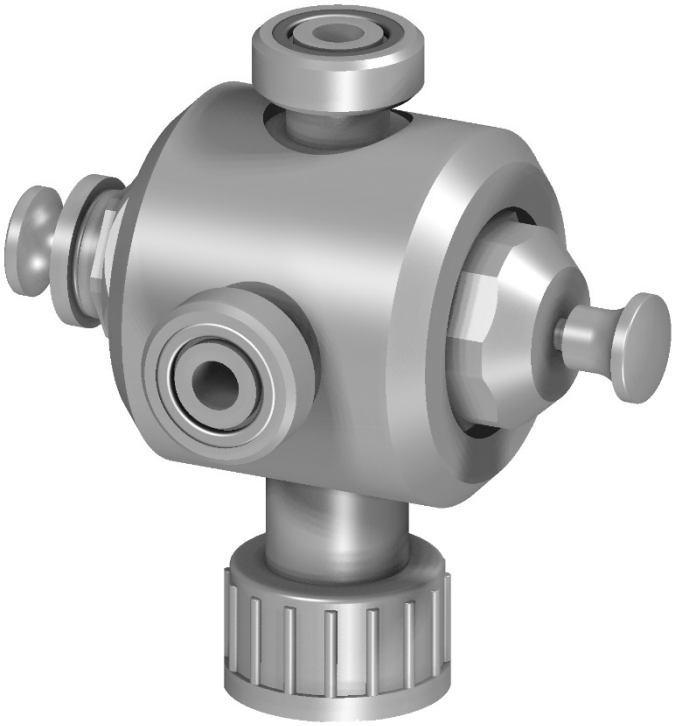
Product: **Multi-function valve**

Type: **MFV 050**



Please state here the exact type and serial number of your Multi-function valve. (can be read off the type plate on the Multi-function valve)
Type:
Serial No.:
These data are important in case of queries or for ordering spare and wearing parts and must absolutely be stated.

Manufacturer:

sera GmbH
sera-Straße 1
34376 Immenhausen
Germany
Tel. +49 5673 999-00
Fax. +49 5673 999-01
www.sera-web.com
info@sera-web.com

Translation of the original operating instructions!

Table of contents:

1 In General

The purpose of the multi-function valve is to make dosing processes safer and more efficient.
In addition, the multi-function valve prevents the contact with the medium by the relief of the pressure line prior to maintenance works and by the specific return of medium to the storage tank.

Before commissioning and while operating **sera** multi-function valve the regulations valid at the place of installation must be strictly observed.

Carefully read these instructions and especially the safety instructions contained herein before putting the **sera** multi-function valve into service.

2 Safety Instructions

2.1 Quality instructions

Observance of these operating instructions and, in particular, the safety instructions, helps to

- Avoid danger to staff, machines, and environment.
- Increase the reliability and service life of the multi-function valve and the entire installation.
- Reduce expenses for repairs and downtimes.

The **sera** quality management and quality assurance system for pumps, installations, fittings and compressors is certified according to DIN EN ISO 9001:2008.

CAUTION !

Always keep these operating instructions within reach at the workplace of the multi-function valve!

CAUTION !

Pay attention to the safety data sheet of the medium conveyed! Take appropriate accident prevention measures to avoid that operators are endangered by the used conveying media!

2.2 Marking of Instructions

Information signs that are directly attached at the multi-function valve, as for example arrows indicating the direction of flow, must be strictly obeserved und must be kept in a completely legible condition.
The same goes for the type plate of the valve.

The following data are to be taken from the type plate:

Type : exact type designation
Mat. : valve- / diaphragm- / sealing material
Pe : setting pressure (relief valve) [bar]
PN : max. permissible pressure [bar]
year : year of construction
Nr. : serial-No.

Example:

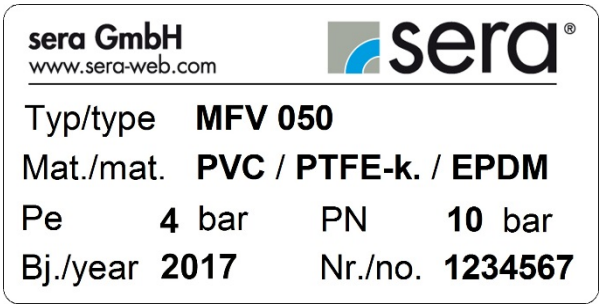


Fig. 01 Type plate MFV

2.3 Qualification and Training of Personnel

The personnel who operate, maintain, carry out inspections or install the pump must be suitably qualified for their tasks. The operator has to define clearly the responsibility and the supervision of the personnel. If the personnel do not have the knowledge required, then the operator has to carry out corresponding training and instructions. Such a training can be realized - if required - upon order of the operator of the valve by the manufacturer / supplier. The operator has to ensure furthermore that the personnel have understood the contents of the operating instructions completely.

2.4 Dangers in Case of Inobservance of the Safety Instructions

The inobservance of the safety instructions may result in personal injuries, hazards to the environment and damages to the valve.

The inobservance of the safety instructions may have the following consequences:

- Failure of important functions of the valve/unit
- Failure of prescribed methods for maintenance and upkeep
- Danger to persons by electrical, mechanical and chemical influences
- Danger to the environment due to leakage of hazardous media

2.5 Safety-Conscious Working

The safety instructions mentioned in these operating instructions, the national regulations for accident prevention as well as all internal working-, operating and safety instructions of the operator must be observed.

