

1 General

This technical manual contains all the necessary instructions for the installation, start-up, maintenance and repair of the pneumatic metering pump.

The safety instructions and pointers must always be observed!

Scope of guarantee:

The manufacturer only accepts the guarantee with regard to the operating safety, reliability and capacity of the metering pump under the following conditions:

- Assembly, connection, adjustment, maintenance and repairs are carried out by authorized, qualified personnel.
- The metering device is used in accordance with the instructions in the technical manual.
- Only **original spare parts** are used for repairs.
- If the pump casing is opened, then the guarantee will become void.

1.1 Safety instructions

During maintenance and repair work on parts which come into contact with cleaning products, and when replacing the bindings, the prescribed **protective clothing** (protective glasses, protective gloves, apron) must be worn because of the danger of irritation.

Only **original spare parts** must be used for repairs.

1.2 Pointers

In this manual, the **CAUTION**, **ATTENTION** and **NOTE** pointers have the following meanings:

CAUTION: This heading is used if imprecise or non-adherence to operating instructions, work instructions, prescribed work procedures and the like can lead to injury or accident.

ATTENTION: This heading is used if imprecise or non-adherence to operating instructions, work instructions, prescribed work procedures and the like can lead to the device being damaged.

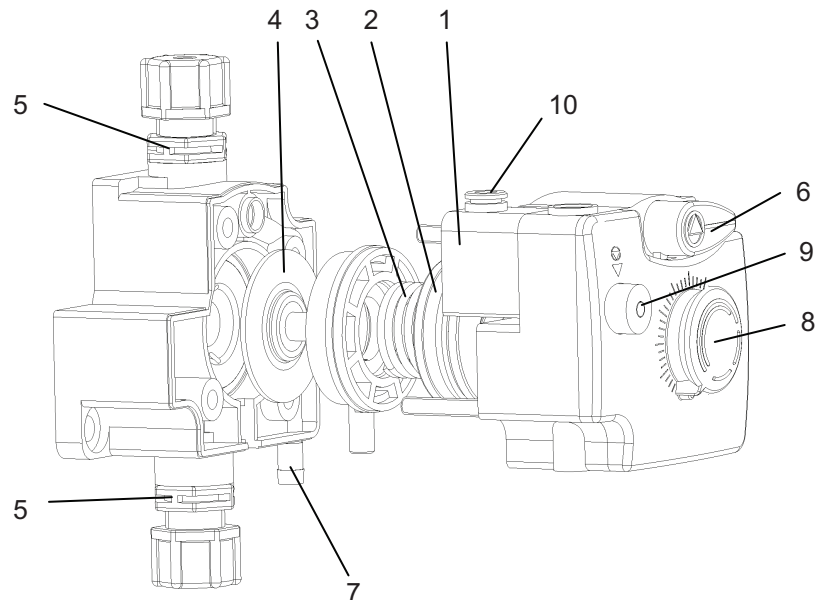
NOTE: This heading is used if a special feature is being pointed out.

2 Description of pump functions

2.1 Pump model without integrated solenoid valve

The metering pump is pneumatically activated via an external 3/2-way solenoid control. The piston (2) is moved with the PTFE-coated diaphragm (4) against the return spring (3) to the metering stroke. The suction stroke is caused by the return spring (3).

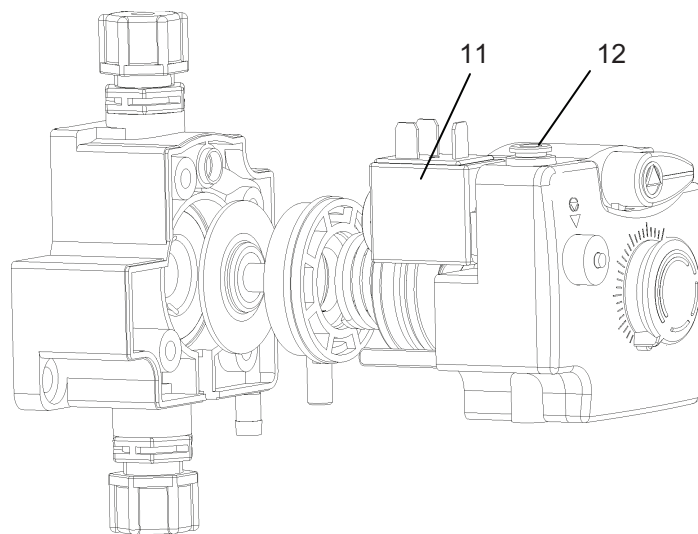
The pump heads are equipped with double spherical valves (pos. 5) for the suction and pressure lines, as well as with a separate venting lever (pos. 6) with return line connection (pos. 7). The metering capacity of the pump can be mechanically adjusted during operation by means of stroke adjuster (pos. 8).



1. Valve block
2. Piston
3. Return spring
4. Diaphragm
5. Double ball valve
6. Venting lever
7. Return line connection
8. Stroke adjuster
9. Manual push button
10. Compressed air inlet

2.2 Pump model with integrated solenoid valve

This version of the metering pump is activated via an integrated 3/2-way solenoid control valve (11) (it functions as described at 2.1 above). The compressed air inlet (12) is located at the control block.



