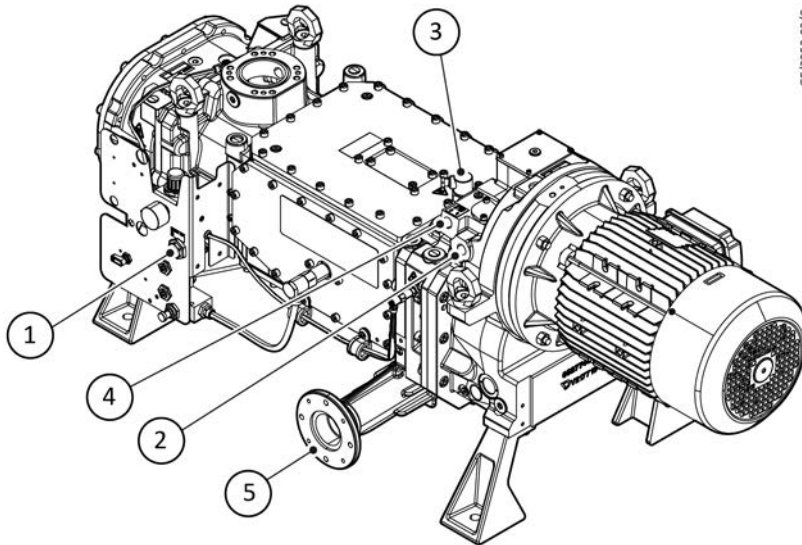
1. Use G1/2 male pipe fittings to fit the cooling-water supply and return hoses.
2. Remove the blanking plugs from the cooling-water inlet and outlet.
3. Connect your water return hose to the cooling-water-outlet and connect your water supply hose to the water-cooling inlet.
4. Turn on the cooling-water supply.
5. Inspect the water hoses, pipelines and connections and check that there are no leaks.

Figure 10 EDS 200/300 cooling water connection



1. Exhaust
2. Pump body temperature control connector
3. Cooling-water inlet
4. Cooling-water outlet
5. Purge gas inlet

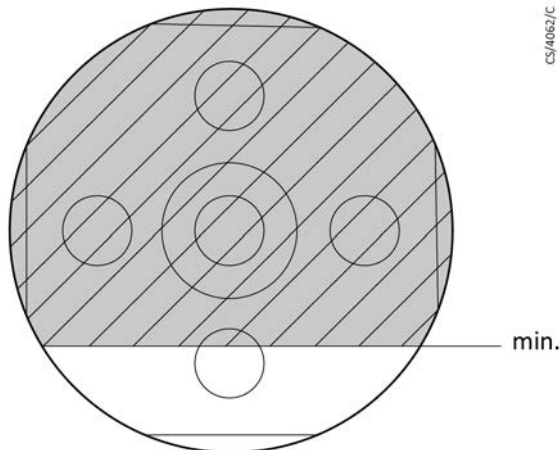
Figure 11 EDS 480 cooling water connection



- | | |
|--|-------------------------|
| 1. Purge gas inlet | 2. Cooling-water outlet |
| 3. Pump body temperature control connector | 4. Cooling-water inlet |
| 5. Exhaust | |

Type	Cooling-water demand at feed temperature (assuming a constant discharge temperature of 50 °C)		
	30 °C - 35 °C	25 °C - 30 °C	5 °C - 25 °C
EDS 200/300/480	8.0 l/min	6.0 l/min	4.0 l/min
Depending on your application and use of thermostatic valve temperatures and flows may differ.			

Figure 12 Cooling water level



For closed water-cooling circuit only.

For level indicator, refer to [Figure: EDS 200/300 components](#) and [Inspect pipelines and connectors](#) on page 54.

Make sure that the coolant level is not below the minimum label indicated on the pump. This may cause the internal cooling circuit to be inefficient or to stop.

The coolant level in the expansion tank may be above the sight glass due to temperature fluctuations. This may affect the reading of the correct level. With indirectly cooled variants, this is easily recognisable by the colour of the glycol mixture (for example- red or green).

7.5.1 Water quality

In order to ensure long trouble-free operation the cooling-water must not contain any oils, greases and suspended solids. Moreover, we recommend compliance with the following limit values:

Appearance	Clear, free of oils and greases
Suspended matter	< 250 mg/l
Particle size	< 150 µm
Electrical conductivity	< 700 µS/cm
pH value	7.0 to 9.0
Total hardness (total alkaline earths)	< 8 °dH
Aggressive carbon dioxide	None, not detectable
Chloride	< 100 mg/l
Sulphate	< 150 mg/l
Nitrate	≤ 50 mg/l
Iron	< 0.2 mg/l
Manganese	< 0.1 mg/l
Ammonium	< 1.0 mg/l
Free chlorine	< 0.2 mg/l
8 °dH (degrees German hardness) = 1.4mmol/l = 10 °e (degrees English hardness) = 14 °f (degrees French hardness)	
If there is the danger of frost, you may use a water Drystar mixture of up to 50%.	
DS water can be used for cooling the pump, if the pH value corresponds to the range indicated above.	

7.6 Connecting purge gas



WARNING: LEAKAGE OF GAS

The atmospheric shaft-seal between the gearbox and atmosphere is a PTFE dynamic seal, which may, under wear-out conditions, lead to small leakage of gearbox gas. Ensure that purge gas is supplied continuously to the main pump shaft-seals to prevent process gas entering the gearbox which could otherwise leak from the atmospheric shaft-seal. Leakage of purge gas to atmosphere should also be considered; ensure the pump is in a well ventilated area.

The pump must be operated with purge gas. The purge gas is distributed in the pump via flow restrictors as follows:

- to the shaft-seal on the low vacuum side

- into the pumping chamber (balance line)
- to the shaft-seal on the high vacuum side.

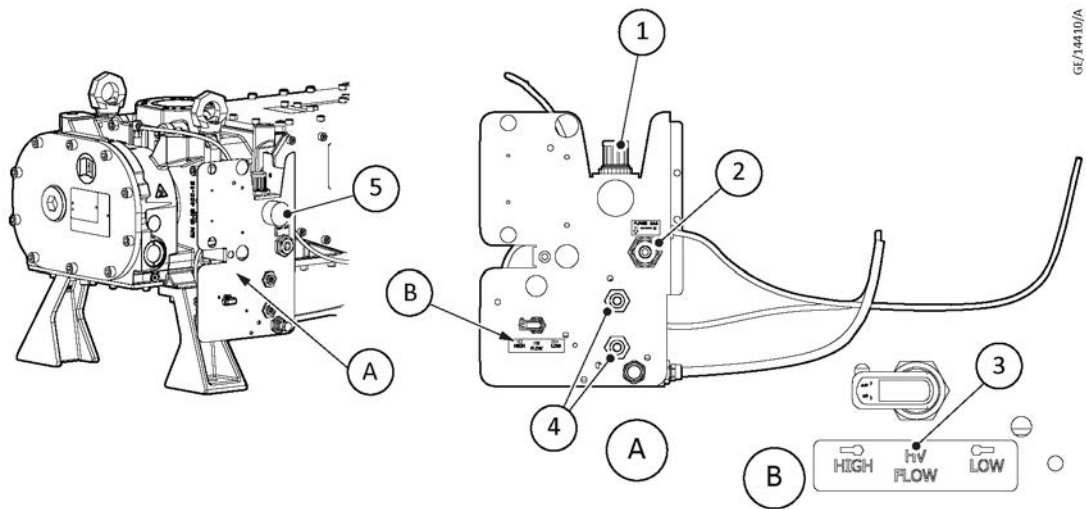
For low HV purge setting, the flow restrictors ensures that the gas flow to the shaft-seal on the high vacuum side becomes very low at ultimate pressure. The low HV purge setting is standard.

For EDS 480, the high flow switch position will result in a continuous gas flow of 6 slm to the high vacuum shaft-seal. This can be used to protect the shaft-seal from dusty process deposits. The ultimate pressure will increase to around 1 mbar. Refer to . The purge gas on the shaft-seals provides an air cushion under the shaft-seals and thus prevents premature wear.

Use of the correct shaft-seal purge and gas-ballast requirements depend on your application. If in doubt about your application setting, contact us.

- Connect an inert gas supply to the gas system. An upstream supply pressure of 4 to 10 bar(g) is required. Ensure that your gas system can maintain pressure while flowing up to 12 slm of purge gas.
- Adjust the regulator on the gas panel to 2.2 bar(g).
- The purge supply should be maintained whenever the pump is operational, to ensure the process seals operate correctly and that the oil boxes are adequately protected from process media.
- Be aware that the purge supplies are not automatically controlled, therefore it could be possible to pressurise the pump or system if the purge is left on with a closed system.
- Atmospheric gas ballast can be adjusted or shut off completely, depending on your application, using the manual needle valve.

