

Multi-function valve MFV

Installation and operating instructions



English (GB) Installation and operating instructions

Original installation and operating instructions.

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Warning

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

1. Safety instructions

These installation and operating instructions contain all information important for users of the product:

- technical data
- instructions on installation and use
- safety information.

If you require further information or if any problems arise, which are not described in detail in this manual, please contact Grundfos.

1.1 Symbols used in this document

The safety instructions are identified by the following symbols:



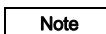
Warning

If these safety instructions are not observed, it may result in personal injury.



Caution

If these safety instructions are not observed, it may result in malfunction or damage to the equipment.



Note

Notes or instructions that make the job easier and ensure safe operation.

1.2 Qualification and training of personnel

The personnel responsible for the installation, operation and service must be appropriately qualified for these tasks.

Areas of responsibility, levels of authority and the supervision of the personnel must be precisely defined by the operator. If necessary, the personnel must be trained appropriately.

1.3 Safe operation

If safe operation is no longer possible, the product must be taken out of operation and secured against unintentional operation.

This is the case in the following situations:

- If the product is visibly damaged.
- If the product no longer seems operational.
- After long periods of storage under unfavourable conditions.

1.4 Safety instructions for the operator/user

The owner/operations manager of the system is responsible for training of operating personnel.



Warning

When working with chemicals, the accident prevention regulations applicable at the installation site must be applied!

Observe the chemical manufacturer's safety data sheets when handling chemicals!



Warning

When working on the product, or connections and lines, always wear protective clothing (e.g. safety goggles and gloves)!

The system must be unpressurised!

Only operate the system if all lines are connected correctly!



Warning

The chemical resistance of the parts that come into contact with the dosing medium depends on the medium, media temperature and operating pressure! Ensure that all parts in contact with the medium are resistant to the medium under operating conditions!

2. General information

2.1 Applications

The multi-function valve is suitable for the following applications:

- To maintain the required counterpressure of the pump in case of:
 - insufficient counterpressure in the system
 - open discharge.
- To protect the discharge line against an impermissibly high pressure build-up within the scope of the applications described in this manual.
- To deaerate the pump during start-up.
- To drain the discharge line.



Warning

Other applications or the operation in ambient and operating conditions, which are not approved, are considered improper and are not permitted! Grundfos cannot be held liable for any damage resulting from incorrect use!

2.2 Improper operating methods

The operational safety of the product is only guaranteed if it is used in accordance with section [2.1 Applications](#).

Caution

Multi-function valves are not isolating valves. They are never completely tight when closed.

The product must not be used for:

- operation in potentially explosive areas
- combustible media
- frozen media or gases
- abrasive or crystallising media.

2.3 Warranty

A guarantee claim in accordance with our general terms of sale and delivery is only valid if the following requirements are fulfilled:

- The product is used in accordance with the information within this manual.
- The product is not dismantled or handled incorrectly.
- The maintenance is carried out by authorised and qualified personnel.
- Only original spare parts are used for repairs during maintenance.

2.4 Function

The multi-function valve for direct installation on the discharge valve of the pump is designed as a double-diaphragm valve for pressure build-up (pressure loading valve) and pressure relief (pressure relief valve).

The valve can be used for the following purposes:

- **Start-up:** To deaerate the dosing head by relieving the counterpressure before starting the dosing pump.
- **Process:** To build up the required counterpressure to ensure that the suction and discharge valves are working properly. The valve keeps the pressure constant at the set pressure. This ensures optimum dosing in unpressurised systems and systems with fluctuating pressures.
- **Safety:** To protect the discharge line against impermissibly high pressure build-up. If the pressure rises above the set opening pressure of the valve, the valve opens, and the dosing medium passing through the pressure relief valve can flow back into the dosing tank.
- **Anti-siphoning:** In situations where the inlet pressure of the pump is higher or equal to the system pressure, but lower than the opening pressure of the multi-function valve, the multi-function valve prevents undesired siphoning, i.e. uncontrolled flow of the dosing medium through the discharge line (siphoning).