2.6 Safety Instructions for the Operator

Leakage of dangerous conveying media and materials must be drained off so that a risk to persons and the environment can be excluded. The legal regulations are to be adhered to.

2.7 Safety Instructions for Maintenance, Inspection and Installation

The operator has to ensure that all maintenance, inspection and installation tasks are carried out by authorized and sufficiently qualified personnel, who have carefully read and understood the operating instructions.

Only those spare parts are to be used that satisfy the requirements of the relevant operating conditions.

Only loosen screws and connections when the system is not under pressure.

2.8 Arbitrary Modification and Spare Parts Production

Modifications or changes of the multi-function valve are only allowed after previous agreement of the manufacturer. Original spare parts and accessories that are authorized by the manufacturer are essential for safety reasons. Use of other non-authorized parts or arbitrary modification may result in the loss of warranty claims towards the manufacturer/supplier for damages arising as a consequence thereof.

2.9 Proper Use

Use the **sera** multi-function valve only for the purpose indicated in the corresponding confirmation of order.

If the valve is to be used for other purposes, it is required to consult **sera** beforehand to settle whether the multi-function valve is suitable for the new usage!

The criteria for determining whether the multi-function valve is appropriately used are:

- Consider the characteristics of the medium conveyed (refer to the safety and product data sheet of the used medium – the safety data sheet is to be provided by the supplier / operator of the conveying medium).
- Stability of the materials which have contact with the medium conveyed
- Operating conditions at the place of installation
- Pressure and temperature of the conveying and cooling medium

2.10 Personal Protection for Service and Maintenance

The relevant national safety regulations applying to the usage of the medium conveyed have to be adhered to.

In case of accidents check whether the following substances are emitted:

- Leakage of fluids
- Escape of vapours

Emissions must be monitored by monitoring systems of the total installation.

CAUTION !

Use protective clothing, gloves, breathing mask and suitable goggles for face protection!

CAUTION !

Personal protective equipment must be provided by the equipment operator at all times!

3 Transportation and Intermediate Storage

3.1 General

Before shipment **sera** products are tested for proper functioning and quality.

3.2 Storage

An undamaged packaging protects the device during subsequent storage and should only be opened when the multi-function valve will be installed.

A proper storage will increase the service life of the multi-function valve.
Proper storage means avoidance of negative influences, such as heat, humidity, dust, chemicals etc.

The following storage conditions must be observed:

- Storage place: cool, dry, dust-free and slightly ventilated
- Storage temperature between –10°C and +45°C
- Relative humidity of air not more than 50%

Do not store solvents, fuels, lubricants, chemicals, acids, disinfectants and similar together with the product in the storage room.