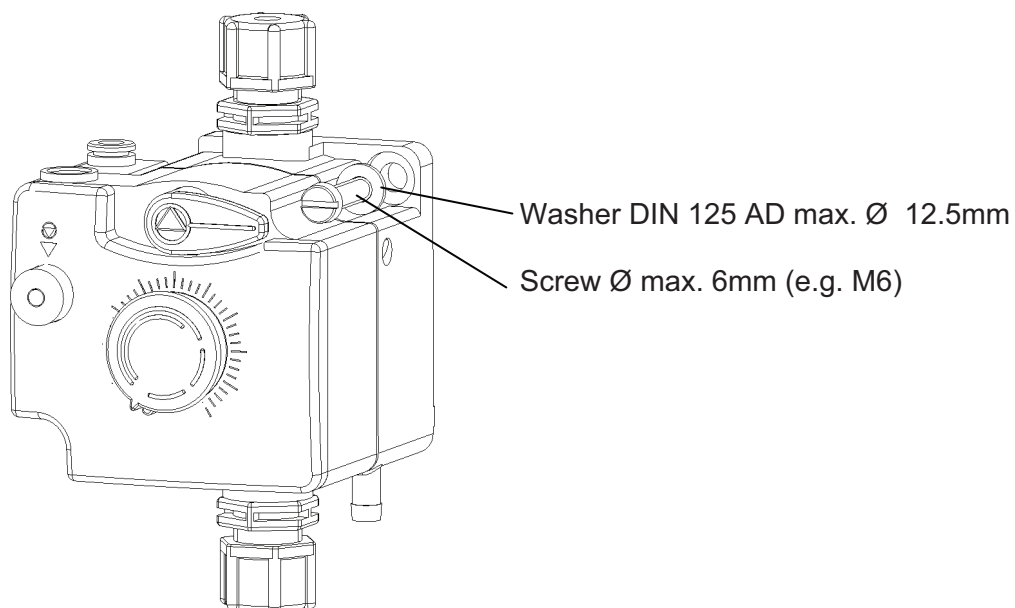
- 11. Solenoid control valve
- 12. Compressed air inlet

3. Getting started

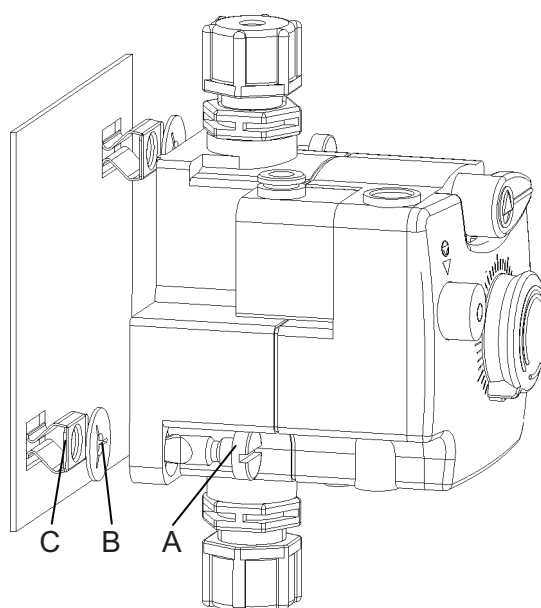
NOTE: When setting up the pump, take into account the suction height of up to 1.5 metres.

3.1. Fixing in place (see also chapter 5)

3.1.1. Fixing to a wall, with screws



3.1.2. Fixing to a wall, with bayonet-mounting (option)



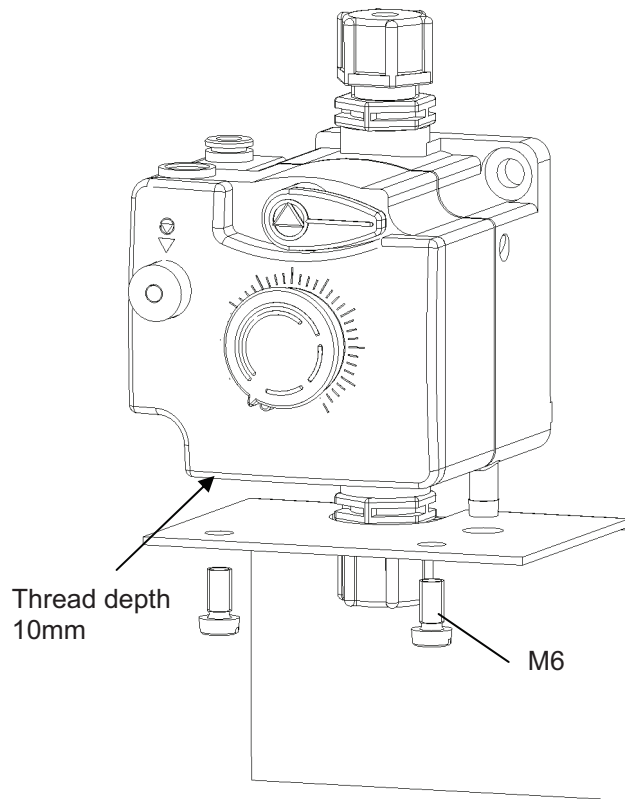
To mount, guide bayonet screw (A) through the hole and then secure by means of retaining washer (B).

The bottom part of the locking unit (C) should be clipped into the square hole.

To lock in place, apply gentle pressure and turn the bayonet screw one quarter of a turn to the left or right.

To release, turn one quarter of a turn to the left or right.

3.1.3. Bracket (option)

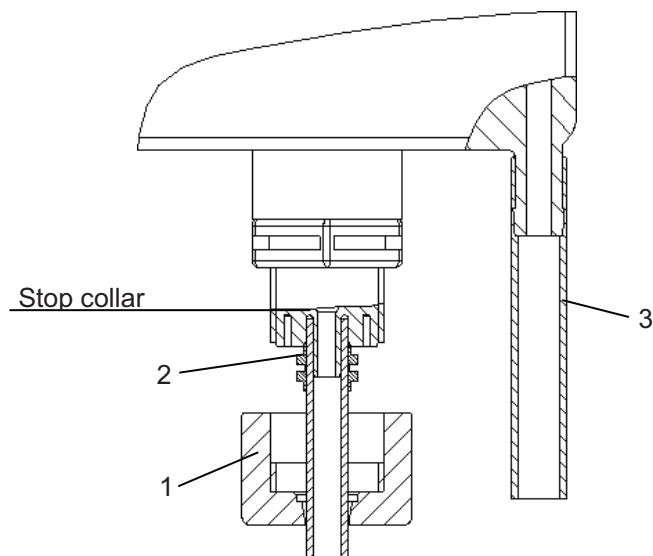


Warning: Do not screw into the pump more than 10mm and less than 5mm.