3. Technical data

3.1 Storage and ambient temperatures

	Operating pressure	
	< 12 bar	12-16 bar
Min./Max. ambient temperature [°C]	0/+40	0/+20
Min./Max. storage temperature [°C]	-10/+50	

3.2 Permissible media temperature

Material	Operating pressure	
	< 12 bar	12-16 bar
PVC, PP	0 °C to +40 °C	0 °C to +20 °C
PVDF	-10 °C to +40 °C	-10 °C to +20 °C

3.3 Type key

Code	Example	MFV	5/8-	10	PP/	E	U2
MFV	Multi-function valve						
	Pump connection						
5/8	G 5/8						
	Relief pressure						
10	10 + 2 bar						
16	16 + 2 bar						
	Connection material						
PP	Polypropylene						
PVC	Polyvinyl chloride						
PV	Polyvinylidene fluoride (PVDF)						
	Gasket material						
E	EPDM						
V	FKM						
T	PTFE						
	Connection, discharge side/relief side						
U2	Combined connection for hose 4/6 mm, 6/9 mm, 9/12 mm						
U7	Combined connection for hose 0.17" x 1/4", 1/4" x 3/8", 3/8" x 1/2"						

3.4 Multi-function valve data

Values are valid for media with a viscosity similar to that of water. For media with a higher viscosity, the specified pressures will be higher.

Pump-side connection	Preset valve working pressures		Max. operating pressure [bar]	Materials			Max. flow rate [l/h]	Pump types
	Approx. opening pressure [bar]	Approx. relief pressure [bar]		Housing	Connections	Gasket		
G 5/8	3-4	10 + 2 16 + 2	16	PVDF	PVC/PP/ PVDF	FKM/EPDM/ PTFE	60	DDA, DDC, DDE, DDI, DMX, DMH

3.5 Dimensional drawings

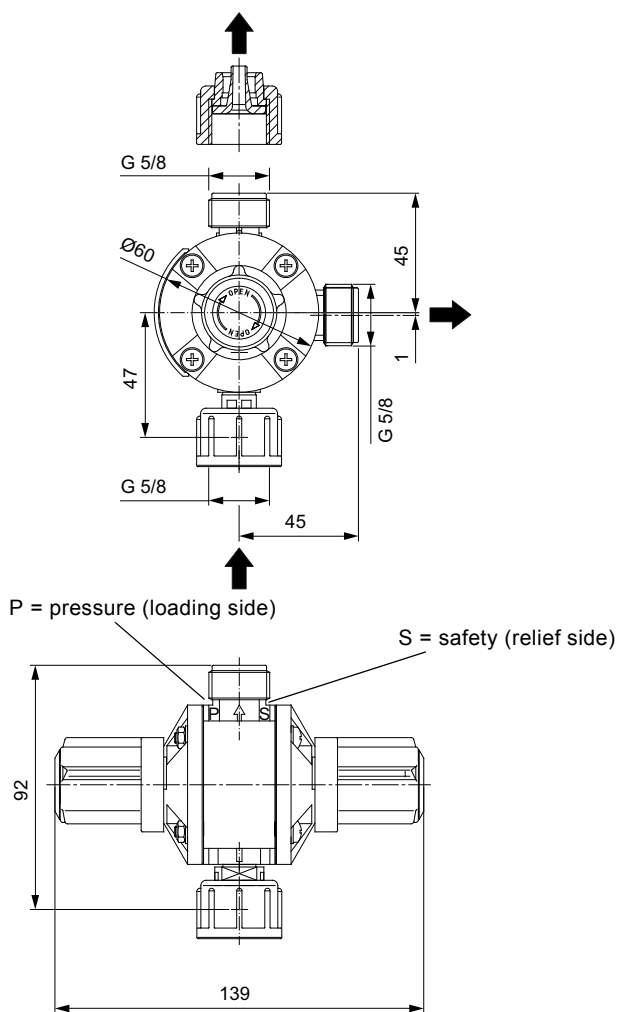


Fig. 1 Multi-function valve, dimensional drawings

4. Installation



Warning
The valve must only be installed by authorised and qualified personnel!



Warning
When working with chemicals, the accident prevention regulations applicable at the installation site must be applied!
Observe the chemical manufacturer's safety data sheets when handling chemicals!



Warning
When working on the product, or connections and lines, always wear protective clothing (e.g. safety goggles and gloves)!
The system must be unpressurised!
Only operate the system if all lines are connected correctly!

