

# DMX 221

Dosing pump

Installation and operating instructions



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# 1. General information

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Read this document before you install the product. Installation and operation must comply with local regulations and accepted codes of good practice.

Observe the instructions of optional components of the product.

Observe the material safety data sheet of the dosing medium.

Observe the installation and operating instructions supplied with the AR control unit, Servomotor or VFD in addition to the instructions in this manual.

- AR control unit: <http://net.grundfos.com/qr/i/91834764>
- Servomotor: <http://net.grundfos.com/qr/i/95721057>
- VFD supplier manual: <https://www.nord.com>.

## Related information

- 11.1 Diaphragm leakage sensor
- 11.2 Pumps with VFD

## 1.1 Qualification and training

The persons responsible for installation, startup and service must be appropriately qualified for these tasks.

If the persons do not have the necessary knowledge, training and instruction must be given. If necessary, training can be performed by the manufacturer or supplier on request.

## 1.2 Symbols used in this document



### DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.



### WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.



### CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The text accompanying the three hazard symbols DANGER, WARNING and CAUTION is structured in the following way:



### SIGNAL WORD

Description of the hazard

Consequence of ignoring the warning

Action to avoid the hazard.





A blue or grey circle with a white graphical symbol indicates that an action must be taken.



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

## 1.3 Symbols on the product

Information provided directly on the pump must be observed and maintained in a readable condition at all times.

Symbol	Description
	Arrows on the inlet and outlet valves indicate the flow direction
	An arrow on the motor indicates the direction of rotation

## 2. Installing the product

---

### 2.1 Location

- The product must be protected from direct sunlight and rain.
- Make sure the ambient conditions match the enclosure class of the motor and the pump.
- Install the product indoors if it has electronic components.
- Provide enough space for maintenance and minimum 90 mm above the motor fan cover.
- Observe all the ambient-condition requirements mentioned in the technical data section.
- Observe the sections Installation requirements and Safety instructions and requirements for startup.

#### Related information

- [2.1.1 Installation requirements](#)
- [2.1.2 Installation tips](#)

#### 2.1.1 Installation requirements



#### **WARNING**

##### **Chemical hazard**

Death or serious personal injury

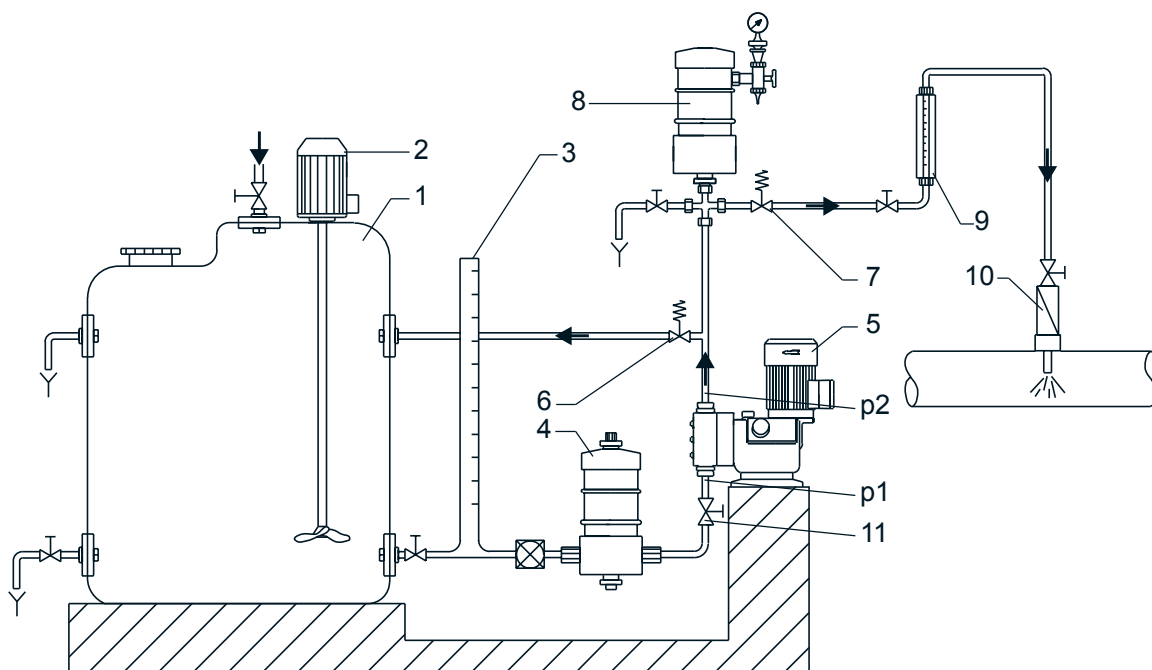
- Observe the material safety data sheet of the dosing medium.
  - Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.
- Make sure the pump is suitable for the dosing medium.
  - Observe sections Installation tips and Operating conditions. If you have questions, contact your Grundfos service partner.
  - Design your dosing system with monitoring and control functions to safeguard the entire system.
  - Make sure the pressure at the outlet valve is 1 bar higher than the pressure at the inlet valve.
  - Use pipes and hoses that match the connections and the maximum operating pressure. Observe section Type key.
  - Keep all lines free from strain. Avoid loops and buckles in the hoses. Keep the inlet line as short as possible. Use swept bends instead of elbows.
  - Make sure the dosing medium is flowing in an upward direction.
  - Provide a minimum space of 90 mm above the motor fan cover.

