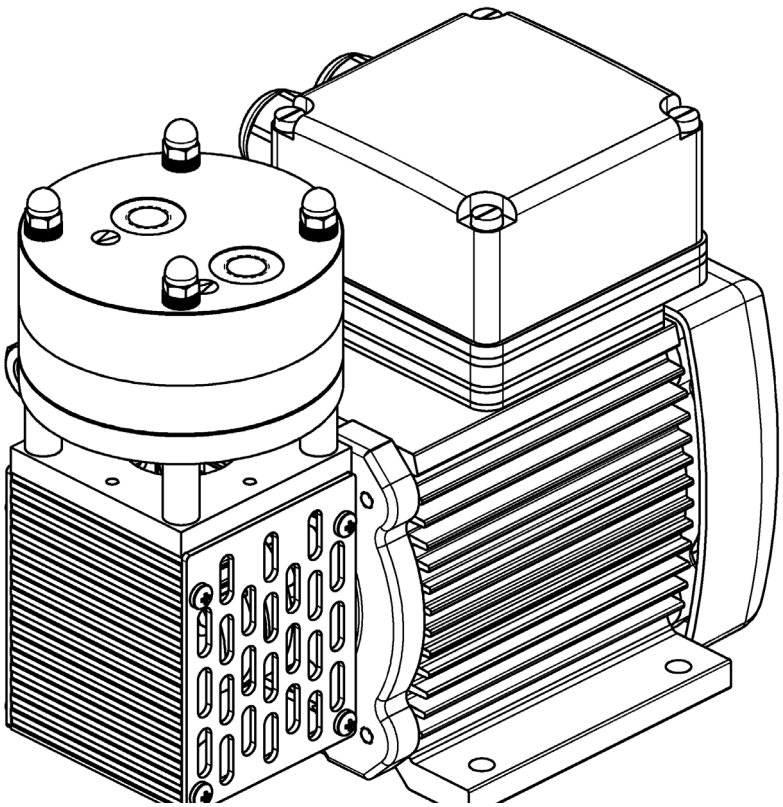
OEM

N 012/024/036
TRANSLATION OF ORIGINAL OPERATING AND INSTALLATION INSTRUCTIONS
ENGLISH

DIAPHRAGM VACUUM PUMPS AND COMPRESSORS



Note!
Before operating the pump and the accessories, please read the operating instructions and pay attention to the safety precautions!

KNF Neuberger GmbH
Alter Weg 3
79112 Freiburg
Germany
Phone +49-(0)7664-5909-0
Fax +49-(0)7664-5909-99

E-mail: info@knf.de
www.knf.de

Contents **Page**

1. About this document....3
2. Use....4
3. Safety....5
4. Technical Data....7
5. Design and function....10
6. Installation and connection....12
7. Operation....21
8. Servicing....23
9. Troubleshooting....28
10. Spare parts and accessories....30
11. Returns....31

1. About this document

1.1. Using the Operating and Installation Instructions

The Operating and Installation Instructions are part of the pump.

➔ Pass on the Operating and Installation Instructions to the next owner.

Project pumps

Customer-specific project pumps (pump models which begin with “PJ” or “PM”) may differ from the Operating and Installation Instructions.

➔ For project pumps, also observe the agreed upon specifications.

1.2. Symbols and markings

Warning



WARNING

A danger is located here.

Possible consequences of a failure to observe the warning are specified here. The signal word, e.g. Warning, indicates the danger level.

➔ Measures for avoiding the danger and its consequences are specified here.

Danger levels

Signal word	Meaning	Consequences if not observed
DANGER	warns of immediate danger	Death or serious injuries and/or serious damage are the consequence.
WARNING	warns of possible danger	Death or serious injuries and/or serious damage are possible.
CAUTION	warns of a possibly dangerous situation	Minor injuries or damage are possible.

Tab. 1

Other information and symbols

➔ An activity to be carried out (a step) is specified here.

1. The first step of an activity to be carried out is specified here. Additional, consecutively numbered steps follow.

This symbol refers to important information.

2. Use

2.1. Proper use

The pumps are exclusively intended for transferring gases and vapors.

Owner's responsibility

Operating parameters and conditions

Only install and operate the pumps under the operating parameters and conditions described in chapter 4, Technical data.

Only complete pumps may be taken into service.

Make sure that the installation location is dry and the pump is protected against rain, splash, hose and drip water.

Requirements for transferred medium

Before using a medium, check whether the medium can be transferred danger-free in the specific application case.

Before using a medium, check the compatibility of the materials of the pump head, diaphragm and valves with the medium.

Only transfer gases which remain stable under the pressures and temperatures occurring in the pump.

2.2. Improper use

The pumps may not be operated in an explosive atmosphere.

The pumps are not suitable for transferring dusts.

The pumps are not suitable for transferring liquids.

The pumps must not be used to create vacuum and overpressure simultaneously.

An overpressure must not be applied to the suction side of the pump.

3. Safety

Note the safety precautions in chapters 6. Installation and connection, and 7. Operation.

The pumps are built according to the generally recognized rules of technology and in accordance with the occupational safety and accident prevention regulations. Nevertheless, dangers can result during their use which lead to injuries to the user or others, or to damage to the pump or other property.

Only use the pumps in proper technical condition and in accordance with their intended use in a safety and danger-conscious manner while observing the operating and installation instructions.

Personnel

Make sure that only trained and instructed personnel or specially trained personnel work on the pumps. This especially applies to assembly, connection and servicing work.

Make sure that the personnel has read and understood the operating and installation instructions, and in particular the “Safety” chapter.

Working in a safety-conscious manner

Observe the accident prevention and safety regulations when performing any work on the pump and during operation.

Handling dangerous media

When transferring dangerous media, observe the safety regulations when handling these media.

Handling combustible media

Be aware that the pumps are not designed to be explosion-proof.

Make sure the temperature of the medium is always sufficiently below the ignition temperature of the medium, to avoid ignition or explosion. This also applies for unusual operational situations.

Note that the temperature of the medium increases when the pump compresses the medium (compressor operation).

Hence, make sure the temperature of the medium is sufficiently below the ignition temperature of the medium, even when it is compressed to the maximum permissible operating pressure of the pump. The maximum permissible operating pressure of the pump is stated in the technical specifications (chapter 4).

If necessary, consider any external sources of energy, such as radiation, that may add heat to the medium.

In case of doubt, consult the KNF customer service.

Environmental protection

Store all replacement parts in a protected manner and dispose of them properly in accordance with the applicable environmental protection regulations. Observe the respective national and international regulations. This especially applies to parts contaminated with toxic substances.

EC Directives / Standards

For the purposes of the Machinery Directive 2006/42/EC, pumps are “party completed machinery”, and are therefore to be regarded as not ready for use. Partly completed machinery may not be commissioned until such time as it has been determined that the machine in which the partly completed machinery is to be assembled is in conformity with the provisions of the Machinery Directive

2006/42/EC. The following essential requirements of Annex I of Directive 2006/42/EC (general principles) are applied and observed:

- General Principles No. 1
- No. 1.1.2. / 1.1.3. / 1.3.1. / 1.3.3. / 1.3.4. / 1.4.1. / 1.5.1. / 1.5.2. / 1.5.8. / 1.5.9. / 1.7.4. / 1.7.4.1. / 1.7.4.3.

As these partly completed machinery are OEM-models the power supplies and the equipment for disconnecting and switching-off the partly completed machinery respectively have to be considered when mounting as well as over-current and overload protective gear.

In addition a protection against mechanical parts in motion and hot parts, if existing, has to be provided when mounting.

CE The pumps conform to the Directive 2011/65/EU.

The pumps conform to the Directive 2014/30/EU concerning Electromagnetic Compatibility.

