

# *Instruction Manual*

## XDD 1 115/230 V and XDD 1 24 V DC Diaphragm Pumps



| Description     | Item Number |
|-----------------|-------------|
| XDD 1 115/230 V | TBA         |
| XDD 1 24 V      | TBA         |



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# 1 Introduction

## 1.1 Safety information

Remove all packing material, remove the product from its packing-box, remove the protective covers from the inlet and outlet ports and keep them, inspect the equipment. If the equipment is damaged, notify the supplier and the carrier in writing within three days; state the item number of the product together with the order number and the supplier's invoice number. Retain all packing material for inspection.



### **WARNING**

**Do not use the equipment if it is damaged.**

If the equipment is not used immediately, replace the protective covers. Store the equipment in suitable conditions.

- Read and obey this manual before installing or operating the equipment.
- Transport the pump at the provided handle or the recessed grip.

The following symbols appear in this document:



Warning - refer to accompanying documentation.



Warning - Isolate equipment from mains. - risk of electric shock.



Warning - Hot surfaces.



Warning - Use protective equipment.



Use the equipment for the intended use only, i. e. for generation of vacuum.

- Prevent any part of the human body from coming in contact with the vacuum.
- Obey notes on correct vacuum and electrical connections.
- Make sure that the individual components are only connected, combined and operated according to their design and as indicated in the instructions for use.

Obey **national safety regulations and safety requirements** concerning the use of vacuum and electrical equipment.

- Equipment must be connected only to a **suitable fused (slow-blow fuse 1.7 / 0.85 A) and protected electrical supply** and a suitable earth point. Failure to connect the motor to ground may result in deadly electrical shock.
- The supply cable may be fitted with a moulded European IEC plug or a plug suitable for your local electrical supply. If the plug has been removed or has to be removed, the cable will contain wires colour coded as follows: green or green and yellow: earth; blue or white: neutral; brown or black: live.

**Note:** Check that mains voltage and current conform with the equipment (see rating plate).

### CAUTION

When using pumps with dual-voltage motor check that the voltage selection switch is correctly positioned. **Attention: If the voltage is not correctly selected, the motor can be damaged if the pump is switched on.**

- If the equipment is brought from cold environment into a room for operation, allow the equipment to warm up (pay attention to water condensation on cold surfaces).
- Make sure ventilation is adequate if pump is installed in a housing or if ambient temperature is elevated.

Obey all **relevant safety requirements** (regulations and guidelines) and adopt suitable safety measures.

- Provide a firm level platform for the equipment and check that the system to be evacuated is mechanically stable and that all fittings are secure.

**Note:** Flexible elements tend to shrink when evacuated.

Due to the high compression ratio of the pumps, pressure at the outlet port might be generated being higher than the max. permitted pressure compatible with the mechanical stability of the system.



### WARNING

Obey **maximum permitted pressures and pressure differences**, see [Section 2 Technical data](#). Do not operate the pump with overpressure at the inlet.



### WARNING

Do not permit any **uncontrolled pressurizing** (e. g. make sure that the exhaust pipeline cannot become blocked). If you have an exhaust-isolation valve, make sure that you cannot operate the equipment with the valve closed. **Risk of bursting!**

Ensure that the system design does not allow the exhaust pipeline to become blocked:

- Avoid overpressure of more than 0.2 bar in case inert gas is connected.
- The diameter of the inlet and outlet pipeline should be at the least as large as the diameter of the pump connection pipelines.

To the best of our knowledge the equipment is in compliance with the requirements of the applicable EC-directives and harmonized standards (see "Declaration of conformity") with regard to design, type and model, especially directive IEC 1010. This directive gives in detail conditions, under which the equipment can be operated safely (see also IP degree of protection).

- Adopt suitable measures in case of differences, e. g. using the equipment outdoors, installation in altitudes of more than 1000 m above mean sea level, conductive pollution or moisture.



### WARNING

Pay attention to symbol “hot surfaces” on the equipment. Adopt suitable measures to prevent any danger arising from the formation of hot surfaces or electric sparks.



### WARNING

The pumps are not suitable to pump dangerous or explosive gases or explosive or flammable mixtures. Ensure that the materials of the wetted parts are compatible with the pumped substances, see [Section 2](#) Technical data.

Adopt suitable measures to prevent the release of dangerous, explosive, corrosive or polluting fluids.

Use inert gas for gas ballast or venting if necessary.

The user must take suitable precautions to prevent any formation of explosive mixtures in the expansion chamber. In case of a diaphragm crack, mechanically generated sparks, hot surfaces or static electricity may ignite these mixtures.

Take adequate precautions to protect people from the effects of dangerous substances (chemicals, thermal decomposition products of fluoroelastomers), wear appropriate safety clothing and safety glasses.

Obey applicable regulations when disposing of chemicals. Take into consideration that chemicals may be polluted.



### WARNING

Pumps with dual-voltage motor: The motor is shut down by a thermal cutout in the winding.

Manual reset is necessary. Switch off the pump or isolate the equipment from mains. Wait approx. five minutes before restarting the pump.



### WARNING

Pumps with 24 V DC voltage: The motor is protected by a temperature sensor at the circuit board (current limitation if the temperature at the circuit board is higher than 70°C).

Avoid high heat supply (e. g. due to hot process gases).

Ensure sufficient air admittance if pump is installed in a housing.

Due to the residual **leak rate of the equipment**, there may be an exchange of gas, albeit extremely slight, between the environment and the vacuum system.

- Adopt suitable measures to prevent contamination of the pumped substances or the environment.

Ensure that in case of failure, the pump and the vacuum system turn always into a safe status.

- In case of leaks in the manifold pumped substances may leak into the environment or in the pump housing or the motor.
- Obey especially all notes on use and operation and on maintenance.
- Failure of the pump (e. g. due to power failure) must not lead to a critical dangerous situation under any circumstances.

Use only **genuine spare parts and accessories**.

- Otherwise safety and performance of the equipment as well as the electromagnetic compatibility of the equipment might be reduced.

Ensure that maintenance is done only by suitably trained and supervised technicians. Ensure that the maintenance technician is familiar with the safety procedures which relate to the product processed by the vacuum system and that the equipment, if necessary, is appropriately decontaminated before starting maintenance. Obey local and national safety regulations.

