Operating manual (Translation)

Vacuum valve (weight loaded)

12504/12818

1 Foreword

These instructions contain instructions, notes and advice worth knowing, which are necessary for the installation and/or operation.

Read the instructions to ensure trouble-free operation.

The technical data, descriptions and design specifications correspond to the state at the time of printing. Intermediate design changes are possible in the interest of continuous further development.

Pictures and drawings shown are only complete to the extent that they are required for understanding.

The instructions serve to inform the operating personnel, the operator and, if applicable, trained qualified personnel. The instructions are part of the system delivery. Removing chapters from these instructions is prohibited. Missing instructions or missing pages thereof must be replaced immediately.

Any person who is instructed to set up, commission, operate, maintain and repair the system is required to read these instructions, specifically the safety notes, and have an understanding of its content and language.

If necessary, internal instructions under consideration of the technical qualification of the respective personnel must be provided.

To prevent operating errors and ensure the correct performance of necessary testing measures, the instructions must be accessible to operating personnel at all times.

Handtmann Armaturenfabrik GmbH & Co. KG is not liable for damages and malfunctions resulting from non-compliance with these instructions.

2 General

2.1 Manufacturer

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2.2 Proper application

Vacuum valves are used in the food, beverage, pharmaceutical and chemical industries. They are suitable for the protection of tanks and other closed systems against negative pressure.

2.3 Improper application

Unintended use applies if:

- operating conditions or uses other than those intended for the component/assembly/system apply,
- media other than those intended for the component/assembly/system are fed through them,
- unqualified personnel carries out the installation, operation and maintenance,
- unauthorized changes or modifications made on the component/assembly/system,
- Notes in the instructions are not observed.

Any improper use will void any warranties and statutory liability claims.

2.4 Duties of operator

The operator must ensure in particular that

- the component/assembly/plant is operated in accordance with its intended purpose and in correct functional condition.
- the legal requirements for operation and maintenance are observed.
- only sufficiently qualified authorised personnel performs maintenance on the component/assembly/plant.
- the personnel responsible for operation and maintenance is familiar with and observes the operating and assembly instructions and particularly the safety instructions contained in them.
- the attached safety and warning signs are not removed and remain legible.

3 Safety Information

3.1 Symbols

DANGER

Danger - endangerment caused by product-specific and process-specific conditions!

This symbol identifies an extremely dangerous situation that may result in severe bodily injury or even death if the relevant safety instructions are disregarded.

WARNING

Warning – general dangers!

This symbol identifies dangerous situations that may result in light to severe bodily injury if the relevant safety instructions are disregarded.

CAUTION

Caution – damage to components!

This symbol points out that special care must be taken during installation, operation or maintenance.

NOTICE

Note

This symbol refers to issues requiring special attention.

NOTICE

Note

This symbol identifies an environmentally friendly procedure or disposal method.

3.2 Hazards and Safety Instructions

Notice and Safety

The following safety advice is an addition to existing national regulations and laws for accident prevention. Existing regulations and laws for accident prevention always have to be adhered to. Pay attention to the specific regulations and laws in your country.

The safety advice does not take into account:

- Coincidences and events that may occur during assembly, operation and maintenance.
- Local safety regulations in responsibility of the operator.

Basic safety advice

Requirements for a proper function of the valve/component:

- Proper transportation and storage
- Installation and setting into operation by authorized staff
- Operation according to these operating instructions – proper application
- Proper and regular maintenance

WARNING

Warning – general dangers!

To avoid danger for health and life the following safety instructions strictly have to be obeyed.

- Assembly and setting into operation only by qualified staff.
- Instruction and supervision by the operator.
- Keeping of technical and electrical data as specified in the operating instructions.
- Guarantee the electric safety of external devices.
- Keep legal regulations.

Non-observance may lead to the following dangers:

- Malfunction of the valve/component respectively of the plant.
- Danger for persons due to electrical, mechanical and chemical affects.
- Danger for the environment due to possible leakage of dangerous media.