#### Related information

- [5.3.2 Type key](#)
- [3.2 Safety instructions and requirements for startup](#)

## 2.1.2 Installation tips

The drawing shows an example of an optimum installation. The following subsections describe various components and when they should be used.

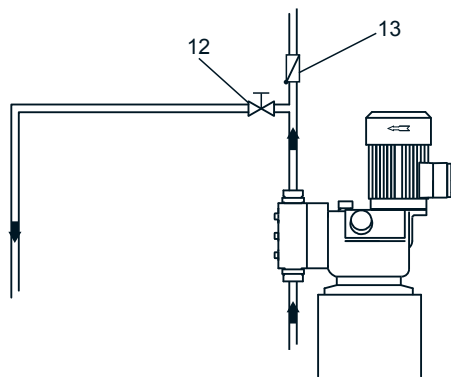


Pos.	Component
1	Dosing tank
2	Electric mixer
3	Graduated cylinder
4	Pulsation damper, inlet side
5	Dosing pump
6	Pressure relief valve
7	Pressure loading valve
8	Pulsation damper, outlet side
9	Measuring glass
10	Injection unit
11	Isolating valve
p1	Pressure at the inlet valve
p2	Pressure at the outlet valve

### 2.1.2.1 Installation with ball valve and non-return valve

For easy deaeration of the dosing head, we recommend that you install a ball valve (12) with a bypass line immediately after the outlet valve.

In order to prevent backflow in the outlet line and to simplify startup, we recommend that you install a non-return valve (13) in the outlet line.



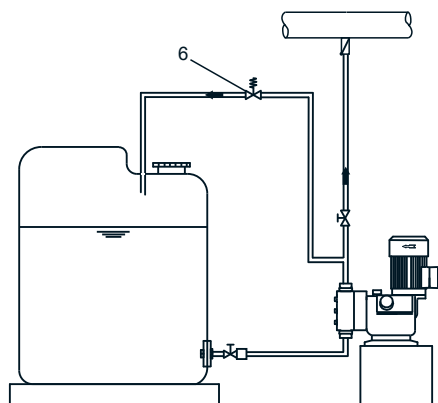
### 2.1.2.2 Installation of the inlet line

When you install the inlet line, observe the following points:

- Keep the inlet line as short as possible. Avoid tangling.
- Use swept bends instead of elbows.
- Always run the inlet line up towards the inlet valve.
- Avoid loops. Loops may cause air bubbles.

### 2.1.2.3 Installation with pressure-relief valve

To protect the dosing pump and outlet line from excessive pressure, we recommend that you install a pressure-relief valve (6) in the outlet line.

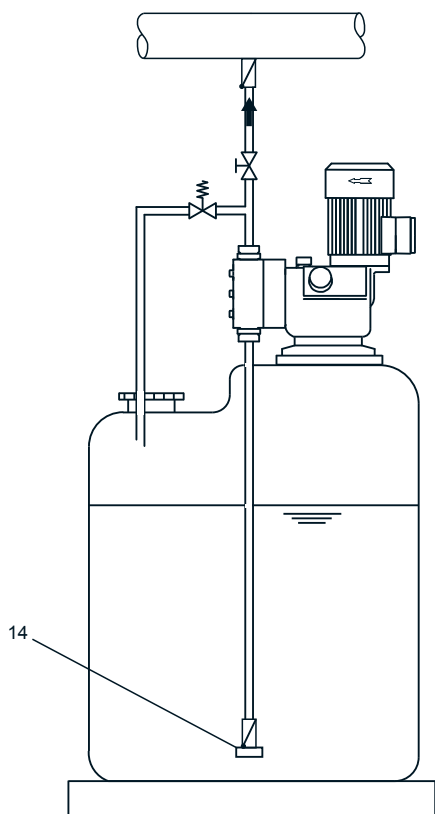


### 2.1.2.4 Installation on a tank

When dosing non-degassing media with a viscosity similar to that of water, the pump can be mounted on a tank.

