

Series MV/F, MVM/F,
MVP/F, MVMP/F

Diaphragm Shut-off and Control Valve



Keep for future use!

This operating manual must be strictly observed before transport, installation, operation and maintenance

Subject to change without notice.

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9510-001-en Revision 22 Edition 12/2022

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Relevant documents

- ◆ EG-Declaration of conformity
- ◆ Declaration of conformity FDA & 97/48/EG
- ◆ Manufacturer Declaration ATEX Directive 2014/34/EU
- ◆ Manufacturer Declaration TA-Luft
- ◆ Form for Safety Information Concerning the Contamination QM 0912-16-2001_en
- ◆ For MVP/F and MVMP/F:
- ◆ Operating manual actuator

1 Technical data

Manufacturer :

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Designation :

Diaphragm valve with PTFE diaphragm / EPDM diaphragm support

Diaphragm shut-off valve series

MV/F → Design DIN/ISO, hand-actuated

MVM/F → Design MSS SP-88, hand-actuated

Diaphragm control valve series

MVP/F → Remote actuation by pneumatic actuators to DIN /ISO 5211

- of column-style/bracket-style design
- of compact design

or by electric actuators

MVMP/F → Remote actuation by pneumatic actuators to DIN /ISO 5211

- of column-style/bracket-style design
- of compact design

or by electric actuators

Certified to Clean Air Act (TA Luft)

Strength and tightness (P10, P11) of the pressure-bearing body tested to DIN EN 12266-1.

Gas-tight (P12) in the seat to DIN EN 12266-1, leak rate A

Face to face alternatively:

- ◆ DIN EN 558-1 basic series 1, ISO 5752 series 1
 with flanges DIN EN 1092-2, type B
 (ISO 7005-2 Type B) PN 16 or flanges drilled to ASME B16.5 Class 150
- ◆ MSS SP-88 with flanges drilled to ASME B16.5 Class 150

Materials :

Body material:

Ductile cast iron EN-JS 1049 / ASTM A395
 DN 15 + 20 precision cast stainless steel 1.4408

Lining material: PFA .../F
 On request: antistatic .../F-L

Diaphragm: TFM-PTFE with EPDM diaphragm support (on request antistatic diaphragm of PTFE)

Bonnet, handwheel, stem (valve stem) and compressor: Stainless steel

Temperature range : -30 °C to 150 °C

see pressure-temperature diagram in **Section 1.4.**

Test pressure : **ISO**
 PN 16 to DN 50 PFA/PFA-L
 PN 10 DN 80 PFA/PFA-L,
 DN 100, DN 150 PFA
MSS
 Class 150 (PN10) ½"-6"

Operating pressure and vacuum see pressure-temperature diagram in **Section 1.4.**

Diaphragm valve sizes :

DIN/ISO: DN 15, 20, 25, 40, 50, 80, 100, 150
 MSS SP-88 1", 1½", 2", 3", 4", 6"

Installation position : any

See **Section 6.2.**

Dimensions and individual parts :

See sectional drawings in **Section 10.**

Weight :

Nominal size		manually operated (approx. in kg)		without actuator (approx. in kg)	
ISO	MSS	ISO	MSS	ISO	MSS
15	½"	4.0	---	4.2	---
20	¾"	4.0	---	4.2	---
25	1"	4.6	4.5	4.8	4.7
40	1½"	8.9	7.9	9.1	8.9
50	2"	11.6	11.0	12.0	11.4
80	3"	23.7	23.0	21.3	20.6
100	4"	33.5	30.7	29.7	26.9
150	6"	64.6	59.5	56.2	51.1

For weight of actuator, see actuator manufacturer's manual.

Wear parts: Diaphragm / support diaphragm,

Option safety packing: packing rings

Options :

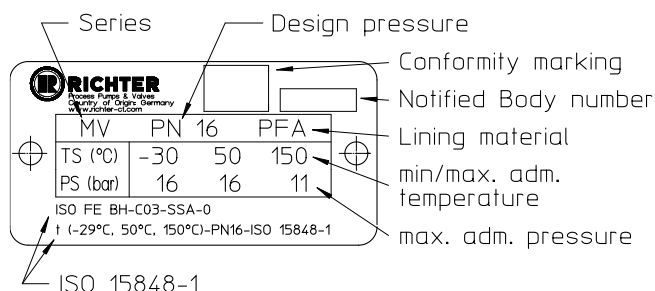
- ◆ Travel stop for MVP/F, MVMP/F
- ◆ Safety stuffing box for use with hazardous or environmentally critical media, adjustable from outside by hand.
- ◆ Monitoring connection

1.1 Type plate, conformity and body markings

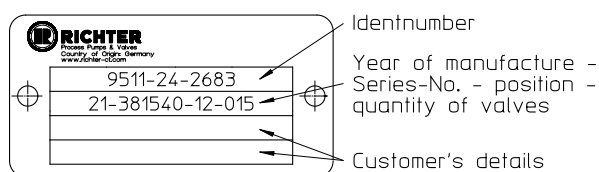
The stainless steel name plate is undetachably riveted to the body.

If the operator attaches his identification, it must be ensured that the valve matches the application in question.

Example of name plate with conformity marking:



Example : Second name plate



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No conformity marking is permissible for the sizes 15, 20 and 25; the name plate therefore has no conformity marking.

Body identification :

The following are visible on the body according to DIN EN 19 and AD 2000 A4:

- ◆ Nominal size
- ◆ Rated pressure
- ◆ Body material
- ◆ Manufacturer's identification
- ◆ Melt number/Foundry identification
- ◆ Cast date

1.2 Flow rates

Nominal size		Kv100 [m ³ /h]
[mm]	[inch]	
15	1/2"	2.8
20	3/4"	8
25	1"	9
40	1 1/2"	22
50	2"	36
80	3"	85
100	4"	157
150	6"	292

1.3 Tightening torques

All screws greased, tighten in diametrically opposite sequence!

The tightening torques for pipe screws and body screws mentioned must not be exceeded. For an exception, see **Section 8**, Flange connection valve/pipe is leaking.

The following tightening torques are recommended.

Pipe screws, flanges to ISO/DIN

Flange nom. size [mm]	screws [ISO/DIN]	Tightening torque	
		[Nm]	[in-lbs]
15	4 x M12	6	55
20	4 x M12	8	70
25	4 x M12	10	90
40	4 x M16	20	180
50	4 x M16	26	230
80	8 x M16	25	220
100	8 x M16	35	310
150	8 x M20	65	575

Pipe screws, flanges to ASME Class 150 or flanges ISO/DIN drilled to ASME Class 150

Flange nom. size		screws [ASME]	Tightening torque	
[mm]	[inch]		[in-lbs]	[Nm]
15	1/2"	4 x 1/2"	45	5
20	3/4"	4 x 1/2"	55	6
25	1"	4 x 1/2"	70	8
40	1 1/2"	4 x 5/8"	135	15
50	2"	4 x 5/8"	220	25
80	3"	4 x 5/8"	400	45
100	4"	8 x 5/8"	310	35
150	6"	8 x 3/4"	710	80

Body screws

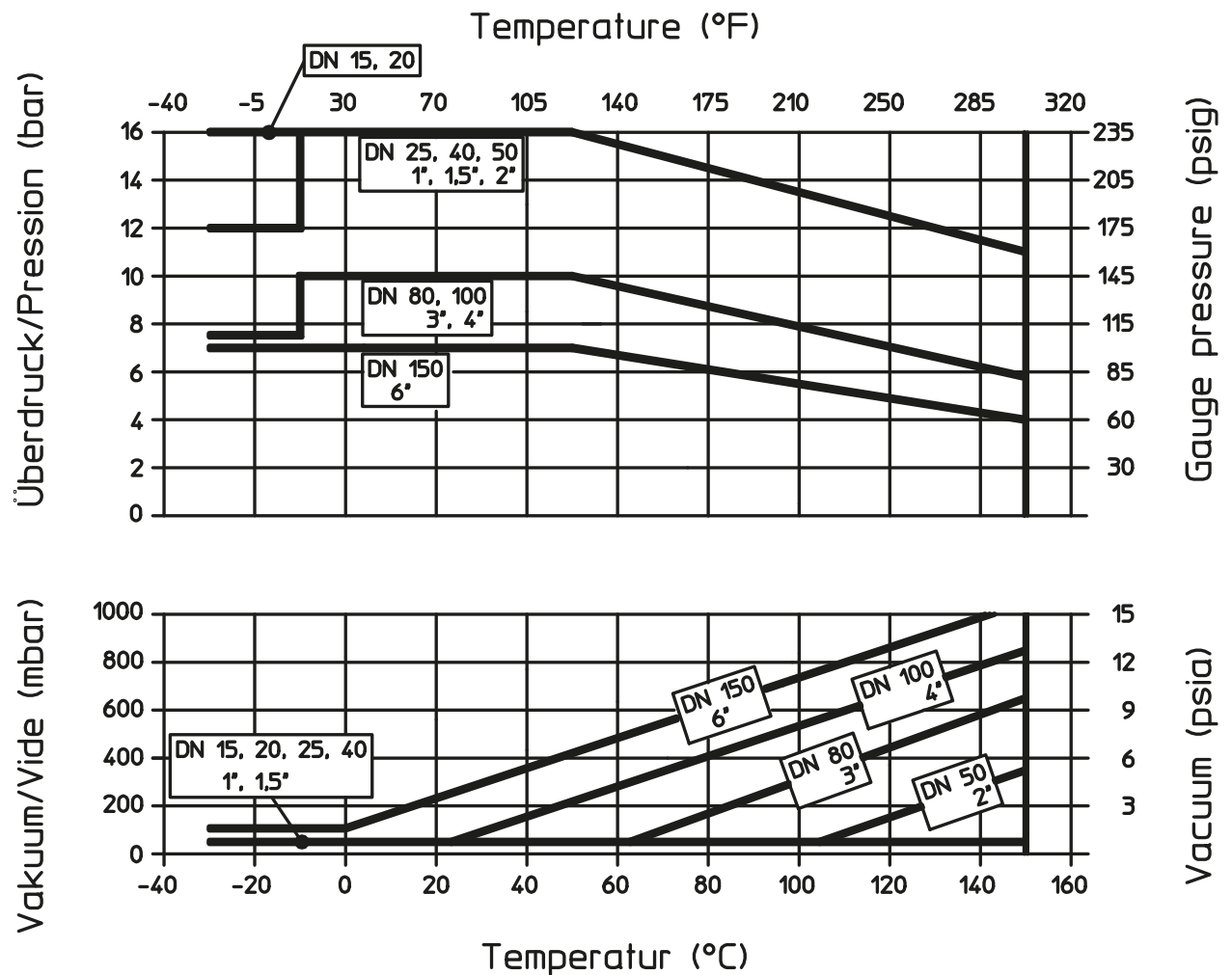
Nominal size		screws [ISO/DIN]	Tightening torque	
[mm]	[inch]		[Nm]	[in-lbs]
15	1/2"	4 x M8	12	106
20	3/4"	4 x M8	12	106
25	1"	4 x M8	12	106
40	1 1/2"	4 x M10	25	221
50	2"	4 x M10	31	274
80	3"	4 x M16	80	708
100	4"	8 x M12	55	487
150	6"	10 x M16	150	1195

Schließkraft / Handwheel

Nominal size		Tightening torque	
[mm]	[inch]	[Nm]	[inch-lbs]
15	½"	4	35
20	¾"	4	35
25	1"	5	44
40	1½"	15	133
50	2"	15	133
80	3"	25	221
100	4"	30	266
150	6"	95	841

1.4 Pressure-temperature diagram

2014/68/EU (PED), AD2000, DIN EN 16668



DIN EN ISO 15848-1 certificate valid from -29°C to 150°C



When used in the minus temperature range, the regulations applicable in the country in question must be observed.