Endangerment of operating personnel	
Explanations	**Measures**
The component/assembly weights several kilograms. During transport, installation or repair work, crushing injuries may occur.	• Protect the elements for installation, disassembly and maintenance work from sliding and falling. • Wear required personal protective equipment in compliance with national regulations, such as protective gloves, safety shoes and, if necessary, safety helmet.
Danger at the connection points due to fluid, vapor or gas pressure.	• Depressurize and/or drain the line system for installation and maintenance work. • The line section must be disconnected from the remaining line system.
No tasks are required on the component/assembly/system in normal operation. Personnel who are accidentally present can be hit by emerging, pressurized, hot fluid or vapor if the process elements start to leak.	• Inspect the floor under the component/assembly for unusual wetness and, if applicable, report same immediately to the appropriate department to correct the leaks. • Wear safety clothing in the area of the component/assembly.
If the system is operated at a higher fluid temperature, the surface temperature of the component/assembly/system can reach this value as well.	• Attach warning signs for hot surfaces. • Flush the line system with cold water before performing maintenance work. • Wear personal protective equipment when working on the assembly (cut-resistant, heat-resistant hand protection and foot protection).
The surfaces of the component/assembly/system can be blinding or throw unfavorable shadows with the corresponding incidence of light.	• Ensure proper lighting • recommended illuminance as defined in DIN EN 12464-1 of min. 500 lux.
In case of leakage in the component / assembly / system, CO_2 can escape and lead to suffocation of persons.	• The operator must take appropriate protective measures, such as CO_2 sensors or a ventilation system.
In case of leakage in the valve, hot medium (up to 140°C) can flow out and scald personnel.	• The component/assembly/system must be subjected to a regular visual inspection for leaks.
General hazards during installation, maintenance and cleaning of the component/assembly/system	• Install proper protections before working on the component/assembly/system ✓ Switch off the sections with the controls ✓ Activation of isolation equipment ✓ Close infeeds ✓ Switch off the system ✓ Attach/set up warning signs

Endangerment of operating personnel	
Explanations	**Measures**
Flame cutting and welding work can cause hazards such as • Fire, • Cutting injuries and • Burns.	• Before starting welding work, a temporary permit must be obtained for working with open fire/welding. • Welding work must exclusively be performed by qualified personnel with the corresponding protective equipment. • All flammable parts must be removed from the area before welding work. • Flammable parts that cannot be removed must be covered. • Fire-extinguishing agents, such as powder extinguishers (see Fire Class) must be kept ready. • Organize fire guards who repeatedly check the work location for pockets of fire for 24 hours after completion of the work. • Wear heat-resistant protective gloves, suitable work clothing and safety goggles.
Cleaning agent may emerge from the leakage drain during CIP cleaning. There is a danger of slipping and cleaning agent may get into the eyes.	• Wear appropriate safety goggles in CIP operation. • If the CIP cleaning is activated, keep the hazardous area surrounding the leakage drain open and dry.
For versions with swing bends (if installed): When changing the swing bend, the butterfly valve area of the pneumatic butterfly valve becomes freely accessible. A malfunction or pressure drop can cause unintended opening or closing of the butterfly valve. This results in a danger of crushing for fingers and hands.	• Prior to maintenance work on a butterfly valve, disconnect it from the air supply. • Wear protective gloves • Attach warning signs for risk of crushing
Functional failure due to incorrect handling	
The switching operation of the valves is impaired or jerky.	• Remove residue or loosened small parts from the area of the valve seat • Follow the operating instructions of the respective components
Installing or changing faulty or unspecified parts can disable or significantly impair the function.	• Use only parts approved by the manufacturer

4 Notes

4.1 Notes on transport

DANGER

Danger - Danger of injury to persons!

There is a risk of accident during transport due to the high weight.

– Do not walk or stand under suspended loads.
– When unloading the assembly, always use inspected and approved lifting gear (e.g., forklift truck, pallet truck, crane) and suitable aids with a sufficient load carrying capacity.
– Shackles, e.g., in accordance with DIN 82101
– Lashing chains, e.g., in accordance with DIN 5687 quality class 8
– Transport must be performed only by instructed personnel.

CAUTION

Warning - General dangers

The danger areas must be cordoned off during transport and assembly (barrier tape).

ATTENTION

Note

Observe the information signs for transport.

Fig. 1: Transport signs

4.2 Instructions for Delivery and Performance

- Check the delivery note data for factual correctness.
- Check the delivery for completeness. Later complaints will not be accepted.
- Perform visual inspection of the packaging system for external transport damage.

These must be reported to the forwarder immediately. Claims due to transport damage not visible right away must be made within a week.

4.3 Storage Instructions

- The goods should remain in the delivered packaging systems until assembly.
- The goods must be stored in dry, closed rooms. Exposure to UV radiation and direct sunlight must be avoided. The maximum moisture must not exceed 60 %; the maximum storage temperature must not exceed 40 °C.
- It is vital to read the manual after unpacking the goods and before assembly.