3.2 Connections

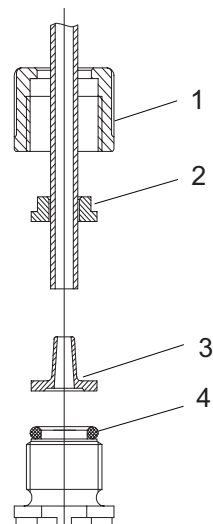
3.2.1 Serto system DI/DA 4/6

- Cut off hose at right angles.
- Slide union nut (1) and clamping ring (2) over the hose.
- Push hose onto the valve's connector nipple right up to the stop collar.
- Tighten union nut
- Push on venting line NW6 (3) and secure from slipping off with hose clip.



3.2.2 Universal system DI/DA 4/6 / 6/8 / 6/12

- Cut off hose at right angles.
- Slide union nut (1) and clamping ring (2) over the hose.
- Push hose onto the tapered part (3) right up to the stop collar.
- Place O-ring (4) into valve groove and tighten union nut.
- Push on venting line NW6 (3) and secure from slipping off with hose clip.

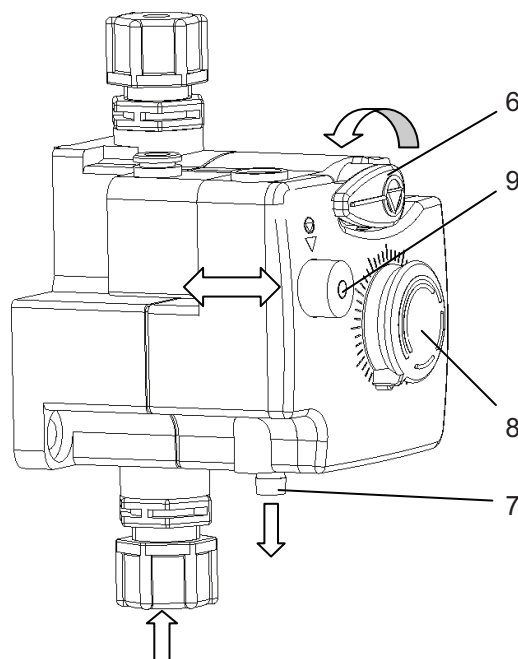


3.3 Air connection

Establish air (PE/PA air pressure hose AD6) and electrical connections as appropriate for each model type.

- a) without integrated solenoid valve (see section 2.1)
- b) with integrated solenoid valve (see section 2.2)

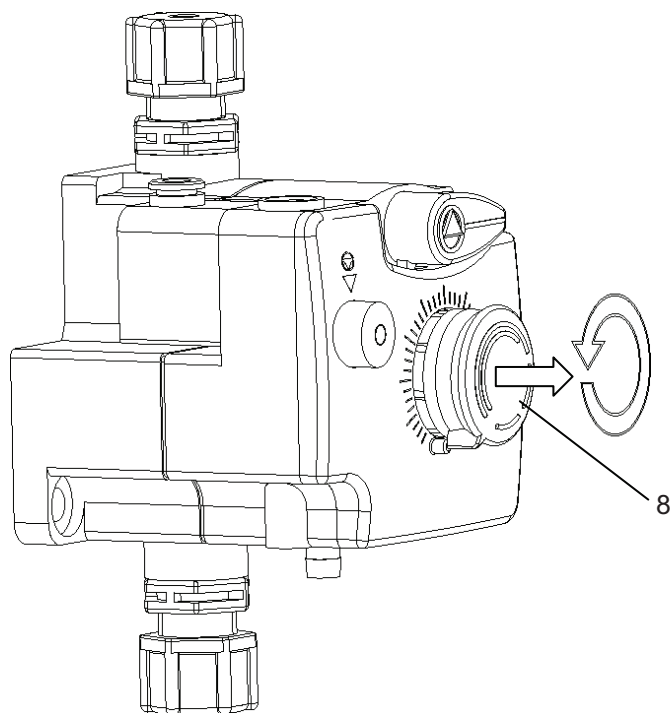
3.4 Deairing of the pump head



- Turn venting lever (6) to the left to 'Vent', so that the arrow is pointing down
- Using the stroke adjuster, set metering amount to 100% (chapter 3.5)
- Charge the system (air pressure line) with compressed air
 - a) Pump without integrated solenoid valve:
 - Press the push button (9) repeatedly until the metering material comes out of the return line (venting line - 7) without any bubbles. The pump creates suction every time that the button (9) is pushed, and an intake stroke is created every time it's released.
 - Air can also be vented by switching the compressed air on and off.
 - b) Pump with integrated solenoid valve:
 - Air can be vented by activating the solenoid valve or by pressing the manual push button. Each control pulse of the valve or press on the button creates a metering stroke.
 - Repeatedly activate the solenoid valve, or press the push button until the metering material comes out of the return line (venting line) without any bubbles.
- If necessary, set the metering amount, by adjusting the stroke setting after the pump has been primed to the metering amount set prior to venting – see chapter 3.5.
- Turn venting lever to the right to 'Metering', so that the arrow is pointing up.

3.5 Stroke setting

To set the metering amount, release the ratchet by pulling out the stroke adjuster (8), set to the desired setting (by turning) and press the stroke adjuster back in.