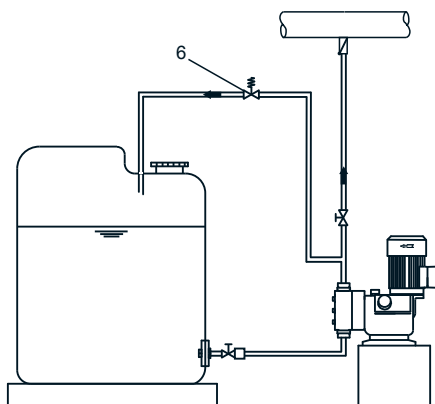
- Observe the maximum suction lift.
- For sedimenting media, we recommend that you install an inlet line with a filter (14). Install the foot valve 10 mm above the possible level of sedimentation.





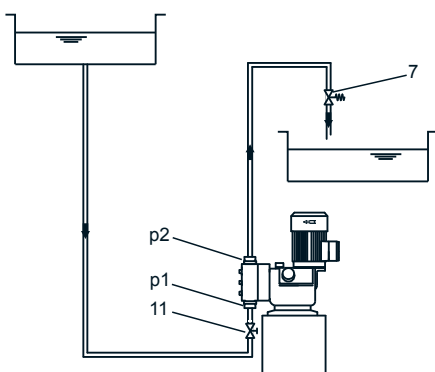
### Flooded suction

When dosing degassing media or media with a higher viscosity than that of water, the suction lift will be reduced. In these cases, flooded suction may be required.



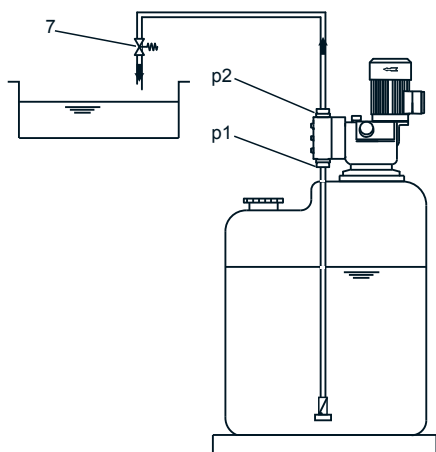
### 2.1.2.5 Siphon effect

The pressure at the outlet valve ( $p_2$ ) must always be at least 1 bar higher than the pressure at the inlet valve ( $p_1$ ). If this is not the case, for example in an installation with open outflow or with flooded suction, siphon effect may occur. To avoid the siphon effect, install a pressure-loading valve (7) in the outlet line and an isolating valve (11) directly before the inlet valve.



### 2.1.2.6 Installation with pressure-loading valve

The pressure at the outlet valve (p2) must always be at least 1 bar higher than the pressure at the inlet valve (p1). If the pressure difference (p2 minus p1) is lower than 1 bar, install a pressure-loading valve (7) in the outlet line.

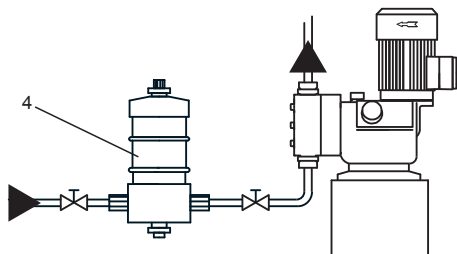


### 2.1.2.7 Installation with pulsation damper on the inlet side

In a dosing system, pressure peaks can occur in the inlet line in case of one of the following conditions:

- long inlet line
- inlet line with small diameter
- dosing medium with high density or viscosity
- large pump.

To protect the inlet line against pressure peaks, we recommend that you install a properly sized pulsation damper (4) directly before the inlet valve of the pump.

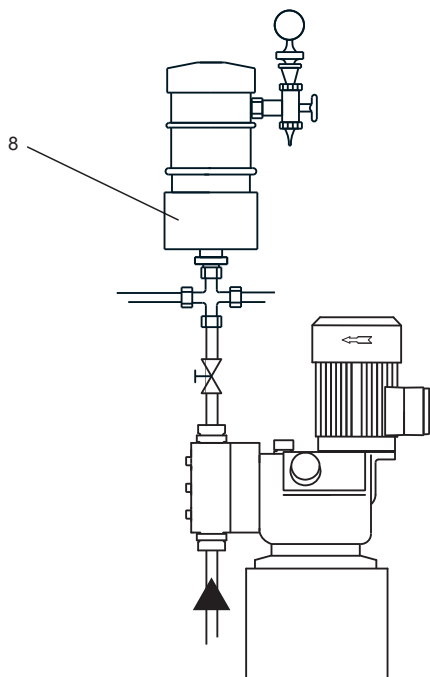


### 2.1.2.8 Installation with pulsation damper on the outlet side

In a dosing system, pressure peaks can occur in the outlet line in case of one of the following conditions:

- long outlet line
- outlet line with small diameter
- dosing medium with high density or viscosity
- large pump.