Figure 13 Ports and regulators



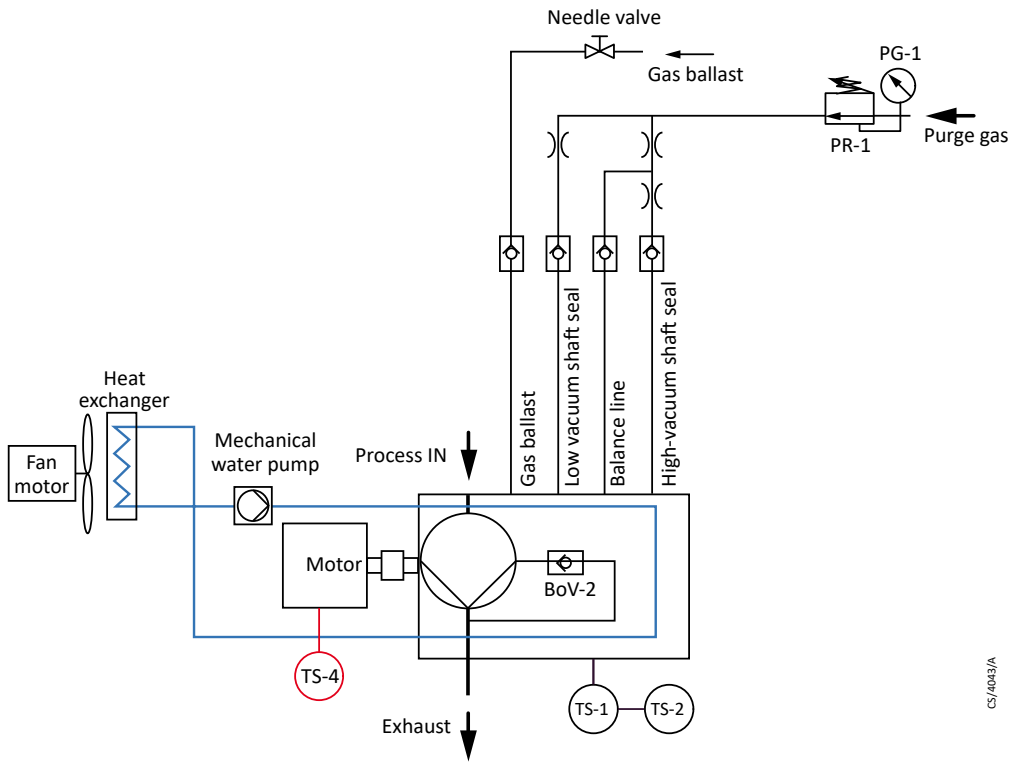
- | | |
|------------------------------------|--------------------------------------|
| 1. Gas system pressure regulator | 2. Purge gas inlet |
| 3. HV Purge high flow switch label | 4. Outlet (Prepared for accessories) |
| 5. Gas system pressure gauge | |

The gas panel is shown for EDS 480. The gas panel EDS 200/300 differs slightly.

Note:

The purge gas connection for EDS 200/300 is different, refer to [Figure: EDS 200/300 components](#).

Figure 14 Schematic for purge gas and switches - EDS pump with air cooling (EDS 200, EDS 300)



CS/4063/A



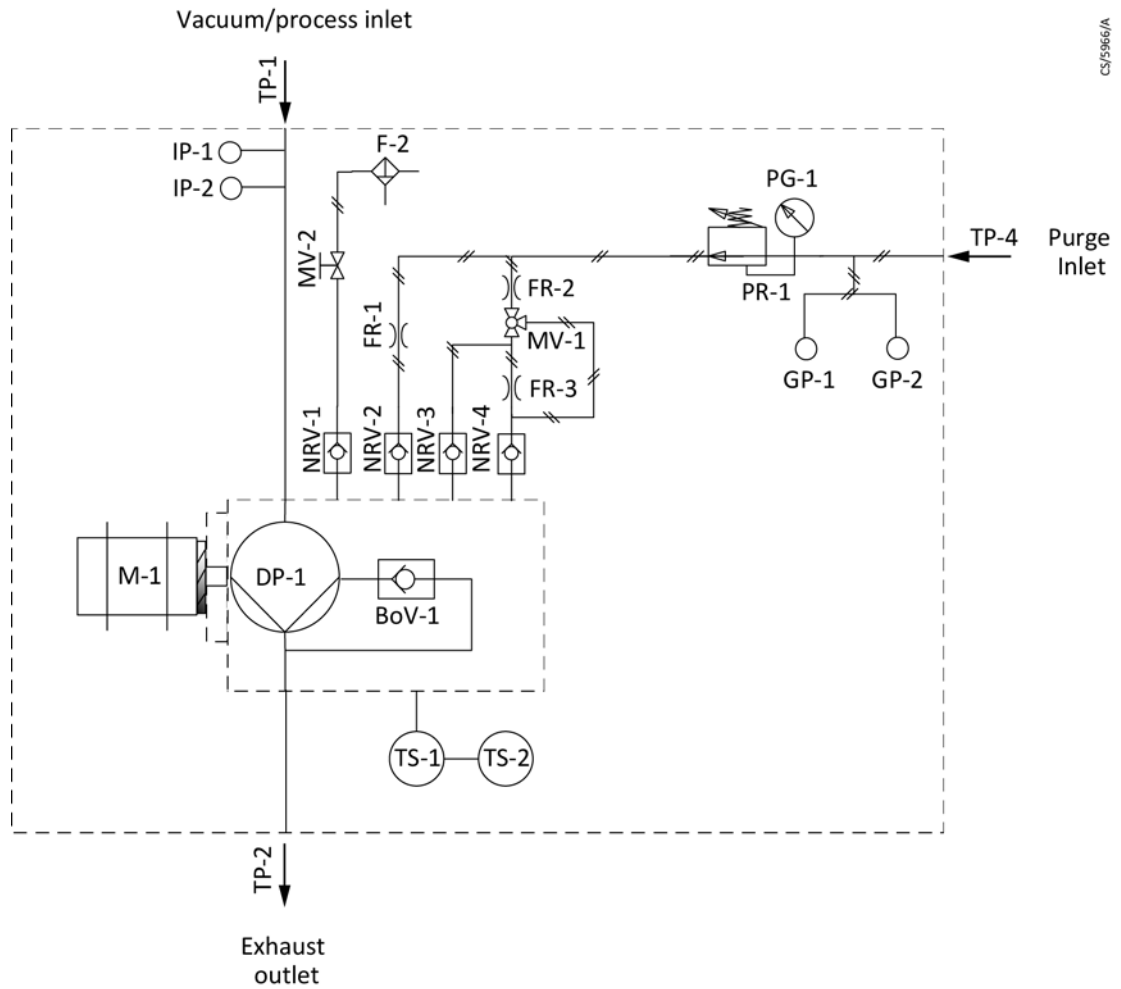


PG-1	Pressure gauge purge gas
PR-1	Pressure regulator purge gas
BoV-1	Blow off valve
TS-1	Pump body thermal snap switch, warning
TS-2	Pump body thermal snap switch, trip
TS-4	Motor thermistor
	Flow restrictor
	Non-return valve