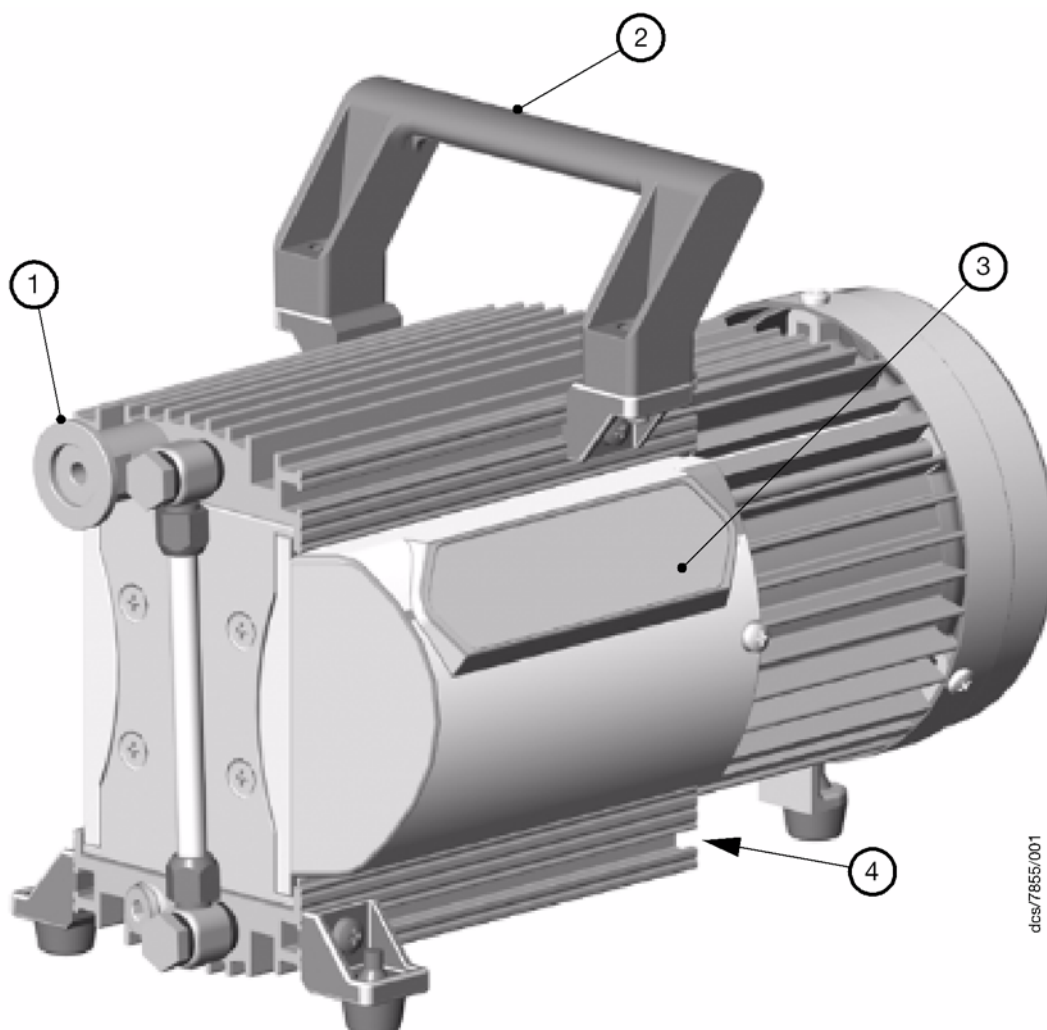
**WARNING**

Before starting maintenance vent the system, isolate the pump and other components from the vacuum system and the electrical supply, drain condensate and allow sufficient cooling of the pump.

Before starting maintenance, wait two minutes after isolating the equipment from mains to allow the capacitors to discharge.

In order to comply with law (occupational, health and safety regulations, safety at work law and regulations for environmental protection) vacuum pumps, components and measuring instruments returned to the manufacturer can be repaired only when certain procedures (see section **Return of Edwards Equipment - Procedure** (Forms HS 1 and HS 2) are followed.

Figure 1 - General view of XDD 1 with dual-voltage motor

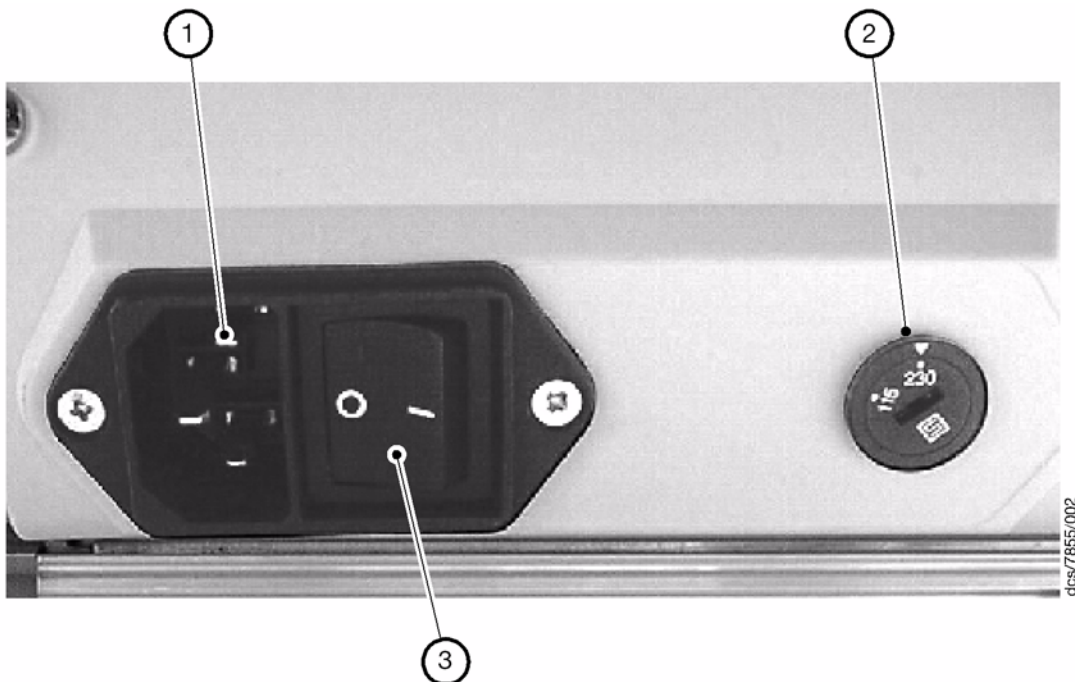


- 1. Inlet (small flange) NW 16
- 2. Handle (removable)

- 3. Pump rating plate
- 4. Outlet (silencer) at lower side



Figure 2 - Adjust the supply voltage



1. Connection mains cable
2. Voltage selection switch
3. Mains switch



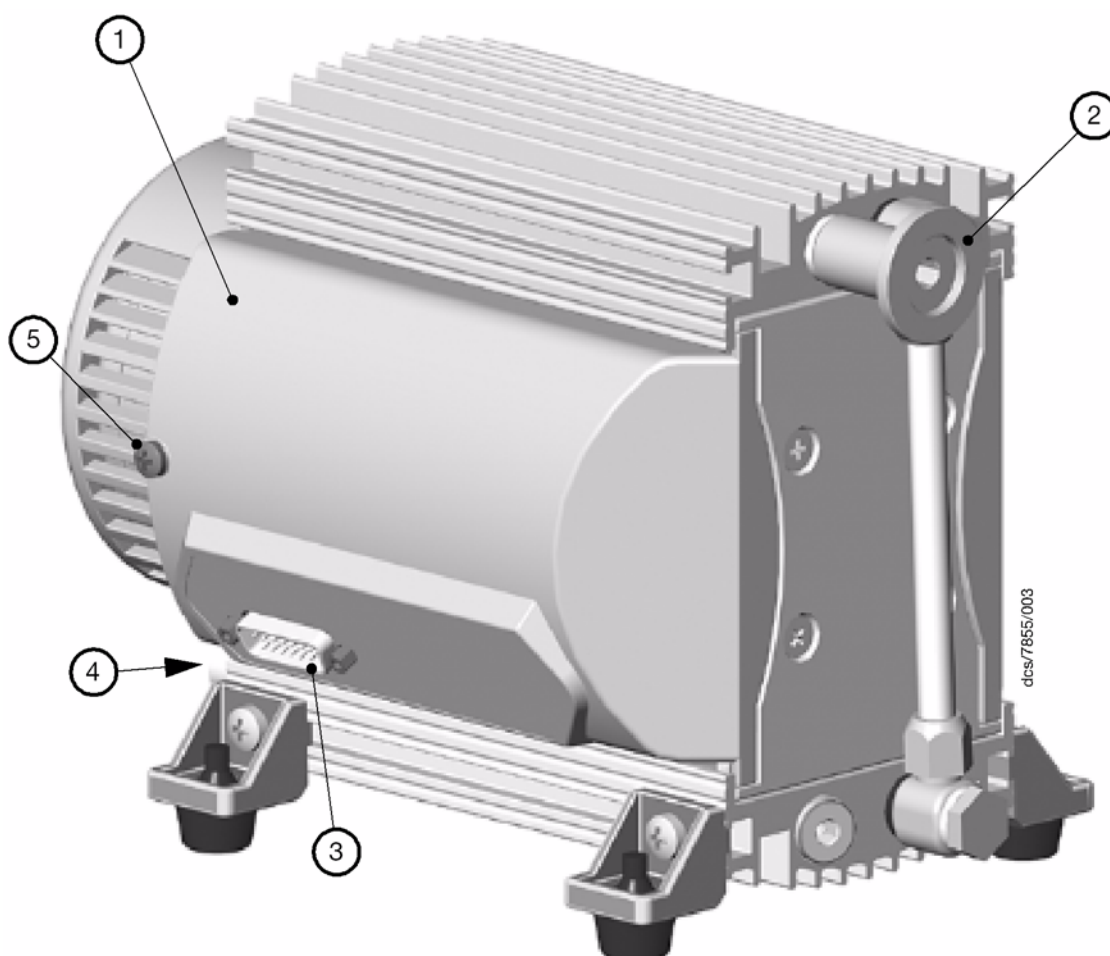
### WARNING

When using pumps with dual-voltage motor check that the voltage selection switch is correctly positioned. Attention: If the voltage is not correctly selected, the motor can be damaged if the pump is switched on.