1.5 Required shut-off forces

Forces apply to PFA/PTFE-lined body and PTFE diaphragm. Other materials for linings and diaphragms require different forces.

	p1 is stated at p2 = 0 bar (overpressure)										
bar	1	2	3	4	5	6	8	10	12	14	16
psi	14.5	29	43.5	58	72.5	87	116	145	174	203	232
DN	N	N	N	N	N	N	N	N	N	N	N
15	976	1040	1105	1181	1246	1311	1441	1582	1712	1842	1972
20	1370	1473	1572	1676	1779	1880	2085	2287	2494	2697	2904
25	1370	1473	1572	1676	1779	1880	2085	2287	2494	2697	2904
40	1598	1863	2133	2398	2663	2931	3463	3997	4529	5073*	5616
50	1598	1863	2133	2398	2663	2931	3463	3997	4529	5073*	5616
80	2904	3645	4383	5120	5861	6598	8077	9556			
100	5019	6105	7190	8273	9360	10446	12616	14786			
150	6665	8744	10825	12907	14985	17067					

2 Notes on safety

This operating manual contains fundamental information which is to be observed during installation, operation and maintenance.

It must be read before installation and commissioning!

For valves which are used in potentially explosive areas, see **Section 3**.

Installation, operation and maintenance are to be performed by qualified staff.

The area of responsibility, authority and supervision of the staff must be regulated by the customer.



General hazard symbol!

People may be put at risk.



Safety symbol! The ball valve and its function may be put at risk if this safety symbol is not observed.

It is imperative to observe warnings and signs attached directly to the ball valve and they are to be kept fully legible.

Non-observance of the notes on safety may result in the loss of any and all claims for damages.

For example, non-observance may involve the following hazards:

- ◆ Failure of important functions of the valve/plant.
- ◆ Risk to people from electric, mechanical and chemical effects.
- ◆ Risk to the environment through leaks of hazardous substances.

2.1 Intended use

Richter diaphragm valves are pressure containing components in accordance with the Pressure Equipment Directive (PED) for the passage and shutoff of fluids at a specified differential pressure.

The valves are suitable for vapours, gases and non-boiling liquids of group 1 according to the PED and have a corrosion-resistant plastic lining.

They are used as shut-off, control and throttling valves for corrosive, pure and high-purity liquids, gases and vapours in chemical, pharmaceutical, food and industrial processes.

They are hermetically tight.

The wetted materials are FDA-compliant.

Richter diaphragm valves are soft-sealing and gas-tight.

Solids can lead to increased wear, damage to sealing surfaces or to a reduction in the service life of the valve.

The operator must carefully examine in the event of operating data other than those provided whether the designs of the valve, accessories and materials are suitable for the new application (consult the manufacturer).

2.2 For the customer / operator

If a valve is used, the operator must ensure that

- ◆ actuators which are retrofitted are adapted to suit the valve
- ◆ hot or cold valve parts are protected by the customer against being touched
- ◆ the valve has been properly installed in the pipe system
- ◆ the usual flow rates are not exceeded in continuous operation.

This is not the manufacturer's responsibility.

Loads caused by earthquakes were not allowed for in the design.

Fire protection to DIN EN ISO 10497 is not possible (plastic lining and plastic components).



Diaphragm valves which are used as end valves must be sealed with a blind flange at the free connection end and appropriately secured against unauthorised activation.

2.3 Improper operation

The operational safety of the valve supplied is only guaranteed if it is used properly in accordance with **Section 2.1** of this operating manual.



The operation limits specified on the identification plate and in the pressure-temperature diagram must under no circumstances be exceeded.

3 Safety notes for applications in potentially explosive areas based on the Directive 2014/34/ EC (ATEX)

The valves are intended for use in a potentially explosive area and are therefore subject to the conformity assessment procedure of the directive 2014/34/EC (ATEX).

As part of this conformity assessment, an ignition hazard analysis to EN 13463-1 to satisfy the fundamental safety and health requirements was conducted with the following result:

- ♦ **The valves do not have any ignition source of their own and can be operated both manually as well as mechanically/electrically.**
- ♦ **The valves are not covered by the scope of application of the ATEX directive and therefore do not need to be identified accordingly.**
- ♦ **The valves may be used in a potentially explosive area.**

Supplementary notes:

- ♦ **Electric/mechanical actuators must be subjected to their own conformity assessment to ATEX.**

It is imperative to observe the individual points of intended use for application in a potentially explosive area.

3.1 Intended use

Improper operation, even for brief periods, may result in serious damage to the valve.

In connection with explosion protection, potential sources of ignition (overheating, electrostatic and induced charges, mechanical and electric sparks) may result from these improper operation; their occurrence can only be prevented by adhering to the intended use.

Furthermore, reference is made in this connection to the Directive 95/C332/06 (ATEX 118a) which contains the minimum regulations for improving the occupational health and safety of the workers who may be at risk from an explosive atmosphere.

A difference is made between two cases for the use of chargeable liquids (conductivity $< 10^{-8}$ S/m):

1. Chargeable liquid and non-conductive lining

Charges can occur on the lining surface. As a result, this can produce discharges inside and outside the valve.

a) Discharges inside the valve

However, these discharges inside the valve cannot cause ignitions if the valve is completely filled with medium.

If the valve is not completely filled with medium, e.g. during evacuation and filling, the formation of an explosive atmosphere must be prevented, e.g. by superimposing a layer of nitrogen. It is recommended to wait 1 hour before removing the valve

from the plant in order to permit the elimination of static peak charges.

This means that, to safely prevent ignitions, the valve must be completely filled with medium at all times or else a potentially explosive atmosphere must be excluded by superimposing a layer of inert gas.

b) Discharges outside the valve

At the points where the non-conductive lining e.g. protrudes on the sealing surfaces to the outside or gets contact with the atmosphere on the outside, it may lead to discharges from the lining to nearby valves or attachments.

To safely avoid explosion hazards and accidents, therefore, the atmosphere surrounding the valve must not be explosive.

2. Chargeable liquid and conductive lining

No hazardous charges can occur as charges are discharged direct via the lining and shell (surface resistance $< 10^9$ Ohm, leakage resistance $< 10^6$ Ohm).

If non-conductive versions of individual components are installed in the valve, it may restrict the permitted ATEX zone and explosion subgroup when operating the valve despite the conductive lining of the armor plating (see "Technical rules for hazardous substances: Avoidance of ignition hazards due to electrostatic charges" (TRGS 727)).

In these cases, consult the manufacturer.

Static discharges of non-conductive linings are only produced through the interaction with a non-conductive medium and are therefore the responsibility of the plant operator.

Static discharges are not sources of ignition which stem from the valves themselves!

- ♦ The temperature of the medium must not exceed the temperature of the corresponding temperature class or the maximum admissible medium temperature as per the operating manual.
- ♦ If the valve is heated (e.g. heating jacket), it must be ensured that the temperature classes prescribed in the Annex are observed.
- ♦ For safe and reliable operation, it must be ensured with regular inspection intervals that the unit is properly serviced and kept in a perfect technical condition.
- ♦ Increased wear to the valve can be expected with the conveyance of liquids containing abrasive constituents. The inspection intervals are to be reduced compared with the usual times.
- ♦ Actuators and electric peripherals, such as temperature, pressure and flow sensors etc., must comply with the valid safety requirements and explosion protection provisions.

- ◆ The valve must be grounded.
This can be achieved in the simplest way via the pipe screws using tooth lock washers. Otherwise grounding must be ensured by different measures e.g. a cable link.
- ◆ Attachments such as actuators, position controllers, limit switches etc. must satisfy the relevant safety regulations as regards explosion protection

and, if required, be designed in compliance with ATEX.

- ◆ Special attention must be paid to the appropriate safety and explosion protection notes in the respective operating manuals.
- ◆ Plastic-lined valves must not be operated with carbon disulphide.

4 Safety note for valves, certified to Clean Air Act (TA Luft)

Certificate / Manufacturer Declaration Validity is dependent on the operating instructions being read and observed.

- ◆ Carry out regular maintenance intervals and check the tightness of the screw connections and tighten as necessary.

5 Transport, storage and disposal



For all transport work, observe generally accepted engineering practice and the accident prevention regulations.

The valve is supplied with flange caps. Do not remove them until just before installation. They protect the plastic surfaces against dirt and mechanical damage.



Handle the goods being transported with care. During transport protect the valve against impacts and collisions.

Directly after receipt of the goods, check the consignment for completeness and any in-transit damage.

Do not damage paint protection.

5.1 Storage

If the valve is not installed immediately after delivery, store them properly.

The valves be stored in a dry, vibration-free and well-ventilated room at as constant a temperature as possible.

Protect elastomers against UV light.

In general, a storage period of 10 years should not be exceeded.

5.2 Return consignments



Valves which have conveyed aggressive or toxic media rinse and clean before being returned to the manufacturer's works.

It is **imperative** to enclose a **safety information sheet / general safety certificate** on the field of application with the return consignment.

Pre-printed forms are enclosed with the installation and operating manual.

Safety precautions and decontamination measures are to be mentioned.

5.3 Disposal

Parts of the valve may be contaminated with medium which is detrimental to health and the environment and therefore cleaning is not sufficient.



Risk of personal injury or damage to the environment due to the medium!

- ◆ Wear protective clothing when work is performed on the valve.
- ◆ Prior to the disposal of the valve:
 - Collect any medium, etc. which has escaped and dispose of it in accordance with the local regulations.
 - Neutralise any medium residues in the valve.
- ◆ Separate valve materials (plastics, metals, etc.) and dispose of them in accordance with the local regulations.

6 Installation

- ◆ Examine valve for in-transit damage, damaged diaphragm valves may not be installed.
- ◆ Before installation the valve and the connecting pipe must be carefully cleaned to remove any dirt, especially hard foreign matter.
- ◆ During installation, pay attention to the correct tightening torque, aligned pipes and tension-free assembly.



Ensure that a remotely actuated actuator cannot be accidentally switched on.

6.1 Flange caps and gaskets

- ◆ Leave protective caps on the flanges until just prior to installation.

Where there is a particularly high risk of damage to the plastic sealing surfaces, e.g. if the mating flanges are made of metal or enamel, PTFE-lined gaskets with a metal inlay should be used. These gaskets are available as special accessories in the Richter range.

6.2 Direction of flow and installation position

Installation is independent of the direction of flow.

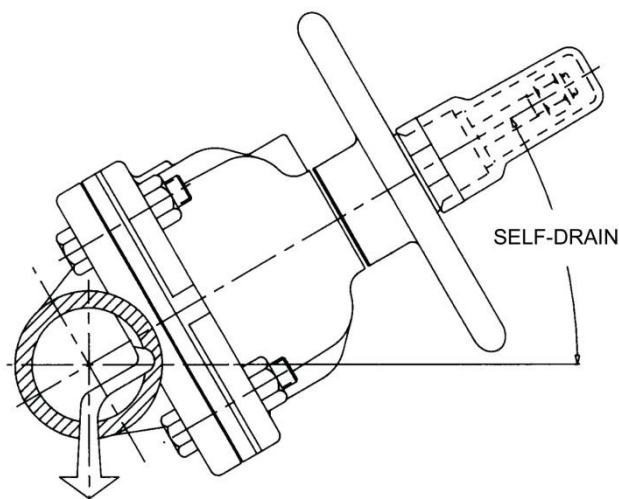
The installation position of hand-actuated diaphragm valves can be freely selected.