4 Technical data

4.1 Dimensions

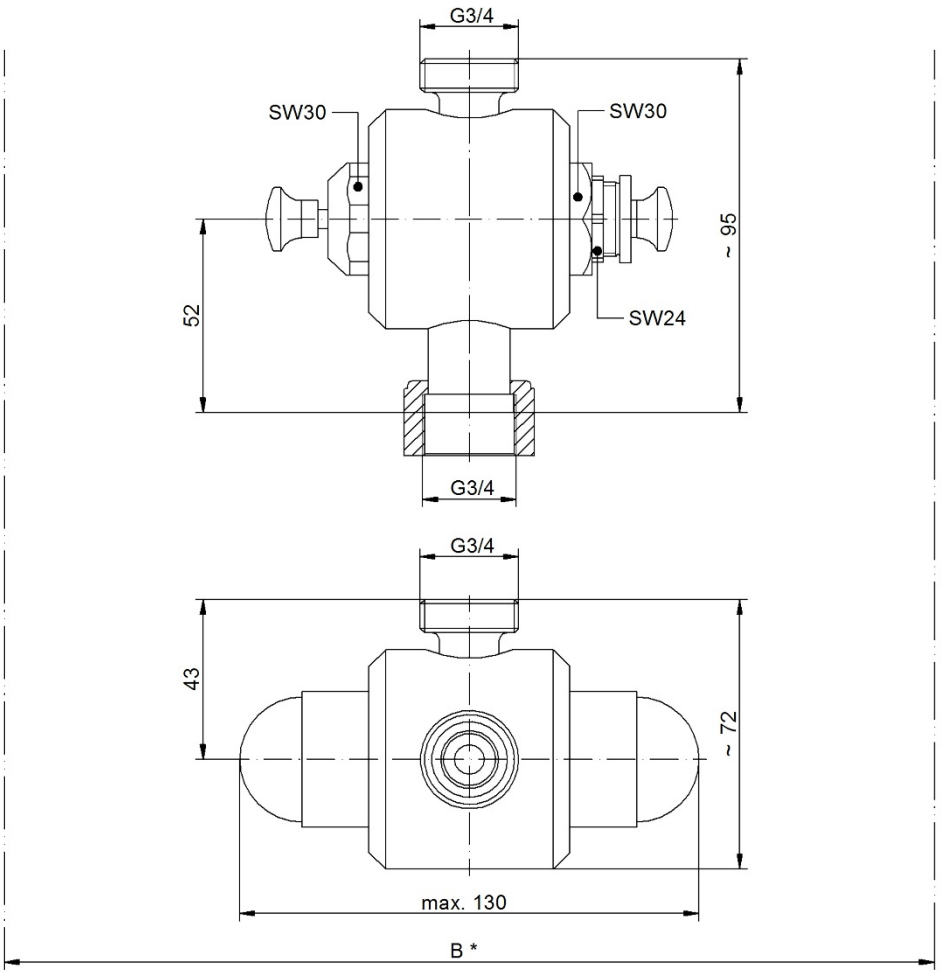


Fig. 02 Dimensions MFV

4.2 Performance data

Material			Setting pressure		Weight	Article-No.
Valve body	**Diaphragms**	**Valve seals**	**Relief valve**	**Pressure keeping valve**		
PVC	EPDM / PTFE - faced	EPDM	4 – 10 bar	1 - 1,5 bar	0,2 kg	37600973
		FPM				37600974
		FEP- covered				37600975
PP	EPDM / PTFE - faced	EPDM	4 – 10 bar	1 - 1,5 bar	0,2 kg	37600982
		FPM				37600983
		FEP- covered				37600984

Note:
The indicated opening pressures of the relief valve can vary around –1 to +1,5 bar to the nominal opening pressure due to different stroke frequencies and stroke volumes of the used dosing pumps!

Tab. 01 Performance data

5 Installation / Connections

5.1 Installation

The multii-function valve MFV is directly mounted onto the pressure valve of the dosing pump.

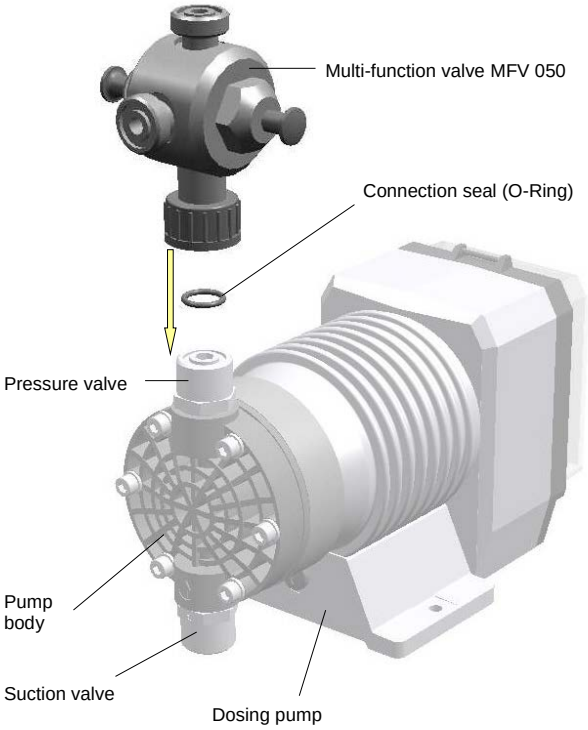


Fig. 03 Installation of MFV

Put the outlet of the exhaust line into the required position and tighten the union nut (hand-tight).

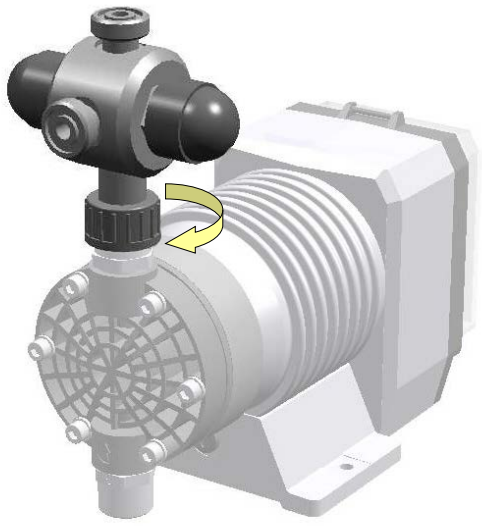


Fig. 04 Application example solenoid diaphragm pump

5.2 Connections

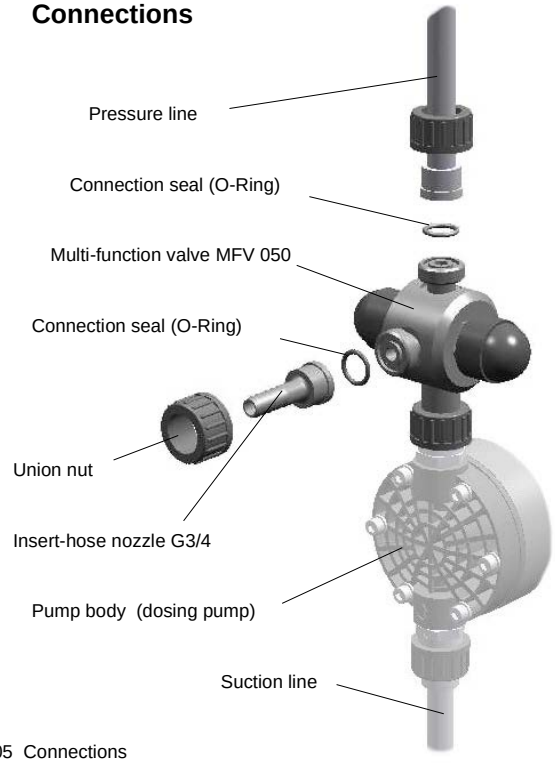


Fig. 05 Connections

The exhaust line is to be led back to the storage tank downgrade and unpressurized. Mount the exhaust line as figured, fix the hose clamp.