Use a screw driver to adjust the supply voltage on the voltage selection switch at the terminal box of the pump:

1. 115 corresponds to 100-120 V.
2. 230 corresponds to 200-240 V.

Figure 3 - General view of XDD 1 24 V DC



1. Cover of the circuit board
2. Inlet (small flange) NW 16
3. Male 15 pin D-connector
4. Outlet (silencer) at lower side
5. Screw to secure cover

---

**CAUTION**

Ensure sufficient cooling of the pump!

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**Note:** The pump is factory set to a fixed intermediate motor speed (80% of maximum pumping speed) using the trimming potentiometers and runs without control signal after application of the 24 V DC supply voltage.

## 2 Technical data

Table 1 - General data

| Type  |                   | XDD 1 115/230 V   | XDD 1 24 V DC   |
|---|-------------------|---|---|
| Pumping speed (according to DIN 28432)                                    | m <sup>3</sup> /h | 1.2 / 1.4*  | 1.7; preset: 1.4                                      |
| Ultimate (total) vacuum (absolute)  | mbar              | < 2   | < 2   |
| Max. permitted pressure at the outlet (absolute)                          | bar               | 1.1   |   |
| Permitted ambient temperature storage/operation                           | °C                | -10 to +60 / +10 to +40   |   |
| Permitted relative atmospheric moisture during operation, no condensation | %                 | 30 to 85  |   |
| Motor power   | W                 | 80  | 64  |
| No-load speed   | min <sup>-1</sup> | 1500 / 1800*  | 350 - 2200; preset: 1700                              |
| Max. rated input current  |                   |   |   |
| 120 V ~   | VA                | 192 / 204*  | -   |
| 230 V ~   | VA                | 184 / 196*  | -   |
| Current   |                   |   |   |
| 120 V ~   | A                 | 1.6 / 1.75*   | -   |
| 230 V ~   | A                 | 0.8 / 0.85*   | -   |
| 24 V DC   | A                 |   | max 7.0   |
| Operation current at < 10 mbar at 24 V DC                                 | A                 |   | < 1.5 (1700 min <sup>-1</sup> )                       |
| Cos φ   |                   | 0.95 / 0.98   |   |
| Max. permitted range of supply voltage                                    |                   | <b>Attention: Voltage selection switch</b><br>100-120 V~+5% / -10%<br>200-230 V~ +/-10% | 24 V DC +/- 10%                                       |
| Motor protection  |                   | Thermal cutout, manual reset  | Temperature sensor on the pcb<br>(current limitation) |
| Sound power level   | dB(A)             | Approx. 57  |   |
| Inlet   |                   | Small flange NW 16  |   |
| Outlet  |                   | Silencer  |   |
| Overall dimensions  |                   | See dimensional drawing   |   |
| Mass  | kg                | 6.5   | 4.1   |

\* 50/60 Hz

Table 2 - Materials data

| Components              | Wetted parts                                      |
|-------------------------|---|
| Housing cover           | Aluminium   |
| Head cover              | Aluminium   |
| Diaphragm clamping disc | Aluminium   |
| Valve                   | FPM (e.g. Viton <sup>*</sup> )                    |
| Diaphragm               | PTFE -NBR (e. g. Perbunan <sup>†</sup> ) sandwich |
| Inlet (small flange)    | Stainless steel                                   |
| Outlet (silencer)       | Aluminium / silicon caoutchouc                    |
| Hose                    | PE  |
| Fitting                 | Aluminium anodized                                |

<sup>\*</sup> reg. trade mark Du Pont

<sup>†</sup> reg. trade mark Bayer AG

**Note:** We reserve the right for technical modification without prior notice!

Figure 4 - Dimensional drawing XDD 1 (dual-voltage motor)