In the case of diaphragm valves with an actuator, inclined positions of the actuator are only permitted after consultation with the manufacturer. In this case a support structure may have to be provided for the actuator.

6.3 Angular position for drainability (Pipeline for loose type flanges)

Both manual and remote actuated MV diaphragm valves can be installed in vertical or horizontal pipes. When installed in vertical pipes, they are self-draining in the opened state. To achieve optimum self-draining in horizontal pipes, the valves must be installed in an inclined position, namely at the angles listed in the following table compared with the horizontal:

DN	15	20	25	40	50	80	100	150
	30°	30°	30°	28°	23°	21°	16°	--



Remark: To attain optimum draining of the plant or plant section, the process line must have a corresponding inclination.

6.4 Grounding

The valve must be grounded. This can be achieved in the simplest way via the pipe screws using tooth lock washers. One pipe screw per flange is underlaid with toothed disks.

At the customer's request a setscrew M6 with a hex. nut and washer will be provided at each flange as an additional grounding connection.

Otherwise grounding must be ensured by different measures e.g. a cable link.

6.5 Pressure test

The test pressure PT of a valve must not exceed the value of $1.5 \times PS(PN)$ as per the identification of the valve.

7 Operation

7.1 Initial commissioning

Normally, the valves have been tested for leaks with air or water. Prior to initial operation check cover screws. For tightening torques, see **Section 1.3**.



Unless otherwise agreed there could be residual amounts of water in the flow section of the valve. This could result in a possible reaction with the medium.

To prevent leaks, all connection screws should be retightened after the initial loading of the valve with operating pressure and operating temperature.

For tightening torques, see **Section 1.3**.

7.2 Improper operation and their consequences

- ◆ When used in the minus temperature range, the regulations applicable in the country in question must be observed.
- ◆ Increased wear occurs in operation with solids contents.
- ◆ Operation during cavitation leads to increased wear.
- ◆ Non-observance of the pressure-temperature diagram can lead to damage.

- ◆ Do not subject the handwheel to heavy loads; the handwheel or diaphragm valve may be damaged.
- ◆ Do only use a handwheel without lever extension as otherwise there is a risk of damage.
- ◆ If no monitoring is provided by the warning connection, do not tighten safety stuffing box. Otherwise any leak cannot be seen.

7.3 Shutdown

The local regulations are to be observed when dismantling the valve.

Prior to undoing the flange connection ensure, that the plant is depressurised and emptied.



Prior to starting any repair work, the valve is to be thoroughly cleaned. Medium residue may be in the valve even if it has been properly drained and flushed.

After dismantling, immediately protect the valve flanges against mechanical damage by using flange caps. See also **Section 6.1**.



Make sure that a remote-controlled actuator cannot be switched on by accident.

8 Malfunctions

- ◆ **Flange connection valve/pipe is leaking**
Retighten the flange screws to a tightening torque according to **Section 1.3**. If this does not remedy the leak, the recommended torques may be exceeded by 10%.
If this also fails to stop the leak, dismantle and inspect the valve.
- ◆ **Flange connection body / bonnet is leaking**
Retighten the cover screws to a tightening torque according to **Section 1.3**. If this does not remedy the leak, the recommended torques may be exceeded by 10%.
- ◆ **Safety stuffing box (option) leaks**
Tighten packing nut until the leak has been eliminated.
Then dismantle the valve as quickly as possible and repair.
- ◆ **Diaphragm valve does not switch**
Is the actuator supplied with power?
Is any directional control valve correctly connected?
Is there any foreign matter in the diaphragm valve?
Leak between stem/bonnet and handwheel?
Diaphragm is defective. For replacement see **Section 9.1**.
In the case of valves which were opened, the diaphragm must always be replaced with a new one.

9 Maintenance

- ♦ All repair work is to be performed by qualified personnel using the appropriate tools.
 - ♦ For the arrangement, designation and item numbers of all parts of the valve, see **Section 10**.
 - ♦ Spare parts are to be ordered with all the details in acc. with the valve identification.
 - ♦ Only original spare parts may be installed.
 - ♦ To prevent leaks, a regular check of the connection screws should be made in line with the operating requirements.
- For tightening torques, see **Section 1.3**.

9.1 Replacing the diaphragm

9.1.1 Dismantling diaphragm valve with handwheel



The plant must be depressurised and drained! The valve can remain installed during the maintenance work.

- ♦ Undo hex. nuts **920/1** of the bonnet **112** and remove. The handwheel can remain installed for replacing the diaphragm.
- ♦ Remove bonnet **112**.
- ♦ Unscrew stem **855** off the bonnet.
- ♦ Unscrew the compressor **211** out of the diaphragm / diaphragm support **212** out of the tube nut **569**.
- ♦ Remove diaphragm / diaphragm support **212**.

9.1.2 Dismantling diaphragm valve with actuator

Compact actuator: Observe separate instructions.

Dismantling column-style/bracket-style actuator:

- ♦ Remove actuator **850** and coupling **804**.
- ♦ Remove bracket **510** or yoke **516** with protective bellows **687/1** and travel stop.
- ♦ The entire actuator with bonnet can also be removed to replace the diaphragm.
- ♦ Further dismantling is performed as described in **Section 9.1.1**.

9.1.3 Assembly

- ♦ Prior to assembly all parts are to be cleaned and the plastic-lined parts checked for damage.
- ♦ The entire valve is always assembled in the open position.

9.1.4 Assembly diaphragm valve with handwheel

- ♦ Screw diaphragm/diaphragm support **212** into the tube nut **569** in the compressor **211** up to the stop and turn into the correct position.
- ♦ The thread of the stem **855** and the nut thread in the bonnet **112** must be clean and free from solvents. Grease the thread with the lubricant Krytox GPL 205.
- ♦ Turn the stem **855** into the bonnet **112**.
- ♦ Insert the plain bearing **300** into the bearing disc **556** and grease with the lubricant Krytox GPL 205. Mount the bearing disc **556** onto the stem **855**.
- ♦ Connect compressor **211** with stem **855**. Push compressor guide onto the stem from the side.
- ♦ Screw stem **855** in the open position right up to the travel stop.
- ♦ Mount bonnet **112** onto the body and bolt together. For tightening torques, see **Section 1.3**.
- ♦ **Check for leaks.** (Only by specialists on the test stand).
- ♦ Turn the stem **855** in until the valve closes (bubble-tight).
- ♦ Screw on hex. nut **920/2** with a space of 1 mm between the bonnet and the hex. nut. The hex. nut serves as a travel stop so that the diaphragm is not damaged.
- ♦ Mount handwheel **210**.
- ♦ Apply screw securing agent Loctite 243 to the thread of the hex. screw **901/1**.
- ♦ Secure handwheel with hex. screw **901/1**.

9.1.5 Assembly diaphragm valve with actuator

Compact actuator: Observe separate instructions.

Dismantling column-style/bracket-style actuator:

- ♦ For assembly of bracket **510** or yoke **516**, see drawing in **Section 10**.
- ♦ Option:
Mount travel stop **508** with protective bellows **687/1**.
- ♦ Mount coupling **804** and actuator **850**. Observe securing position, see operating instructions for the actuator.
- ♦ Further assembly as described in **Section 9.1.4**.

9.1.6 Diaphragm valve with safety stuffing box

A modified bonnet is used when installing a safety stuffing box.

- ♦ Insert 2 packing rings **402/1** offset against each other.
- ♦ Insert thrust ring **405/1**.
- ♦ Screw on packing nut **404**. Only tighten further in the event of a leak.

In order to ensure leak monitoring, Richter recommends the combination of the safety stuffing box with a warning connection.

If only the safety stuffing box is present, do not tighten it so that any leak becomes visible.

Otherwise the valve may be destroyed by an unnoticed internal leak.

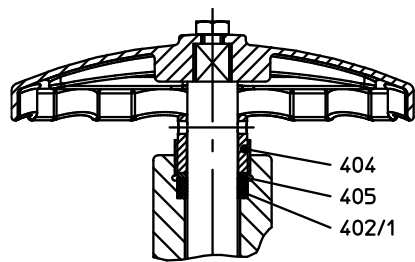
10 Drawings

10.1 Legend

100	Body	855	Stem
112	bonnet	901/1	Hex. screw
210	Handwheel	902/x	stud screw
211	compressor	920/x	Hex. nut
212	diaphragm/diaphragm support	<u>Option safety stuffing box</u>	
300	plain bearing	402/1	Packing ring
302/x	guide ring	404	Packing nut
510	bracket	405	thrust ring
516	Yoke	<u>Option monitoring connection</u>	
517	scraper ring	938/1	hex. head screw plug
523	Stroke index	<u>Option travel stop</u>	
550	disc	508	Travel stop
556	bearing disc	687/1	Protective bellows
569	tube nut	includes:	
800	Valve stem	509/1	Groove nut
804	Coupling	954/1	Snap ring
850	actuator	937/1	Clip
		920/3/4	hex, nut, thin