5 Technical Description

5.1 Technical Data

Product range

Materials	stainless steel 1.4404
Gaskets	EPDM, FDA proof
Surface	0.8 - 1.2 µm

Other parts

Materials	stainless steel 1.4307
Surface	precision turned

Production

Fluids (nontoxic)	Fluids/gases/steam (Group II, PED 2014/68/EU)
Set pressure	Vacuum 3 – 4 mbar
Counter pressure	depressurized tank, max. 0.2 bar
Control air	5 - 8 bar, ∅ 6/4
Stroke	3 - 4 mm
Temperature	0 - 95 °C, temporary 140 °C

5.2 Identification of components

All vacuum valves (VV) must be provided with permanent identification of the component.

– Standard vacuum valves are provided with a setting value (4 mbar)
(opening pressure range 3-5 mbar)

– Special vacuum valves (with special weight) are provided with a customer-specific setting value.
They also include the identifying letter “S” before the manufacturing №.

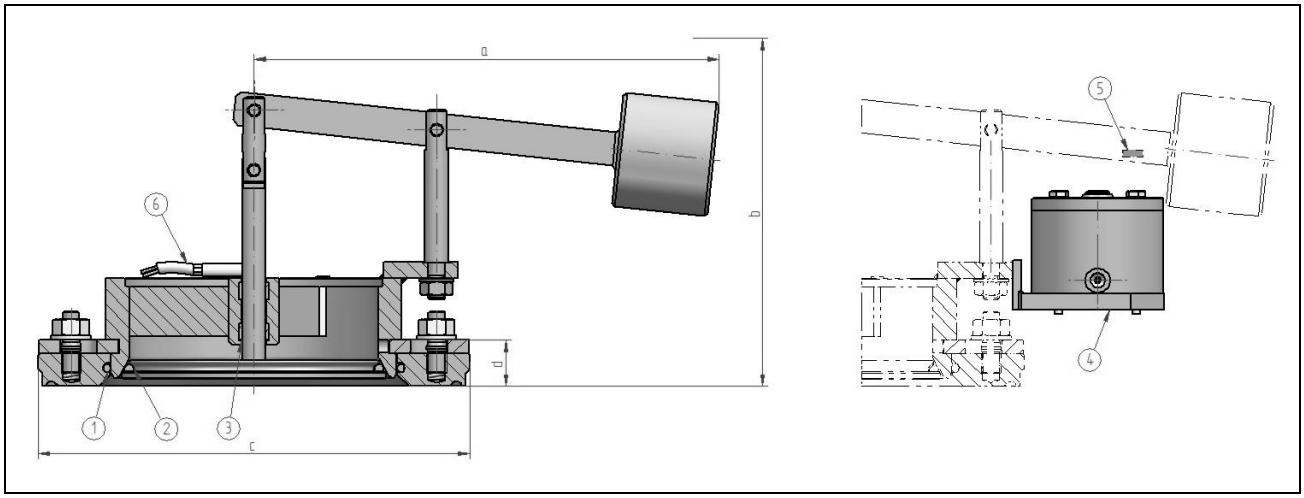
Explanation of the identification:

Numerical code	**AH** **AH**	**VV** **VV**	**xxxxx** **xxxxx**	**xxx** **xxx**	**yyy** **yyy**	**xx / xxxxx** **xx / S xxxxx**
Allocation	1	2	3	4	5	6

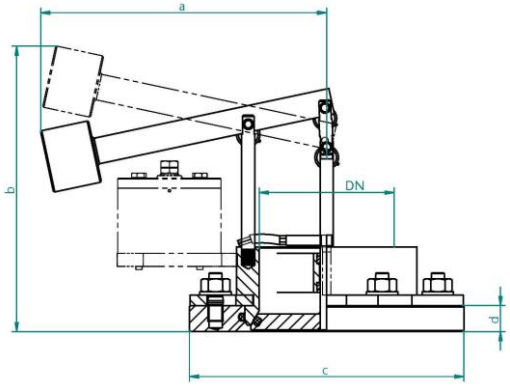
1 Manufacturer
2 Vacuum valve
3 Valve type
4 Nominal width / DN [mm]
5 Set negative pressure p [mbar]
6 Year of manufacture with manufacturing № or “S“ with manufacturing №