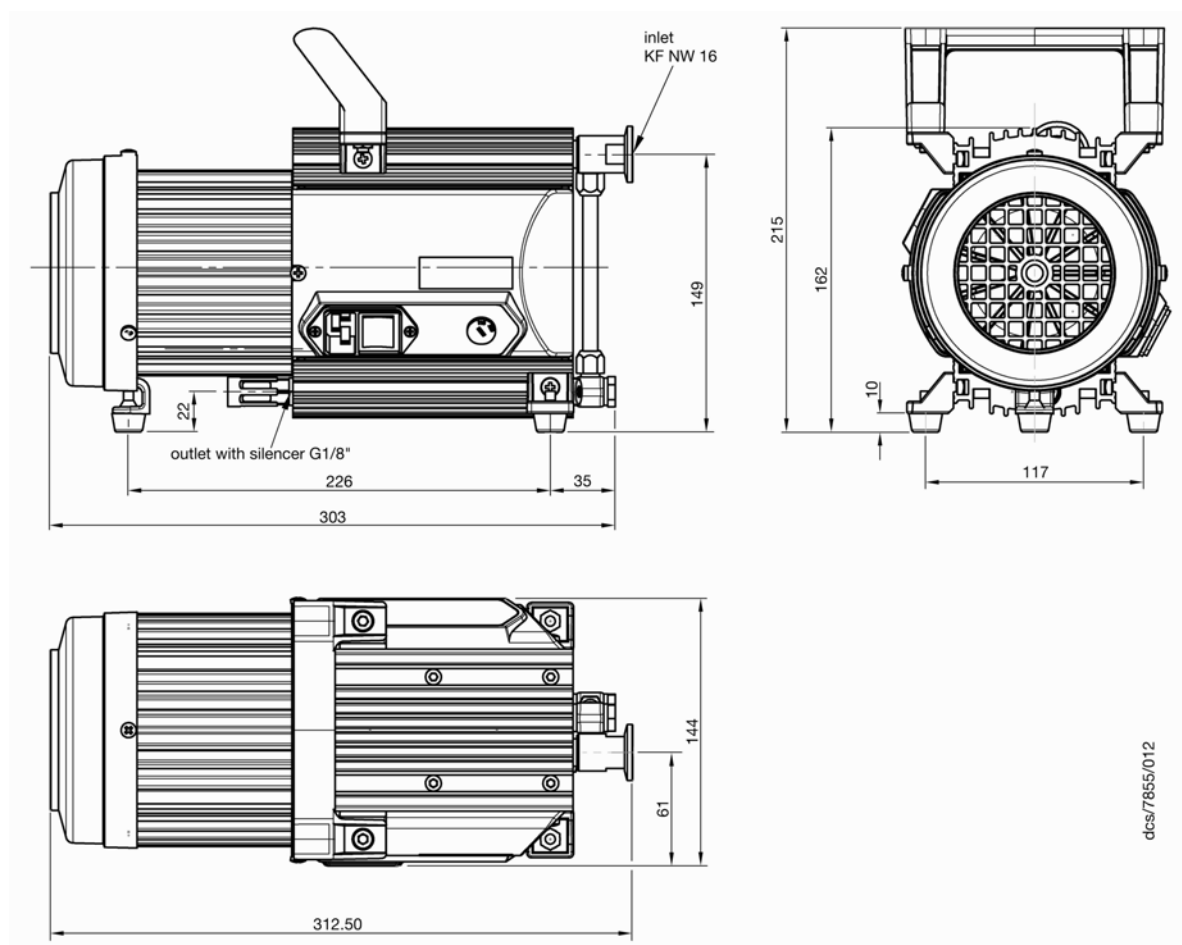
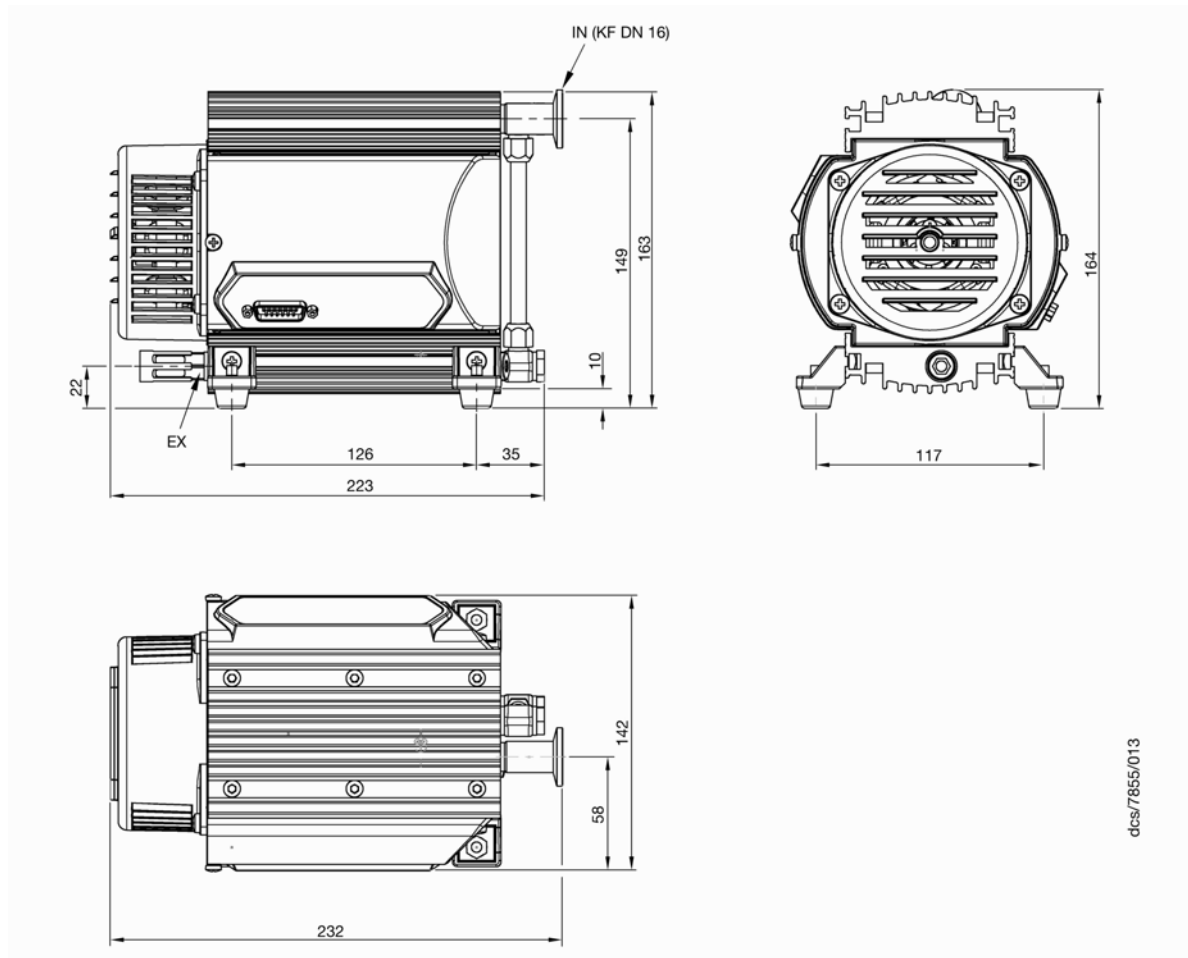


Figure 5 - Dimensional drawing XDD 1 24 V DC



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## 3 Installation

### 3.1 Selection of the external analogue (0-10 V) control signal input

Remove the screw to secure the cover of the circuit board. Move the cover carefully and only as far as necessary. Slide switch is preset to the middle (0-10 V) position. Move both DIP switches to the OFF position.

Figure 6 - Layout circuit board

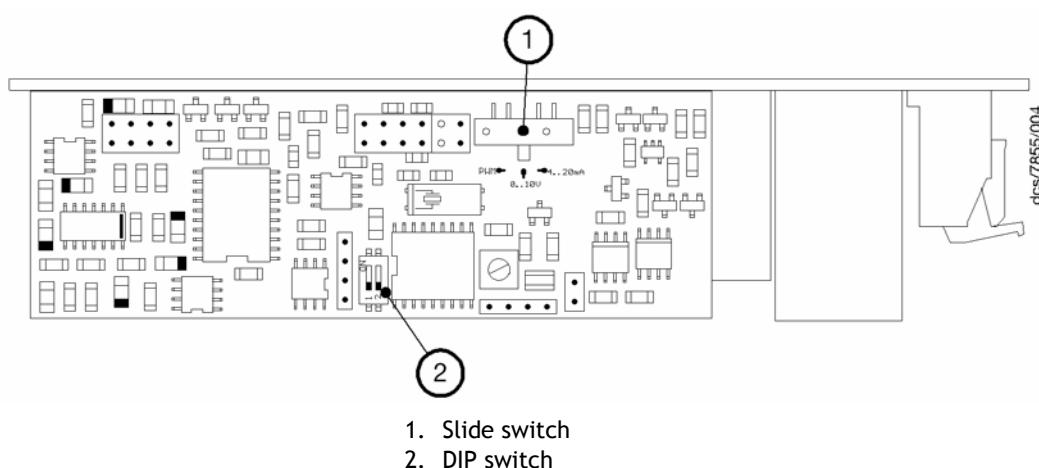
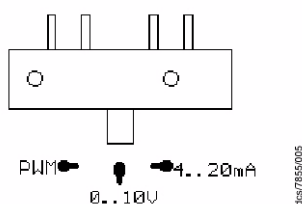
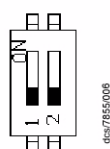


Figure 7 - Selections at the slide switch



Move slide switch to the middle (0-10 V) position.

Figure 8 - Selections at the DIP switch



Both switches to the OFF position for external analogue 0-10 V signal.

### 3.2 Notes regarding the motor speed

Pumping at **high motor speed** increases the **pumping speed** of the pump. Ensure sufficient cooling of the pump!  
Pumping at **low motor speed** increases the **ultimate vacuum** of the pump and also the lifetime of diaphragms and valves.

### 3.3 Electrical connection

The pump has been factory set to a constant pumping speed when connected to a 24 V DC ( $\pm 10\%$ ) supply. The pump can also be controlled using an external analogue 0-10 V signal. Use a suitable connector mating half (not supplied) to connect the electrical supplies and your control equipment to the connector on the logic interface cable. When you make the electrical connections to the XDD 1, refer to [Table 3](#) for full details of the logic interface connections.