Figure 15 Schematic for purge gas and switches - EDS pump with water cooling

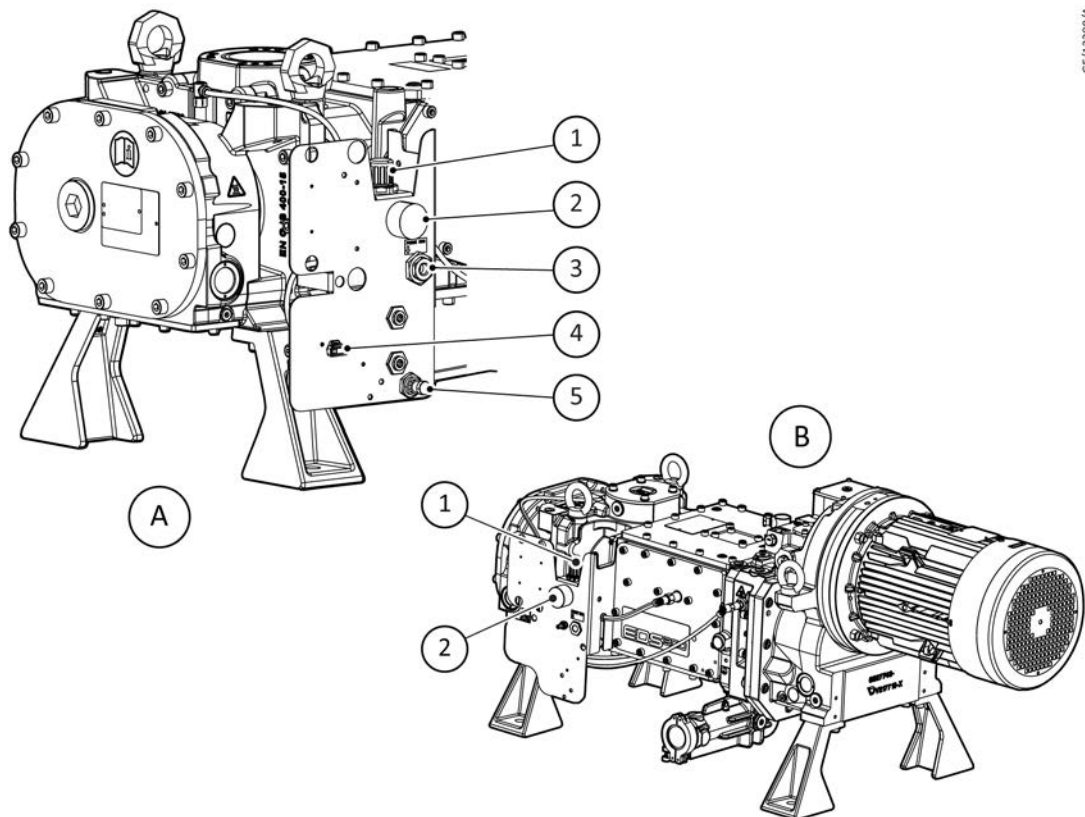


CS/5966/A

PG-1	Pressure gauge purge gas
PR-1	Pressure regulator purge gas
BoV-1	Blow off valve
TS-1	Pump body thermal snap switch, warning
TS-2	Pump body thermal snap switch, trip
TS-4	Motor thermistor
	Flow restrictor
	Non-return valve
GP-1, GP-2	Prepared for accessory (only for EDS 480)
MV-1	HV purge high flow switch (for shaft seal purge)- only for EDS480

7.6.1 Gas system

Figure 16 Gas system



A. EDS 480

1. Purge gas pressure regulator
3. Purge gas IN

5. Gas ballast flow adjustment valve

B. EDS 200/300

2. Purge gas pressure gauge
4. High vacuum purge flow control valve

7.7 Electrical connections

DANGER: ELECTRIC SHOCK



Electrical shock caused by direct or indirect contact with live parts. Electrical shock due to faulty electrical connection and possible residual voltage up to 5 minutes after disconnection from the mains. The electrical connection may only be carried out by a trained person. Observe the national regulations in the user country, example - for Europe EN 50110-1. Prior to servicing, disconnect the vacuum pump from the power supply.

Electrical shock due to interruption of the protective conductor system. In the event of a fault, life-threatening voltages may be present on electrically conductive components. Before commissioning, check the resistance of the earthing cable and the suitability of the assigned overcurrent protection device.



WARNING: LIGHTNING STRIKE

Risk of fire and injury from lightning strike. The operator is responsible for assessing the hazard potential when used outside of buildings.

7.7.1 Wiring the motor

All variants of EDS pumps are supplied with a three-phase 5.5 kW or 7.5 kW motor for EDS 200 and EDS 300 pumps and 11 kW motor for EDS 480 pump.

Wire the motor in accordance with the instructions supplied with the motors.

Ensure that the electrical installation of the EDS pump conforms to your local and national safety requirements. It must be connected to a suitably rated fused and protected electrical supply and a suitable earth (ground) point.

Provide suitable strain relief on the electrical supply cables. If you do not, the cables (or wires in the cables) may become disconnected and there may be a risk of injury or death by electric shock.

We recommend that you connect the electrical supply to the pump motor through a suitable current monitor and that you configure the high current setting on the current monitor to switch off the pump motor at a suitable overload current.

Use motor protective circuit-breakers with characteristics according to IEC/EN 60947-4-1; UL 60947-4-1. Connect the electrical supply to the pump motor through a contactor that has a manual reset control. The contactor must be installed such that a manual reset is required after a power failure. The contactor must incorporate a motor circuit-breaker which meets the full load current ratings of the pump motor.

You must be able to isolate and lockout the electrical supply to the EDS pump motor.

The EDS pump can be operated direct-on-line or via a frequency converter. The selection and installation of a frequency inverter is the responsibility of the user. Ensure that the motor operation and certification are not adversely affected by the use of a frequency converter. The minimum and maximum motor speeds given in the technical data must be followed.

Figure 17 Wiring schematic-1

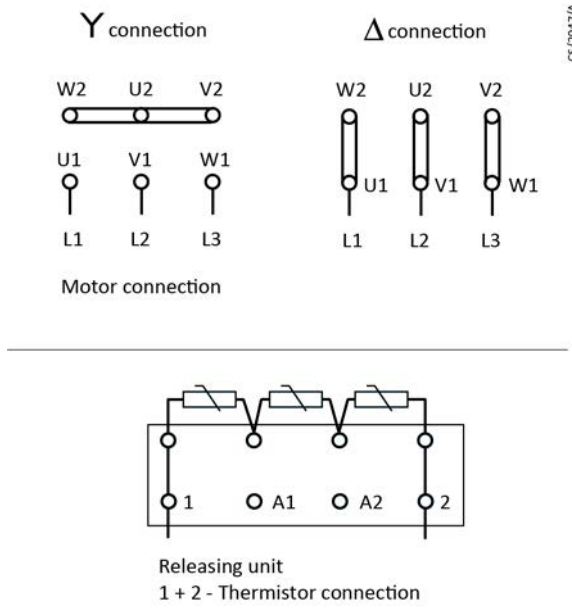
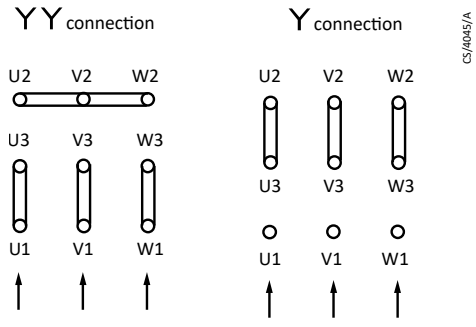


Figure 18 Wiring schematic-2



EDS	Electrical supply	Part No.	Motor terminal connection	Wiring Schematic
EDS 200 water cooled	200/400 V 50 Hz	A41820945	YY/Y	Wiring schematic-2
	230/460 V 60 Hz	A41820946	YY/Y	
	200/380 V 50 Hz (7.5 kW)	A41820934	Y/Δ	Wiring schematic-1
	200/380 V 60 Hz (7.5 kW)	A41820936	Y/Δ	
	575 V 60 Hz	A41820957	Y	
EDS 200 air cooled	200/400 V 50 Hz	A41821945	YY/Y	Wiring schematic-2
	230/460 V 60 Hz	A41821946	YY/Y	
	200/380 V 50 Hz (7.5 kW)	A41821934	Y/Δ	Wiring schematic-1
	200/380 V 60 Hz (7.5 kW)	A41821936	Y/Δ	
	575 V 60 Hz	A41821957	Y	

EDS	Electrical supply	Part No.	Motor terminal connection	Wiring Schematic
EDS 300 water cooled	200/400 V 50 Hz	A41830945	YY/Y	Wiring schematic-2
	230/460 V 60 Hz	A41830946	YY/Y	
	200/380 V 50 Hz	A41830934	Y/Δ	Wiring schematic-1
	200/380 V 60 Hz	A41830936	Y/Δ	
	575 V 60 Hz	A41830957	Y	
EDS 300 air cooled	200/400 V 50 Hz	A41831945	YY/Y	Wiring schematic-2
	230/460 V 60 Hz	A41831946	YY/Y	
	200/380 V 50 Hz	A41831934	Y/Δ	Wiring schematic-1
	200/380 V 60 Hz	A41831936	Y/Δ	
	575 V 60 Hz	A41831957	Y	
EDS 480 water cooled	200/400 V 50 Hz	A41840945	YY/Y	Wiring schematic-2
	230/460 V 60 Hz	A41840946	YY/Y	
	200/380 V 50 Hz	A41840934	Y/Δ	Wiring schematic-1
	200/380 V 60 Hz	A41840936	Y/Δ	
	575 V 60 Hz	A41840957	Y/Δ	

An adequate motor starter/contacter for motor control is required for the pump. When sizing a motor starter, note that the pump motor is an IE3 high efficiency motor. To handle the in-rush current during initial pump start-up a class 30 motor starter is recommended, refer to the addendum manual of motor for more details.