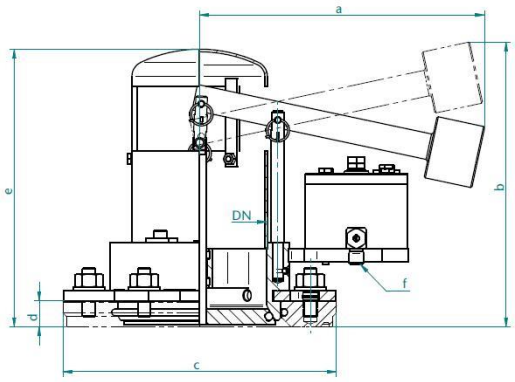
5.3 Valve types

Valve types and dimensions



1	Flange O-ring	2	Guide band	3	Position indicator
4	Seat O-ring	5	Lifting cylinder	6	Heating catridge

12504	DN	a [mm]	b [mm]	c [mm]	d [mm]
	100	218	220	210	20
	150	280	225	260	20
	200	370	270	310	20
	300	445	295	430	20
	400	540	340	540	23

12818 (VV 12504 with splash guard)	DN	a [mm]	b [mm]	c [mm]	d [mm]
	100	220	220	210	20
	150	280	265	260	20
	200	370	280	310	20
	300	445	297	430	20
	400	540	344	540	23

6 Installation, Operation, Maintenance

Important information!

- Valve/component suitable for vertical installation.
- Valves with standard weight open at a negative pressure of 3-5 mbar.
  Pressure compensation to ambient pressure by air draw in.
  The valve will be closed by the counter pressure of the weight.
- Valves with pneumatic lifting open only at a limited counter pressure, i.e. tank inside pressure. This pressure may not exceed 0.2 bar.
  This may cause a malfunction of the valve.
- During the CIP process the pneumatic lifting should be activated only if the tank is depressurized. Otherwise, there will be explosion-like pressure compensation, due to the escaping medium. This mixture of gas and CIP liquid is splashed into the environment.
- The lifting itself can be performed according to the process requirements. The duration of lifting should be about 5-20 seconds and can take place during different cleaning steps. To prevent too strong splashing, the opening gap on the valve can be adjusted via the stroke on the pneumatic cylinder or lifting takes place during the startup phase of the pump with reduced power.
  Further information can be found in the INFO sheet - IB_CIP lifting VV-SV
- During assembly/disassembly please pay attention to the operating instructions respectively to the type plate or type marking.

DANGER

Danger – General risk!

Lifting the valve during CIP and low tank inside pressure ($p < 0.2$ bar) causes splashing of penetrating CIP liquid.

An increasing tank inside pressure can be caused by thermal expansion of the CIP medium during circulation or by pre-stressing of the tank with CO_2/gas.

– Stop spraying of the tank before lifting the valve or de-pressurize the tank.
– Use fully closed splash guard.

6.1 Design Variants

Execution with heating device:

- The heating insets may only be connected according to attached scheme. Pay attention to the connecting voltage!
- Do not remove the heating inset from the flange during function test (heating capacity). It may get damaged by overheating.

Execution with external cleaning:

- The external surface of the valve cone is able to be cleaned by an optional mounted spray pipe. In this case it is necessary to lift the valve cone. Otherwise the CIP liquid is damming up within the cylindrically splash guard and runs off through the drainage drilling to the tank surface
  (cleaning time 10s, CIP pressure 2 bar).

Execution with lifting device:

- Pneumatic lifting cylinder for function test and for lifting the valve cone during CIP. The stroke of the lifting cylinder is factory preset.
  So the stroke of the valve cone is limited to about 3 mm.
  With too large stroke, the emerging splash amount increases.
- Suitable for treated compressed air, max. 6 bar.
- Throttle of air inlet has to be adjusted upon setting into operation.
- Compressed air supply: air hose Ø 6/4.