The multi-function valve is designed as a three-way valve. It has an inlet (A), an outlet on the discharge side (B), and an unpressurised relief outlet (C). See fig. 2.

The multi-function valve can be fitted directly to the discharge valve of the dosing pump.



Warning
Observe the flow direction (indicated by an arrow on the valve housing).

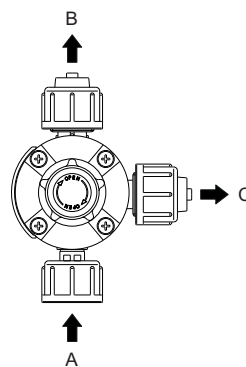


Fig. 2 Connections

1. Screw the inlet (A) onto the pump discharge valve.
2. Connect the discharge line to the outlet (B).
3. Connect the relief line to the relief outlet (C), and direct the unpressurised liquid to the tank or a suitable overflow.
4. Retighten screws on housing cover after 72 operating hours. Max. torque: 2.5 Nm.

5. Settings



Warning
Settings on the valve must only be carried out by authorized personnel!

The valve working pressures of the multi-function valve are factory-set to the values specified in section [3.4 Multi-function valve data](#).

During operation, the valve working pressures depend on various factors, e.g. the flow, the stroke frequency of the pump, or the counterpressure. If a more precise setting is required, the valve must be adapted to the local conditions. For media with a viscosity higher than that of water (1 mPas), the valve working pressures increase.

5.1 Setting the relief pressure



Warning
Danger of injury! Never set the relief pressure higher than the maximum permissible operating pressure of dosing system and dosing pump!

If the factory-set pressure of 10 + 2 bar or 16 + 2 bar is to be changed, proceed as follows (see fig. 3).

Caution
Do not bend or break the small pin on the inside of the protective cap. A broken pin will make the corresponding function (deaeration/draining) impossible.

1. Remove the protective cap from the green knob (pressure relief side).
2. Press the safety bolts against each other with a pair of needle-nosed pliers.
3. Remove the deaeration knob.
4. To increase the relief pressure, use a pair of needle-nosed pliers to turn the threaded thrust part clockwise into the housing, until the required pressure is reached.
5. To reduce the relief pressure, use a pair of needle-nosed pliers to turn the threaded thrust part counterclockwise out of the housing until the required pressure is reached.
6. Refit the deaeration knob. Both safety bolts must engage.
7. Refit the protective cap.

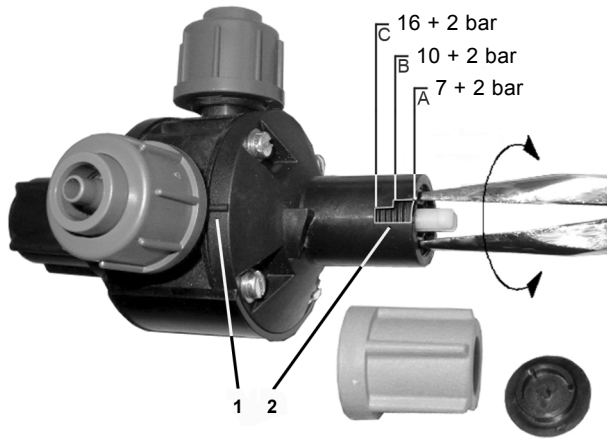


Fig. 3 Setting the relief pressure

Pos.	Description
1	Adjusting mark
2	Adjusting slot for relief pressure

Approx. relief pressure [bar]	
Slot upper edge (A)	7 + 2
Slot centre (B)	10 + 2
Slot lower edge (C)	16 + 2

5.2 Setting the opening pressure

The opening pressure of the pressure loading valve is factory-set to 3 to 4 bar, and should not be adjusted unless absolutely necessary.

For DDI pumps with flow monitor or DDA FC/FCM pumps, a counterpressure of 3 to 4 bar on the pressure loading valve is required.

If the factory-set pressure of 3 to 4 bar is to be changed, proceed as follows (see fig. 4).

Caution

Do not bend or break the small pin on the inside of the protective cap. A broken pin will make the corresponding function (deaeration/draining) impossible.