The following harmonized standards have been used:

- DIN EN 61326-1 class A
- DIN EN 61000-3-2/3
- DIN EN 60204-1
- DIN EN 50581

Customer service and repairs

Only have repairs to the pumps carried out by the KNF Customer Service responsible.

Use only genuine parts from KNF for servicing work.

4. Technical Data

Pump materials

N 0__(.0) AT.16 E

Assembly	Material
Pump parts in contact with gas	Aluminum
Diaphragm	PTFE
Valve Plate	PTFE

Tab. 2

N 0__(.0) ST.__ E

Assembly	Material
Pump parts in contact with gas	Stainless steel
Diaphragm	PTFE
Valve Plate	PTFE

Tab. 3

Pneumatic values

N 012 __.__ E

Parameter	Value
Max. permissible operating pressure [bar g]	1.5
Ultimate vacuum [mbar abs.]	240
Delivery rate at atm. pressure [l/min]*	10.5

Tab. 4 **Liters in standard state (1,013 mbar)*

N 024 __.__ E

Parameter	Value
Max. permissible operating pressure [bar g]	1.5
Ultimate vacuum [mbar abs.]	200
Delivery rate at atm. pressure [l/min]*	18

Tab. 5 **Liters in standard state (1,013 mbar)*

N 036(.0) __.__ E

Parameter	Value
Max. permissible operating pressure [bar g]	1.5
Ultimate vacuum [mbar abs.]	200
Delivery rate at atm. pressure [l/min]*	30**

Tab. 6 **Liters in standard state (1,013 mbar)*

***two-headed pumps: delivery rate per pump head*

Pneumatic connections

Pump type	Value
N 012__.__ E	Thread size G1/8’
N 024__.__ E	Thread size G1/8’
N 036(.0)__.__ E	Thread size G1/4’

Tab. 7

Electrical data

Parameter	Value
Electrical data	See type plate
Protection class motor	IP44
Protection class pump heads .11 versions	IP20
Fuse temperature control [A]*	0.5 delayed

Tab. 8 **According to spare parts list, chapter 10*

Thermo switch

The pumps are fitted as standard with a thermo switch to protect against overloading.

Weight

Pump type	Value
N 012 AT.16 E	3.4 kg
N 012 ST.16 E	4.0 kg
N 012 ST.11 E	4.0 kg
N 024 AT.16 E	6.1 kg
N 024 ST.16 E	7.3 kg
N 024 ST.11 E	7.3 kg
N 036 AT.16 E	10.0 kg
N 036 ST.16 E	12.0 kg
N 036 ST.11 E	11.9 kg
N 036.0 AT.16 E	18.2 kg
N 036.0 ST.16 E	22.2 kg
N 036.0 ST.11 E	22.0 kg

Tab. 9

Dimensions

Pump type	Value L x W x H [mm]
N 012 _T.16 E	200 x 137 x 183
N 012 ST.11 E	
N 024 __.__ E	257 x 150 x 220
N 036 __.__ E	303 x 172 x 249
N 036.0 __.__ E	280 x 399 x 269

Tab. 10

Other parameters

Parameter	Values
Permissible ambient temperature	+ 10 °C to + 40°C
Permissible media temperature	+ 5°C to + 240°C
Maximum permissible ambient relative humidity	80% for temperatures up to 31°C, decreasing linearly to 50% at 40°C.
Max. altitude of site [m above sea level]	2000

Tab. 11

Variants

- . 16 designs have temperature-resistant pump heads for media with temperatures of up to 240 °C.
- .11 designs have two heating insets which heats the pump head up to 240 °C (thermostatically regulated).

5. Design and function

Design N 0__.16 E

1 Pneumatic pump inlet
2 Pneumatic pump outlet
3 Head insulation
4 Terminal cover
5 Motor

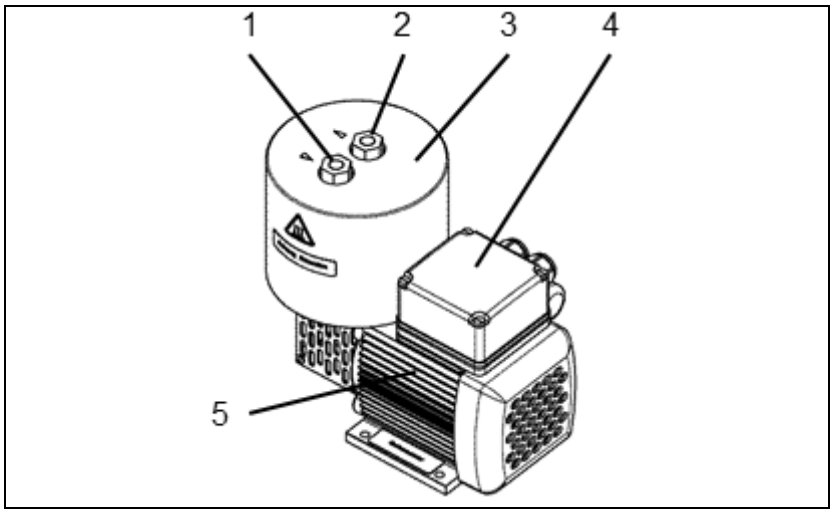


Fig. 1: N 012_T.16 E

Design N 0__.11 E

1 Pneumatic pump inlet
2 Pneumatic pump outlet
3 Head insulation
4 Terminal cover
5 Motor

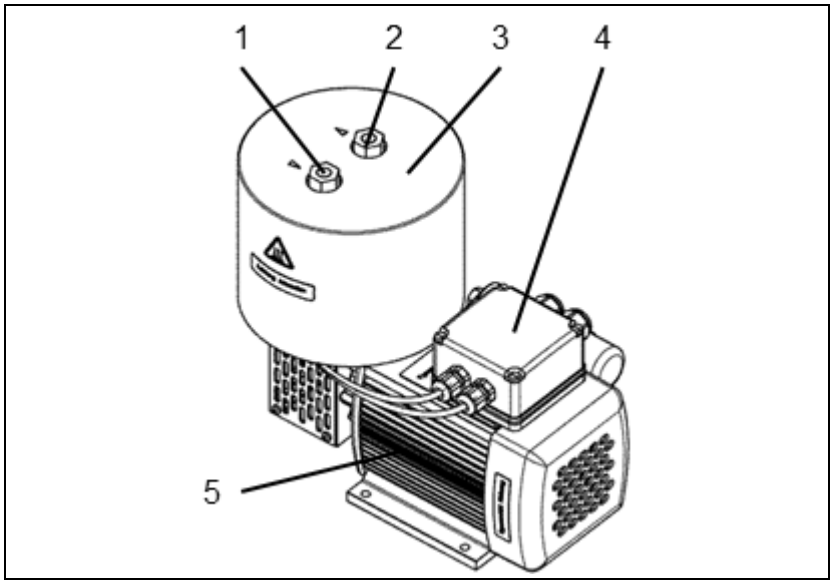


Fig. 2: N 024 ST.11 E

Function Diaphragm Pump

1 Outlet valve
2 Inlet valve
3 Transfer chamber
4 Diaphragm
5 Eccentric
6 Connecting rod
7 Pump drive

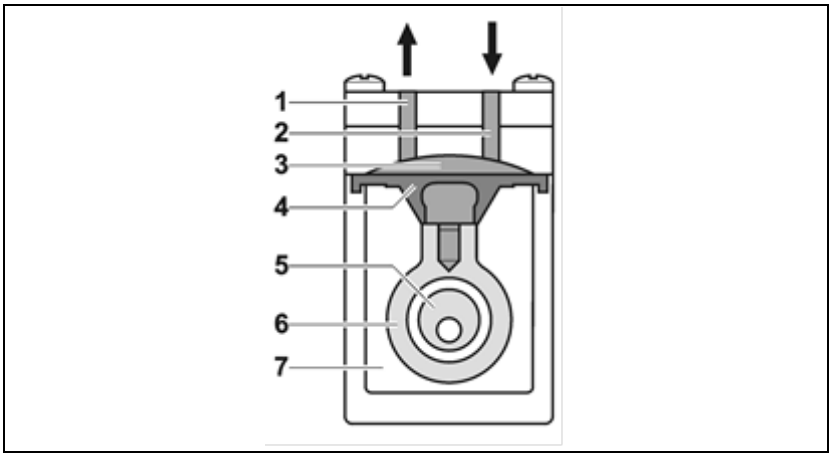


Fig. 3: Pump head

Diaphragm pumps transfer, compress (depending on pump version) and evacuate gases and vapors.