7.7.2 Motor thermistors

Connect the motor thermistors (PTC 150 °C) to your pump-motor control circuit. These must be configured so that manual reset is required, otherwise, the pump may restart automatically once it has cooled down.

The pump motor has 3 PTCs in series. They comply with the standard DIN VDE V098-1-401. In the terminal box are two wires of the PTCs, they have no polarity. Connect them to a control unit. Do not connect the wires directly to the power.

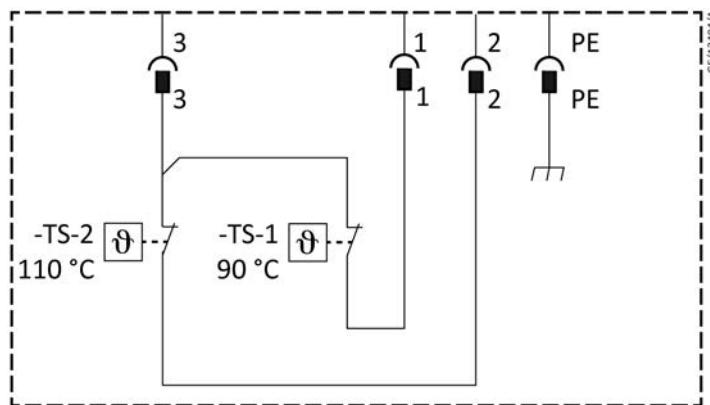
The temperature sensor has basic insulation to the motor winding. The operator has to provide an appropriate measure for the protection against indirect contact. For example, a monitoring body with galvanic isolation from the temperature sensor to the pump control can be provided for this.

7.7.3 Pump body thermal snap switch



WARNING: SWITCH TRIP HAZARD

Risk of injury or damage to the equipment. The thermal snap switch must be connected to the control system to switch the EDS motor off when the switch trips. This must be configured if a manual reset is required.

Figure 19 Pump body thermal snap switch connection

*Included female plug for customer application (crew side)

Wire the snap switch into the pump-motor control circuit so that it stops the pump motor. This must be configured so that a manual reset is required.

Switching point(s)	Connection
Normally closed	Plug: M12 5 pole (part of delivery)
90 °C ± 5 K warning	90 °C: terminal 1 and 3
110 °C ± 5 K trip	110 °C: terminal 2 and 3
Switching capacity: Maximum 48 V d.c./a.c. 1 A	see Figure: Wiring schematic-1

The output of the thermal snap-switch has two connections: one will open the circuit when the temperature of the pump body is higher than 90 °C. Use this output to provide a warning of high temperature. The second output will open the circuit when the temperature of the pump body is higher than 110 °C. Use this output to shut down the pump when it is too hot.

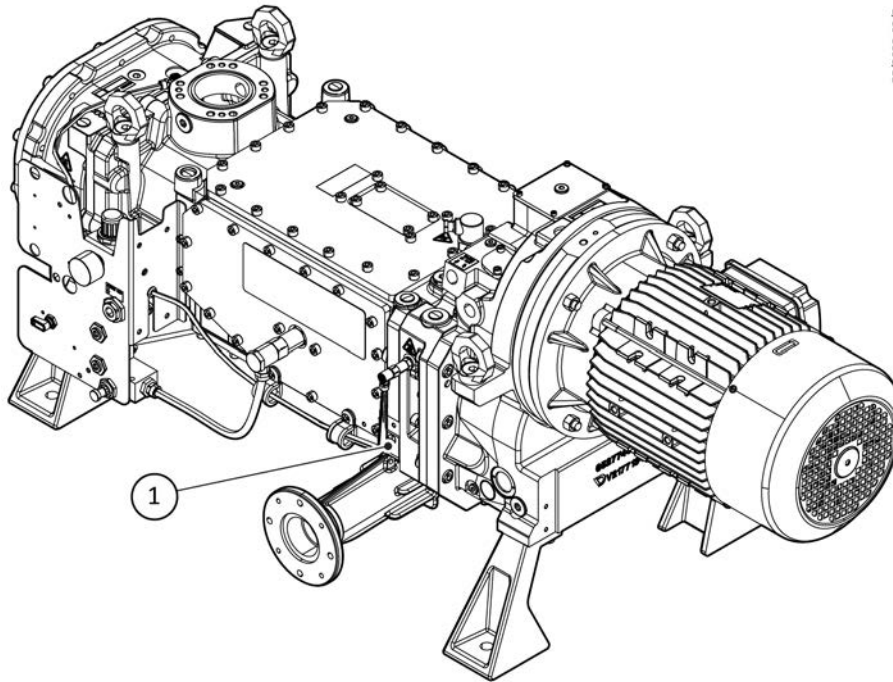
Note:

Pump body thermal snap switch is intended to protect the pump against thermal overload, for example, water failure or insufficient cooling flow. It is not intended to be used as a safety instrument for ATEX applications.

7.7.4 Grounding

Connect the pump to a suitable factory or plant earth (ground) via a M6 earth thread.

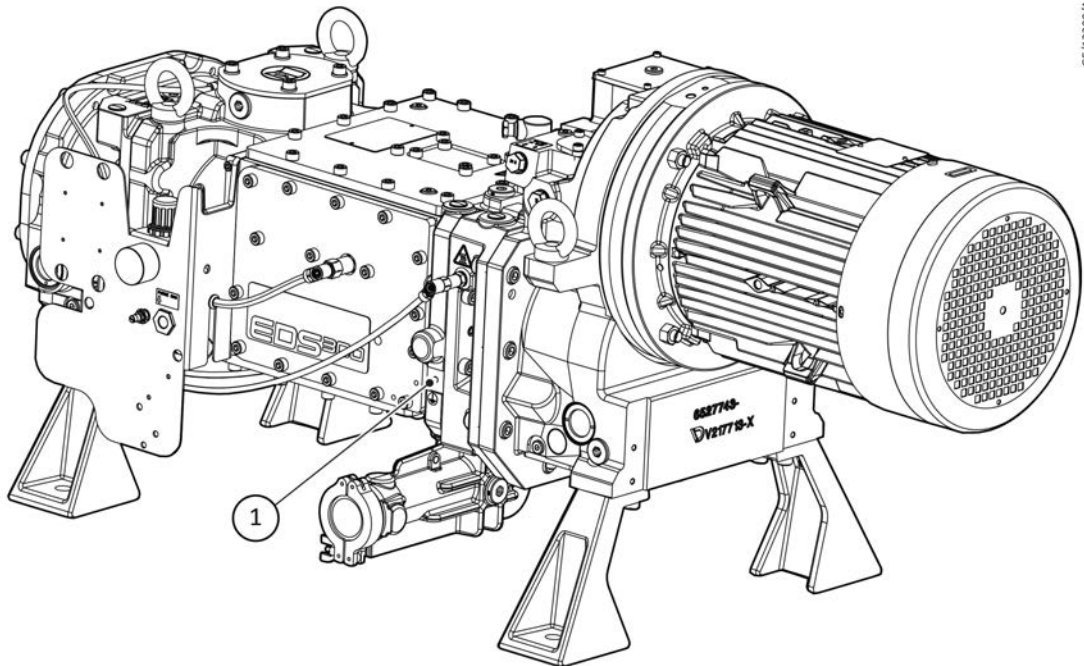
Figure 20 EDS 480 grounding



GE/2053-02/B

1. M6 thread

Figure 21 EDS 200/300 grounding



GE/12399/A

1. M6 thread

7.7.5 Check the direction of rotation of the motor

Blank the inlet or connect the EDS pump to the vacuum system before you check the direction of pump rotation. If you do not, there is danger of objects being trapped in the rotating pump rotors.

Direction of rotation is clockwise as viewed from the motor end of the pump. View the motor fan direction.

Let the pump run up briefly (for approximately 1 second) and then immediately switch it off again.

If the rotation direction is incorrect, isolate and lock-out the power supply, then change the phases on the pump-motor and recheck direction.