**Table 3 - Logic interface connector pins**

| Pin number | Signal                        | Use                          |
|------------|-------------------------------|------------------------------|
| 2          | Control / monitor: 0 V signal | -                            |
| 4          | XDD 1 identity                |                              |
| 9          | Speed (0-10 V)                | To control motor speed       |
| 10         | Earth (ground)                | Screen                       |
| 8, 13, 14  | Electrical supply: 0 V        | Use all pins for connection! |
| 1, 6, 11   | Electrical supply 24 V        | Use all pins for connection! |

### 3.4 External selection of the motor speed via voltage signal

**Voltage input: analog 0 V.... 10 V**

0 V to < 2.5 V: Not operating, stand still of the motor

2.5 V to 7.5 V: Linear increase of the motor speed (350 rpm to 2200 rpm)

7.5 V to 10 V: Maximum motor speed (2200 rpm)



## 4 Use and operation

### 4.1 Installing in a vacuum system

Avoid throttling losses by using connecting pipes with large diameter and keep them as short as possible.

Reduce the transmission of vibration and prevent loading due to rigid pipelines. Insert elastic hoses or flexible elements as couplings between the pump and rigid pipes.

**Note:** *Flexible elements tend to shrink when evacuated.*

Use a suitable valve to isolate the pump from the vacuum system to allow the pump to warm up before condensable vapours are pumped or to clean the pump before it is switched off.

Connect the exhaust to a suitable treatment plant to prevent the discharge of dangerous gases and vapours to the surrounding atmosphere. Use a catchpot to prevent the drainage of contaminated condensate back into the pump.

### 4.2 Prior to use

Check that mains voltage and current conform with the equipment.

---

#### CAUTION

When using pumps with dual-voltage motor check that the voltage selection switch is correctly positioned. Attention: If the voltage is not correctly selected, the motor can be damaged if the pump is switched on.

---

**Note:** *Max. ambient temperature: 40 °C.*

Make sure ventilation is adequate if pump is installed in a housing or if ambient temperature is elevated. Keep a distance of min. 20 cm between fans and ambient parts.

If pump is installed in altitudes of more than 1000 m above mean sea level check compatibility with applicable safety requirements, e. g. DIN VDE 0530 (motor may overheat due to insufficient cooling).

When assembling, ensure **vacuum-tightness**. After assembly, check the complete system for leaks.

### 4.3 During operation

---

#### CAUTION

Do not start or operate the pump if pressure at the outlet is higher than 1.1 bar absolute. Attempts to start or operate the pump at higher pressure may cause blockade and damage of the motor.

---

The pump achieves its **pumping speed**, **ultimate total vacuum** and vapour pumping rate only at operating temperature (after approx. 15 minutes).

Prevent internal condensation, transfer of liquids or dust. The diaphragm and valves will be damaged, if liquids are pumped in significant amounts.

#### 4.3.1 Pumps with dual-voltage motor

Motor is shut down by a **thermal cutout** in the winding. Manual reset is necessary. Switch off the pump or isolate the equipment from mains. Wait approx. five minutes before restarting the pump. Identify cause of failure and eliminate.

**Note:** *Pump starts again after power failure.*

### 4.3.2 Pumps with 24 V DC voltage

The motor is protected by a **temperature sensor at the circuit board** (current limitation if the temperature at the circuit board is higher than 70 °C).

## 4.4 Shutdown

### 4.4.1 Short term

#### Fault

Has the pump been exposed to condensate?

Has the pump been exposed to media which may damage the pump materials or forms **deposits**?

#### Action

Allow the pump to continue to run at atmospheric pressure with gas ballast valve open for a few minutes.

Check and clean pump heads if necessary.

### 4.4.2 Long term

- Take measures as described in section short-term shutdown.
- Separate pump from the apparatus.
- Close manual gas ballast valve.
- Close inlet and outlet port (e. g. with transport caps).
- Store the pump in dry conditions.

## 5 Maintenance

### 5.1 Replacing diaphragms and valves



#### WARNING

Please read section Replacing diaphragms and valves completely before starting maintenance.

**Note:** Partially the pictures show pumps in other versions. This doesn't influence replacing diaphragms and valves of the pump.

All bearings are encapsulated and are filled with long-life lubricant. Under normal operating conditions, the pump is maintenance free. The valves and the diaphragms are wear parts. If the rated ultimate vacuum is no longer achieved, the pump interior, the diaphragms and the valves must be cleaned and the diaphragms and valves must be checked for cracks or other damage.

Depending on individual cases it may be efficient to check and clean the pump heads on a regular basis. In case of normal wear the lifetime of the diaphragms and valves is > 10000 operating hours.

#### CAUTION

Prevent internal condensation, transfer of liquids or dust. The diaphragm and valves will be damaged, if liquids are pumped in significant amount.

If the pump is exposed to corrosive gases or vapour or in case of deposits, maintenance should be carried out frequently.

**Note:** Regular maintenance will improve the lifetime of the pump and also protect both man and environment.



#### WARNING

Before starting maintenance vent the system, isolate the pump and other components from the vacuum system and the electrical supply.

Drain condensate if applicable, avoid the release of pollutants. Allow sufficient cooling of the pump.

#### CAUTION

Ensure that the pump cannot be operated accidentally. Never operate the pump if covers or other parts of the pump are disassembled. Never operate a defective or damaged pump.

Ensure that the maintenance technician is familiar with the safety procedures which relate to the products processed by the pumping system. The pump might be contaminated with the process chemicals that have been pumped during operation. Ensure that the pump is decontaminated before maintenance and take adequate precautions to protect people from the effects of dangerous substances if contamination has occurred.

#### WARNING



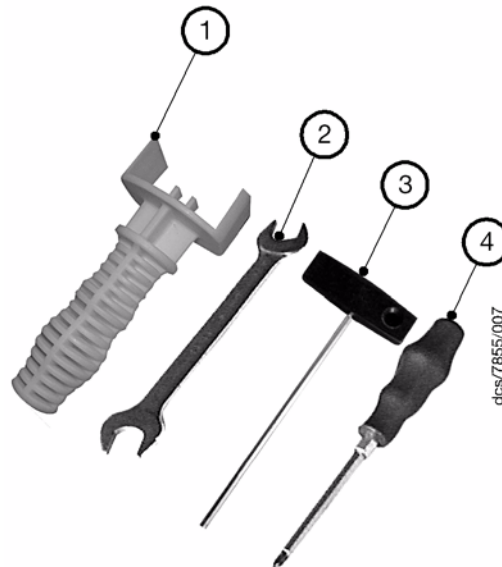
Wear appropriate safety-clothing when you come in contact with contaminated components.





1. Housing cover
2. VS seal
3. Bearing flange
4. Housing
5. Rod
6. Diaphragm support disc
7. Diaphragm
8. Diaphragm clamping disc with connecting screw
9. Head cover
10. Valve
11. VS seal

Figure 10 - Tools required



1. Diaphragm key SW 46 (included in service kit)
2. Open-ended wrench w/f 14
3. Hex key w/f 4/5
4. Phillips screw driver size 2

### 5.1.1 Cleaning and inspecting the pump heads



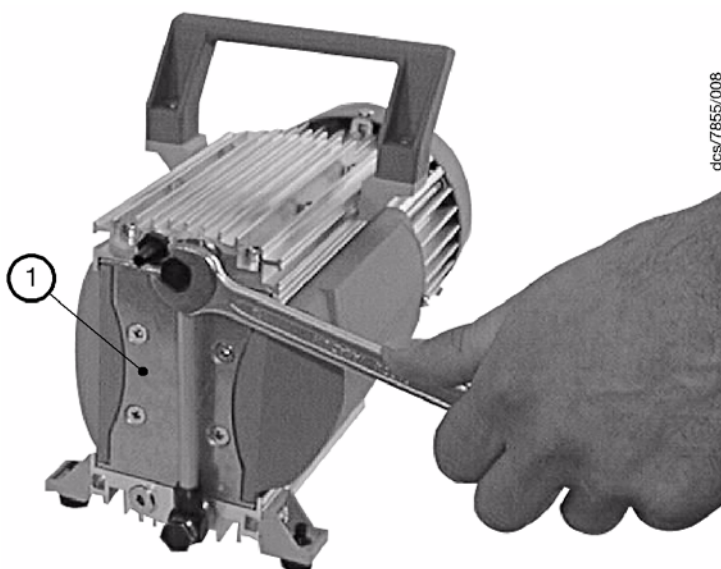
#### WARNING

Do not inhale fumes when using petroleum ether or industrial solvents to remove deposits. Use of solvents needs to be in a well ventilated area and in accordance with local regulations.