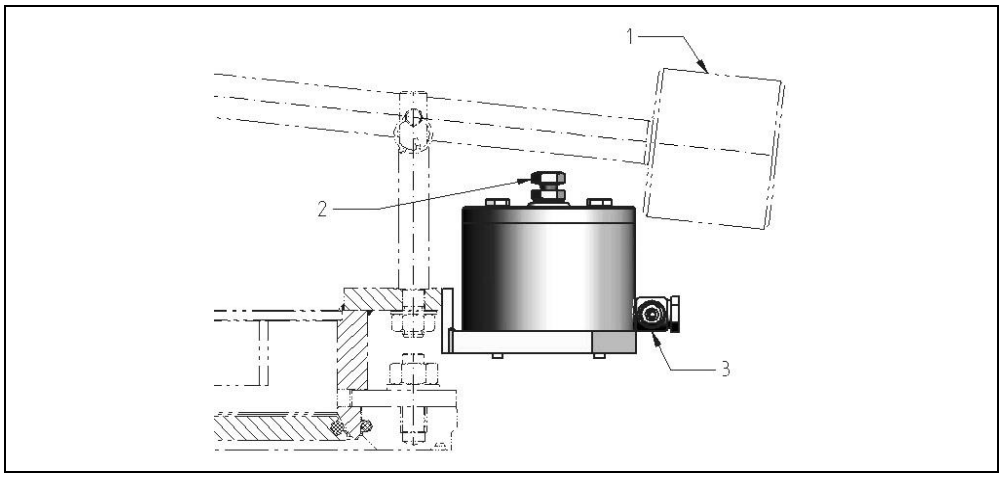


Fig. 2: Schematic representation with lifting device DN 100 – DN 200

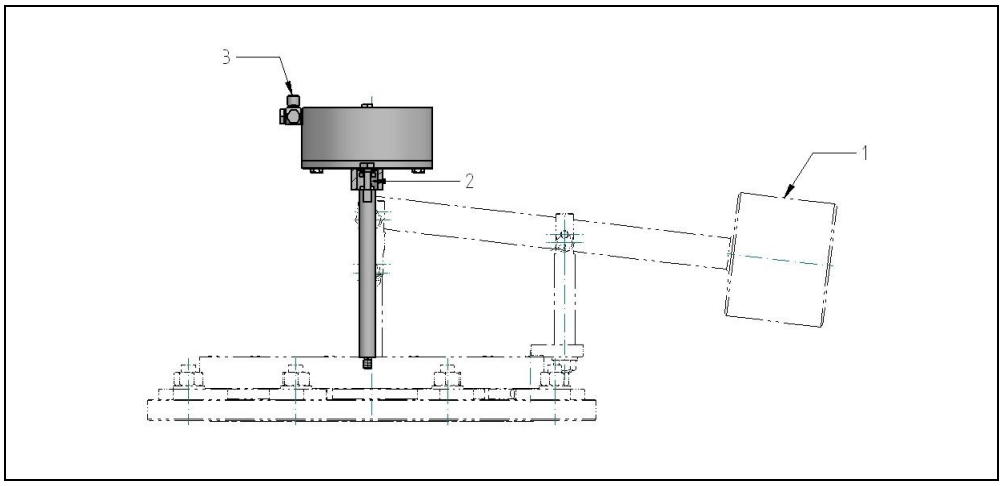


Fig. 3: Schematic representation with lifting device für DN 300 – DN 400

1 Counter weight
2 Lifting adjustment
3 Compressed air supply

Execution with splash guard - Type 12818

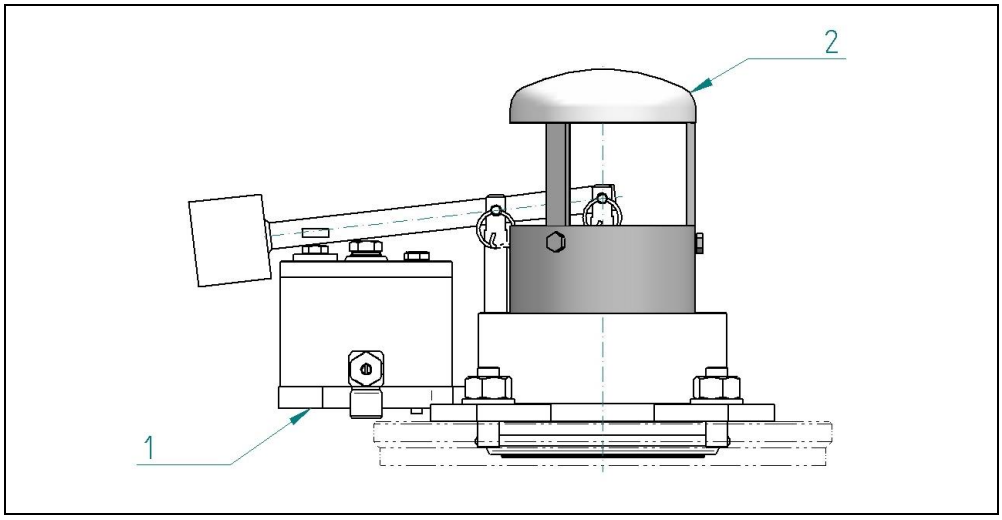


Fig. 4: Schematic representation DN 100 – 400

1 Vacuum valve
2 Splash guard

7 Operation

7.1 Operation

Type 12504 / 12818

Construction with stainless steel valve disk DN 100 – DN 400

- Keep the valve clean, clean regularly.
- Lift the valve cone from time to time.
- Exchange the O-ring (1) carefully.
- Avoid any damages at the valve seat.
- Protect vacuum valves from any force influence from outside. Any damage may affect the function.
- Admissible temperature: max. 125°C