The elastic diaphragm (**4**) is moved up and down by the eccentric (**5**) and the connecting rod (**6**). In the downward stroke it aspirates the gas to be transferred via the inlet valve (**2**). In the upward stroke, the diaphragm presses the medium out of the pump head via the outlet valve (**1**). The transfer chamber (**3**) is hermetically separated from the pump drive (**7**) by the diaphragm.

6. Installation and connection

Only install the pumps under the operating parameters and conditions described in chapter 4, Technical data.

Observe the safety precautions (see chapter 3).

Heating elements

Since the insulating material of the heating elements is hygroscopic, before connecting the heating element, it may be necessary to check the insulation resistance with a suitable measuring instrument (megaohmmeter with 500V DC test voltage, Rmin = 5 MΩ), depending on the type of heating element and the storage conditions (e.g. high humidity). If necessary, the heating element should be dried at an increased temperature (at about 120 °C in the oven. Time: some hours, until acceptable measured values are reached).

6.1. Installation of the pump

➔ Before installation, store the pump at the installation location to bring it up to ambient temperature.

Mounting dimensions

➔ See Fig. 4 to Fig. 11 for mounting dimensions.

Cooling air supply

➔ Install the pump so that the motor fan can intake sufficient cooling air.

Installation location

➔ Make sure that the installation location is dry and the pump is protected against rain, splash, hose and drip water.

➔ Install the pump at the highest point in the system to prevent condensate from collecting in the pump head.

➔ Protect the pump from dust.

➔ Protect the pump from vibrations and jolts.

Disengaging

➔ KNF recommends mechanically disengaging the pump from the piping system. This can be achieved with flexible tubing or pipes, for example. This will avoid transferring to the system any pump oscillations that may arise.

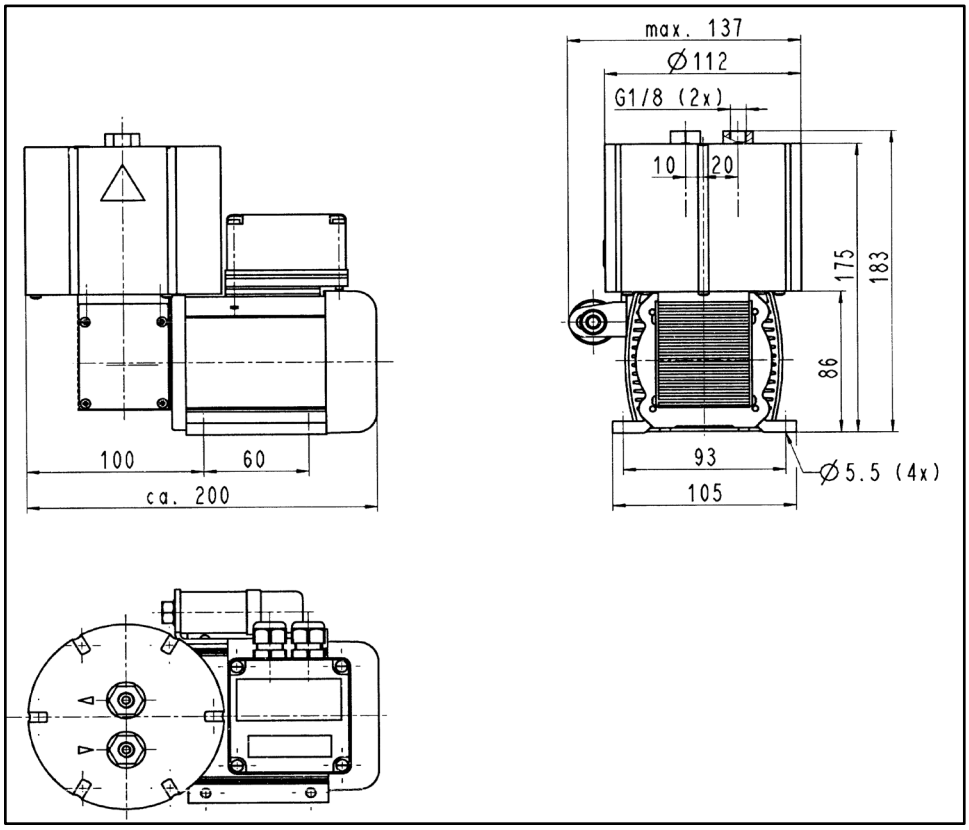


Fig. 4: Mounting dimensions N 012_T.16 E
(Dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)

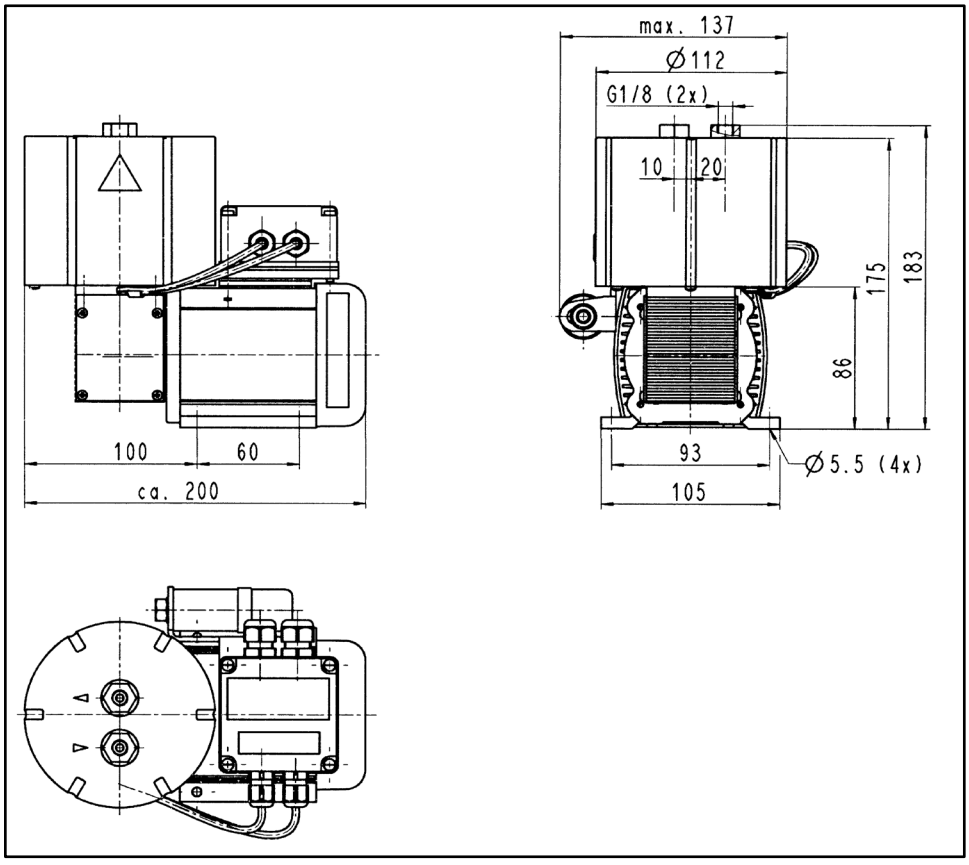


Fig. 5: Mounting dimensions N 012 ST.11E
(Dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)