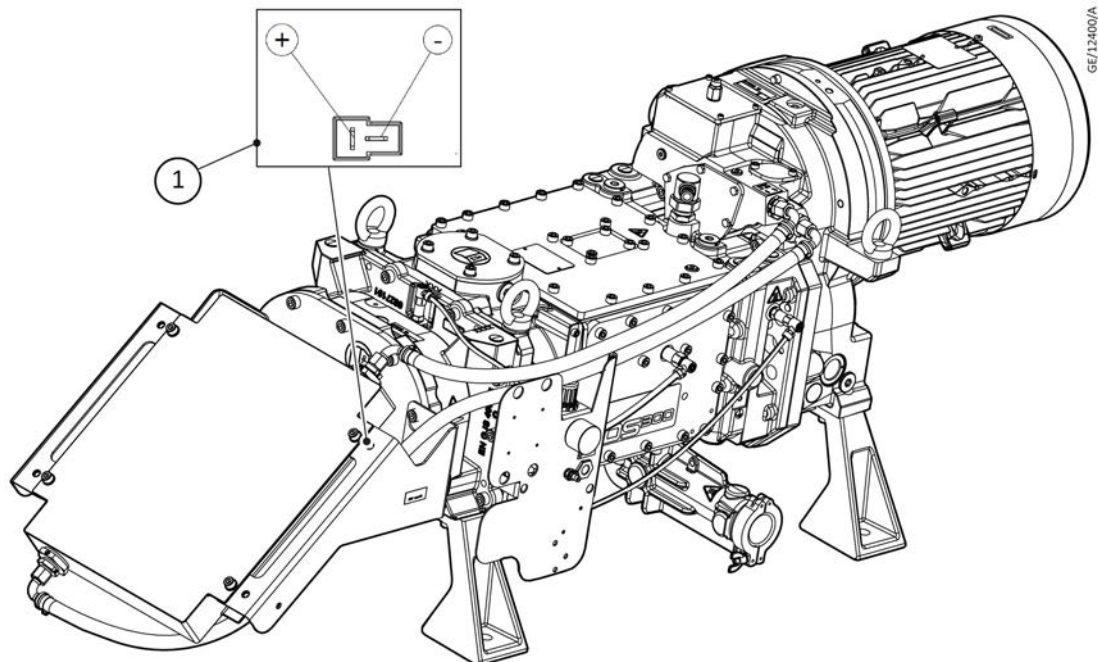
7.7.6 Connect the heat exchanger fan

The fan will need a separate 24V DC supply. It needs to be turned on when the pump is switched on and can be turned off when the pump is not in operation.

(Only for air cooled versions)

Connect the heat exchanger fan as shown.

Figure 22 Heat exchanger fan connection



1. Heat exchanger fan connection (Connector TYCO, PN 180908-0)

The direction of rotation is indicated. Check the direction of rotation by viewing the fan. If the direction of rotation is incorrect, the live and neutral phases are incorrectly wired.

The power supply must be intrinsically safe according to EN 61010 and the fan supply must be fused with maximum 4 A (slow blow).

7.8 Leak check after installation

EDS pumps are not hermetical sealed and leak tight by principle. Leak-check all relevant connections after having installed the pump.

8. Operation

DANGER: EMISSION OF HAZARDOUS GAS



Danger as a result of a rapid increase in pressure due to decomposition of pumped gases. Uncontrolled emission of process gases by reaction products within the pump. The pumping of reactive gases, vapours or gas mixtures is generally prohibited. The operator is responsible for the assessment of the hazard potential of the process media or mixtures.

Dangers through escaping or emitting transported hazardous gases, vapours or substances. Process gases may escape from the exhaust and leaks in the vacuum system. The pumping of pyrophoric/radioactive/oxidising gases or gas mixtures, as well as the pumping of oxygen of more than the atmospheric concentration (21%) is generally prohibited. The operator is responsible for the assessment of the hazard potential of the process media or mixtures.

WARNING: EJECTION OF PARTS



Ejection of parts by bursting of the vacuum system due to excessive pressure caused by clogged or constricted exhaust. Pressure build-up in the vacuum system or exhaust pipes. Do not operate the vacuum system with the outlet closed or throttled.

Ejection of parts by bursting of the vacuum system due to excessive pressure caused by the pump running backwards after it has been switched off under vacuum. There is a risk of overpressure in the inlet lines and recipients as well as uncontrolled backward running of rotors. In the event of a fault or during service, separate the vacuum pumps from the vacuum container and connecting lines before the inlet by using suitable valves.

CAUTION: EXTREME SUCTION



Pulling body parts and objects into the vacuum through open flanges. Do not put the vacuum pump into operation with open flanges. During the installation of the vacuum pump first, mechanically connect the inlets and outlets, and only then make the electrical connections.

CAUTION: TRIP HAZARD



Hazard of slipping, tripping or falling due to oil leakage from the pump. During transport or depending on the work process, the oil may escape from the vacuum pump. Risk of falling on oil spills. Check vacuum pump regularly for oil leaks. Take appropriate safety measures.

CAUTION: HOT SURFACES



Burns due to contact with hot surfaces. Burning of fingers, hands or arms on hot surfaces. Handle the pump only when ventilated and cooled down. Wear suitable protective equipment.



CAUTION: HIGH NOISE LEVELS

Hearing loss due to high noise level. Depending on the operating conditions, higher noise levels can be achieved than specified in the technical data. Take suitable hearing protection measures.

8.1 Media compatibility

See *Normal operation* on page 31. For a list of materials in contact with the process gas, see *Technical data* on page 19.

If you use the system on an application for which it is not suitable, you may invalidate your warranties. If in doubt, contact us.

8.2 Start-up



WARNING: INTERNAL EXPLOSION - FOR EDS 480 ONLY

Risk of explosion. Do not restart the pump within 20 minutes after the shutdown of the pump.

1. Ensure that any isolation valves in the process pipework are in the correct positions (exhaust must be open).
2. Switch on the cooling water for water cooled pumps. For air cooled pumps ensure the heat exchanger fan is powered and running.
3. Switch on or open the purge gas supply line and make sure that the setting is correct. Refer to *Connecting purge gas* on page 36.
4. Start the EDS pump by switching on the electrical supply.
5. Once the pump is shut down, do not restart it within 20 minutes (only for EDS 480).

The pump is ready for the process when the stator temperature, measured next to the stator thermal switch, reaches 40 °C. (note this process-ready temperature may be different, depending on your application)

8.3 Manual shut-down

1. Close the pump-inlet isolation-valve (if fitted).
2. Leave the EDS pump operating for sufficient time such that the pump is thoroughly purged of any process gases. If condensable fluids have been pumped, operate the EDS pump for at least 40 minutes with all purges on.
3. Switch off the EDS pump.
4. Close or switch off the purge gas supply line.
5. For water cooled pumps only keep the water cooling on for 10 minutes, then switch off the cooling water.



NOTICE:

If you switch off water-cooling by closing both cooling-water inlet and outlet, temperature may rise and result in unacceptable high water pressure and the water circuit may leak.

8.4 Unplanned shut-down and alarms



WARNING: INTERNAL EXPLOSION - FOR EDS 480 ONLY

Risk of explosion. Do not restart the pump within 20 minutes after the shutdown of the pump.

Refer to *Pump body thermal snap switch* on page 44 for instrument trip points.

If the pump stops unexpectedly while processing corrosive or condensable vapours internally, it must be fully purged for sufficient time to ensure it is free of corrosives or liquids. Otherwise, the pump may corrode and be damaged.

Once the pump is shut-down, do not restart it within 20 minutes (only for EDS 480).

9. Maintenance

WARNING: UNEXPECTED RESTART



Failure or malfunction of the central control system (unexpected start-up) or danger of a pump restarting automatically after switching off due to a fault. Crushing, cutting or cutting off by touching moving parts due to recurring start command or power supply. Before carrying out maintenance or service work, disconnect the pump from the power supply, secure it against being switched on again, determine that it is de-energised, ground and short-circuit it and cover/isolate adjacent live parts.

CAUTION: HOT EQUIPMENT



Scalding by touching hot equipment or lubricants. Danger of scalding when opening the hot pump with hot operating fluid or cooling-water. Open outlet or inlet port for operating fluids only if the operating fluid has adapted to the room temperature. Wear suitable protective equipment.

CAUTION: HIGH PRESSURE GAS



Danger due to incorrect connection of the pump to the system to be pumped out. Pressure build-up in the vacuum system. Check correct connection of inlet and outlet flanges before operation. When using the pump with seal gas, protect the seal gas supply so that no overpressure can occur in the pump system in the event of a malfunction or power interruption.

9.1 Maintenance intervals

Standard maintenance activities are listed below. These activities are given for standard operating conditions and may differ depending on the harshness of your application. Therefore the maintenance plan might need to be adapted to your process conditions. If in doubt, contact us for any further advice.

Table 6 Maintenance intervals

Service work	Interval
Check the oil level and top-up if required	1 week
Check the cooling-water level and top-up if required	1 week (only air cooled versions)
Check the purge gas supply pressure and hoses	6 months
Check the water hoses	6 months
Drain and replace oil (only for synthetic oil)	1 year
Oil change for PFPE	2 years
Drain and replace coolant	1 year (only air cooled versions)

Service work	Interval
Replace blow-off valve	1 year
Clean the heat exchanger	1 year (only air cooled versions)
Complete overhaul in service centre	4 years or 32000 operating hours
Leak check the entire pump system	after all maintenance and assembly work and upon request
Bearing exchange	40,000h for synthetic oil or 25,000h for PFPE fluid. Depending on application impacts, running conditions, cooling and maintenance these intervals might vary.