Use open-ended wrench to remove fitting at the pump head and remove together with connecting hose.

**Note:** Do not remove bearing flange (1).

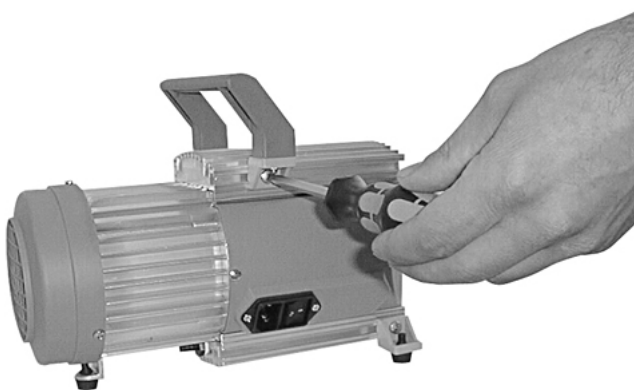
Figure 11 - Remove the fitting at the pump head



1. Bearing flange

Remove two screws at the handle and remove together with handle.

Figure 12 - Remove the handle

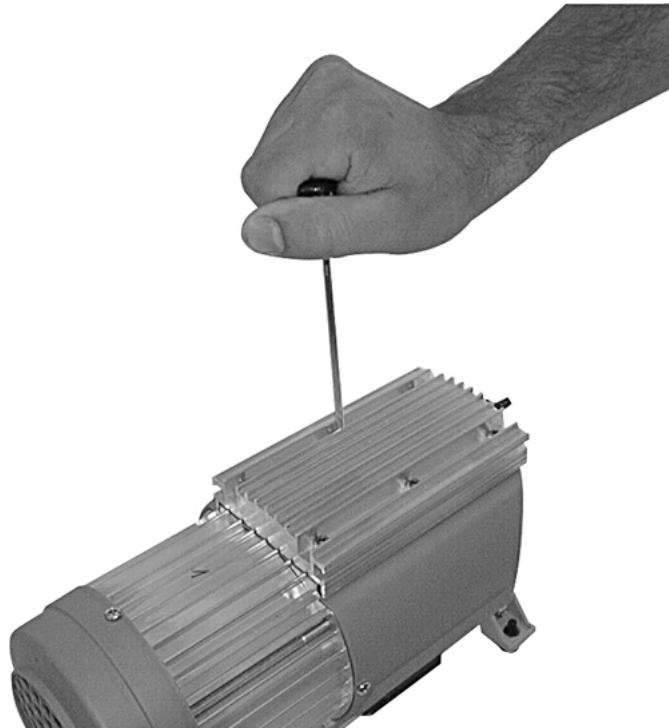


### **WARNING**

Never remove parts by using a spiky or sharp-edged tool (e. g. screw driver), we recommend to use a rubber mallet or compressed air (to be blown carefully into port).

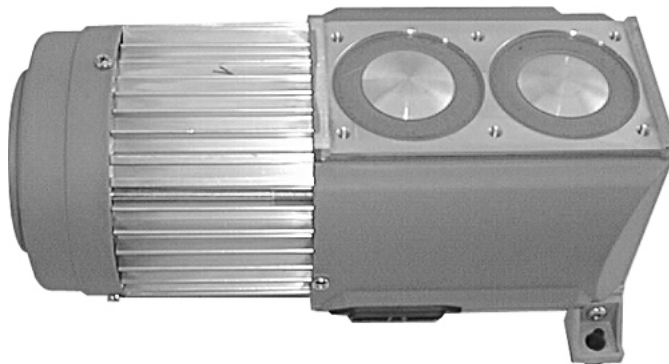
Use hex key to remove six socket head screws from pump head and remove upper housing (housing cover and head cover).

Figure 13 - Remove the housing cover and head cover



1. Remove head cover from housing cover and check valves. Note position of valves and remove.
2. Replace valves if necessary.
3. Use petroleum ether or industrial solvent to remove deposits. **Do not inhale.**
4. Check diaphragm for damage and replace if necessary.

Figure 14 - Remove the head cover from the housing cover



### 5.1.2 Replacing the diaphragm



#### WARNING

Never use a spiky or sharp-edged tool to lift the diaphragm.

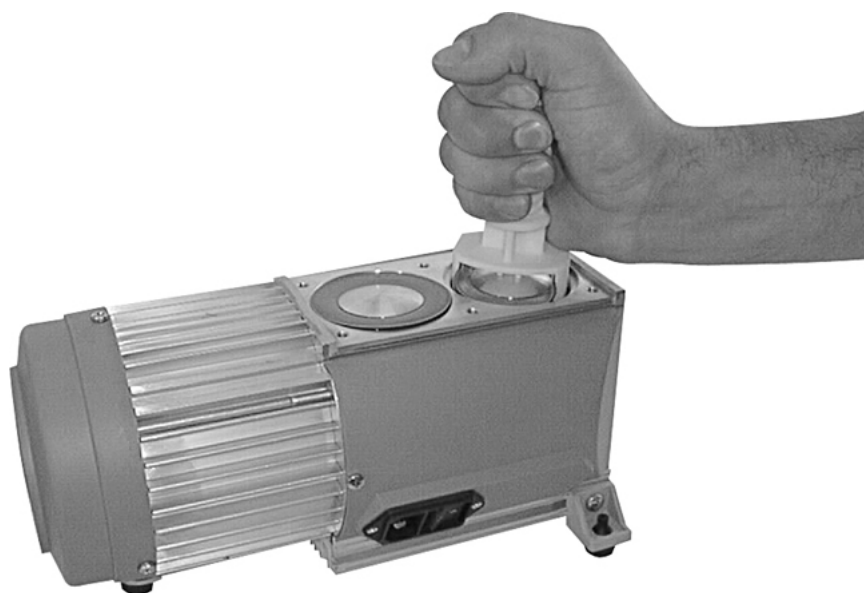


#### WARNING

Do not inhale the fumes when immersing the old diaphragm in naphtha or petroleum.

1. Lift diaphragm carefully.
2. Apply pressure to the clamping disc beside the diaphragm to bring connecting rod into upper turning point position if necessary.
3. Use diaphragm key to grip under the diaphragm to the diaphragm support disc.
4. Apply pressure to the diaphragm clamping disc to bring the diaphragm into lower turning point position. Press diaphragm key against diaphragm clamping disc and unscrew diaphragm support disc with diaphragm.
5. If the old diaphragm is difficult to separate from the support disc, immerse assembly in naphtha or petroleum ether. **Do not inhale!**

Figure 15 - Lift the diaphragm



#### CAUTION

Check for washers under clamping disc. Do not mix the washers from the different heads. Make sure that the original number is reassembled at the individual pump head.

6. Position new diaphragm between diaphragm clamping disc with square head screw and diaphragm support disc.

**Note:** Position diaphragm with white PTFE side to diaphragm clamping disc (to pump chamber).



Figure 16 - Position a new diaphragm



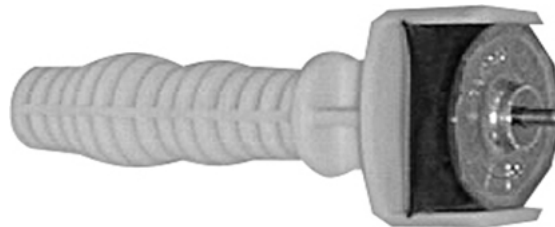
7. Lift diaphragm at the side and position carefully together with diaphragm clamping disc and diaphragm support disc in the diaphragm key.