4 Technical data

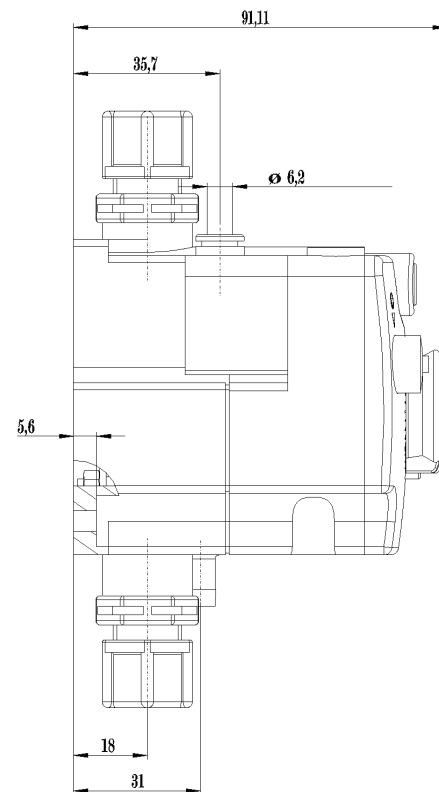
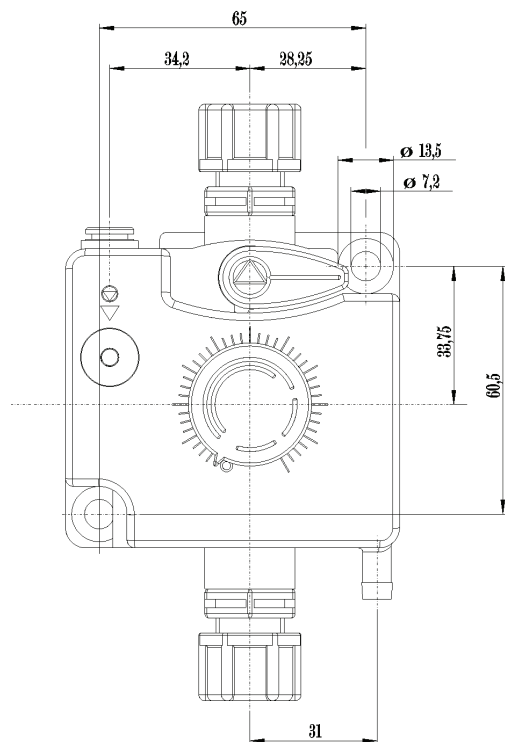
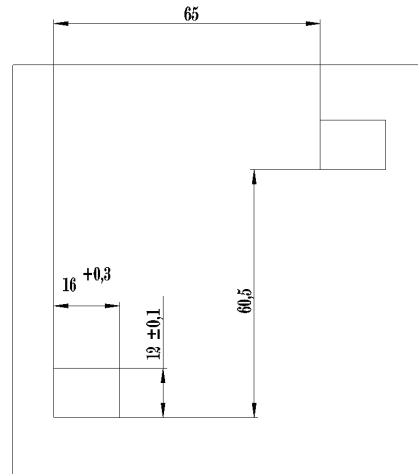
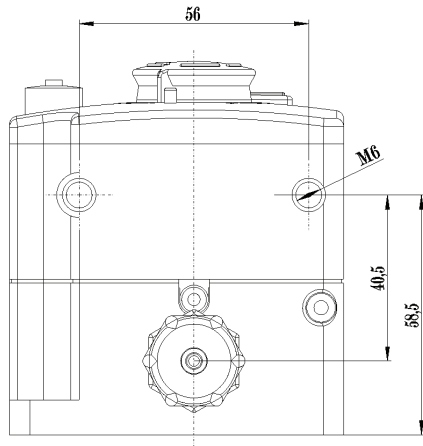
Type	PDP 00030	PDP 00120
Output (l/h)	3.3 / 5 bar	12 / 5 bar
Metering back-pressure (bar)	10	6
Metering operating range, with compressed air at 6 bar.	1.5 - 10	1.5 - 6
Max. air control pressure (bar)	7	
Stroke frequency (strokes/min)	120	
Min. activation time	480 msec. ON 480 msec. OFF	
Suction height (m) at 100% stroke setting*	1.5	
Suction / pressure connection ID / AD	4/6 / option 4/6 / 6/8 / 6/12	
Air connection AD	6	
Voltage** according to version	24 VDC / 50/60 Hz 24 VAC / 50/60 Hz 48 VAC / 50/60 Hz	
Output**	7 W	
Starting time**	100 %	
Component materials:		
Valves, pump head	PP	
Seals	VITON B	
Valve ball	Stainless steel	
Valve spring	Hastelloy	
Housing	PPO / PP	

* Suction heights with clean, moistened valves

** Figures for pump fitted with solenoid valve

All figures based on water at 20°C and operation in accordance with the operating instructions on