CAUTION !

Connection parts for the multi-function valve are not included in the scope of delivery and have to be ordered separately!

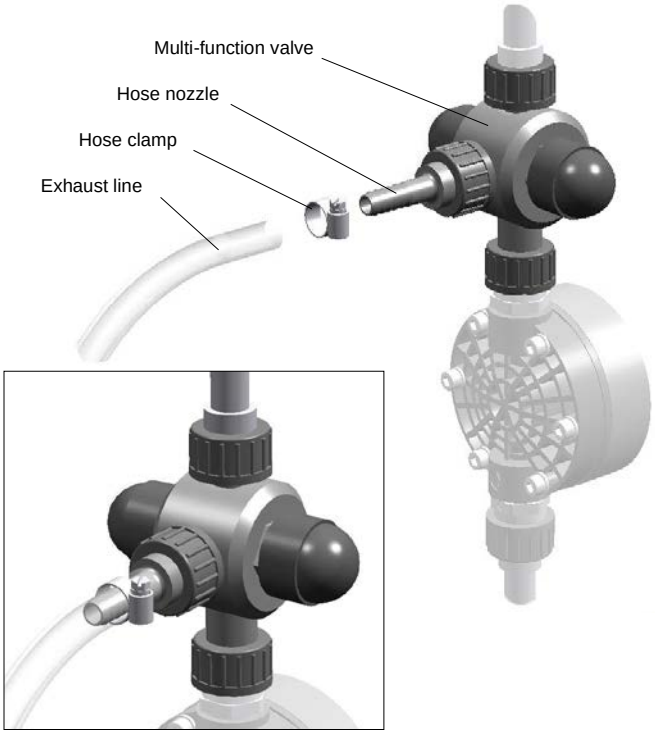


Fig. 06 Connection of exhaust line

6 Construction

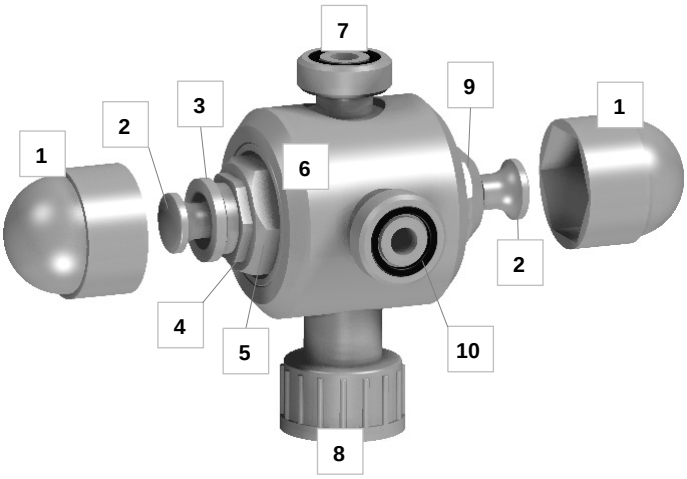


Fig. 07 Construction of MFV

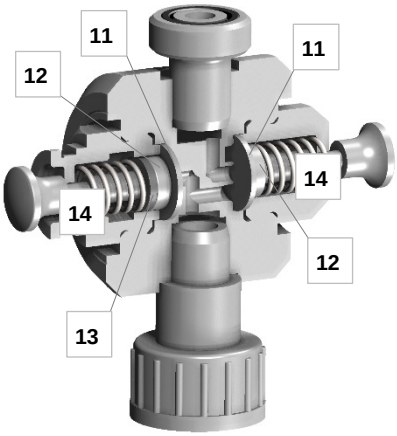


Fig. 08 Internal construction of MFV

Pos	Designation
1	Protecting cap
2	Handle (pressure relief)
3	Adjusting screw (relief valve)
4	Locking nut (relief valve)
5	Side part (relief valve)
6	Valve body
7	Outlet
8	Inlet
9	Side part (pressure keeping valve)
10	Connection exhaust line
11	Diaphragm
12	Pressure disk
13	Shim rings (relief valve)
14	Pressure spring

Tab. 02 Components of MFV

CAUTION !

The side of the relief valve is marked by a rotating groove in the valve body.

7 Functional discription

The multi-function valve MFV offers the following

functions:

- Pressure-keeping valve function
- Relief valve function
- Pressure relief function
- Ventilation

7.1 Function pressure-keeping valve

CAUTION !

Pressure keeping valves are no tightly closing shut-off valves.

Fig. 09 shows the function of the pressure-keeping valve.

If the admission pressure increases beyond the opening pressure, the diaphragm is raised against the spring force and the valve opens.

The opening pressure (keeping pressure) is about 1,0 to 1,5 bar.