9.2 Check the oil



WARNING: RISK OF BURNS

Before removing the oil-drain or oil-fill plug always switch off the pump first and vent to atmospheric pressure. When the pump has become warm during operation the casing and the oil temperature may exceed 80 °C. Leave the pump to cool down. Always wear protective gloves also to protect yourself against aggressive residues in the oil.

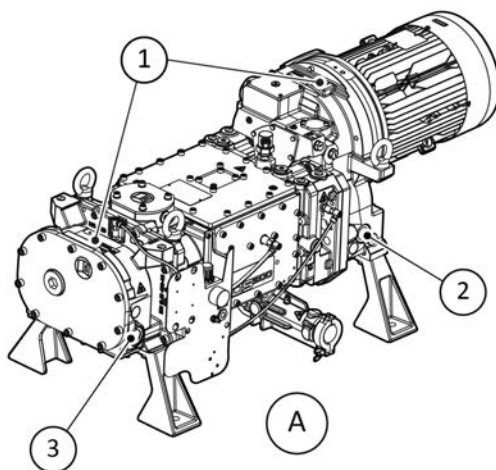
Note:

PFPE is not subjected to ageing if used as intended. Oil change for PFPE is recommended every 2 years. Top up PFPE if the lubricant level is too low, for example, after improper transportation.

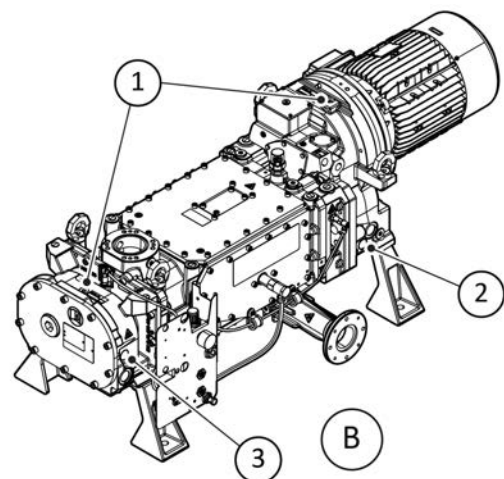
The oil level should be between the bottom and top of the glass for a non-operating pump. When the pump is operating the oil level is slightly lower than in a static condition.

If the oil shows any significant change in normal colour consider an oil change and contact us.

Make sure to use the right kind of oil, see [Accessories](#) on page 64. Only use the oil supplied by us.



A. EDS 200 and EDS 300

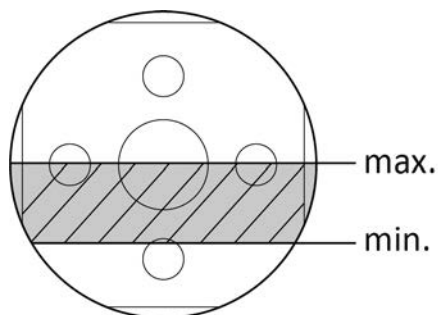


B. EDS 480

GE/12401/A

1. Oil fill plugs
2. Oil level glass-motor side
3. Oil level glass-intake side

Figure 23 Oil level at pump standstill



NOTICE:



If the oil level is too low, the bearings and gearwheels are not lubricated adequately; if it is too high, oil may enter the pumping chamber.

The oil filling openings must be airtight. Under vacuum, the inflow of outside air can cause oily gas to enter the pump chamber via the piston rings.

Clean the oil-fill port and re-install the plug using a gasket which is in perfect condition. Wipe off any oil residues from the casing.

9.3 Inspect the closed cooling-water circuit

(only for air cooled pump variants)

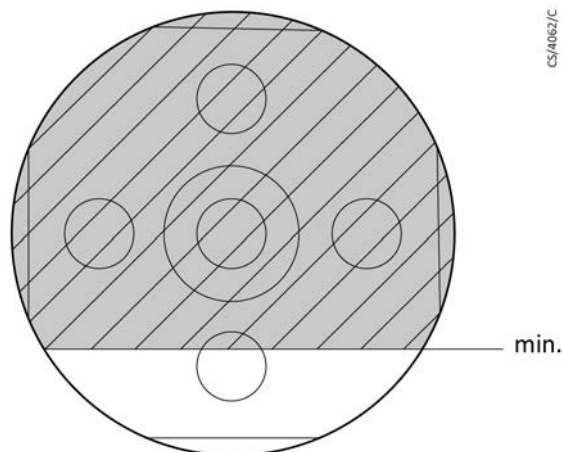


CAUTION: MAINTENANCE SAFETY

The cooling system may be pressurised. Ensure that the EDS pump is cooled before attempting to open the cooling-water header tank. Slowly open the filler cap to release pressure.

Only for air cooled EDS pump the water or Drystar mixture filling of the closed-loop circuit needs to be checked.

Cooling water should be visible in the cooling-water level sight glass above the gearbox. If no water or Drystar mixture is visible, the system will require additional coolant. Fill up the system with adequate coolant, so that the sight glass is completely filled up.

Figure 24 Cooling water level

Make sure that the coolant level is not below the minimum label indicated on the pump. This may cause the internal cooling circuit to be inefficient or to stop.

The coolant level in the expansion tank may be above the sight glass due to temperature fluctuations. This may affect the reading of the correct level. With indirectly cooled variants, this is easily recognisable by the colour of the glycol mixture (for example- red or green).

9.4 Inspect pipelines and connectors

Inspect all of the cooling systems and purge gas pipelines and connections. Check that they are not corroded or damaged. Replace any of the pipelines and connections that are corroded or damaged. Check that all connections are secure. Tighten any loose connections.

Inspect all of the electrical cables. Check that they are not damaged and have not overheated. Replace any cables that are damaged or have overheated. Check that all of the electrical connections are secure. Tighten any loose connections.

Inspect all of the process inlet and exhaust pipelines and connections. Check that they are not corroded or damaged. Replace any of the pipelines and connections that are corroded or damaged. Check that all connections are secure. Tighten any loose connections.

Note:

To vent the cooling circuit and refill an accessory, refer and follow the instructions given in Maintenance kit manual.

9.5 Hand-cranking the pump

In the event of the pump rotors requiring freeing, the pump can be turned manually via a 24 mm hex drive on the end of one of the pump shafts. This is accessed via a G1 1/2 blanking screw in the inlet end oil box cover see [Figure: Inlet flange dimensions \(in mm\)](#).



CAUTION: ACCIDENTAL OPERATION

Risk of damage to equipment. Ensure the pump is switched off and isolated so that it cannot be accidentally started. Allow the pump to cool to a safe temperature and ensure that the pump is fully purged and vented. If you do not, you could be exposed to vacuum, or process gases could escape.

Preparation

Purge and vent the pump. Switch off and isolate the pump from the power supply and wait until the pump is cool. Unscrew the blanking screw from the oil box cover and keep it in a safe clean place. You must ensure that the thread is kept clean as any debris on the thread might damage it when it is screwed back in and/or carry debris into the oil box which can damage the bearings.

Hand cranking

Once the blanking screw is removed, insert a 24 mm socket hex and engage it on the hex on the pump shaft. You must ensure that the tool used to turn the pump is clean, as any debris entering the oil box might cause serious damage to the bearings.

Apply torque to the pump shaft. The normal direction of rotation is anti-clockwise as viewed from the hex end, but the pump can be hand cranked in any direction. Do not exceed a torque of 300 Nm.

After hand cranking, re-seal the blanking screw and tighten to 35 Nm. A leak test must be carried out to ensure that the screw has been fitted correctly before you re-start the pump.

If the pump cannot be turned, contact our service centre.

10. Fault finding

A list of fault conditions and their possible causes is provided here to assist in basic troubleshooting. If you are unable to rectify a fault using this guide, call your supplier or our Service Centre for advice.

Fault	Pump does not start up
Cause	Motor incorrectly connected.
Remedy	Connect motor correctly.
Cause	Overtemperature switch or motor stator defective.
Remedy	Contact us.
Cause	Pressure switch is defective.
Remedy	Replace the pressure switch.
Cause	Lubricant is too thick.
Remedy	Exchange the lubricant or warm up lubricant and pump.
Cause	Motor rotor defective.
Remedy	Contact us.
Cause	Pump has seized: defective rotors, bearings or toothed gears.
Remedy	Contact us.
Fault	Pump gets too hot
Cause	Cooling-water supply is not sufficient.
Remedy	Ensure sufficient cooling-water supply.
Cause	Cooling-water lines are clogged.
Remedy	Decalcify cooling-water lines.
Cause	Ambient temperature is too high or cooling air flow is obstructed.
Remedy	Install the pump at a suitable place or ensure a sufficient flow of cooling air.
Cause	Pump is operating in the wrong pressure range.
Remedy	Check the pressure levels within the system.
Cause	Gas temperature is too high.
Remedy	Check system.
Cause	Clearance between housing and rotors are too small due to contamination.
Remedy	Clean pumping chamber.
Cause	Clearance between housing and rotors are too small due to distortion of the pump.
Remedy	Affix and connect the pump free of tension.