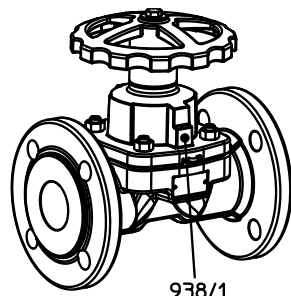
10.2 Options MV/F, MVM/F

Option safety stuffing box

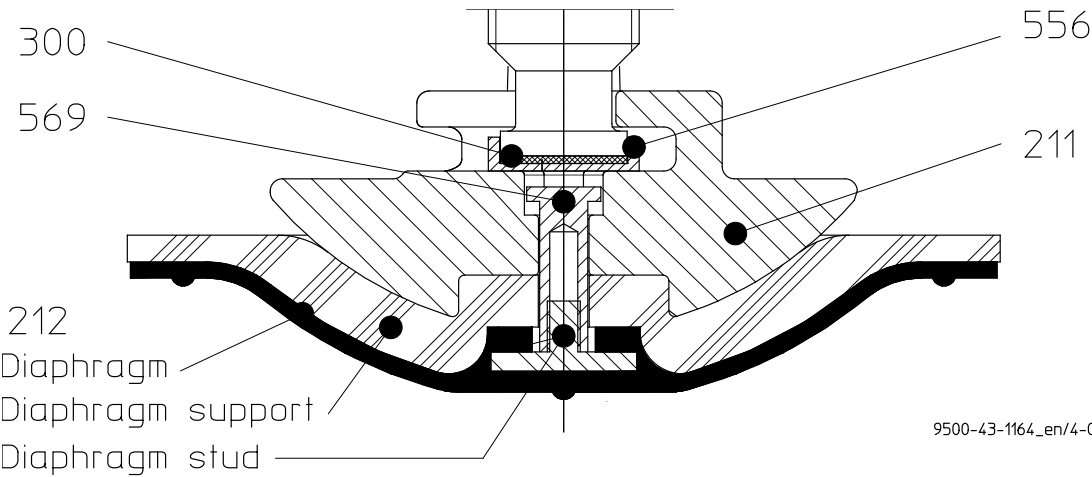


9500-43- 1164

Option monitoring connection

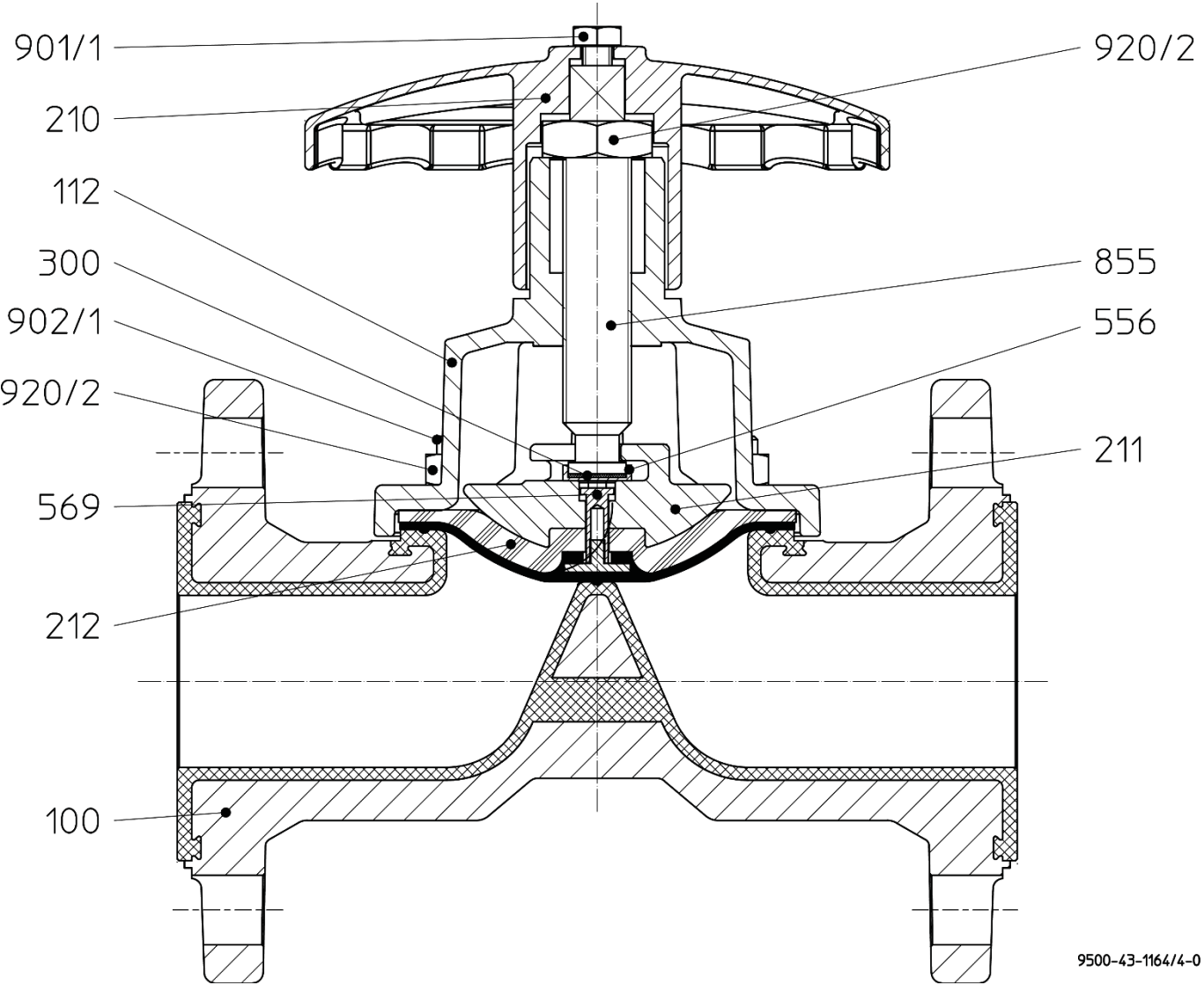


10.3 Detail Diaphragm



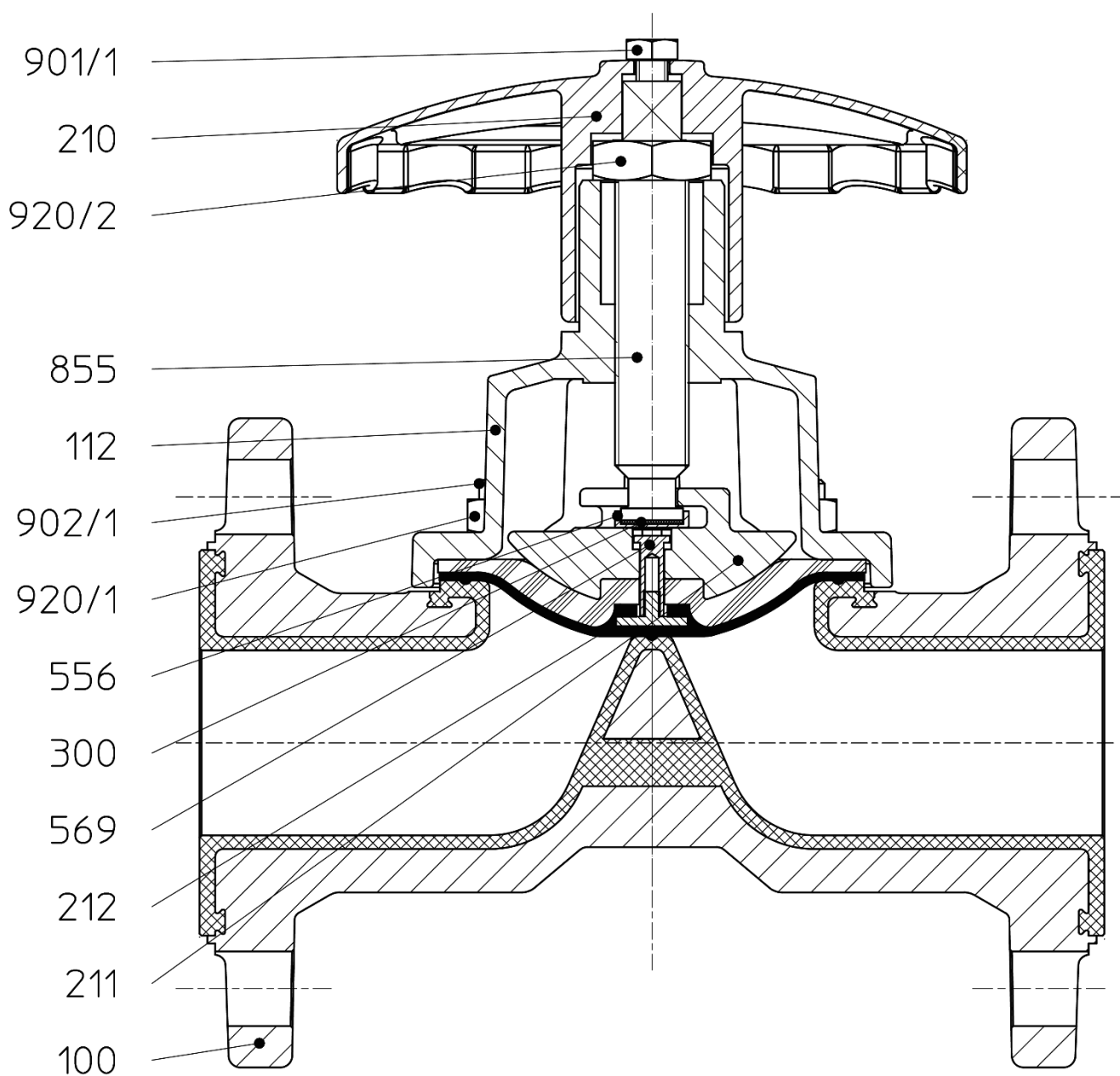
9500-43-1164_en/4-0

10.4 Sectional drawing MV/F



Holes of the flange screws view displaced by 45°

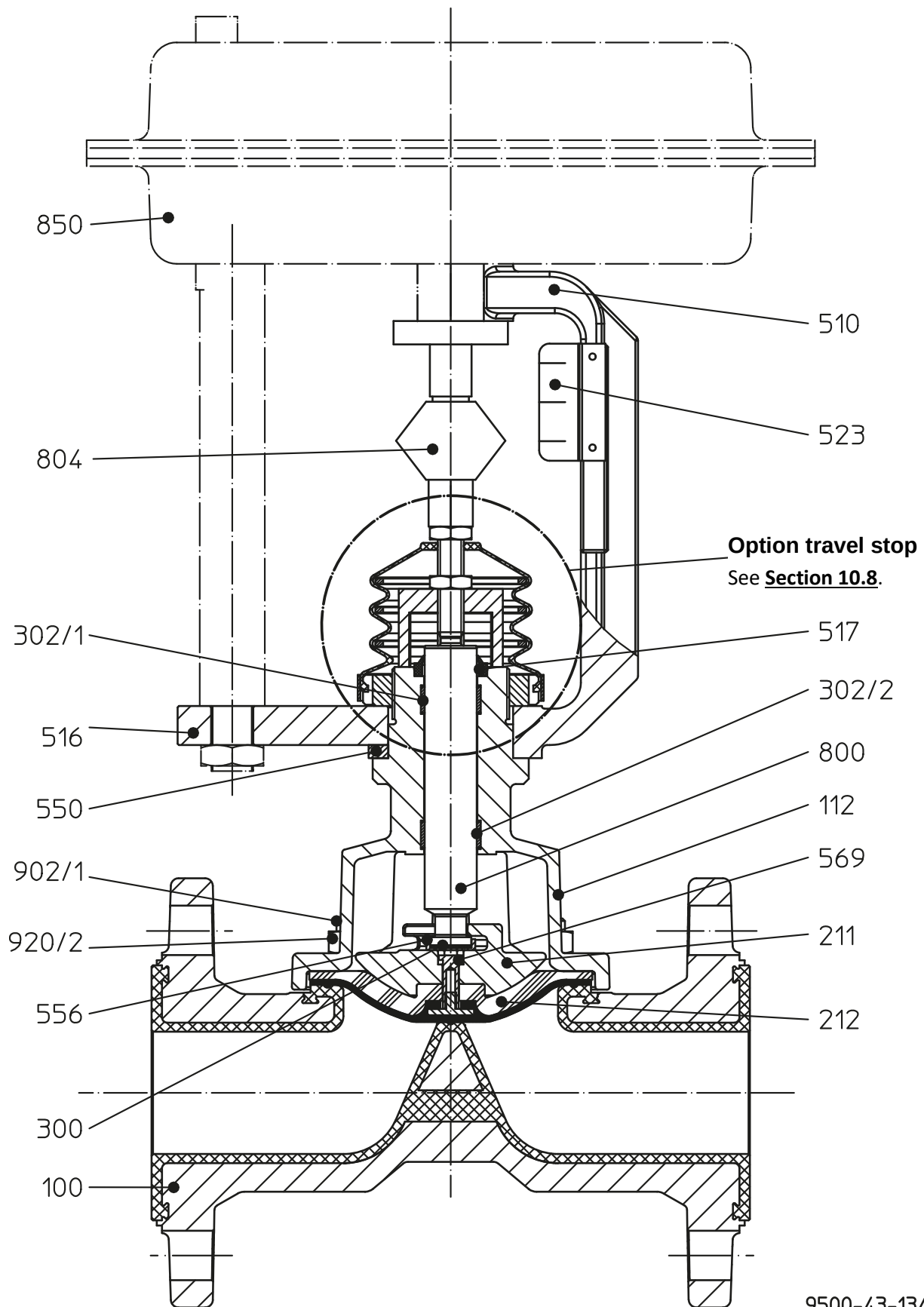
10.5 Sectional drawing MVM/F



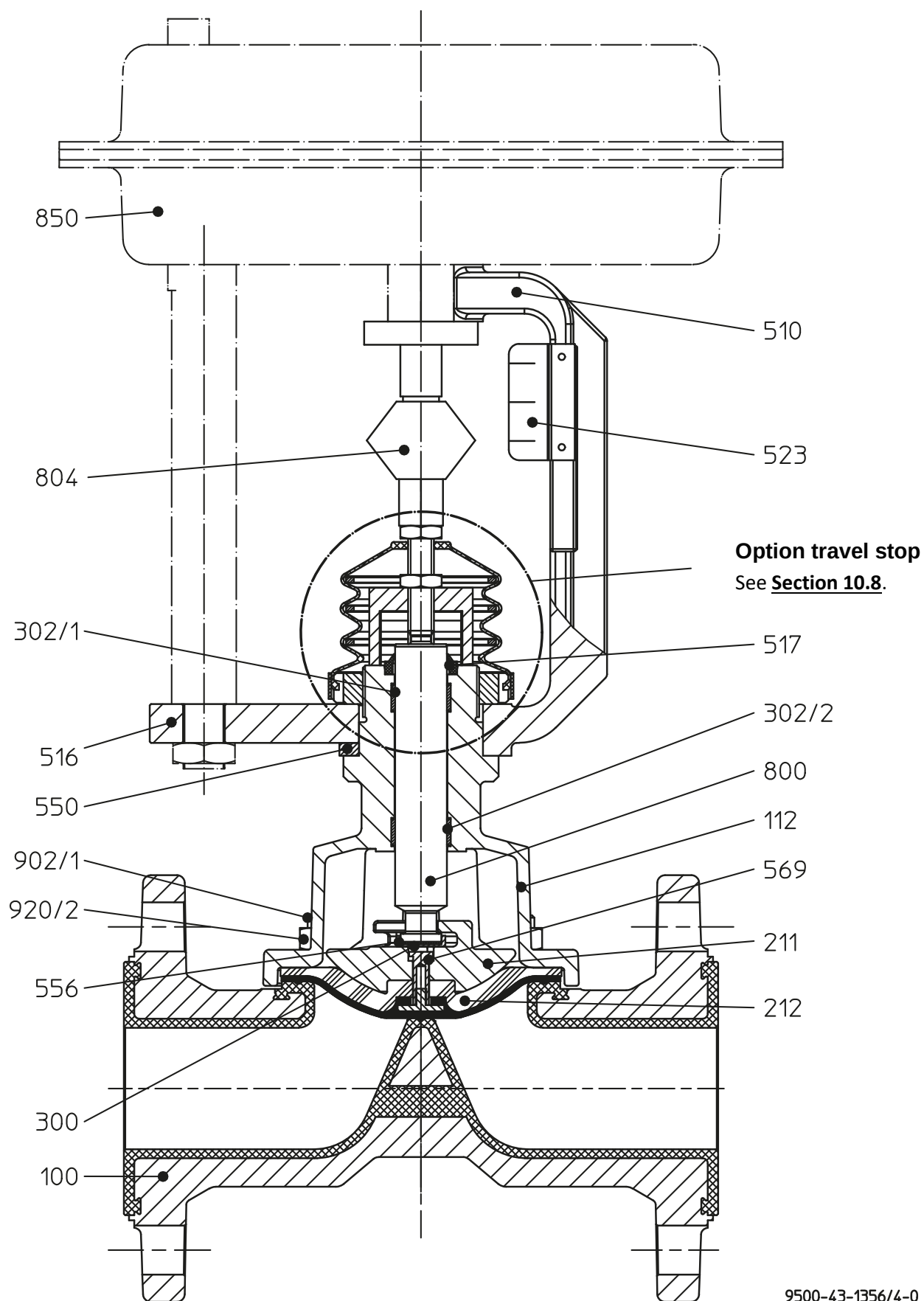
9510-00-3062/4-0

Holes of the flange screws view displaced by 45°

10.6 Sectional drawing MVP/F



10.7 Sectional drawing MVMP/F

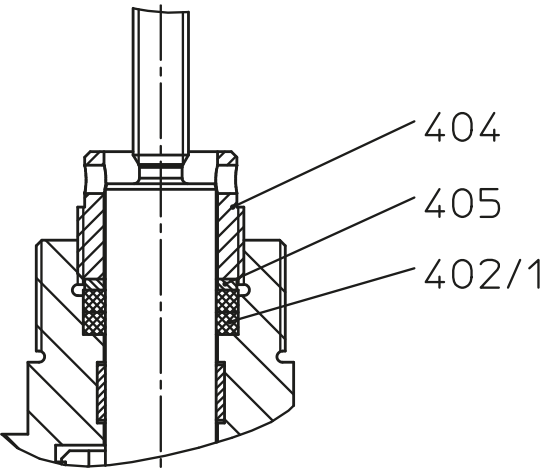


9500-43-1356/4-0

Holes of the flange screws view displaced by 45°

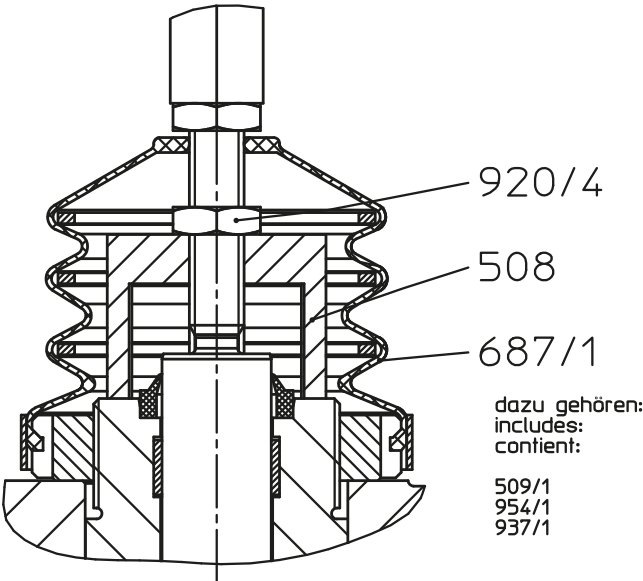
10.8 Options MVP/F, MVMP/F

Option safety stuffing box



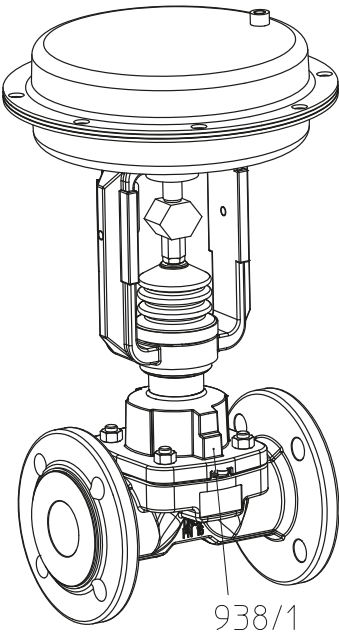
9510-00-3070/4-0

Option travel stop



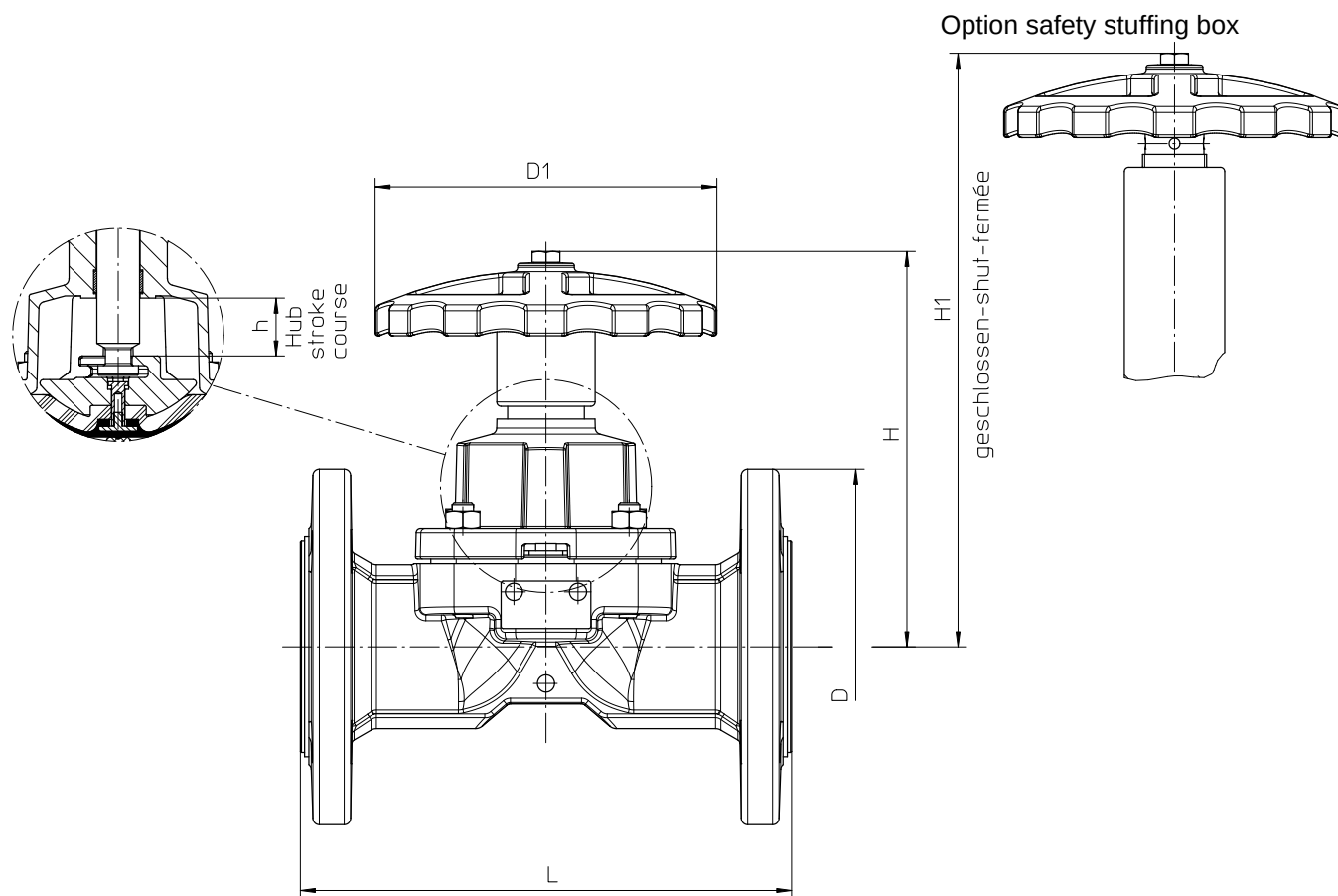
9510-00-3070/4-0

Option monitoring connection



9510-00-3070/4-0

10.9 Dimensional drawing MV/F

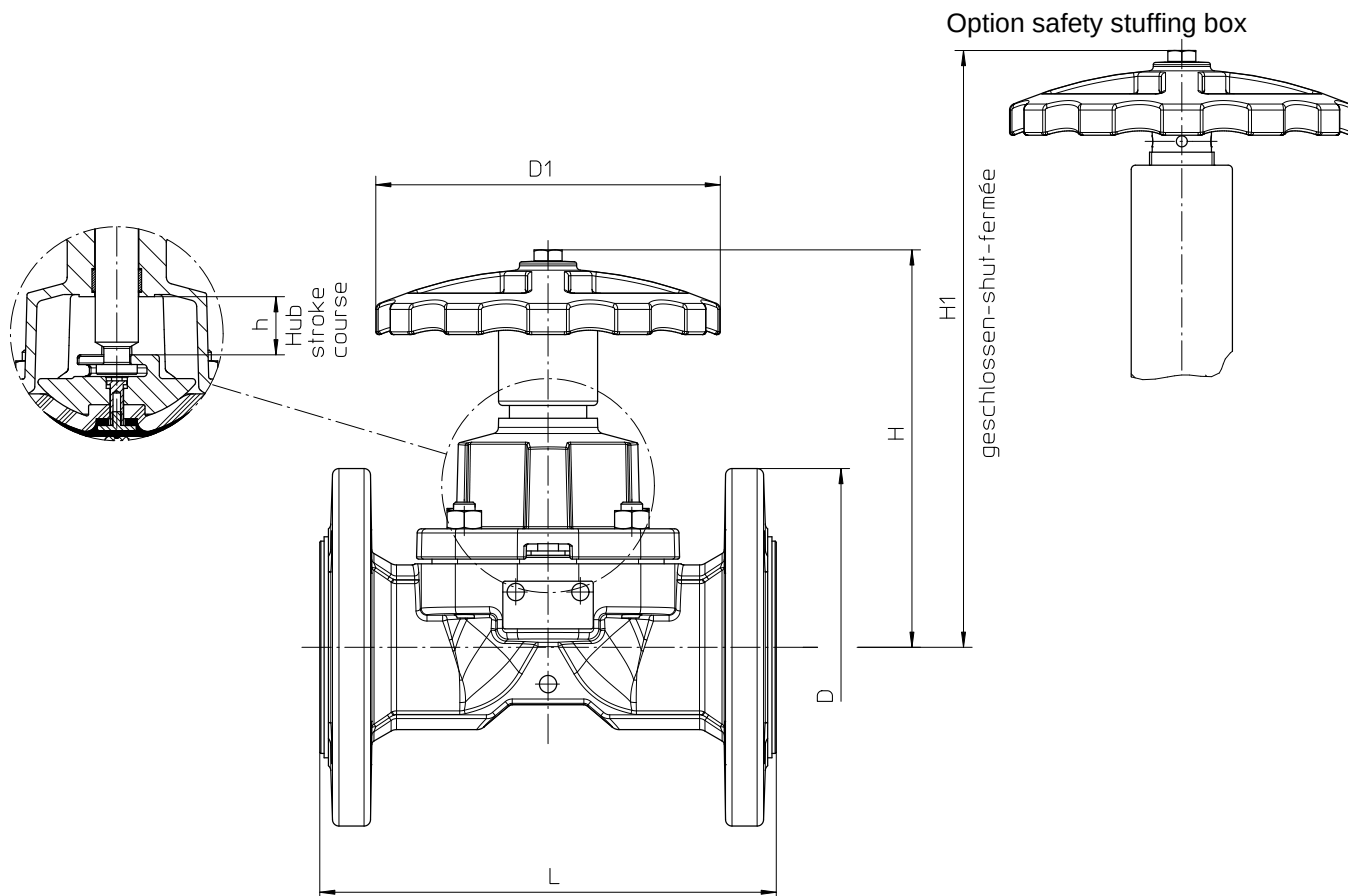