1. Remove the protective cap from the black knob (pressure loading side).
2. Press the safety bolts against each other with a pair of needle-nosed pliers.
3. Remove the knob.
4. To reduce the opening pressure, use a pair of needle-nosed pliers to turn the threaded thrust part counterclockwise out of the housing, until the required counterpressure is reached, e.g. 1 to 2 bar.
5. Refit the knob. Both safety bolts must engage.
6. Refit the protective cap.

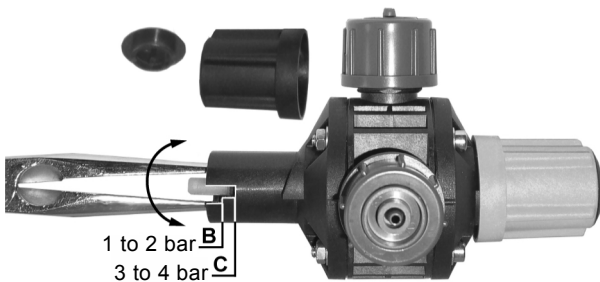


Fig. 4 Setting the opening pressure

Approx. opening pressure [bar]	
Slot centre (B)	1 to 2
Slot lower edge (C)	3 to 4

5.3 Deaerating the pump

Before starting up the pump, it can be depressurised and deaerated using the multi-function valve (see fig. 5).

- To deaerate the pump, turn the green deaeration knob (1) clockwise (direction of arrow on protective cap) as far as it will go.
- As long as the deaeration knob (1) is turned as far as it will go, the dosing medium can flow through the relief line (7) to the tank.
- When released, the deaeration knob automatically returns to its original position.

5.4 Draining the discharge line



Warning

A non-return valve must be fitted to the injection point, otherwise the entire content of the system can flow back.

Proceed as follows (see fig. 5).

- Simultaneously turn the green deaeration knob (1) and the black knob (4) clockwise (direction of arrow on protective cap) as far as they will go. The dosing medium flows through the relief line (7) back to the supply container.
- The two knobs must be held in this position until all the medium has flown into the container.
- When released, both knobs automatically return to their original positions.

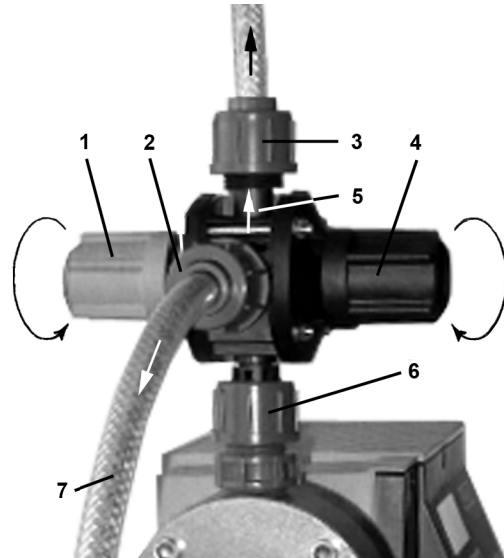


Fig. 5 Multi-function valve components

Pos.	Description
1	Green deaeration knob (pressure relief side)
2	Relief outlet
3	Discharge side outlet
4	Black knob (pressure loading side)
5	Flow direction of dosing medium
6	Valve inlet
7	Relief line

6. Maintenance

Caution

The multi-function valve must not be dismantled. The valve requires no maintenance and cannot be repaired.

7. Fault finding

Fault	Possible cause	Possible remedy
Medium is flowing through the pressure relief valve continuously.	Relief pressure set too low.	Set the valve to a higher relief pressure.
	Defective diaphragm.	Replace the multi-function valve.
	Dirt in the pressure relief valve.	Rinse the pressure relief valve.
No medium is flowing through the pressure relief valve.	Relief pressure set too high.	Set the valve to a lower relief pressure.
	Defective diaphragm.	Replace the multi-function valve.
The pressure loading valve does not produce any counterpressure.	Dirt in the pressure loading valve.	Rinse the pressure loading valve.
	Opening pressure set too low.	Set the pressure loading valve to a higher opening pressure.

8. Disposal

This product or parts of it must be disposed of in an environmentally sound way. Use appropriate waste collection services. If this is not possible, contact the nearest Grundfos company or service workshop.

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