5 Dimensions



6 Metering capacity

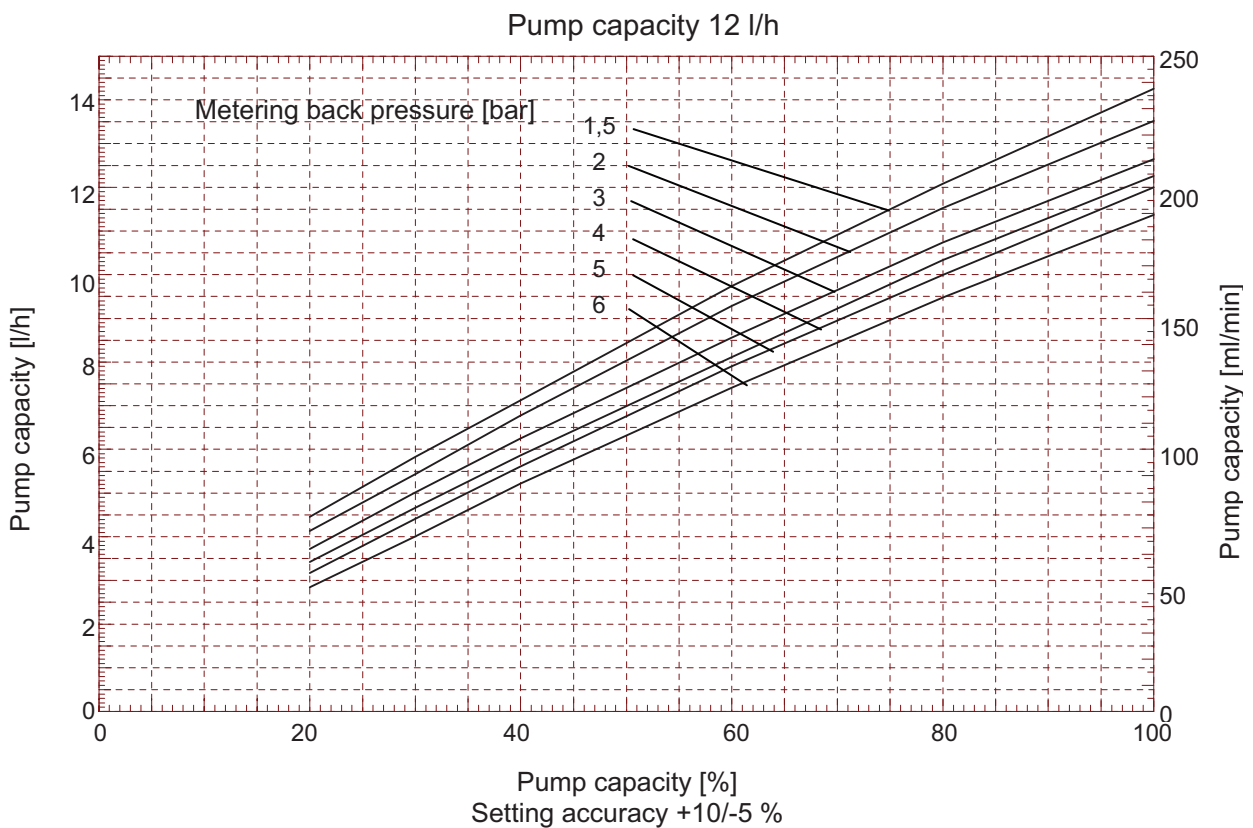
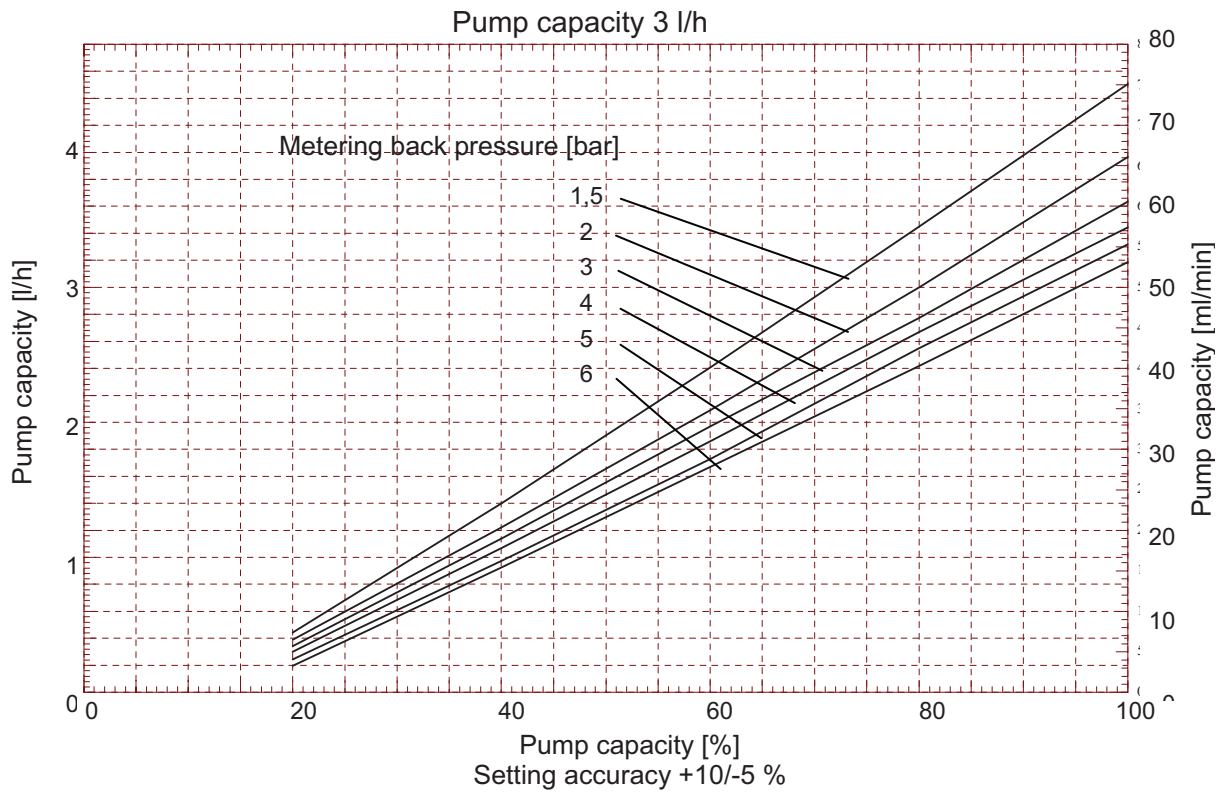
To achieve accurate metering, the following points should be noted:

- a) All metering capacity figures are based on measurements with water at 20°C. The metering capacity depends also on the viscosity and the specific gravity of the metering product.
- b) To achieve a high degree of free flow metering accuracy, a pressure maintenance valve (or metering valve) should be used to produce counter pressure of at least 1 bar and to hold it as static as possible.
- c) If there is primary pressure on the suction side, the differential pressure between the suction side and the pressure side should be at least 1 bar. The head of water on the metering pump must be safeguarded by an appropriate valve arrangement.

NOTE: **Neither a pressure maintenance valve nor a metering valve can be regarded as a means of closing off the flow completely.**

WARNING: **Only adjust the metering stroke of a pump that is in use if the stroke adjustment screw is not under pressure.**

7 Delivery performance diagrams



8 Maintenance

CAUTION: Metering pumps may only be maintained by expert, authorised personnel.

8.1 General maintenance

NOTE: Quarterly maintenance interval, shorter intervals if load is greater (e.g. constant running).