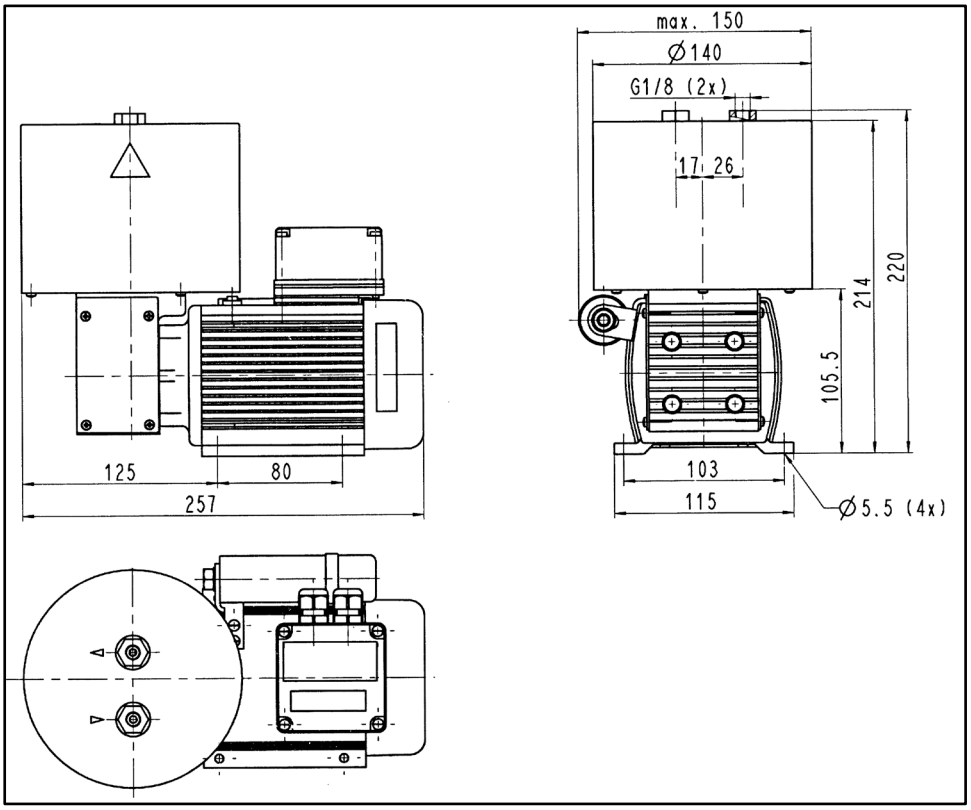


Fig. 6: Mounting dimensions N 024_T.16 E
(Dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)

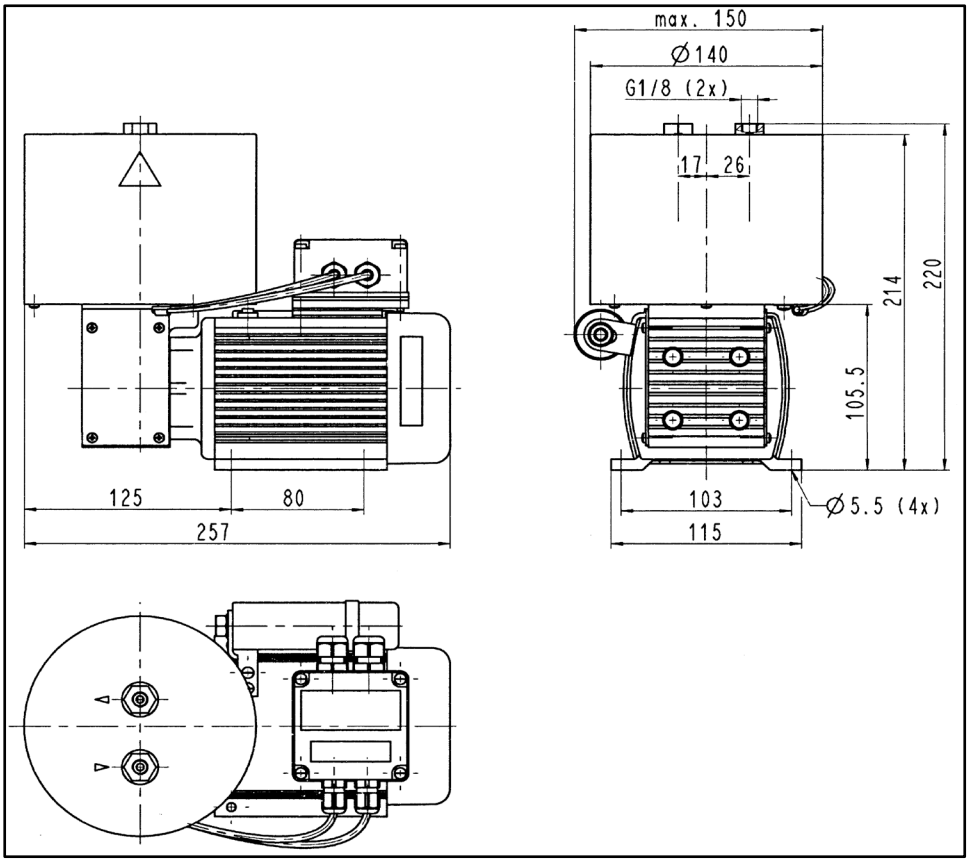


Fig. 7: Mounting dimensions N 024 ST.11 E
(Dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)

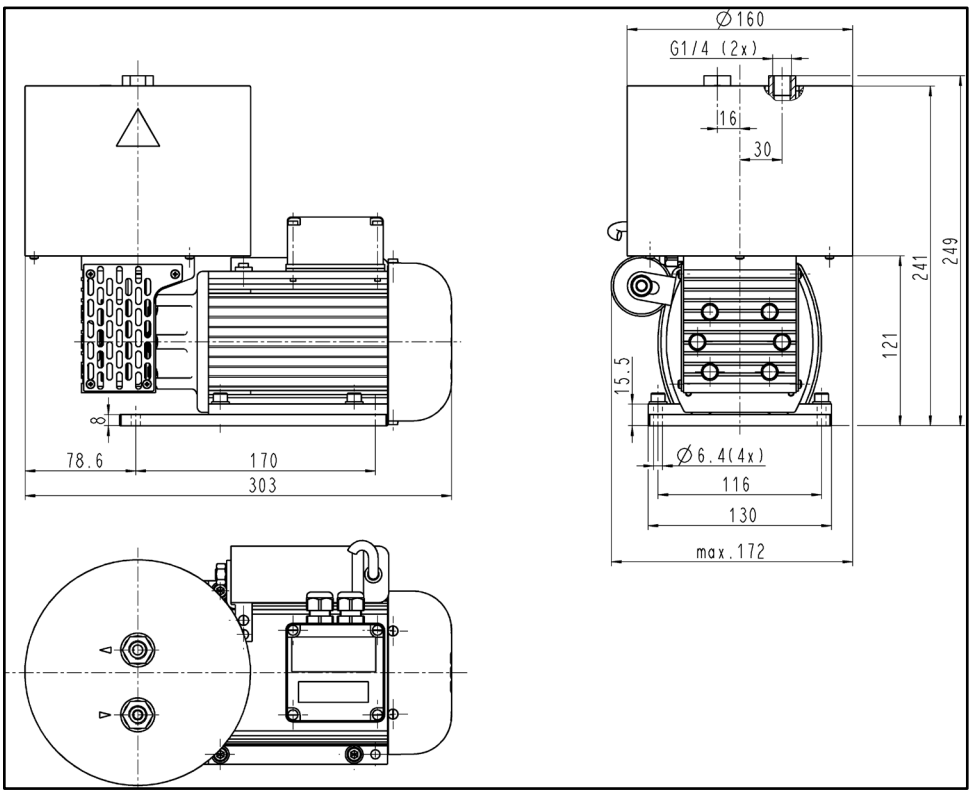


Fig. 8: Mounting dimensions N 036_T.16 E
(Dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)