### CAUTION

Avoid damage of the diaphragm: Do not crack diaphragm in a way that light lines at the diaphragm upper side occur.

8. Smaller number of washers: The pump will not attain final vacuum. More washers: Clamping disc will hit head cover; noise or even blockage of the pump.

Figure 17 - Diaphragm clamping disc



### 5.1.3 Assembling pump heads



### WARNING

Do not turn or change housing covers!

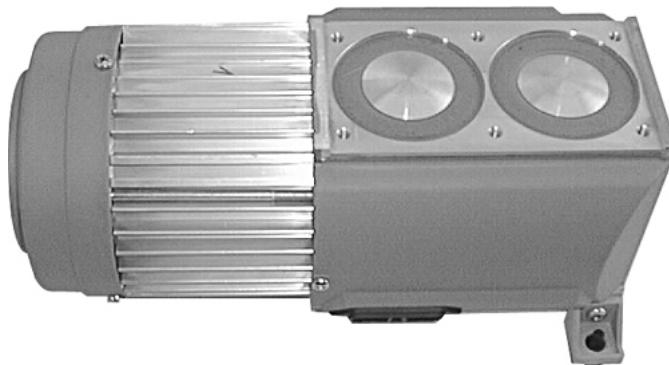
1. Make sure that the square head screw of the diaphragm clamping disc is correctly seated in the guide hole of the diaphragm support disc.
2. Assemble diaphragm clamping disc, diaphragm and diaphragm support disc to connecting rod.
3. Position washers if available between diaphragm support disc and rod.

Figure 18 - Assemble the diaphragm assembly to the connecting rod



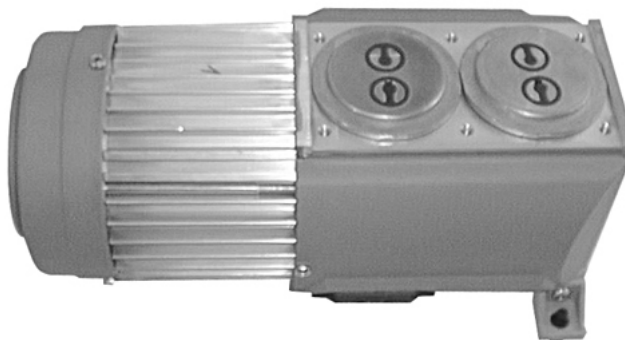
4. Bring diaphragm into a position in which diaphragm is in contact with housing and centred with respect to bore.

Figure 19 - Position the diaphragm



5. Assemble head cover and valves. Check for correct position (see [Figure 20](#) below).

Figure 20 - Assemble the head cover and valves



### CAUTION

Obey position and orientation of the head covers and the valves definitely.

Figure 21 - Scheme pump head with head covers

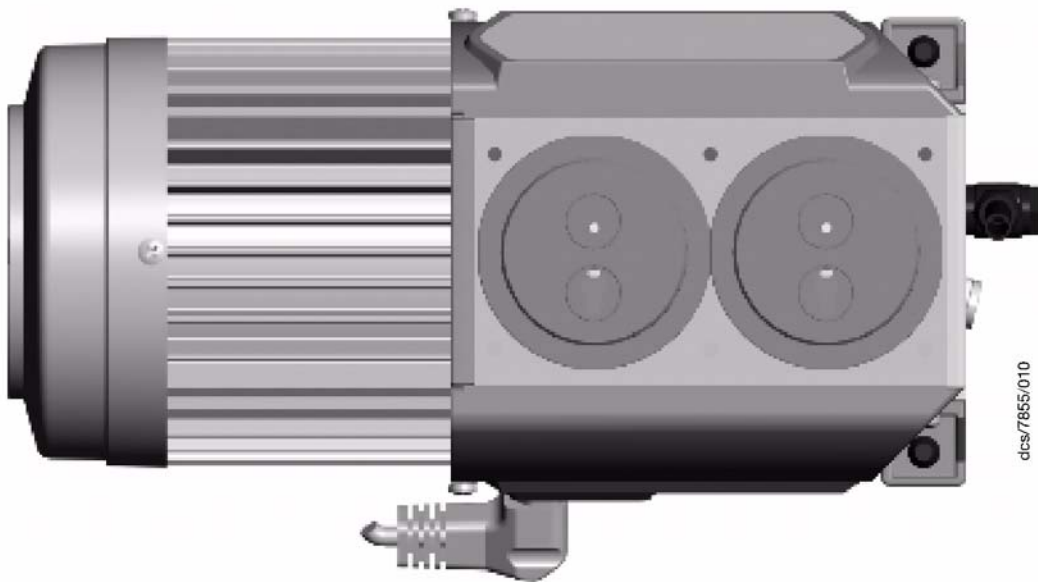
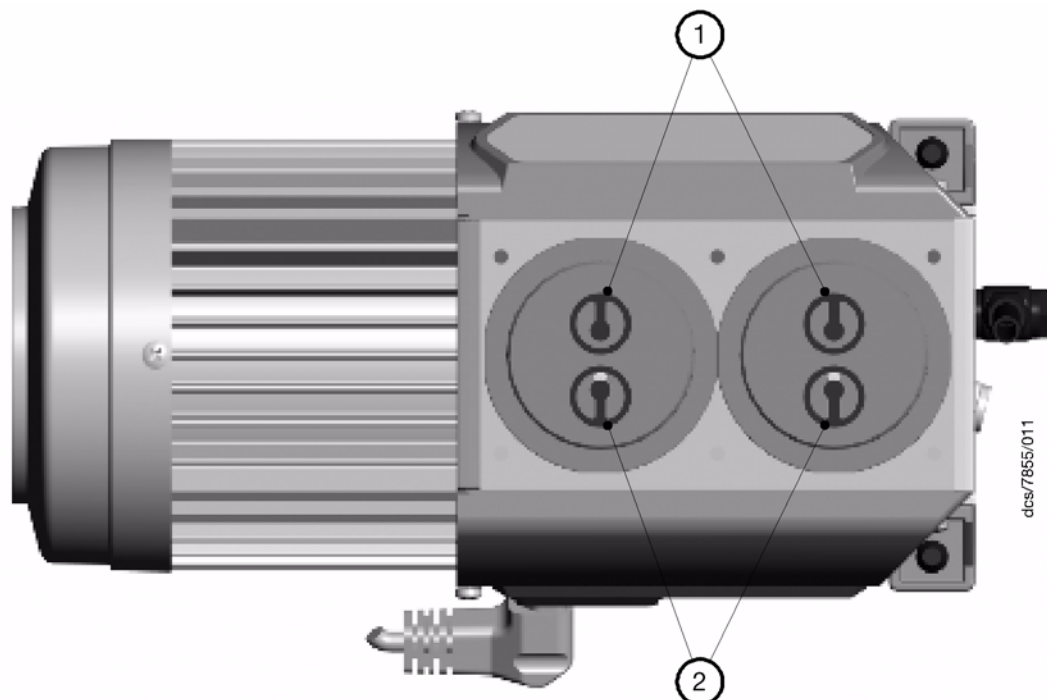