It is recommended that the following be checked:

- Suction and pressure line for leak-free connection
- Suction and pressure valve (pos. 5) for soiling and sealing function
- Check exit hole on intermediate pump section (membrane break)
- Check correct pumping by suction drive
- Metering head screws

NOTE: The lifetime of the membrane depends on:
Counterpressure, operating temperature and metering material.
Frequent checking of the membrane is recommended at extreme temperatures and when metering abrasive materials.

8.2 Replacement of wearing parts

Diaphragm exchange yearly or after 4000 operating hours (see chapter 9)

Valves exchange yearly

Grease piston lip seal after 3 years.

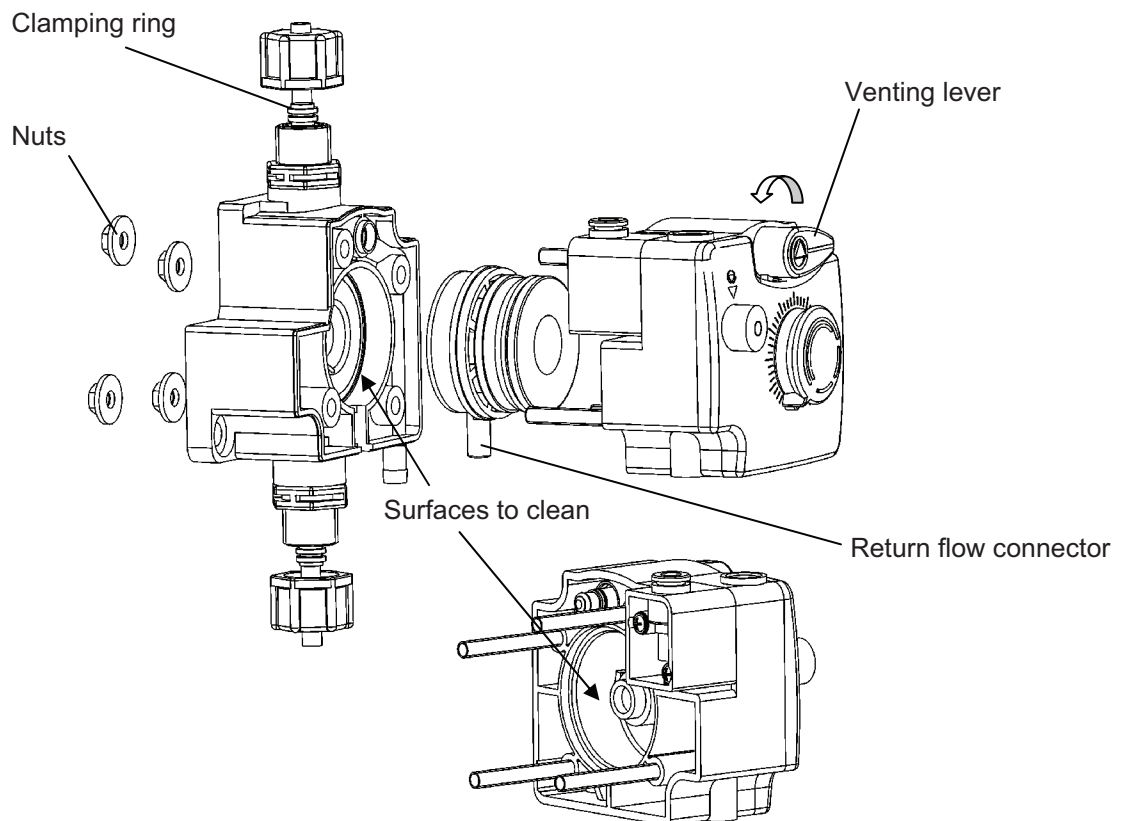
9 Replacing the diaphragm and pump head

WARNING: Before any work is done on the valves or the metering head, the metering head must be emptied. Attention should be paid to instructions on the product datasheet for the material being metered.

NOTE: Check metering head screw tightening torque after 24 hours. Tightening torque 3 - 4 Nm.

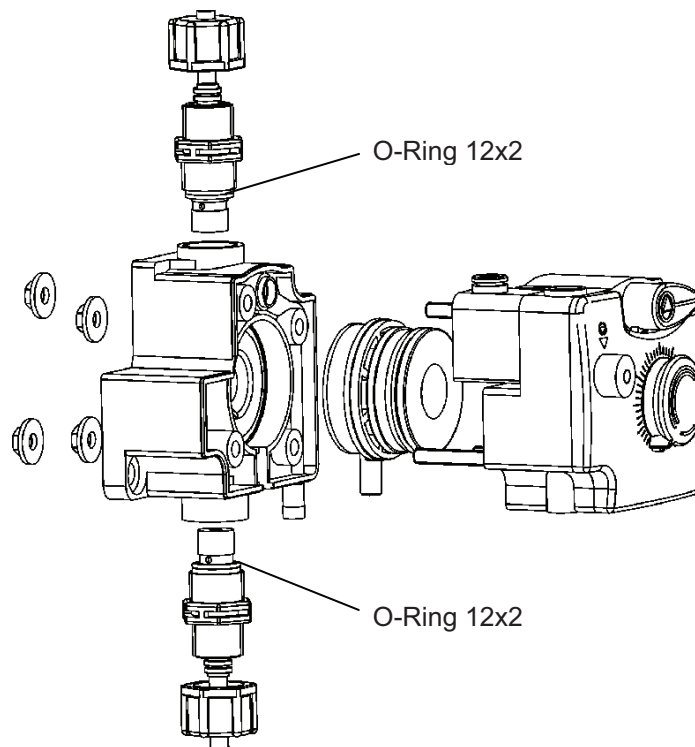
Changing the diaphragm: Turn venting lever left. Cross loosen nuts. Pull off pump head. Take out diaphragm cartridge. Clean mounting surfaces in the pump head and piston running surfaces (see arrows). Carefully insert new diaphragm cartridge. Do not damage piston groove ring. The diaphragm cartridge's return flow connector must point downwards. Push the pump head into place and cross tighten with nuts (tightening torque 3-4 Nm). **NOTE:** If necessary, replace clamping ring. Close venting lever (turn right with the arrow in the 'up' metering direction).