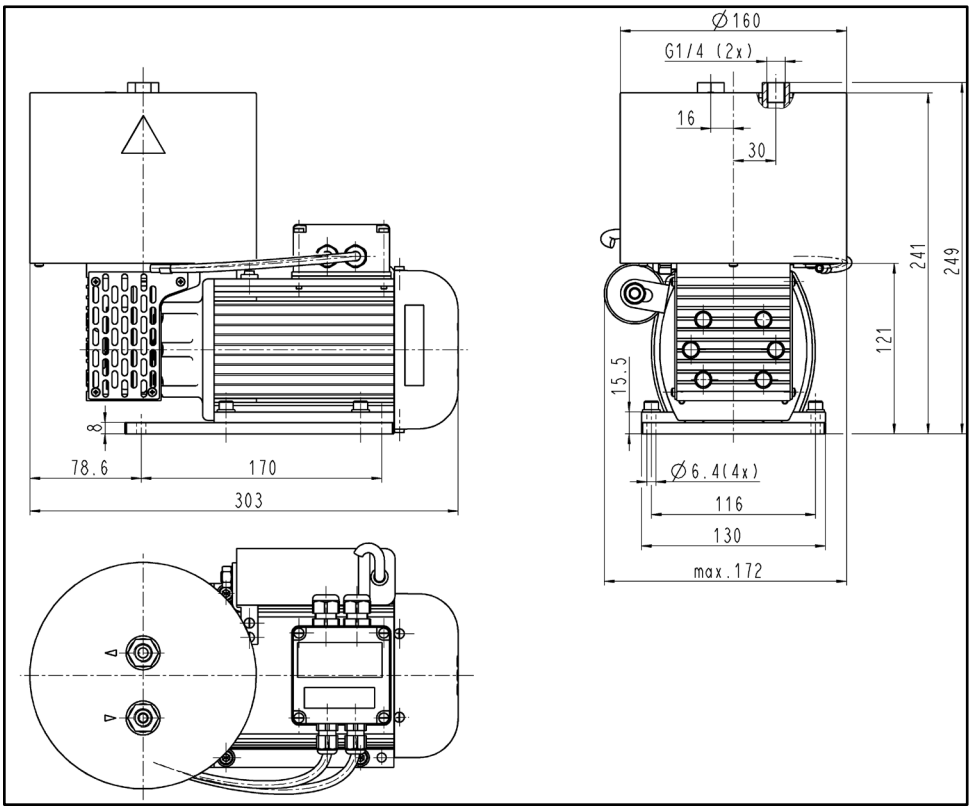


Fig. 9: Mounting dimensions N 036_T.11 E
(Dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)

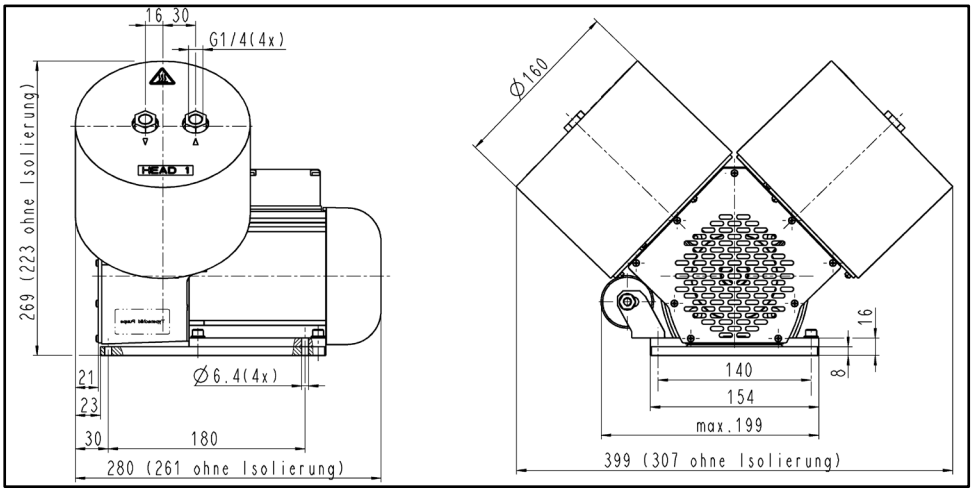


Fig. 10: Mounting dimensions N 036.0_T.16 E
(Dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)

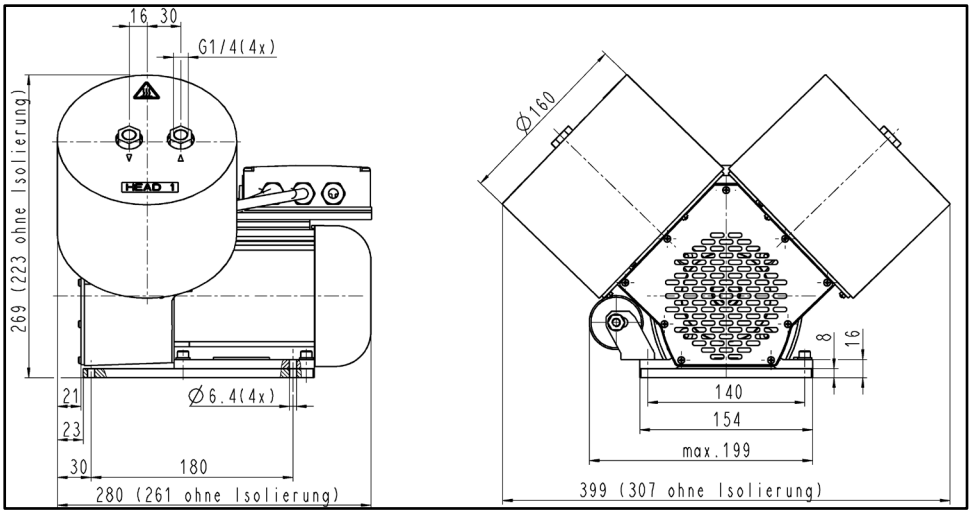


Fig. 11: Mounting dimensions N 036.0_T.11 E
(Dimensional tolerances conform to DIN ISO 2768-1, Tolerance Class V)

6.2. Electrical connection

DANGER

Extreme danger from electrical shock

➔ Only have the pump connected by an authorized specialist.

➔ Only have the pump connected when the power supply is disconnected.

➔ When connecting the device to a power source, the relevant standards, directives, regulations, and technical standards must be observed.

➔ In the electrical installation, arrangements (complying with EN 60335-1) must be made for disconnecting the pump motor from the electrical supply.

➔ KNF recommends that a fuse is installed in the motor supply circuit (overcurrent release).

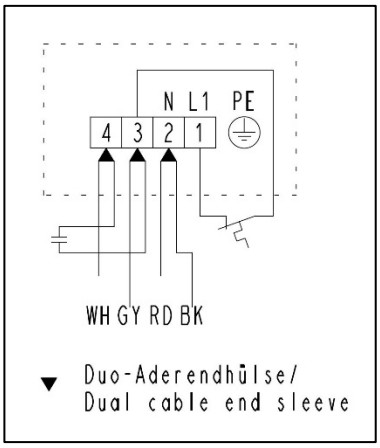


Fig. 12: Electrical Connection .16-designs

➔ For operating current see type plate or data sheet.

Connecting pump

a.) Electrical connection for the .16 designs (pumps with temperature-resistant heads):

1. For electrical data see motor type plate.

   The voltage must not vary by more than + 10% and – 10% from that shown on the type-plate.