Figure 22 - Scheme pump head with head covers and valves

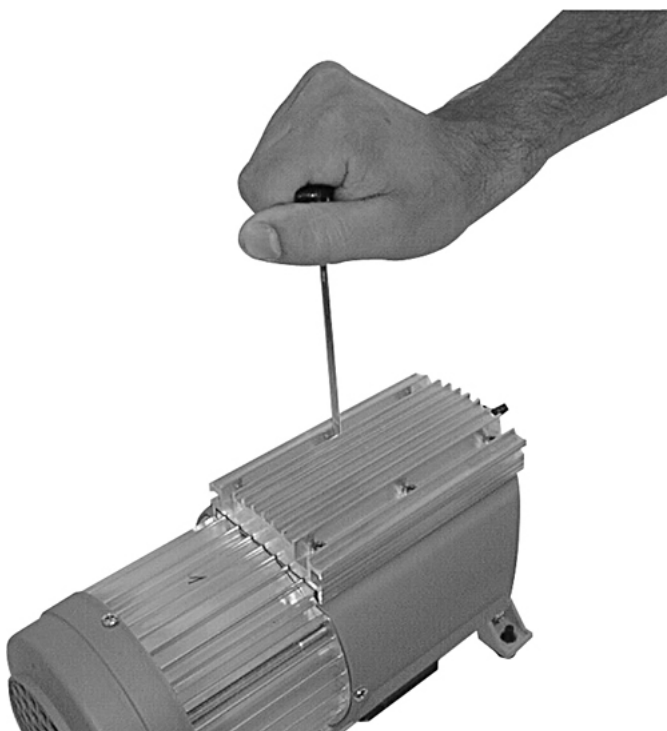


1. Valves at the outlet (round centred opening under valve)
2. Valves at the inlet (kidney-shaped opening beside valve)

6. Position housing cover.
7. Move housing cover slightly to make sure that the head covers are correctly positioned.
8. Screw in six socket head screws fixing housing cover crosswise first slightly, then tighten.

**Note:** Do not tighten until head cover is in contact with housing, **max. torque 6 Nm**.

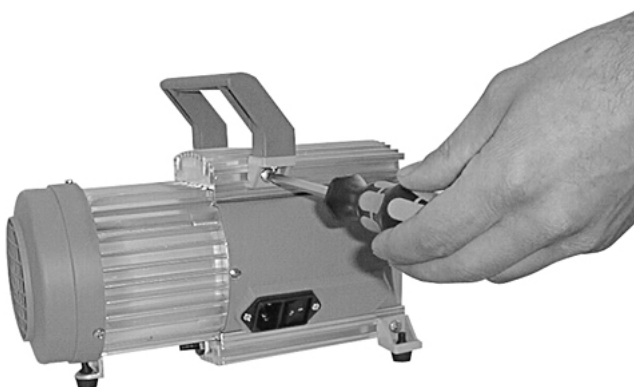
**Figure 23 - Position the housing cover**



9. Assemble handle with screws and tighten.

**Note:** Check for correct position of the handle over the centre of gravity of the pump. The handle is in correct position if the end of the handle is positioned over the end of the housing cover.

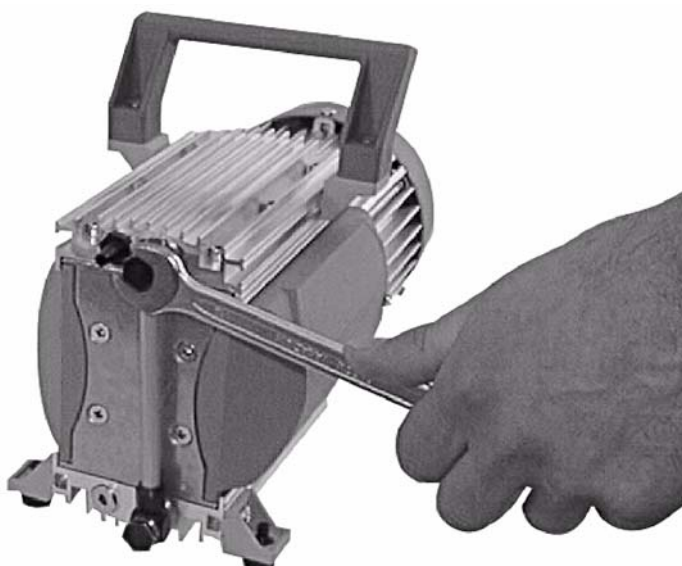
**Figure 24 - Assemble the handle**



### 5.1.4 Assembling fittings

1. Use open ended wrench to reconnect fittings with connection hose to pump heads.
2. Fix the ring nut when tightening the hollow bolt.

Figure 25 - Assemble the fitting at the pump head



### 5.1.5 If the pump does not achieve the ultimate pressure

In case the diaphragms and valves have been replaced, a run-in period of several hours is required before the pump achieves its ultimate vacuum.

If pump does not achieve the ultimate total pressure:

- Check hose connectors between pump heads and manifolds for leaks.
- If necessary recheck pump chamber.

Table 4 - Troubleshooting

| Fault                                     | Possible cause   | Remedy  |
|---|--|---|
| Pump fails to start or stops immediately. | Supply voltage is missing or too low?<br><br><b>Only 24 V DC version:</b><br>Control signal for motor speed is missing?<br><br>Pressure in outlet pipeline too high?<br><br><b>Only pumps with dual-voltage motor:</b> Motor overloaded? | Check or connect supply voltage.<br><br>Check control signal.<br><br>Remove blockade in line, open valve.<br><br>Manual reset is necessary. Switch off the pump or isolate the equipment from mains. Wait approx. five minutes before restarting the pump. Identify cause of failure and eliminate. |

Table 4 - Troubleshooting (continued)

| Fault  | Possible cause   | Remedy  |
|--|--|---|
| Pump does not achieve ultimate total pressure or normal pumping speed. | Centring ring not correctly positioned or leak in the pipeline or vacuum system? | Check pump with a vacuum gauge directly at pump inlet port, check connections and line. |
|  | Long narrow line?  | Use line with larger diameter, length as short as possible.                             |
|  | Pump has been exposed to condensate?   | Run pump at atmospheric pressure for a few minutes.                                     |
|  | Deposits have been formed inside the pump?                                       | Clean and inspect pump heads.   |
|  | Valves or diaphragm damaged?   | Replace valves and/or diaphragms.   |
|  | Outgassing substances or vapour generated in the process?                        | Check process parameters.   |
|  | <b>Only 24 V DC version:</b><br>Pump temperature too high (reduced motor speed)? | Ensure sufficient cooling of the pump or reduce inlet pressure.                         |
| Pump too noisy.  | Atmospheric or high pressure at inlet port?                                      | Connect hose to pump outlet.  |
|  | Diaphragm clamping disc loose?   | Perform maintenance.  |
|  | None of above mentioned causes?  | Contact your supplier.  |
| Pump seized.   |  | Contact your supplier.  |

## 6 Storage and disposal

### 6.1 Storage

Use the following procedure to store the pump:

Close the vacuum system isolation valve to prevent suckback into the vacuum system. Switch off the pump using the on/off switch on the motor. Disconnect the pump from the electrical supply. Purge your vacuum system and the pump with dry nitrogen and disconnect the pump from your vacuum system. Place and secure protective covers over the inlet and outlet ports.

Store the pump in cool, dry conditions until required for use.

### 6.2 Disposal

Dispose of the pump and any components from it safely in accordance with all local and national safety and environmental requirements. Particular care must be taken with components which have been contaminated with dangerous process substances.

Do not incinerate fluoroelastomer seals and O-rings.

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## 7 Spares and accessories

### 7.1 List of spare parts

Table 5 - Spare parts

| Item number | Description                                 |
|-------------|---|
| A746-01-700 | Inlet flange spare XDD1                     |
| A746-01-701 | VS seal spare XDD1                          |
| A746-01-702 | Exhaust silencer spare XDD1                 |
| A746-01-800 | Diaphragm service kit XDD1                  |
| A746-01-703 | Fan cover white, XDD 1, 115/230 V, 50/60 Hz |
| A746-01-704 | Motor cover white, XDD 1, 24 V DC           |
| A746-01-705 | Anti-vibration mount                        |

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