- Check for leaks and, if necessary, make adjustments (see section 10, 'Readjusting the venting lever')



Changing the pump head:

- Dismantle pump head as described above. Unscrew double ball valve with an open-ended spanner (SW22). Clean diaphragm on mounting surfaces. Fit new pump head and cross tighten with nuts (tightening torque 3-4 Nm). Screw in double ball valve with new O-rings and tighten firmly. NOTE: If necessary, replace clamping ring



10 Readjusting the venting lever

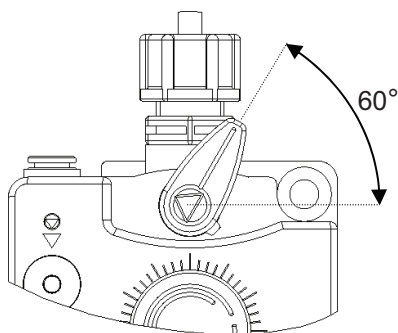
If, despite the venting lever being closed (as in ill. 3), product escapes out of the return line, the venting lever must be readjusted.

To do so, proceed as follows:

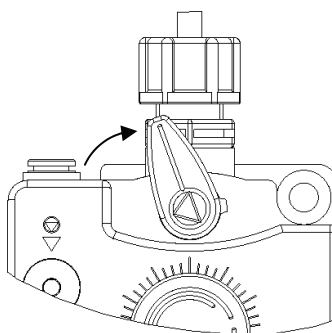
- Turn venting lever by 60° left (ill. 1) and pull off.
- Plug in venting lever on left stop position and turn right until there is no metering product escaping from the venting line.
- Pull off venting lever and push it back on 60° position (ill. 1).
- Close venting lever (turn right with the arrow in the 'up' metering direction).
- Check for leaks in venting position (venting lever in left stop position).

If it is impossible to close the venting lever, or only possible with great force, proceed as follows:

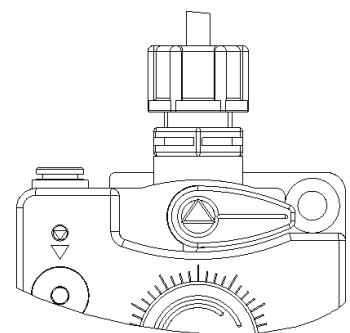
- Pull off venting lever as in ill. 2.
- Turned approx. 15° to the right, push it back on.
- Close venting lever (turn right with the arrow in the 'up' metering direction).
- Check for leaks in operating position (ill. 3).