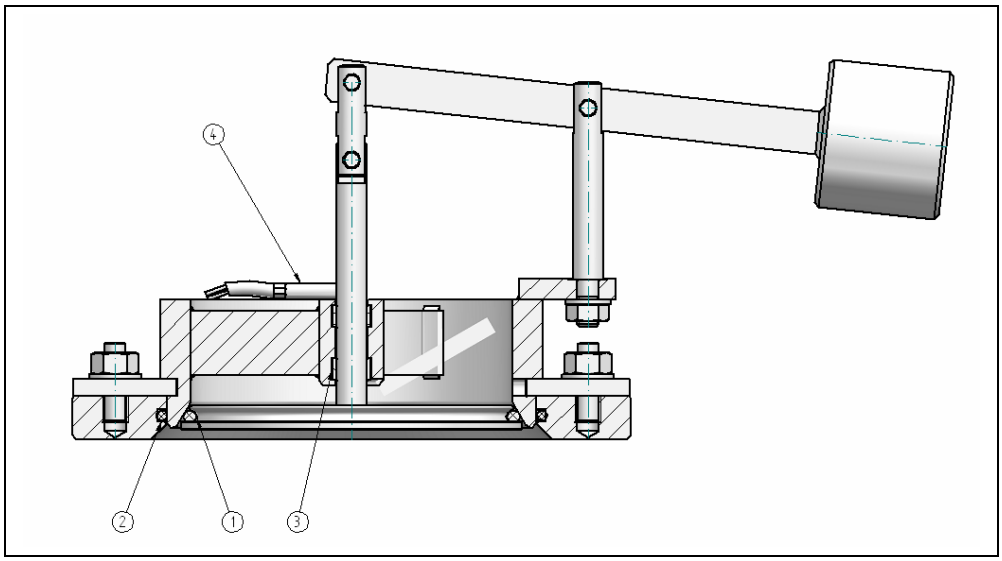


Fig. 5: with stainless steel valve cone

1 O-ring
2 O-ring (flange)
3 Guiding band
4 Heating inset

8 Maintenance

8.1 Maintenance

- Maintain the valve carefully, avoid any damages.
- Dismount the valve.
- Exchange the O-rings (1), (2) and the guiding band (3), do not distort.
  Clean the grooves and sealing area.

– The maintenance should be executed at regular intervals of min. every year. Depending on the operating conditions of the valves, these intervals may be shorter.
– During maintenance pay attention to the assembly and safety instructions.
– Any maintenance work may be carried out only in a depressurized system.