DN	L [mm] [inch]	D [mm] [inch]	D1 [mm] [inch]	H [mm] [inch]	H1 [mm] [inch]	h (stroke) [mm] [inch]	Weight [kg] [lb]
15	130 (5.12)	95 (3.74)	95 (3.74)	100 (3.94)	145 (5.71)	6.4 (0.25)	2.8 (6.17)
20	150 (5.91)	105 (4.13)	95 (3.74)	125 (4.92)	180 (7.09)	12 (0.47)	4 (8.82)
25	160 (6.3)	115 (4.53)	95 (3.74)	127 (5)	183 (7.20)	12 (0.47)	4.6 (10.14)
40	200 (7.87)	150 (5.91)	160 (6.3)	170 (6.69)	229 (9.02)	18 (0.71)	8.9 (19.62)
50	230 (9.06)	165 (6.5)	160 (6.3)	177 (6.97)	231 (9.09)	27 (1.06)	11.6 (25.57)
80	310 (12.2)	200 (7.87)	190 (7.48)	232 (9.13)	310 (12.2)	40 (1.57)	23.7 (52.25)
100	350 (13.78)	220 (8.66)	230 (9.06)	254 (10)	322 (12.68)	40 (1.57)	33.5 (73.85)
150	480 (18.9)	285 (11.22)	350 (13.78)	378 (14.88)	438 (17.24)	60 (2.36)	64.6 (142.42)

Flange connecting dimensions:

DIN EN 1092-2, type B (ISO 7005-2 type B) PN 16
or flanges drilled to ASME B16.5 Class 150

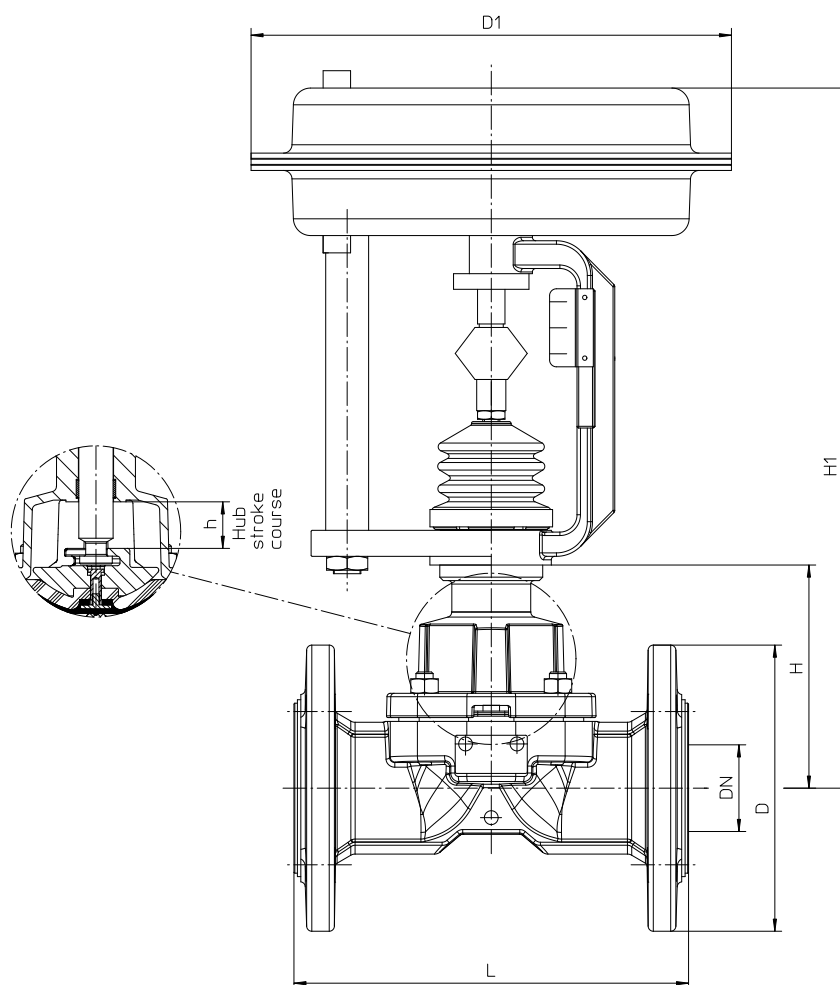
10.10 Dimensional drawing MVM/F



DN	L [inch] [mm]	D [inch] [mm]	D1 [inch] [mm]	H [inch] [mm]	H1 [inch] [mm]	h (stroke) [inch] [mm]	Weight [lb] [kg]
1"	5.8 (147.5)	4.25 (108)	3.74 (95)	5 (127)	7.2 (183)	0.47 (12)	9.92 (4.5)