2. Take off the terminal cover of motor (see Fig. 1, position 4), to do this, release the four screws.
3. Draw the mains cables into the electric supply through the free cable screw holes.
4. Connect the protective ground lead to the earth terminal.
5. Connect the mains cables to the connections L 1 and N of the luster terminal (see Fig. 12).
6. Place the terminal cover back in position and screw it tight; make sure the cover sealing is properly sited.

b.) Electrical connection for the .11 designs (pumps with heated heads; thermostatically regulated):

1. For electrical data see type plates (motor and heating).

   The voltage must not vary by more than + 10% and – 10% from that shown on the type plate.

2. Take off the terminal cover (see Fig. 2, position 4), to do this, release the four screws.
3. Draw the mains cables into the electric supply through the free cable screw holes.
4. Connect the protective ground lead to the earth terminal.
5. Connect the mains cables to the connections L 1 and N of the luster terminal (see Fig. 13 and Fig. 14).
6. Place the terminal cover back in position and screw it tight; make sure the cover sealing is properly sited.

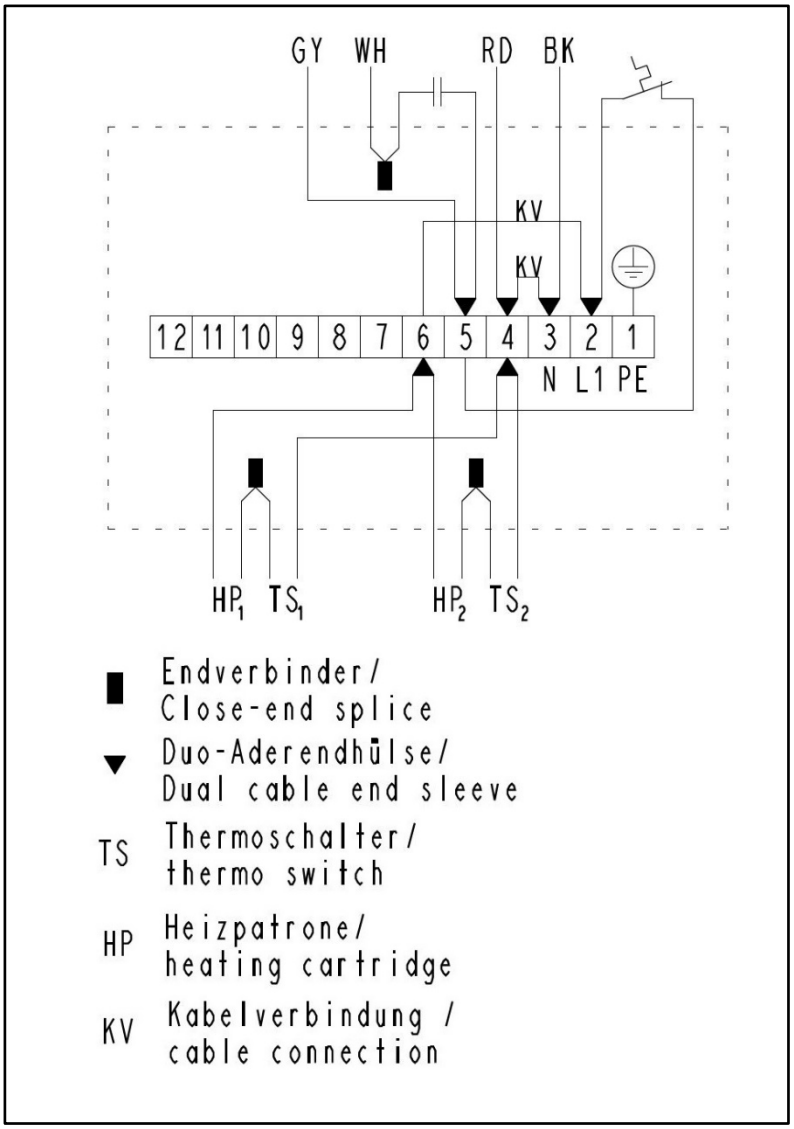


Fig. 13: Electrical connection of N 036.0_T.11 E

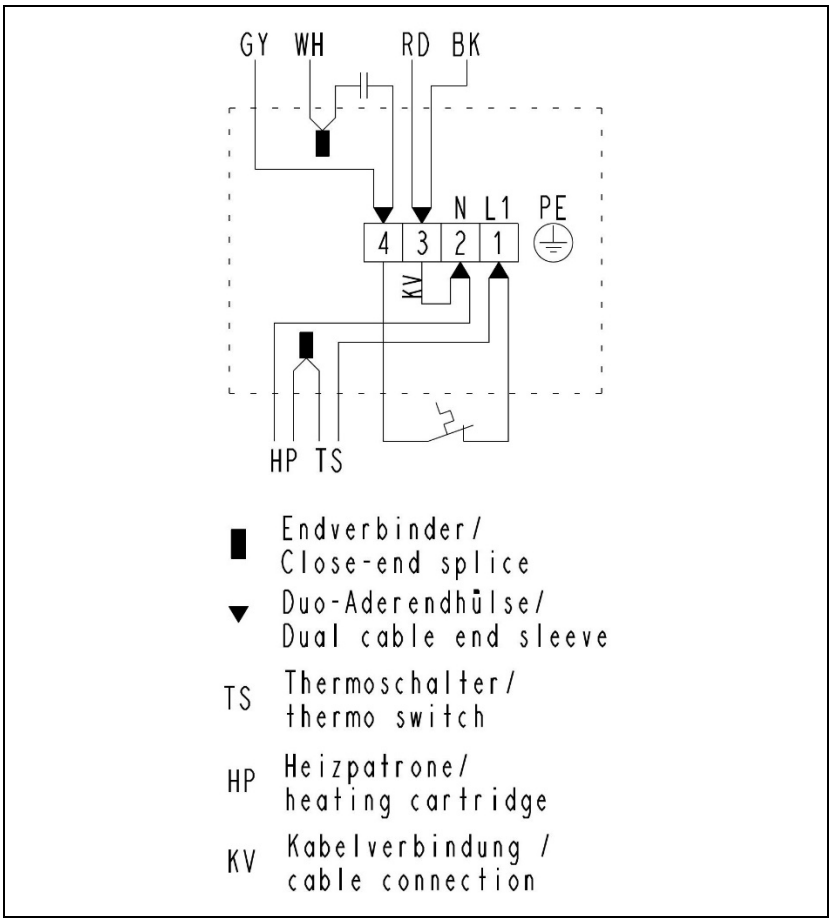


Fig. 14: Electrical connection of.11 E

6.3. Pneumatic connection

Connected components

➔ Only connect components to the pump which are designed for the pneumatic data of the pump (see chapter 4, Technical data).

Pump exhaust

➔ If the pump is used as a vacuum pump, safely discharge the pump exhaust at the pump's pneumatic outlet.

Connecting pump

ℹ A marking on the pump head shows the direction of flow.

1. Remove the protective plugs from the hose connection threads.
2. Connect the suction line and pressure line.
3. Lay the suction and pressure line at a downward angle to prevent condensate from running into the pump.

7. Operation

➔ Only operate the pumps under the operating parameters and conditions described in chapter 4, Technical data.

➔ Make sure the pumps are used properly (see chapter 2.1).

➔ Make sure the pumps are not used improperly (see chapter 2.2).

➔ Observe the safety precautions (see chapter 3).

➔ The pumps are intended for installation. Before putting them into service it must be established that machinery or equipment in which they are installed meets the relevant regulations.



WARNING

Hazard of the pump head bursting due to excessive pressure and temperature increase

➔ Do not exceed max. permissible operating pressure (see chapter 4, Technical data).

➔ Monitor pressure during operation.

➔ If the pressure exceeds the maximum permissible operating pressure, immediately switch off pump and eliminate fault (see chapter 9. Troubleshooting).

➔ Only throttle or regulate the air or gas quantity in the suction line to prevent the maximum permissible operating pressure from being exceeded.