8.2 Seals

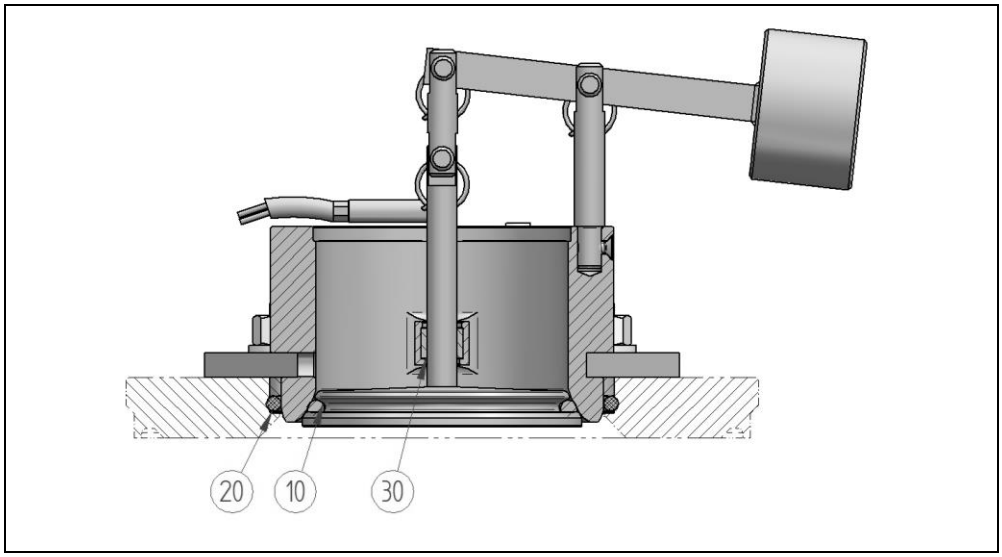


Fig. 6: Type 12504

10 O-ring
20 O-ring
30 Guiding band

8.3 Spare parts

DN	12504	12818
80	012504.00080LE	012504.00080LE
100	012504.00100LE	012504.00100LE
150	012504.00150LE	012504.00150LE
200	012504.00200LE	012504.00200LE
300	012504.00300LE	012504.00300LE
400	012504.00400LE	012504.00400LE

LE - EPDM

9 Additional Equipment

9.1 Heating insets

Heating insets							
DN	Connection-scheme №	Connection voltage Volt	Heating capacity Watt	Quantity	Rated power: Volt	Watt	Part №
400	11 125E33	24	184	8	24	23	105373
300	11 125E10	24	138	6	24	23	105373
200	11 125E30	24	92	4	24	23	105373
150	11 125E31	24	46	2	24	23	105373
100	11 125E31	24	46	2	24	23	105373