1½"	6.89 (175)	5 (127)	6.3 (160)	6.7 (170)	9.02 (229)	0.71 (18)	17.42 (7.9)
2"	7.87 (200)	6 (152.5)	6.3 (160)	6.97 (177)	9.09 (231)	1.06 (27)	24.25 (11)
3"	10.23 (260)	7.5 (190.5)	7.48 (190)	9.13 (232)	12.2 (310)	1.57 (40)	50.71 (23)
4"	12.87 (327)	8.5 (216)	9.06 (230)	9.92 (252)	12.6 (320)	1.57 (40)	67.68 (30.7)
6"	13.38 (416)	11 (279.5)	13.78 (350)	14.76 (375)	17.13 (435)	2.36 (60)	132.06 (59.5)

Flange connecting dimensions:
ASME B16.5 Class 150, raised face

10.11 Dimensional drawing MVP/F



DN	L [mm] [inch]	D [mm] [inch]	D1 [mm] [inch]	H [mm] [inch]	H1 [mm] [inch]	h (stroke) [mm] [inch]	Weight * [kg] [lb]
15	130 (5.12)	95 (3.74)		68 (2.68)		6.4 (0.25)	3 (6.61)
20	150 (5.91)	105 (4.13)		89 (3.5)		12 (0.47)	4.2 (9.26)
25	160 (6.3)	115 (4.53)		92 (3.62)		12 (0.47)	4.8 (10.58)
40	200 (7.87)	150 (5.91)		126 (4.96)		18 (0.71)	9.1 (20.06)
50	230 (9.06)	165 (6.5)		130 (5.12)		27 (1.06)	12 (26.46)
80	310 (12.2)	200 (7.87)		172 (6.77)		40 (1.57)	21.3 (46.96)
100	350 (13.78)	220 (8.66)		193 (7.6)		40 (1.57)	29.7 (65.48)
150	480 (18.9)	285 (11.22)		275 (10.83)		60 (2.36)	56.2 (123.9)