Cause	Friction resistance is too high due to contaminated bearings and/or contaminated lubricant.
Remedy	Clean pump, respectively perform maintenance.
Cause	Lubricant level is too high.
Remedy	Drain lubricant down to the correct level.
Cause	Lubricant level is too low.
Remedy	Top up lubricant to the correct level.
Cause	Wrong lubricant filled in.
Remedy	Contact us.
Cause	Bearing is defective.
Remedy	Contact us.
Fault	Pump is extremely loud
Cause	Bearing damage.
Remedy	Repair pump.
Cause	Thick particle deposits.
Remedy	Clean pump, respectively perform maintenance.
Fault	Motor power consumption is too high
Cause	Like "Pump gets too hot".
Remedy	See Pump gets too hot on page 56.
Cause	Incorrect mains voltage for the motor.
Remedy	Connect the motor to the correct mains voltage.
Fault	Pump is too loud
Cause	Motor stator defective.
Remedy	Contact us.
Cause	Motor rotor defective.
Remedy	Contact us.
Cause	Distances between housing and rotors is too small due to contamination.
Remedy	Clean pumping chamber.
Cause	Distances between housing and rotors is too small due to distortion of the pump.
Remedy	Affix and connect the pump free of tensions.
Cause	Rotors make contact with the housing.
Remedy	Contact us. Shut down the pump immediately.

Cause	Rotor is running untrue.
Remedy	Contact us. Shut down the pump immediately.
Cause	Oil slinger disc makes contact with the gear housing.
Remedy	Contact us.
Fault	Pump is losing lubricant
Cause	Oil drain plug is leaky.
Remedy	Drain lubricant, firmly screw in a new oil drain plug with the gasket, fill in the correct lubricant quantity.
Cause	Oil level glasses leaky.
Remedy	Contact us.
Cause	Gear cover is leaky.
Remedy	Replace the O-ring of the gear cover.
Cause	Puddle under the motor, leak in the seal.
Remedy	Contact us. Shut down the pump immediately.
Cause	No lubricant leak is apparent.
Remedy	See Lubricant in the pump chamber on page 58.
Fault	Oil gets too dark
Cause	Oil has been used up.
Remedy	Exchange the oil.
Cause	Pump gets too hot.
Remedy	See Pump gets too hot on page 56; after remedy of the fault, exchange the oil.
Fault	Lubricant in the pump chamber
Cause	Lubricant level is too high.
Remedy	Drain the lubricant down to the correct level.
Cause	Lubricant is ejected from the system.
Remedy	Check system.
Cause	Pump is not standing horizontally.
Remedy	Place the pump correctly.
Cause	Pump has a gas leak towards the outside.
Remedy	Run a leak search and pinpoint leaks. If the leak is not at the oil-fill or oil-drain plugs, return the pump to us.
Cause	Pump has an internal leak.
Remedy	Contact us.

Cause	Shaft-seals are defective.
Remedy	Contact us.
Fault	Pump does not attain its pumping speed
Cause	Intake screen is clogged.
Remedy	Clean intake screen.
Cause	Motor incorrectly connected.
Remedy	Connect motor correctly.
Cause	Motor stator defective.
Remedy	Contact us.
Cause	Motor rotor defective.
Remedy	Contact us.
Cause	Vacuum pump system has a gas leak.
Remedy	Detect leak and seal it.
Cause	Rotor gap is too great.
Remedy	Contact us.
Cause	Bearing defective.
Remedy	Contact us.

11. Storage

Store the pumps only horizontally standing on their feet.

Open the pumps only immediately before installing them.



NOTICE:

If there is the danger of frost, the cooling-water must be drained.

You may use a water glycol mixture of up to 50%

Parameter	Value
Temperature (only for storage without cooling-water)	-30 °C to +50 °C
Storage site	dry
Maximum atmospheric humidity	90%, non-condensing

The pump must be stored at the most for one year only. Longer storing without turning the rotors will damage the bearings. Connect the pump to operate it briefly and then decommission it as described in the following sections. (The intake flange can stay sealed during this brief operation, the exhaust flange must be opened.).

12. Disposal

12.1 Waste disposal

The equipment may have been contaminated by the process or by environmental influences. In this case, the equipment must be decontaminated in accordance with the relevant regulations. We offer this service at fixed prices. Further details are available on request.

Separate clean components according to their materials, and dispose of these accordingly.

When sending us any equipment, observe the regulations given in section [Return the equipment or components for service](#) on page 62.

Disposal of waste oil

Owners of waste oil are responsible for the proper disposal of this waste.

Waste oil from vacuum pumps must not be mixed with other substances or materials.



Waste oil from vacuum pumps (Manufacturer's oils are based on mineral oils) which are contaminated due to the influence of oxygen in the air, high temperatures or mechanical wear must be disposed of through a local waste oil disposal system.

Waste oil from vacuum pumps which is contaminated with other substances must be marked and stored in such a way that the type of contamination is apparent. This waste must be disposed of as special waste.

European, national and regional regulations concerning waste disposal need to be observed. Waste must only be transported and disposed of by an approved waste disposal vendor.

PFPE from vacuum pumps may be regenerated, if required, and provided the quantities are large enough. For this, contact us for assistance.

Symbols on the vacuum device

	<p>Do not dispose of the vacuum device as residual waste. Dispose of it in accordance with the applicable local regulations.</p>
	<p>China RoHS: Products marked with this symbol contain residual quantities of substances that are subject to quantitative regulation in accordance with Chinese Directive GB/T 26552. These parts can safely be used for the environmental protection use period (20 years) as indicated and should enter into the recycling system after their environmental protection use period.</p>

13. Service

Our products are supported by a world-wide network of our service centres. Each service centre offers a wide range of options including equipment decontamination, service exchange, repair, rebuild and testing to factory specifications. Equipment which has been serviced, repaired or rebuilt is returned with a full warranty.

The local service centre can also provide our engineers to support on-site maintenance, service or repair of the equipment.

For more information about service options, contact the nearest service centre or our other company.

13.1 Return the equipment or components for service

Before you send your equipment to us for service or for any other reason, you must complete a Declaration of Contamination Form. The form tells us if any substances found in the equipment are hazardous, which is important for the safety of our employees and all other people involved in the service of your equipment. The hazard information also lets us select the correct procedures to service your equipment.

If you are returning equipment note the following:

- If the equipment is configured to suit the application, make a record of the configuration before returning it. All replacement equipment will be supplied with default factory settings.
- Do not return equipment with accessories fitted. Remove all accessories and retain them for future use.
- The instruction in the returns procedure to drain all fluids does not apply to the lubricant in pump oil reservoirs.

Download the latest documents from edwardsvacuum.com/HSForms/, follow the procedure in HS1, fill in the electronic HS2 form, print it, sign it, and return the signed copy to us.



NOTICE:

If we do not receive a completed form, your equipment cannot be serviced.