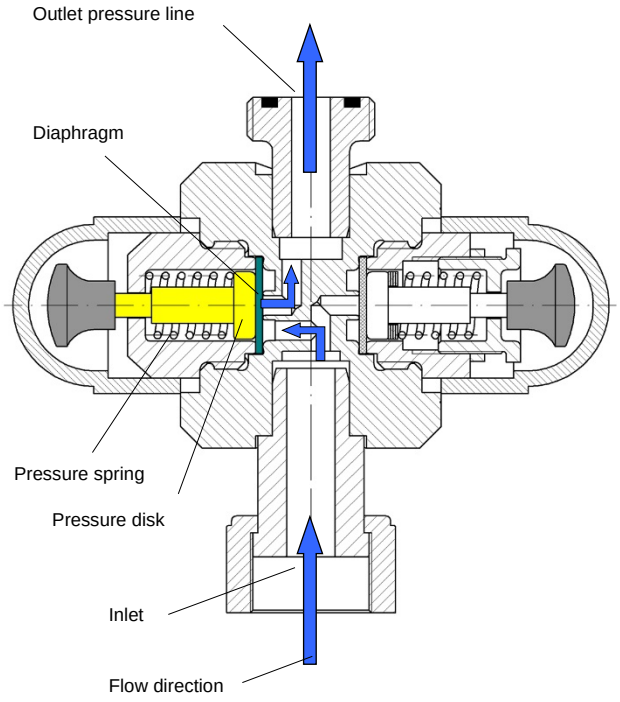


Fig. 09 Function pressure-keeping valve

7.2 Function relief valve

Fig. 10 shows the function of the relief valve.

If the admission pressure increases beyond the opening pressure, the diaphragm is raised against the spring force and the valve opens.

CAUTION !

The indicated opening pressures of the relief valve can vary around –1 to +1,5 bar to the nominal opening pressure due to different stroke frequencies and stroke volumes of the used dosing pumps!

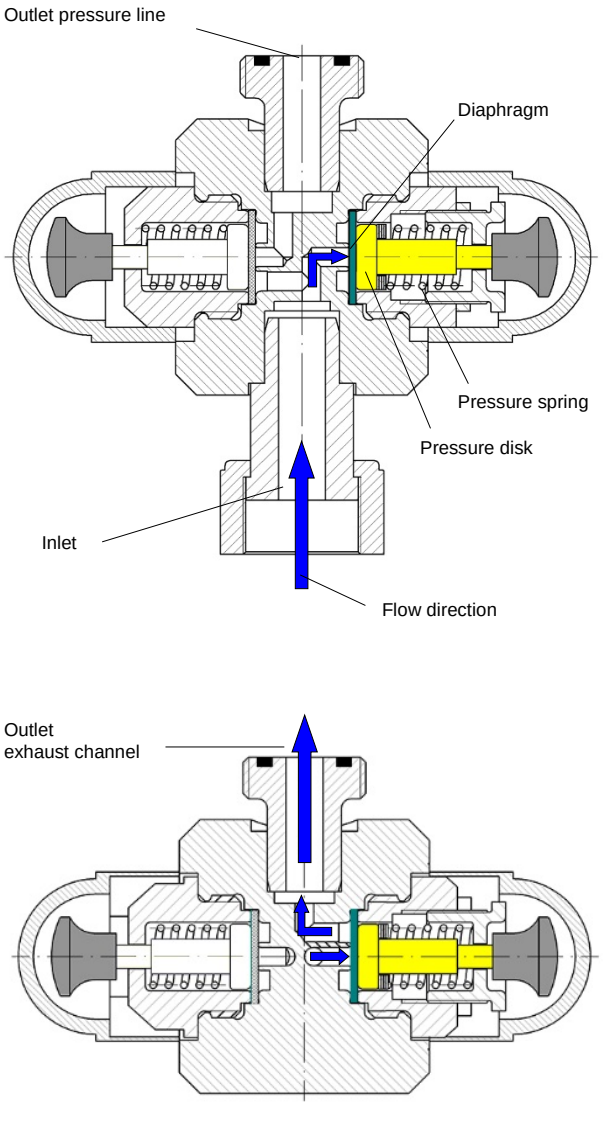


Fig. 10 Function relief valve

7.3 Function pressure relief

Fig. 11 shows the function of the pressure relief (of the pressure-/ dosing line)

At first the protecting caps have to be removed for the pressure relief so that the handles are easily accessible.

The simultaneous(!) pulling of both handles causes the pressure-keeping valve and the relief valve to open. The system pressure is reduced to a relatively small remaining pressure via the exhaust channel.
The release or removal of lines is not necessary.

CAUTION !

The pressure relief is only to be carried out when the dosing pump is switched off !

In order to avoid damages at the multi-function valve the handles are only to be pulled simultaneously and with the same expenditure of force for each handle!