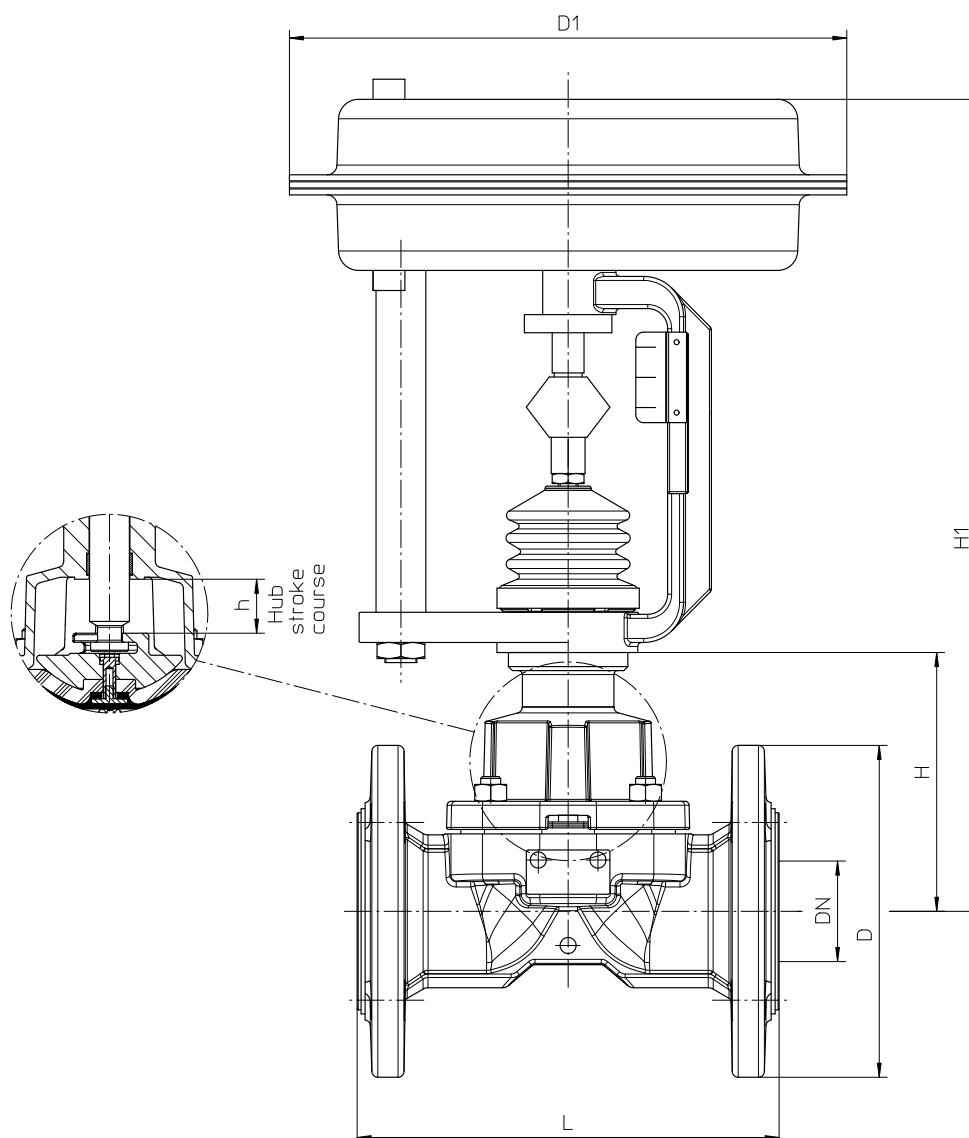
Flange connecting dimensions:

DIN EN 1092-2, type B (ISO 7005-2, type B) PN 16
or flanges drilled to ASME B16.5 Class 150

* without actuator

Dimensions D1 and H1 vary depending on the
actuator manufacturer.

10.12 Dimensional drawing MVMP/F



DN	L [inch] [mm]	D [inch] [mm]	D1 [inch] [mm]	H [inch] [mm]	H1 [inch] [mm]	h (stroke) [inch] [mm]	Weight * [lb] [kg]
1"	5.8 (147.5)	4.25 (108)		3.62 (92)		0.47 (12)	9.92 (4.5)
1½"	6.89 (175)	5 (127)		4.96 (126)		0.71 (18)	17.42 (7.9)
2"	7.87 (200)	6 (152.5)		5.13 (130)		1.06 (27)	24.25 (11)
3"	10.23 (260)	7.5 (190.5)		6.77 (172)		1.57 (40)	50.71 (23)
4"	12.87 (327)	8.5 (216)		7.52 (191)		1.57 (40)	67.68 (30.7)
6"	13.38 (416)	11 (279.5)		10.71 (272)		2.36 (60)	132.06 (59.5)

Flange connecting dimensions:
ASME B16.5 Class 150, raised face

* without actuator
Dimensions D1 and H1 vary depending on the
actuator manufacturer.

CE Konformitätserklärung nach EN ISO/IEC 17050
Declaration of Conformity according to EN ISO/IEC 17050

Produkt <i>Product</i>	Kunststoffausgekleidete Hubventile <i>Plastic lined globe control valves</i>
Bauart <i>Design</i>	Membranabsperrentil, Probenahmeventil, Bodenauslaufventil <i>Diaphragm shut-off or control valve, sampling valve, drain valve</i>
Baureihe <i>Series</i>	MV, MVM, MVP, MVMP, PA, PA/S, PAP, PAP/S, BAV, BAVM
Nennweite <i>Size</i>	DN 15 bis DN 150, ½" bis 6" <i>DN 15 to DN 150, ½" to 6"</i>
Seriennummer <i>Series number</i>	ab/from 01.09.2024
EU-Richtlinie <i>EU-Directive</i>	2014/68/EU Druckgeräterichtlinie 2006/42/EG ²⁾ Maschinenrichtlinie Anhang II, Nr. 1A 2014/68/EU <i>Pressure Equipment</i> 2006/42/EC ²⁾ <i>Directive Machinery Annex II, No. 1A</i>
Angewandte Technische Spezifikation <i>Applied Technical Specification</i>	DIN EN 16668, AD2000 DIN EN ISO 12100
Überwachungsverfahren <i>Surveillance Procedure</i>	2014/68/EU Zertifizierungsstelle für Druckgeräte der TÜV Nord Systems GmbH & Co. KG Große Bahnstraße 31 D-22525 Hamburg Notified Body 0045
Konformitätsbewertungs- verfahren 2014/68/EU <i>Conformity assessment procedure 2014/68/EU</i>	Modul H Zertifikats Nr. 0045/202/1411/Z/00470/22/D/001(00)
Kennzeichnung <i>Marking</i>	2014/68/EU ¹⁾ ≥ DN 32, ≥ 1" 2006/42/EG 2006/42/EC

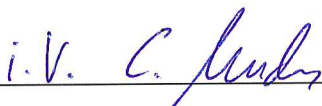
CE 0045
CE

Das Unternehmen Richter Chemie-Technik GmbH bescheinigt hiermit, dass die o.a. Baureihen die grundsätzlichen Anforderungen der aufgeführten Richtlinien und Normen erfüllen.
Richter Chemie-Technik GmbH confirms that the basic requirements of the above specified directives and standards have been fulfilled.

¹⁾ Für nicht aufgeführte Nennweiten ist eine Kennzeichnung nicht zulässig.
For sizes not listed a marking is not permitted.

²⁾ Armaturen mit freiem Wellenende, vorbereitet für Antrieb oder mit Antrieb und Zubehör. Ausgenommen sind handbetätigte Armaturen.
Valves with a bare shaft, prepared for actuator or with actuator and accessories. Excluded are manually actuated valves.

Kempen, 01.09.2024


Christian Muders
Director Global Engineering


Manuel Müller
Quality Manager



Konformitätserklärung
Declaration of Conformity

In Übereinstimmung mit den Leitlinien der britischen Regierung
in accordance with UK government guidance

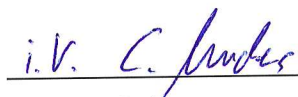
Produkt <i>Product</i>	Kunststoffausgekleidete Hubventile <i>Plastic lined globe control valves</i>
Bauart <i>Design</i>	Membranabsperrrventil, Probenahmeventil, Bodenauslaufventil <i>Diaphragm shut-off or control valve, sampling valve, drain valve</i>
Baureihe <i>Serie</i>	MV, MVM, MVP, MVMP, PA, PA/S, PAP, PAP/S, BAV, BAVM
Nennweite <i>Size</i>	DN 15 bis DN 150, ½" bis 6" <i>DN 15 to DN 150, ½" to 6"</i>
Seriennummer <i>Series number</i>	ab/from 01.09.2024
UK Gesetzliche Vorschriften <i>UK Statutory instruments</i>	2016 No. 1105 Druckgeräteverordnung 2016 2008 No. 1597 ¹⁾ Maschinenverordnung 2008 2016 No. 1105 The Pressure Equipment Regulations 2016 2008 No. 1597 ¹⁾ The Supply of Machinery Regulations 2008
Angewandte Technische Spezifikation <i>Applied Technical Specification</i>	DIN EN ISO 12100 DIN EN 16668, EN 13445
Überwachungsverfahren <i>Surveillance Procedure</i>	2016 No. 1105, 2008 No. 1597 Conformity Assessment Durchgeführt gemäß dem bestehenden PED-Modul H-Zertifikat im Rahmen der Erleichterungen der britischen Regierung vom Juni 2022. Applied according to existing PED Module H certificate under the UK government June 2022 easements.
Konformitätsbewertungs- verfahren 2014/68/EU <i>Conformity assessment procedure 2014/68/EU</i>	Modul H Zertifikats Nr. 0045/202/1411/Z/00771/19/D/001(00), TÜV Nord CE 0045 Module H Certificate no. 0045/202/1411/Z/00771/19/D/001(00), TÜV Nord CE 0045
Kennzeichnung <i>Marking</i>	2016 No. 1105, 2008 No. 1597 ¹⁾ 2016 No. 1105, 2008 No. 1597 ¹⁾



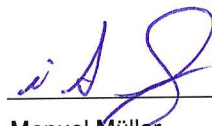
Das Unternehmen Richter Chemie-Technik GmbH bescheinigt hiermit, dass die o.a. Baureihen die grundsätzlichen Anforderungen der aufgeführten Richtlinien und Normen erfüllen. Diese Erklärung wird unter der alleinigen Verantwortung des Herstellers abgegeben.
Richter Chemie-Technik GmbH confirms that the basic requirements of the above specified directives and standards have been fulfilled. This declaration is issued under the sole responsibility of the manufacturer.

¹⁾ Armaturen mit freiem Wellenende, vorbereitet für Antrieb oder mit Antrieb und Zubehör. Ausgenommen sind handbetätigte Armaturen.
Valves with a bare shaft, prepared for actuator or with actuator and accessories. Excluded are manually actuated valves.

Kempen, 01.09.2024



Christian Muders
Director Global Engineering



Manuel Müller
Quality Manager

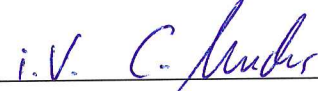
Konformitätserklärung FDA & 2014/68/EU
Declaration of Conformity

Produkt <i>Product</i>	PFA ausgekleidete Hubventile <i>PFA lined globe control valves</i>
Bauarten <i>Design</i>	Membranabsperrentil, Probenahmeventil, Bodenauslaufventil <i>Diaphragm shut-off or control valve, sampling valve, drain valve</i>
Baureihen <i>Series</i>	MV, MVM, MVP, MVMP, PA, PA/S, PAP, PAP/S, BAV, BAVM
Richtlinie <i>Directive</i>	FDA Regulation 21 CFR §177.15 50 2014/68/EU, EU Nr. 10/2011, EU Nr. 1935/2004, 84/500/EWG, 2005/31/EG
Mediumberührte Werkstoffe <i>Materials of media-wetted parts</i>	PFA PTFE Mod. PTFE

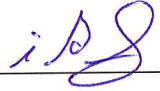
Das Unternehmen Richter Chemie-Technik GmbH bescheinigt hiermit, dass in medium berührten Teilen der o.a. Baureihen Materialien verwendet wurden, welche die Vorschriften der FDA Regulation 21 CFR §177.15 50, die Verordnungen 2014/68/EU, EU Nr. 10/2011, EU Nr. 1935/2004, 84/500/EWG und 2005/31/EG erfüllen bzw. dafür die allgemeinen Unbedenklichkeitsbescheinigungen des Herstellers/Lieferanten oder Prüflabors vorliegen. Entsprechende Einzelnachweise sind vorhanden.

The company, Richter Chemie-Technik GmbH, herewith certifies that in medium-wetted parts of the above-mentioned series materials were used which satisfy the provisions of the FDA Regulation 21 CFR §177.15 50 and Directives 2014/68/EU, EU no. 10/2011, EU Nr. 1935/2004, 84/500/EWG and 2005/31/EG or for which general compliance certificates of the manufacturer/supplier/test laboratory are available. Relevant *individual proof can be provided*.