14. Spares

Table 7 Spare

Part number	Description
H11032010	Ultragrade® Endurance Extend 110 1 l
H11032012	Ultragrade® Endurance Extend 110 4 l
H11033015	Ultragrade® Kinetic 150 1 l
H11033010	Ultragrade® Kinetic 150 4 l
H11312021	Drynert® 25/6, 1 kg (0.5 l)
H11312025	Drynert® 25/6, 5 kg (2.5 l)
H12810003	Drystar coolant 0.9/2 l
A41889706	EDS 200-480 Direct cooled service kit
A41889708	EDS 200-480 Indirect cooled service kit
A41889705	EDS 200-480 BoV kit
A41889701	EDS 200-480 Industrial atmospheric seal kit
EK32000112	Sight glass 40, 3 x 4 kit
EK32000114	EDS 200/300 Industrial exhaust kit
EK32000120	EDS 480 Industrial exhaust kit
A41829000	EDS 200 service module
A41839000	EDS 300 service module
A41849000	EDS 480 service module

14.1 Wearing parts

Part number	Description
ES23955165	Gasket for plug screw G3/8 (oil fill plug)

15. Accessories

Table 8 Accessories

Accessories	Part number
Exhaust pressure transmitter (PS1)	A41894000
Exhaust gas temperature transmitter (TS3)	A41895001
Stator temperature transmitter (Pt 100)	A41895000
Ultragrade® Endurance Extend 110, 1 l	H11032010
Ultragrade® Endurance Extend 110, 4 l	H11032012
Ultragrade® Kinetic 150, 1 l (optional)	H11033015
Ultragrade® Kinetic 150, 4 l (optional)	H11033010
Drynert® 25/6, 1 kg (0.5 l)	H11312021
Drynert® 25/6, 5 kg (2.5 l)	H11312025
Roots adapter EH1200/EH2600/EH4200 (EDS 200, EDS 300)	A41893000
Roots adapter for EH 500 (EDS 200, EDS 300)	A41893001
Roots adapter EH1200/EH2600/EH4200 (EDS 480)	A41893002
TCV direct cooled	A41890000
Silencer kit NW 40	A41896009
Silencer kit ISO65 (EDS 480)	A41896004
Solenoid valve for purge system	A41891001
200/300/480 INLET PURGE /MANUAL VALVE	A41891002
200/300/480 INLET PURGE /SOLENOID VALVE	A41891004
200/300/480 FLUSH KIT /MANUAL VALVE	A41892002
200/300/480 FLUSH KIT /SOLENOID VALVE	A41892004
MAINTENANCE-KIT FOR COOLANT CHANGE	A41892005
Non-return valve for EDS 200 and EDS 300	A41896003
Non-return valve for EDS 480	A41896006
BoV plug accessory for EDS 200, EDS 300 and EDS 480	A41897000
BoV kit valve ball PEEK for EDS 200, EDS 300 and EDS 480	A41897001

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EU Declaration of Conformity

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The product specified and listed below

- Screw vacuum pump - with motor

EDS 200 and EDS 300**A418**^v_w^y_x^z

v = 2, 3 (pumping speed)
w = 0, 1 (cooling system)
y = 0, 9 (oil type)
x = 34, 36, 45, 46, 57 (motor variants)
z = blank or V01 to V99

EDS 480**A418**^v_w^y_x^z

v = 4 (pumping speed)
w = 0 (cooling system)
y = 9 (oil type)
x = 34, 36, 45, 46, 57 (motor variants)
z = blank or V01 to V99

ATEX Marking:

II 3/-G Ex h IIC T3 Gc/-
5°C ≤ Ta ≤ 40°C
(Internal atmospheres only)



II 3/-G Ex h IIC T3 Gc/- X
5°C ≤ Ta ≤ 40°C
(Internal atmospheres only)

Is in conformity with the relevant requirements of European CE legislation:

2006/42/EC	Machinery directive <i>Note: The safety objectives of the Low Voltage Directive 2014/35/EU were complied with in accordance with Annex 1 No. 1.5.1 of this directive.</i>
2014/34/EU	ATEX directive on use in potentially explosive atmospheres
2014/30/EU	Electromagnetic compatibility (EMC) directive
2011/65/EU	Restriction of certain hazardous substances (RoHS) directive as amended by Delegated Directive (EU) 2015/863

Based on the relevant requirements of harmonised standards:

EN 1012-2:1996 +A1:2009	Compressors and vacuum pumps. Safety requirements. Vacuum pumps
EN 60204-1:2018	Safety of machinery. Electrical equipment of machines. General requirements
EN ISO 80079-36:2016	Explosive atmospheres – Part 36: Non-electrical equipment for explosive atmospheres. Basic method and requirements
EN ISO 80079-37:2016	Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres -- Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k"
EN 61000-6-2:2005	Electromagnetic Compatibility (EMC) - Part 6-2: Generic Industrial Immunity Standard
EN 61000-6-4:2007/A1:2011	Electromagnetic Compatibility (EMC) - Part 6-4: Generic Industrial Emission Standard

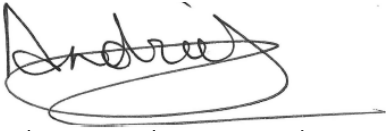
This declaration, based on the requirements of the listed Directives and EN ISO/IEC 17050-1, covers all product

This product has been manufactured under a quality management system certified to ISO 9001:2015

serial numbers from this date on: 2021-12-14

You must retain the signed legal declaration for future reference

This declaration becomes invalid if modifications are made to the product without prior agreement.



*Andries De Bock – Vice President Engineering
Industrial Vacuum Division, Cologne*



*Axel Guddas – General Manager
Product Company Cologne*

Declaration of Conformity

Edwards Ltd

Innovation Drive
Burgess Hill
West Sussex
RH15 9TW
UK

Documentation Officer

documentation@edwardsvacuum.com

This declaration of conformity is issued under the sole responsibility of the manufacturer.

- Screw vacuum pump - with motor

EDS 200 and EDS 300**A418vwxyz**

v = 2, 3 (pumping speed)
w = 0, 1 (cooling system)
y = 0, 9 (oil type)
x = 34, 36, 45, 46, 57 (motor variants)
z = blank or V01 to V99

EDS 480**A418vwxyz**

v = 4 (pumping speed)
w = 0 (cooling system)
y = 9 (oil type)
x = 34, 36, 45, 46, 57 (motor variants)
z = blank or V01 to V99

ATEX Marking:

II 3/-G Ex h IIC T3 Gc/-

5°C ≤ Ta ≤ 40°C

(Internal atmospheres only)



II 3/-G Ex h IIC T3 Gc/- X

5°C ≤ Ta ≤ 40°C

(Internal atmospheres only)

The object of the declaration described above is in conformity with relevant statutory requirements:

Supply of Machinery (Safety) Regulations 2008

The objectives of the Electrical Equipment (Safety) Regulations 2016 are governed by Annex 1 1.5.1 of this regulation.

Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

Electromagnetic Compatibility Regulations 2016

Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012


Relevant designated standards or technical specifications are as follows:

EN 1012-2:1996 +A1:2009	Compressors and vacuum pumps. Safety requirements. Vacuum pumps
EN 60204-1:2018	Safety of machinery. Electrical equipment of machines. General requirements
EN ISO 80079-36:2016	Explosive atmospheres – Part 36: Non-electrical equipment for explosive atmospheres. Basic method and requirements
EN ISO 80079-37:2016	Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres -- Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k"
EN 61000-6-2:2005	Electromagnetic Compatibility (EMC) - Part 6-2: Generic Industrial Immunity Standard
EN 61000-6-4:2007/A1:2011	Electromagnetic Compatibility (EMC) - Part 6-4: Generic Industrial Emission Standard

This declaration, based on the requirements of the listed Statutory Instruments and EN ISO/IEC 17050-1, covers all product serial numbers from this date on: 2021-12-14

You must retain the signed legal declaration for future reference
This declaration becomes invalid if modifications are made to the product without prior agreement.

Signed for and on behalf of Edwards Ltd



*Andries De Bock – Vice President Engineering
Industrial Vacuum Division, Cologne*



*Axel Guddas – General Manager
Product Company Cologne*

ADDITIONAL LEGISLATION AND COMPLIANCE INFORMATION

EMC (EU, UK): Class A/B Industrial equipment

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

RoHS (EU, UK): Material Exemption Information

This product is compliant with the following Exemptions

Annex III:

- 6(a) **Lead** as an alloying element in steel for machining purposes and in galvanised steel containing up to 0.35 % lead by weight
- 6(b) **Lead** as an alloying element in aluminium containing up to 0.4% by weight

REACH (EU, UK)

This product is a complex article which is not designed for intentional substance release. To the best of our knowledge the materials used comply with the requirements of REACH. The product manual provides information and instruction to ensure the safe storage, use, maintenance and disposal of the product including any substance based requirements.

Article 33.1 Declaration (EU, UK)

This product contains Candidate List Substances of Very High Concern above 0.1%ww by article as clarified under the 2015 European Court of Justice ruling in case C-106/14.

- Lead (Pb)
This substance is present in certain steel / aluminium components.

Additional Applicable Requirements


The product is in scope for and complies with the requirements of the following:

2012/19/EU

Directive on waste electrical and electronic equipment (WEEE)

材料成分声明

China Material Content Declaration

部件名称 Part name 	有害物质 Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr VI)	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
铸铝及铝合金制品 Aluminium alloys	X	O	O	O	O	O
钢合金制品 Steel alloys	X	O	O	O	O	O
<p>O: 表示该有害物质在该部件的所有均质材料中的含量低于 GB/T 26572 标准规定的限量要求。 O: Indicates that the hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.</p> <p>X: 表示该有害物质在该部件的至少一种均质材料中的含量超出 GB/T26572 标准规定的限量要求。 X: Indicates that the hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T26572.</p>						

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