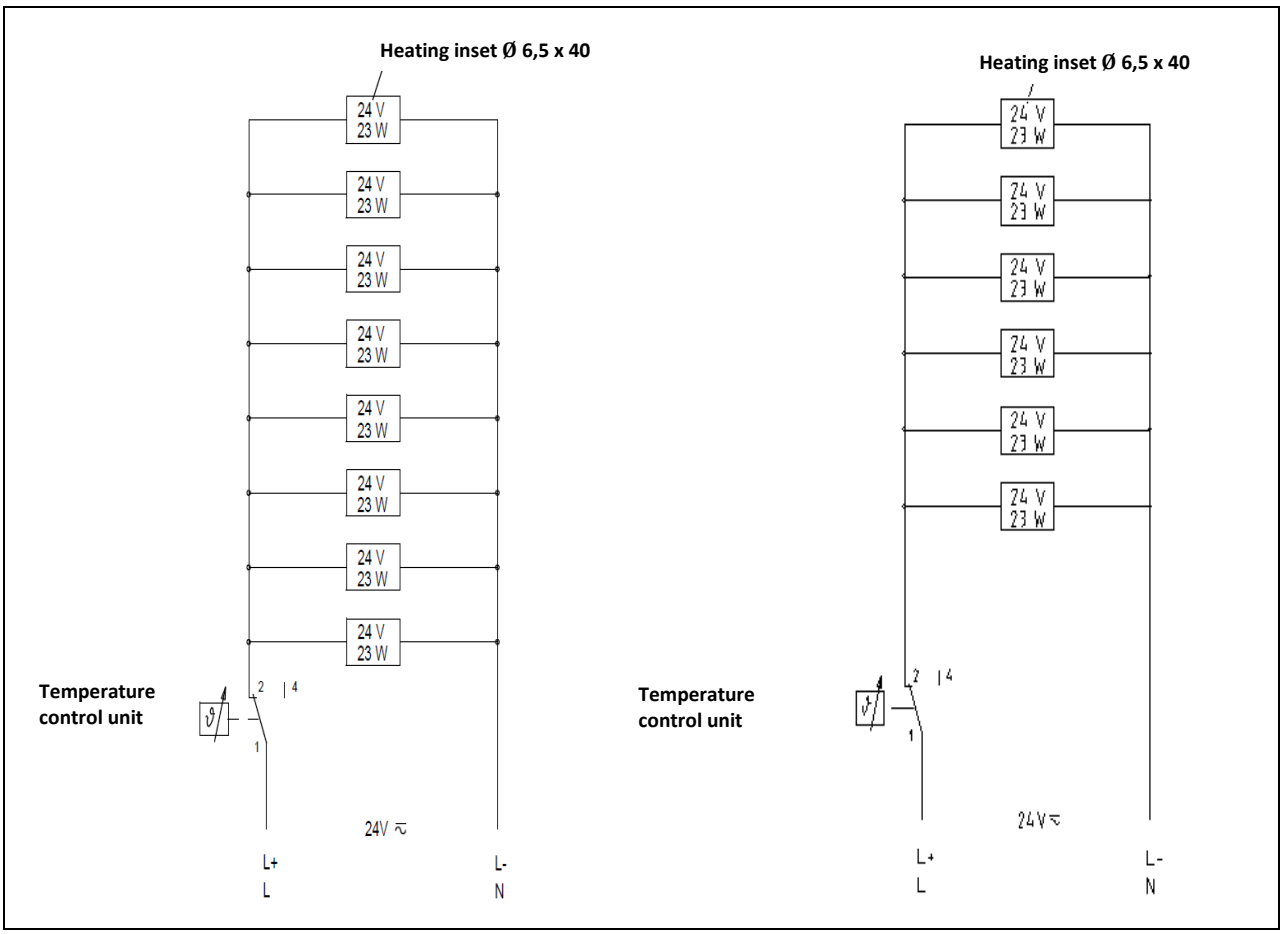


Fig. 7: E 33, DN 400 E 10, DN 300

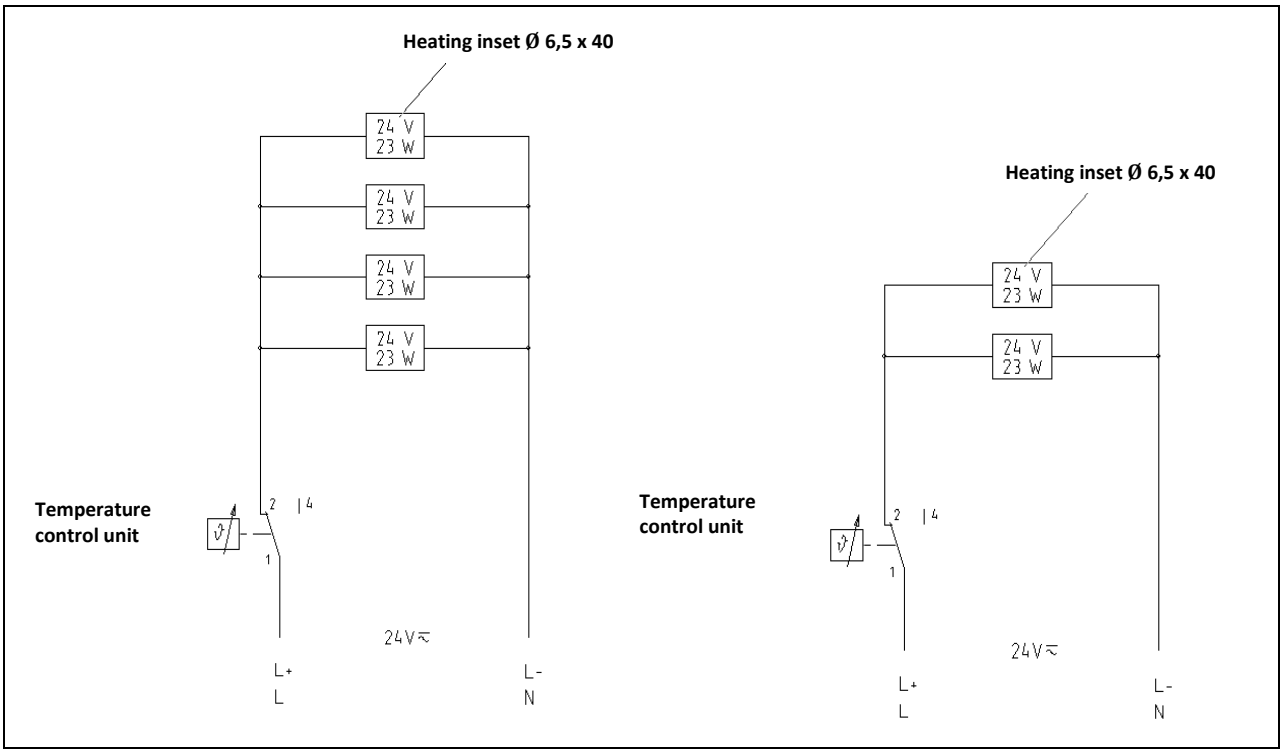


Fig. 8: E 30, DN 200

E 31, DN 80 - DN150

10 Disposal

ATTENTION

Note

Dispose of the component/assembly/system in an environmentally friendly manner according to country-specific specifications.

Find out how to dispose of the individual materials.

Dispose of all resulting parts in such a way that damage to health and the environment is excluded.

If necessary, ask your environmental officer.

10.1 Disposal of Packaging

ATTENTION

Note

Dispose of the packaging materials in an environmentally safe manner according to country-specific specifications.

Packaging can consist of the following materials:

Wood/polyethylene foil (PE foil)/paper and or cardboard/plastic/steel strips.