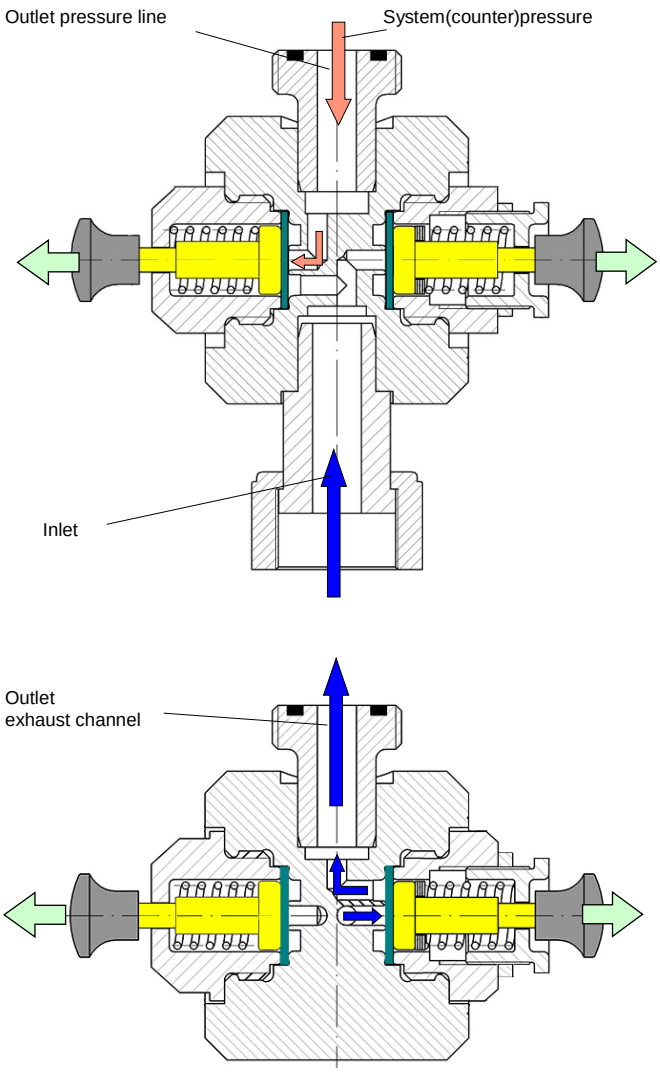


Fig. 11 Function pressure relief

7.4 Ventilation

The multi-function valve can be used as a vent valve for dosing pumps with small stroke volume and without own ventilation at the pump head (for example priming problems during the first commissioning of the dosing pump or after a drum change).

To do so, pull the handle at the relief valve side until the pumping medium exits without bubbles.

CAUTION !

The side of the relief valve is marked by a all around groove in the valve body!

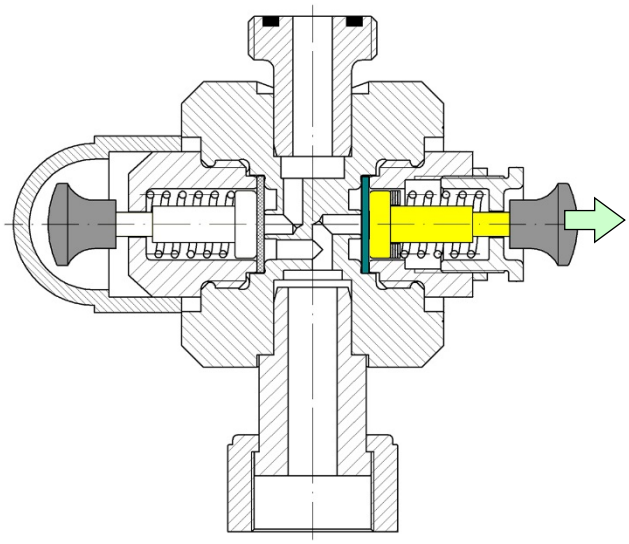


Fig. 12 Function ventilation

8 Pressure adjustment of relief valve

The relief valve has a variable setting pressure.
For factory set pressure, see type plate or order confirmation.

The following figures show the pressure adjustment of the relief valve.

- Remove protection cap (relief valve side).
- Release the locking nut SW24 (**1**).

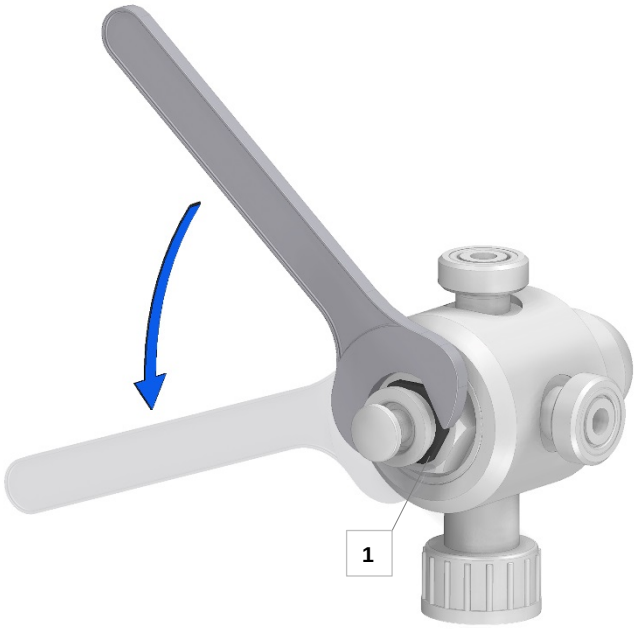


Fig. 13 Pressure adjusting of relief valve

- Turn the adjusting screw (**2**):

In clockwise direction:
Set pressure **higher**

In counterclockwise direction:
Set pressure **lower**

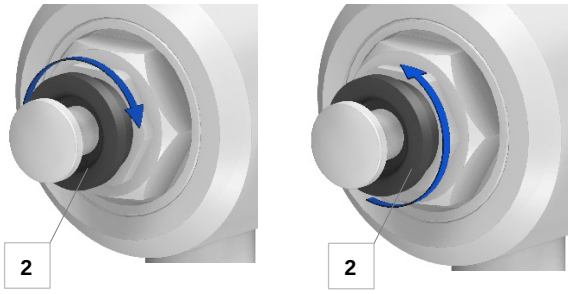


Fig. 14 Pressure adjusting of relief valve

NOTE !