➔ If the air or gas quantity in the pressure line is throttled or regulated, make sure that the maximum permissible operating pressure is not exceeded.

i Excessive pressure (with all of the related hazards) can be prevented by placing a bypass line with a pressure-relief valve between the pressure and suctions sides of the pump. For further information, contact our technical adviser (contact data: see www.knf.com)

i The pump may not start up against pressure or vacuum during switch-on. This also applies in operation following a brief power failure. If a pump starts against pressure, it may block. This activates the thermal switch, and the pump switches off.

➔ Make sure that normal atmospheric pressure is present in the lines during switch-on.

Pump standstill

➔ With the pump at a standstill, open pressure and suction lines to normal atmospheric pressure.

Thermo switch



WARNING

Automatic starting can cause personal injury and pump damage.

When the operation of the pump is interrupted by the thermal switch, the pump will restart automatically after cooling down.

➔ Take all necessary care to prevent this leading to a dangerous situation.



CAUTION

Danger of burning yourself when using hot media

➔ Do not touch the supply and return lines of the pumps, pump head or pump head insulation.

Vapors as media

➔ The service life of the diaphragm is prolonged if the formation of condensate is avoided. For this reason, work with saturated or nearly saturated vapors only if the pump is warm.

8. Servicing

8.1. Servicing schedule

Component	Servicing interval
Pump	- Regular inspection for external damage or leaks
Diaphragm and valve plates	- Replace at the latest, when pump output decreases

Tab. 12

8.2. Cleaning

8.2.1. Flushing pump

➔ KNF recommends: When transferring aggressive media, flush the pump under atmospheric conditions some minutes with air (or, if necessary for safety reasons, with an inert gas) prior to switch-off to increase the service life of the diaphragm.

8.2.2. Cleaning pump

➔ Only use solvents for cleaning if the head materials cannot be attacked (check the resistance of the material!)

➔ If compressed air is available, blow out the components.

8.3. Replacing diaphragm and valve plates

Conditions

- Motor disconnected from mains and de-energized
- Pump is clean and free of dangerous substances
- Tubes removed from pump's pneumatic inlet and outlet.



CAUTION

Danger of burning yourself when using hot media

➔ Let the pump head cool down before working on the pump.

Diaphragm and valve plates are the only parts of the pump subject to wear. They are simple to change.

Always change diaphragm, valve plates and sealing rings at the same time. If diaphragm and valve plates are not changed at the same time the nominal performance of the pump is not guaranteed after the service.



WARNING

Health hazard due to dangerous substances in the pump

Depending on the substances transferred, caustic burns or poisoning are possible.

➔ Wear protective clothing if necessary, e.g. protective gloves.

➔ Clean pump with suitable measures.

After opening the pump head, or replacing the diaphragm and valve plates the high gas-tightness is no longer guaranteed. A leak test is able to verify that the original standard of gas-tightness has been achieved.

Spare part

Spare parts*	Quantity
Valve plates	2 (per pump head)
Diaphragm	1 (per pump head)
O-Rings	2 (per pump head)

Tab. 13: Spare parts **According to Spare parts list, chapter 10*

Tools and materials

Type range	Tools/Material
	Phillips screwdriver No. 1
N 012	Fork wrench or socket wrench 7 mm
N 024	Fork wrench or socket wrench 8 mm
N 036, N 036.0	Fork wrench or socket wrench 10 mm
	Pin-wrench for two-hole nuts, pin diameter 4 mm (available as “wrench for retainer plate”, a KNF accessory see section 10)
	Screwdriver for slotted screw (only for .11 versions)
	Felt-tip pen
	Sharp knife

Tab. 14: Tools and material

Change the wave diaphragm and valve plates in the following sequence:

a.) Preparatory steps

b.) Removing pump head

c.) Changing diaphragm

d.) Changing valve plates and sealing rings

e.) Refitting pump head

f.) Final steps.

Proceed as follows (see Fig. 15).

For two-headed pumps: Perform and finish all work on one pump head before working on the second pump head.

1 Carrier
2 Diaphragm
3 Intermediate plate
4 Head plate
5 Disk spring
6 Cap nut
7 Retainer plate
8 Diaphragm support
9 Con-rod extension
10 O-ring
11 Valve plate

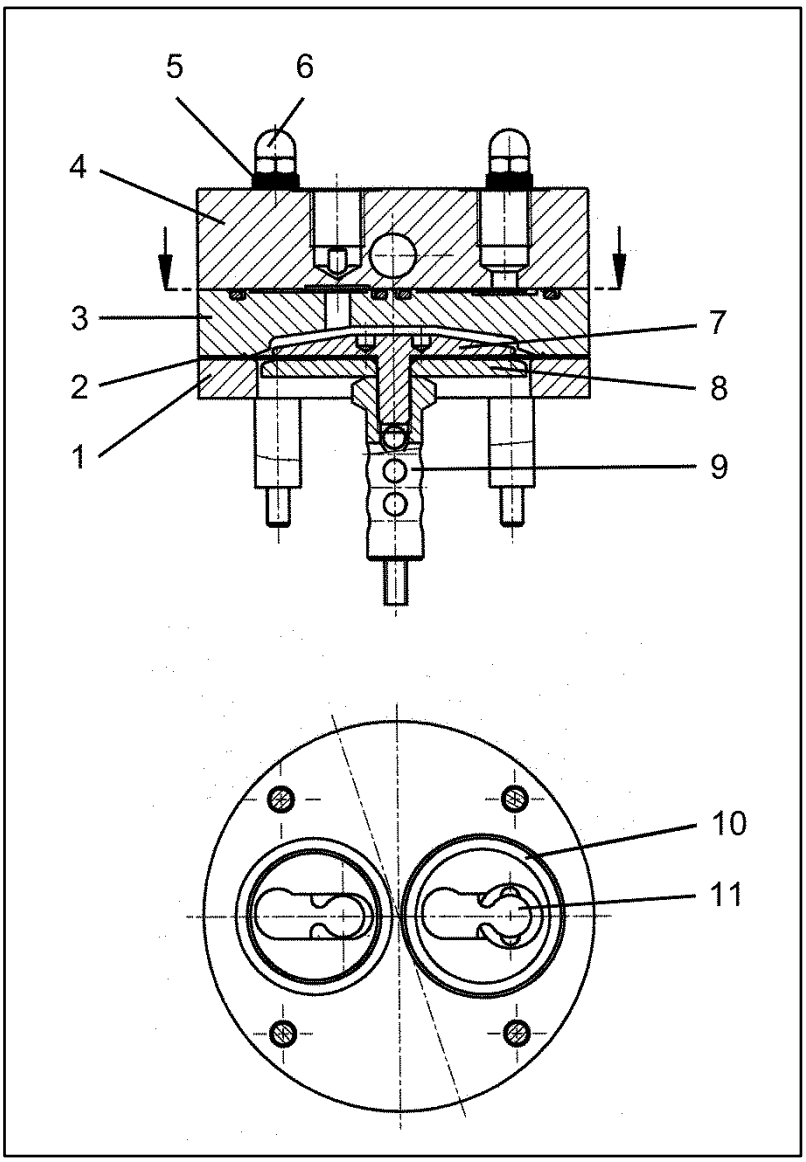


Fig. 15: Pump head (symbolic)

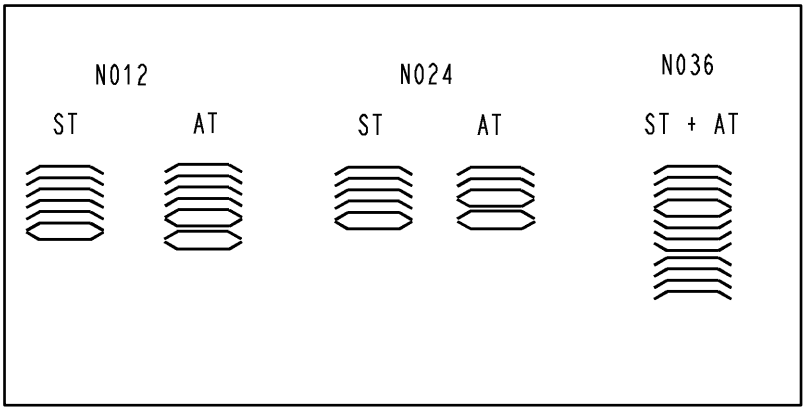


Fig. 16: Arrangement of the disk spring for material version of pump head

a.) Preparatory step

1. Release the screws on the underside of the head insulation (see fig. Fig. 1 to Fig. 2) and lift the head insulation out upwards.
2. For .11 designs only (pumps with thermostatically-regulated head heating): Remote the strain relief from the underside of the head insulation or from the compressor housing (N 036.0).

b.) Removing pump head

For pumps with heating inset (.11 designs): The heating inset remains fitted in the head plate.