ill. 1



ill. 2



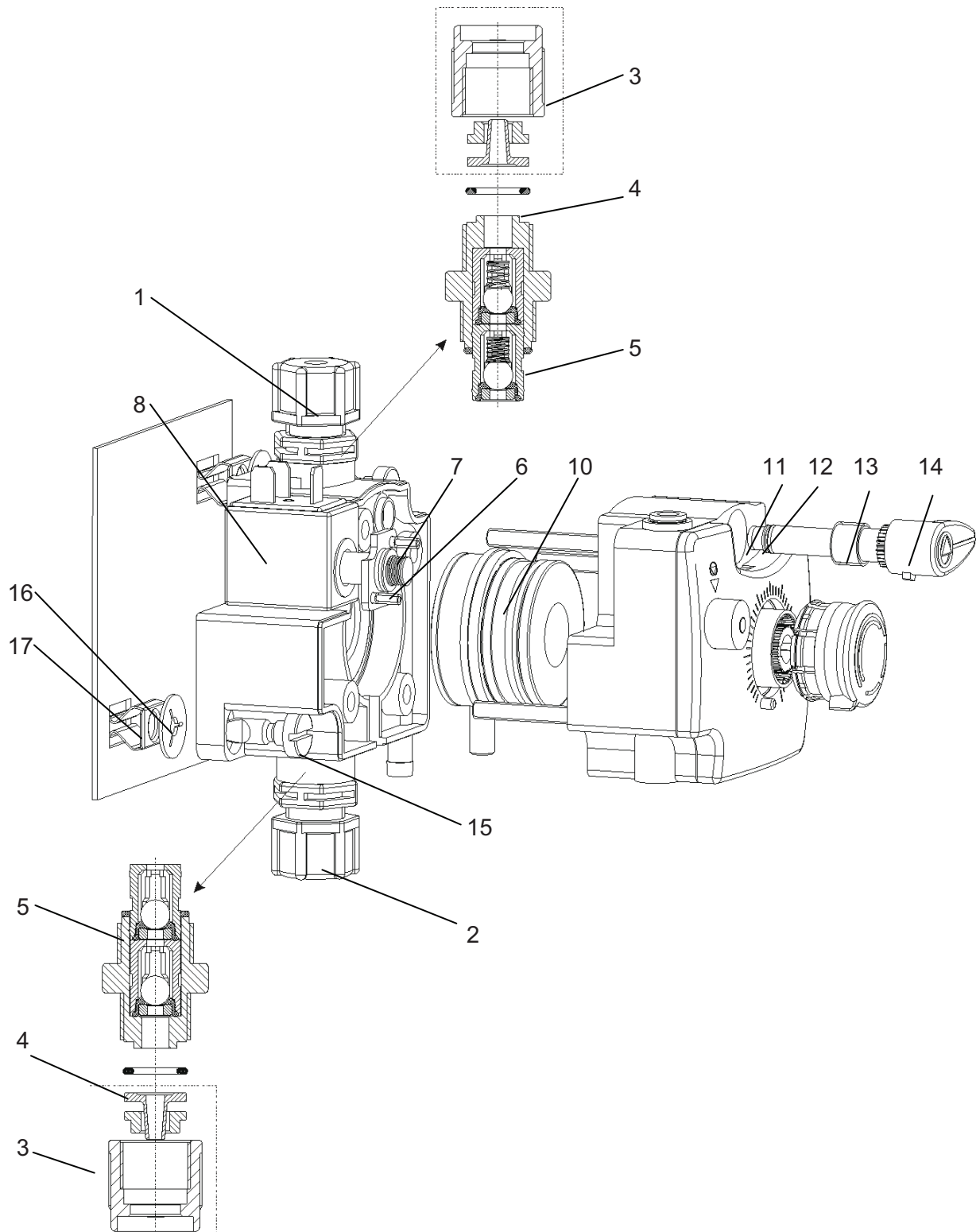
ill. 3

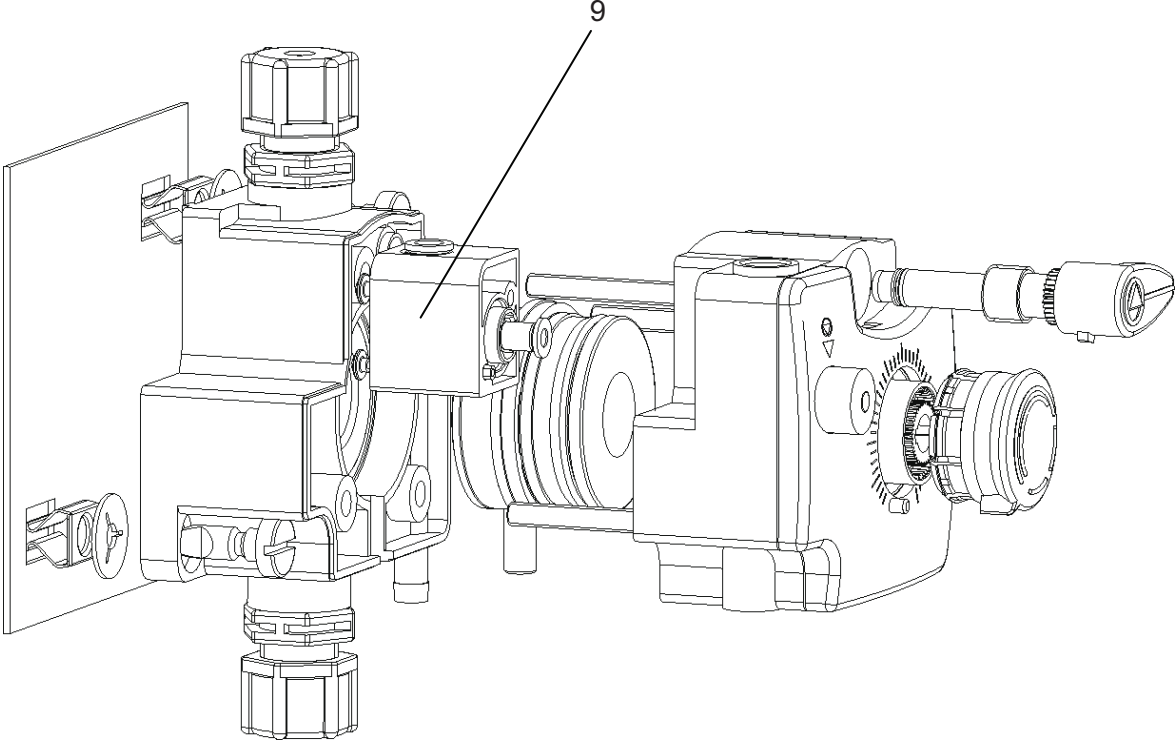
11 Tips for dealing with faults which may occur

CAUTION: Before carrying out repair and maintenance work or when metering dangerous substances, always rinse the metering head, relieve the pressure line and wear protective clothing (protective glasses, protective gloves and apron).

Fault	Possible cause	Rectification
Pump does not suck up despite bleeding and max. stroke setting	Deposits on the valve seats, valves clogged up or desiccated Return spring broken Air in diaphragm chamber	Flush out suction line and valves. Prime pump head with water Exchange the diaphragm cartridge Deaerate the pump
Pump performance reduced	Air line provides too little pressure Piston seal defective	Check air line and air pressure Exchange the diaphragm cartridge
Pump draws air	Suction and pressure valve connections leak, pump head not tightened down	Check valves and suction line for leaks; tighten pump head screws
Pump head leaks	Pump head is loose, diaphragm ruptured	Tighten pump head screws; exchange the diaphragm
For pump fitted with solenoid valve:		
Pump does not work, even though compressed air supply is OK	No activation signal Defective coil	Check voltage on the solenoid valve If necessary, change coil

12 Wearing and replacement parts





Pos.-no.	Article	Material No.
1	Pressure valve (O-ring Viton B)	241005
	Pressure valve (EPDM)	241007
2	Suction valve (O-ring Viton B)	241004
	Suction valve (EPDM)	241006
3	Connection set (ID/AD) 4/6, 6/8, 6/12 mm	248028
4	O-ring Viton B 10x2,5	417003327
	O-ring EPDM 10x2,5	417001080
5	O-ring Viton B 12x2	417003309
	O-ring EPDM 12x2	417001101
6	Armature system 1,7 CU F FL KPL to be ordered with 2x Pos. 7 (EJOT-PT-screw)	417704075
7	EJOT-PT-screw KB 30 X 10 WN1423 V2A	413071239
8	Magnet coil CK024C 24 V AC	417704076
	Magnet coil CK048C 48 V AC	417704077
	Magnet coil CK024D 24 V DC	417704078
	Magnet coil 230 V AC	417704079
9	Compressed-air inlet	241016
10	Diaphragm cartridge 3,0 l/h	241013
	Diaphragm cartridge 12,0 l/h	241015
11	O-ring Viton B 3,5x1,5	417003313
	O-ring EPDM 3,5x1,5	417001012
12	O-ring Viton B 5,28x1,78	417003596
	O-ring EPDM 5,28x1,78	417001030
13	Venting screw PP PDP	34103016
14	Venting lever	34103018
15	Bayonet screw S60	413229080
16	Retaining washer S60	413229081
17	Locking unit S60	413229082