Install a pressure gauge in the discharge line and test the setting pressure.

- Tighten locking nut (**1**).
- Put on protection cap.

9 Diaphragm change

CAUTION !

Before starting the change of the diaphragm at the multi-function valve it is to be assured that the dosing pump/-unit is switched off and is secured against (unauthorized) restarting.

Note safety advice acc. to chapter 2.10 !

CAUTION !

Please note that the necessary wearing and spare parts are available for all works before the maintenance works starts.

The subsequently described procedure for carrying out a diaphraghm exchange goes for the pressure-keeping valve as well as for the relief valve!

(As for the detailed design of the multi-function valve see chap. 10, fig. 14)

- Remove the plastic cap
- Uncrew the side part (completely)
- Remove the defective diaphragm

- Insert a new diaphragm into the valve body

CAUTION !

The diaphragm must be inserted into the valve body in such a way that the PTFE-faced surface (during operation) gets into contact with the medium.

- Screw the side part into the valve body
- Fingertight fastening
- Put the protecting cap back

The multi-function valve is again ready for use !

When completely mounting the wearing part kit(s) the side part(s) are to be pre-mounted before the assembly acc. to fig. 14.

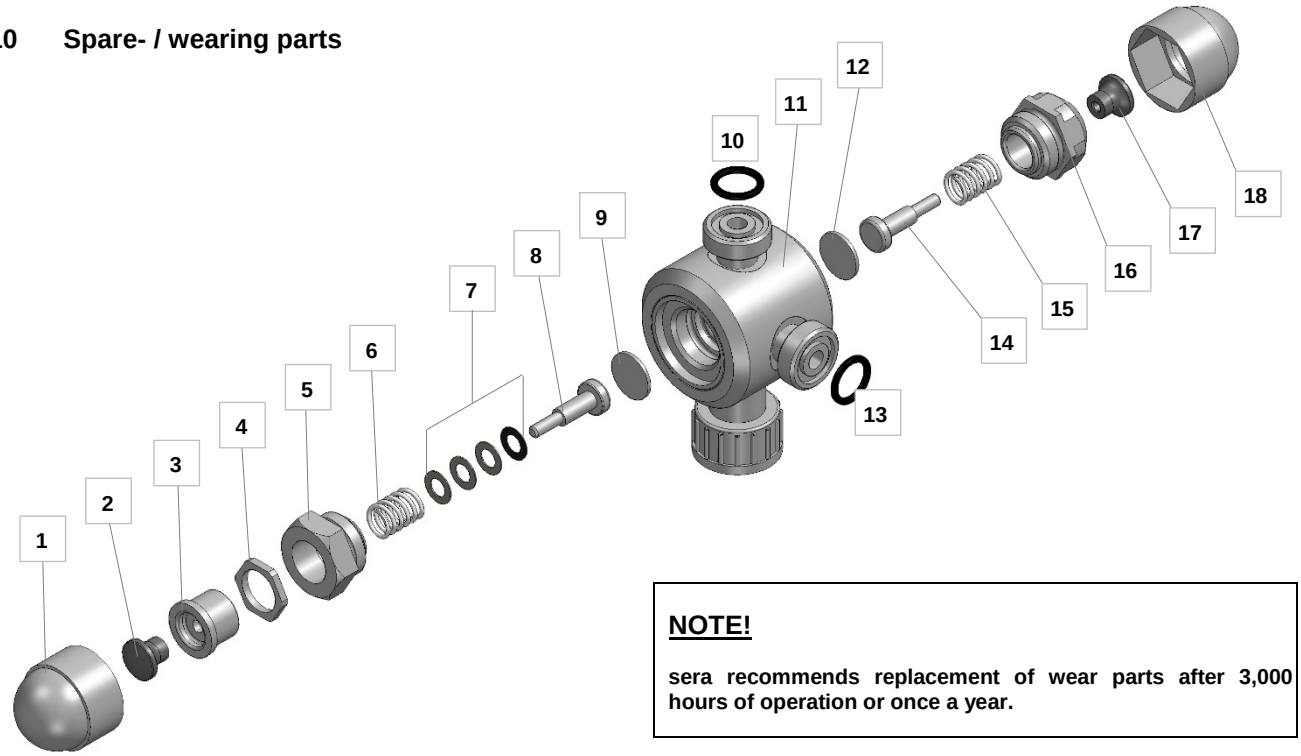
Side part relief valve:

Pressure disk → shim rings → pressure spring → side part → locking nut → adjusting nut → handle

Side part pressure-keeping valve:

Pressure disk → pressure spring → side part → handle

10 Spare- / wearing parts



NOTE!

sera recommends replacement of wear parts after 3,000 hours of operation or once a year.