1. Mark the position of carrier (**1**), intermediate plate (**3**), and head plate (**4**) relative to each other by a drawing line with a felt-tip marker. This is to ensure that the parts will be reassembled in correct position at a later stage.
2. Release the cap nuts (**6**) and remove them together with the disk springs (**5**).

i The disk springs are fitted in order to maintain the tension of the diaphragm right across the temperature range of the pump.

3. Remove head plate (**4**).
4. Remove intermediate plate (**3**).
5. Remove the valve plates (**5**) and O-rings (**10**) from intermediate plate (**3**).

c.) Changing diaphragm

1. Cut around the circumference of the diaphragm (**2**) (cut retainer plate (**7**) free - to facilitate loosening).
2. Release the retainer plate (**7**) by turning it counter-clockwise with a pin wrench or a retaining plate wrench. To counterhold, insert open-ended wrench above the upper insulating plate and onto the connecting rod extensions (**9**).

i Take care to ensure that the spacers do not slip under the diaphragm support (**8**).

3. Remove diaphragm (**2**).
4. Check that all parts are free from dirt and clean them if necessary (see section 8.2. Cleaning).
5. Slide a new diaphragm (**2**) onto the threaded bolt of the retainer plate (**7**).
6. Screw the retainer plate (**7**) with diaphragm (**2**) into the conrod extension (**9**); to tighten the retainer plate, use the wrench for retainer plate/the pin wrench to turn it clockwise and firmly.

   Tightening torque:

   N 012: 7 Nm

   N 024: 8 Nm

N 036, N 036.0: 13 Nm

d.) Changing valve plates and sealing rings

1. Check that intermediate plate and head plate are clean. If damages, distortion, or corrosion are evident on these parts they should be replaced.
2. Place the intermediate plate (**3**) on the carrier (**1**) in the position indicated by the felt tip pen mark.
3. Lay the new valve plates (**11**) onto the valve seats of the intermediate plate (**3**).

The valve plates are identical for the pressure and suction side; the position of the valve plates is determined by the shape of the valve seats

4. Fit the new O-rings (**10**) in the intermediate plate (**3**).

e.) Refitting pump head

1. Place the head plate (**4**) on the intermediate plate (**3**) in the position indicated by the felt-tip pen marking.
2. Place dis springs (**5**).
   For position see Fig. 16.
3. Place the cap nuts (**6**) in position, and tighten to the torque value shown below.
   N 012: 2 Nm
   N 024: 5 Nm
   N 036, N 036.0: 7 Nm

f.) Final steps

1. Refit head insulation.
2. .11 designs only (pumps with thermostatically-regulated head heating):

   Slide the protective tube into the bore of the base plate. Tighten the strain relief on the underside of the head insulation or on the compressor housing (N 036.0).
3. Reconnect the pump to the electricity supply.

If you have any questions about servicing call our technical adviser (see last page for contact telephone number).

9. Troubleshooting



DANGER

Extreme danger from electrical shock!

➔ Disconnect the pump power supply before working on the pump.

➔ Make sure the pump is de-energized and secure.

➔ Check the pump (see Tab. 15 to Tab. 17)

Pump does not transfer	
Cause	Fault remedy
Thermo switch has operated following to over-heating.	➔ Disconnect pump from mains. ➔ Allow pump to cool. ➔ Trace cause of over-heating and eliminate it.
Connections or lines blocked.	➔ Check connections and lines. ➔ Remove blockage.
External valve is closed or filter is clogged.	➔ Check external valves and filters.
Condensate has collected in pump head.	➔ Detach the condensate source from the pump. ➔ Flush the pump under atmospheric conditions some minutes with air (if necessary for safety reasons: with an inert gas).
Diaphragm or valve plates are worn	➔ Replace diaphragm, valve plates and O-rings (see chapter 8.3).

Tab. 15

Flow rate, pressure or vacuum too low The pump does not achieve the output specified in the Technical data or the data sheet.	
Cause	Fault remedy
Condensate has collected in pump head.	➔ Detach the condensate source from the pump. ➔ Flush the pump under atmospheric conditions some minutes with air (if necessary for safety reasons: with an inert gas).
There is gauge pressure on pressure side and at the same time vacuum or a pressure above atmospheric pressure on suction side.	➔ Change the pressure conditions.
Pneumatic lines or connection parts have an insufficient cross chapter.	➔ Disconnect pump from system to determine output values. ➔ Eliminate throttling (e.g. valve) if necessary. ➔ Use lines or connection parts with larger cross chapter if necessary.
Leaks occur on connections, lines or pump head.	➔ Eliminate leaks.
Connections or lines completely or partially jammed.	➔ Check connections and lines. ➔ Remove the jamming parts and particles.
Head parts are soiled.	➔ Clean head components.
Diaphragm or valve plates are worn.	➔ Replace diaphragm, valve plates and O-rings (see chapter 8.3).

Tab. 16

Pump head is not heating up*	
Cause	Fault remedy
Cable connection in terminal box (.11 designs) has no contact.	➔ Attach cable (see Fig. 7).
No voltage in the power source.	➔ Check power source.
Thermo switch defective.	➔ Replace thermo switch**

Tab. 17 ** only .11 designs*

***Please contact KNF costumer service if you have questions.*

Fault cannot be rectified

If you are unable to determine any of the specified causes, send the pump to KNF Customer Service (contact data: see www.knf.com).

1. Flush the pump to free the pump head of dangerous or aggressive gases (see chapter 8.2.1).
2. Remove the pump.
3. Clean the pump (see chapter 8.2.2).
4. Send the pump, together with completed Health and Safety Clearance and Decontamination Form, to KNF stating the nature of the transferred medium.

10. Spare parts and accessories

10.1. Spare parts

N 012 _T.__ E

Spare part	Order No.
Valve plate	049733
Diaphragm	049734
O-ring	055675
Disk spring	056019
Fuse temperature control	023901

Tab. 18

N 024 _T.__ E

Spare part	Order No.
Valve plate	049733
Diaphragm	051337
O-ring	055675
Disk spring	056020
Fuse temperature control	023901

Tab. 19

N 036 _T.__ E

N 036.0 _T.__ E

Spare part	Order No.
Valve plate	054112
Diaphragm	054111
O-ring	055676
Disk spring	056021
Fuse temperature control	023901

Tab. 20

10.2. Accessory

Accessory	Order No.
Wrench for retainer plate	018812

Tab. 21

11. Returns

Prerequisite for repairing a pump by KNF is a completed Decontamination Form.

This is made available on the KNF website as a download. To find the form, select your country on the overview page (www.knf.com). You can find the Decontamination Form in the download area.

If you have questions, please contact your sales partner (contact data: see www.knf.com).

KNF worldwide
Find your local KNF partner on www.knf.com