Kempen, 01.09.2024



Christian Muders
Director Global Engineering



Manuel Müller
Quality Manager

Herstellererklärung ATEX
Richtlinie 2014/34/EU
Manufacturer's Declaration ATEX
Directive 2014/34/EU

Alle Richter Armaturen inkl. Absperr-, Regel- und Sicherheitsventile
All Richter Valves incl. Shut-off, Control and Safety Valves

Die oben bezeichneten Armaturen wurden einer Risikoanalyse nach der Richtlinie 2014/34/EU mit folgendem Ergebnis unterzogen:

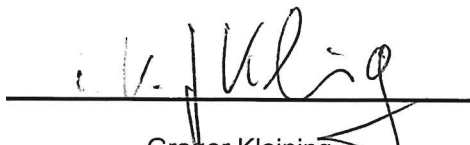
The valves specified above underwent a risk analysis according to Directive 2014/34/EU with the following result:

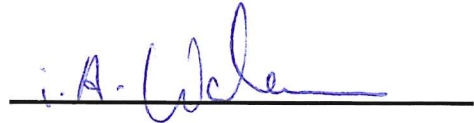
- **Richter Armaturen besitzen keine eigenen potentiellen Zündquellen. Die Armaturen können sowohl manuell als auch mechanisch/elektrisch angetrieben werden.**
Die Armaturen fallen nicht in den Anwendungsbereich der ATEX-Richtlinie 2014/34/EU und dürfen deshalb auch nicht danach gekennzeichnet werden.
Richter valves do not have their own potential sources of ignition. The valves can be actuated manually as well as mechanically/electrically.
ATEX Directive 2014/34/EU is not applicable to these valves. Therefore, it is not allowed to mark the valves according to that Directive.
- **Die Armaturen dürfen in explosionsgefährdeten Bereichen eingesetzt werden.**
The valves can be used in potentially explosive atmospheres.
- **Dennoch müssen für den Armatureneinsatz in explosionsgefährdeten Bereichen Sicherheitshinweise bzgl. des Explosionsschutzes beachtet werden. Richter hat hierzu die Betriebsanleitungen um den Zusatz „Sicherheitshinweise für den Einsatz in explosionsgefährdeten Bereichen in Anlehnung an die Richtlinie 2014/34/EU“ erweitert.**
However, when using the valves in potentially explosive atmospheres, specific safety notes on explosion protection must be observed. Here, Richter has extended their operating manuals to include the supplement „Safety notes for applications in potentially explosive atmospheres based on Directive 2014/34/EU“.

Ergänzender Hinweis: *Supplementary note:*

- **Elektrische/mechanische Antriebe müssen einer eigenen Konformitätsbewertung nach ATEX unterzogen werden.**
Electric/mechanical actuators must undergo a separate conformity assessment.

Kempen, 01.09.2021


Gregor Kleining
Director Global Engineering


Ivo Watermann
ATEX Beauftragter

Herstellererklärung / Manufacturer's Declaration

TA-Luft / German Clean Air Act

Richter Membranventil / Richter Diaphragm Valve

Hiermit erklären wir, dass die Membranventile der Baureihen
Hereby we declare, that the Diaphragm Valves of the series

MV, MVA, MVM

die Anforderung der Leckagerate $L_B (\leq 10^{-4} \text{ mg/s}\cdot\text{m})$ gemäß Ziffer 5.2.6.4 der Technischen Anleitung zur Reinhaltung der Luft (TA-Luft) von 2021 erfüllen.

Grundlage sind die Prüfungen sowie deren Bewertung und Qualifikation nach DIN EN ISO 15848-1 vom TÜV Süd Industrie Service GmbH.

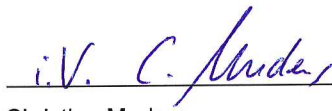
Voraussetzung für die Gültigkeit der Herstellererklärung ist das Beachten und Einhalten der Betriebsanleitung.

meet the requirement of the leakage rate $L_B (\leq 10^{-4} \text{ mg/s}\cdot\text{m})$ according to clause 5.2.6.4 of German Clean Air Act (TA-Luft) of 2021.

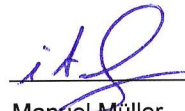
This is based on the tests as well as their evaluation and qualification according to DIN EN ISO 15848-1 by TÜV Süd Industrie Service GmbH.

A prerequisite for the validity of the manufacturer's declaration is that the operating instruction manuals are observed and complied with.

Kempen, 01.09.2024



Christian Muders
Director Global Engineering



Manuel Müller
Quality Manager

08.01.2015

Declaration of no objection

Dear Sirs,

The compliance with laws for the industrial safety obligates all commercial enterprises to protect their employees and/or humans and environment against harmful effects while handling dangerous materials.

The laws are such as: the Health and Safety at Work Act (ArbStättV), the Ordinance on Harzadous Substances (GefStoffV, BIOSTOFFV), the procedures for the prevention of accidents as well as regulations to environmental protection, e.g. the Waste Management Law (AbfG) and the Water Resources Act (WHG)

An inspection/repair of Richter products and parts will only take place, if the attached explanation is filled out correctly and completely by authorized and qualified technical personnel and is available.

In principle, radioactively loaded devices sent in, are not accepted.

Despite careful draining and cleaning of the devices, safety precautions should be necessary however, the essential information must be given.

The enclosed declaration of no objection is part of the inspection/repair order. Even if this certificate is available, we reserve the right to reject the acceptance of this order for other reasons.

Best regards

RICHTER CHEMIE-TECHNIK GMBH

Safety Information / Declaration of No Objection Concerning the Contamination of Richter-Pumps, -Valves and Components

1 SCOPE AND PURPOSE

Each entrepreneur (operator) carries the responsibility for the health and safety of his employees. This extends also to the personnel, who implements repairs with the operator or with the contractor.

Enclosed declaration is for the information of the contractor concerning the possible contamination of the pumps, valves and component sent in for repair. On the basis of this information for the contractor is it possible to meet the necessary preventive action during the execution of the repair.

Note: The same regulations apply to repairs **on-site**.

2 PREPARATION OF DISPATCH

Before the dispatch of the aggregates the operator must fill in the following declaration completely and attach it to the shipping documents. The shipping instructions indicated in the respective manual are to be considered, for example:

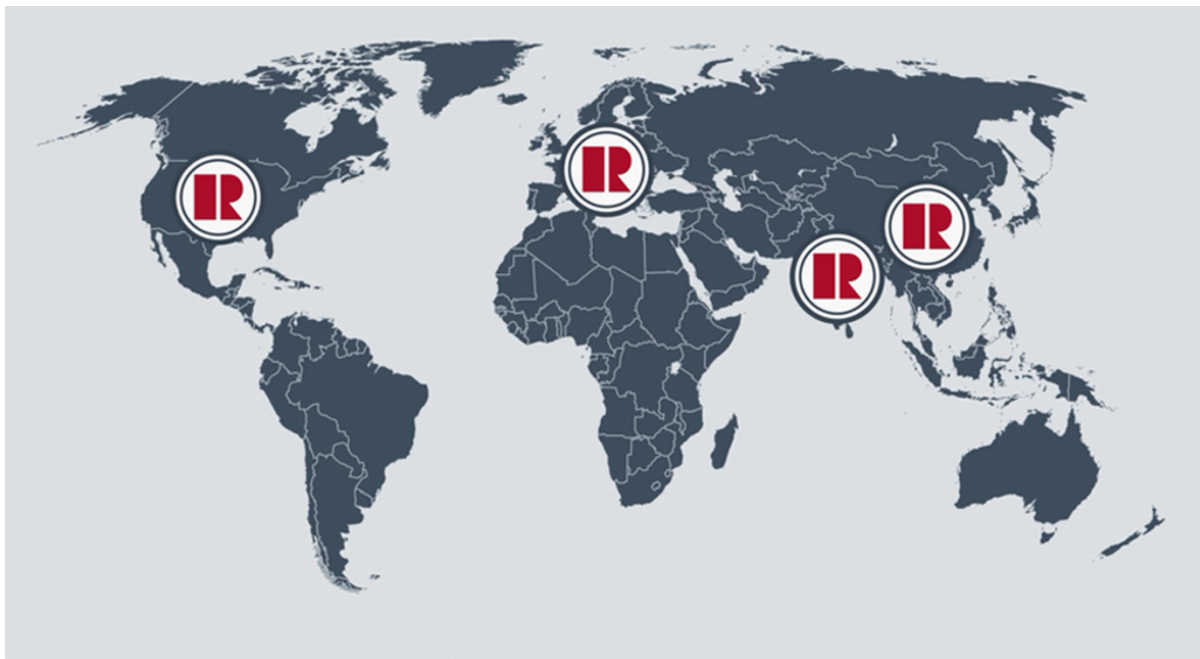
- Discharge of operational liquids
- remove filter inserts
- lock all openings hermetically
- proper packing
- Dispatch in suitable transport container
- Declaration of the contamination fixed **outside!!** on the packing

RICHTER
Process Pumps & Valves

Every aggregate has to have it's own declaration.

Contractor/dep./institute : _____ Street : _____ Postcode, city : _____ Contact person : _____ Phone : _____ Fax : _____ End user : _____		Reason for transmitting * Please mark the applicable Repair: ☐ subject to fee ☐ Warranty Austausch: ☐ subject to fee ☐ Warranty ☐ Exchange/ Replacement already initiated/received Return: ☐ Leasing ☐ Loan ☐ for credit note																
A. Details of Richter-product: Classification: _____ Article number: _____ Serial number: _____		Failure description: _____ _____ _____																
B. Condition of the Richter-product: Was it in operation ? ☐ no ¹⁾ ☐ yes ☐ no → Drained (product/operating supply item) ? ↓ ☐ ☐ All openings hermetically locked! ☐ ☐ Cleaned ? ☐ ☐ If yes, with which cleaning agent: and with which cleaning method:		Contamination : toxic ☐ no ¹⁾ ☐ yes caustic ☐ ☐ inflammable ☐ ☐ explosive ²⁾ ☐ ☐ mikrobiological ²⁾ ☐ ☐ radioactive ³⁾ ☐ ☐ other pollutant ☐ ☐																
¹⁾ if "no", then forward to D. ²⁾ Aggregates, which are contaminated with microbiological or explosive substances, are only accepted with documented evidence of an approved cleaning. ³⁾ Aggregates, which are contaminated with radioactive substances, are not accepted in principle.		C. Details of the discharged materials (must be filled out imperatively) 1. With which materials did the aggregate come into contact ? Trade name and/or chemical designation of operational funds and discharged materials, material properties, e.g. as per safety data sheet (e.g. toxic, inflammable, caustic) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">X</td> <td style="width: 40%;">Trade name:</td> <td style="width: 55%;">Chemical designation:</td> </tr> <tr><td>a)</td><td></td><td></td></tr> <tr><td>b)</td><td></td><td></td></tr> <tr><td>c)</td><td></td><td></td></tr> <tr><td>d)</td><td></td><td></td></tr> </table>		X	Trade name:	Chemical designation:	a)			b)			c)			d)		
X	Trade name:	Chemical designation:																
a)																		
b)																		
c)																		
d)																		
2. Are the materials specified above harmful to health ? ☐ no ☐ yes 3. Dangerous decomposition products during thermal load ? ☐ no ☐ yes If yes, which ones?		_____ _____ _____																

Company stamp



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Subject to change without notice.
These installation and operating instructions must be kept!

Edition 09/2024
Revision 7.0
9510B001-en

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