Fig. 15 Spare-/wearing parts

10.1 Wearing parts

Wearing part kit **Relief valve**		
Wearing part kit consisting of:		**Article – No.**
Pos.	**Designation**	
6	Pressure spring	90018326
7	Shim ring (4x)	
8	Pressure plate	
9	Diaphragm	

Tab. 03 Wearing part kit relief valve

Wearing part kit **Pressure keeping valve**		
Wearing part kit consisting of:		**Article - No.**
Pos.	**Designation**	
12	Diaphragm	90018327
14	Pressure plate	
15	Pressure spring	

Tab. 04 Wearing parts pressure keeping valve

10.2 Ersatzteile

Spare parts			
Pos.	**Designation**	**Material**	**Article - No.**
1 / 18	Protection cap	PE	90005795
2 / 17	Handle		90017645
16	Side part pressure keeping valve	PVC	90017649
		PP	90017652
11	Valve body	PVC	90017647
		PP	90017650
5	Side part relief valve	PVC	90043316
		PP	90044851
3	Adjusting screw relief valve	PVC	90043317
		PP	90044838
4	Locking nut relief valve		90360382

Tab. 05 Spare parts

Sealing kit (complete)			
Consisting of:			
Pos.	**Designation**	**Material**	**Article - No.**
10 / 13	O-Ring	EPDM	90018328
		FPM	90018329
		FEP-cov.	90018330

Tab. 06 Sealing kit (complete)

11 Fault analysis and corrective action

sera products are proven technical products which are only shipped after an extensive final test in our works.
Should any malfunctions occur, these can be located and corrected easily with the help of the following reference guide (Tab. 07).

Type of fault	Possible cause of problem	Rectifiying the problem
Leaky valve, liquid comes out of the split between valve body and side part	Diaphragm fixing is too slack	Tighten side part by hand
	Diaphragm is defective	Replace the diaphragm
Relief valve already opens clearly under the nominal pressure	Foreign matter between diaphragm and valve seat	Remove the foreign matter
	Diaphragm is defective	Replace the diaphragm

Tab. 07 Fault analysis and correctice action

12 De-Commissioning

Remove dosing medium from multi-function valve by means of flushing. The flushing agent must be suitable for dosing medium and material of the multi-function valve.

13 Disposal

Stop the operation of the unit. See decommissiong.

13.1 Dismounting and Transport

- Remove all remaining fluid out of the pump, clean, neutralize and decontaminate the pump carefully.
- Pack the pump properly and arrange everything for transport.

CAUTION !

The consignor is liable for any defects resulting from leaking lubricants or residual fluids!

13.2 Complete Disposal

- Drain off all fluids and dispose of them in accordance with the regulations.
- Dismount all materials and send them to a suitable processing company.

14 Clearance Certificate

NOTE!

Inspection / repair of machines and machine parts is only carried out after the opposite clearance certificate was filled in correctly and completely by authorized and qualified personnel.

NOTE!

Acceptance will be refused if parts are returned to the manufacturer without a proper clearance certificate.

All industrial companies are obligated by the legal provisions for occupational health, e.g. the workplaces ordinances, the Ordinance on Hazardous Substances, the regulations for prevention of accidents and the environmental protection regulations such as the Waste Management Act and the German Household Water Act to protect their employees or man and the environment from detrimental effects when handling hazardous substances.

Should special safety precautions be necessary despite careful draining and cleaning of the product the necessary information are to be provided.

Machines which are operated with radioactive media shall only be inspected and/or repaired in the safety area of the owner by a **sera** specialized fitter.

The clearance certificate is part of the inspection-/repair order. **sera** reserves the right to refuse acceptance of the order for other reasons.

NOTE!

Please make a copy and leave the original with the operating instructions!
(can also be downloaded from: www.sera-web.com)

Clearance Certificate

Product

Type _____ Serial-No. _____

the product was carefully emptied before shipping / delivery, and cleaned inside and outside. ☐ **YES**

Conveying medium

Designation _____ Concentration _____ %

Properties

Please tick!

If either of the listed properties, then enclose the appropriate safety and handling instructions.

☐ Harmless

☐ Toxic ☐ Corrosive ☐ Flammable ☐ Oxidising ☐ Unhealthy

☐ Explosive ☐ Dangerous for the environment ☐ Irritant ☐ Bio-hazardous ☐ Radioactive

The product was used with health or water-polluting substances and came up with labeling requirements and pollution prone media in contact. ☐ **YES** ☐ **NO**

Special security arrangements with respect to health or water-hazardous media are in the further handling ☐ **not required** ☐ **required**

The following safety precautions regarding rinsing, residual liquids and waste disposal are required:

Process data

The product was used with the following operating conditions described conveying medium:

Temperature _____ °C Pressure _____ bar

Sender

Company: _____ Telephone: _____

Contact person: _____ FAX: _____

Address: _____ E-mail: _____

Zip code, City: _____ Your order No: _____

We confirm that we have the information in this safety certificate (Clearance Certificate) have been correctly and completely and that the returned parts were carefully cleaned.

The parts are sent free of residues of dangerous amount.

Place, Date _____ Department _____ Signature (and company stamp) _____

Notes

Notes

Notes