To protect the outlet line against pressure peaks, we recommend that you install a properly sized pulsation damper (8) in the outlet line.



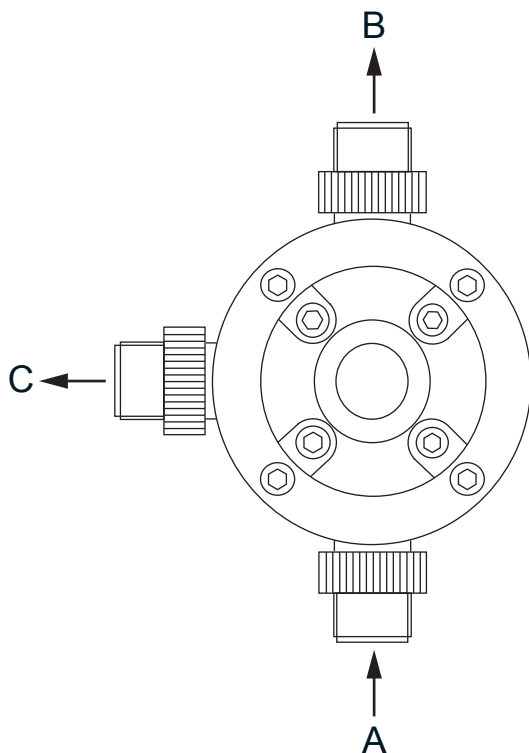
## 2.2 Mechanical installation

### 2.2.1 Mounting the pump

Have a spanner and four M6 screws available. The screws are not included in the scope of delivery.

1. Place the pump horizontally on a wall bracket or a tank.
2. Fix the pump with the four screws. Tighten the screws gently in order not to damage the housing.

## 2.2.2 Dosing head connections



Pos.	Description
A	Inlet valve, connection for the inlet line
B	Outlet valve, connection for the outlet line
C	Integral relief valve (optional), connection for the overflow line



### WARNING

#### Chemical hazard

Death or serious personal injury

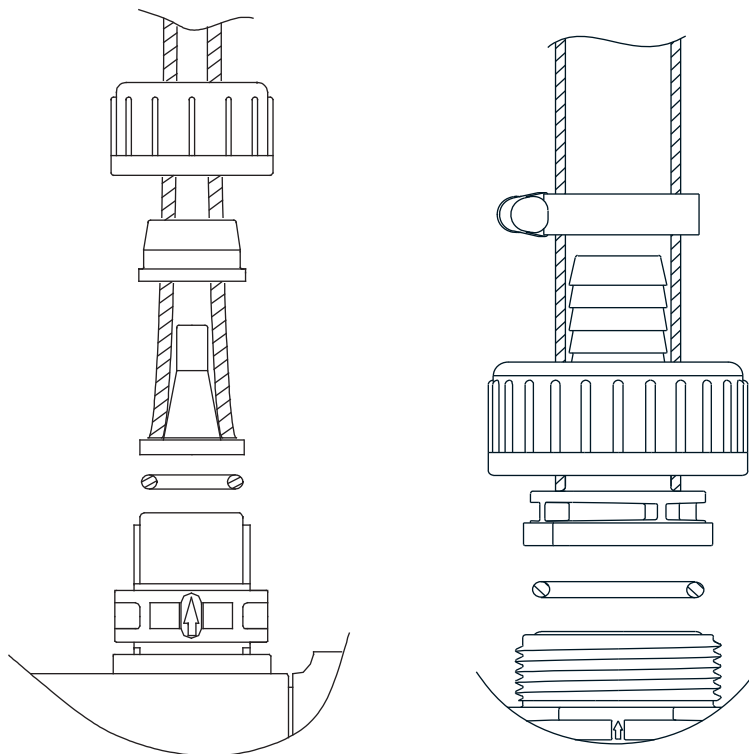
- For pumps with an integral relief valve, connect an overflow line to C.

### Related information

- [2.1.1 Installation requirements](#)

### 2.2.2.1 Connecting hoses

Hoses are to be connected to the valves with a connection piece.



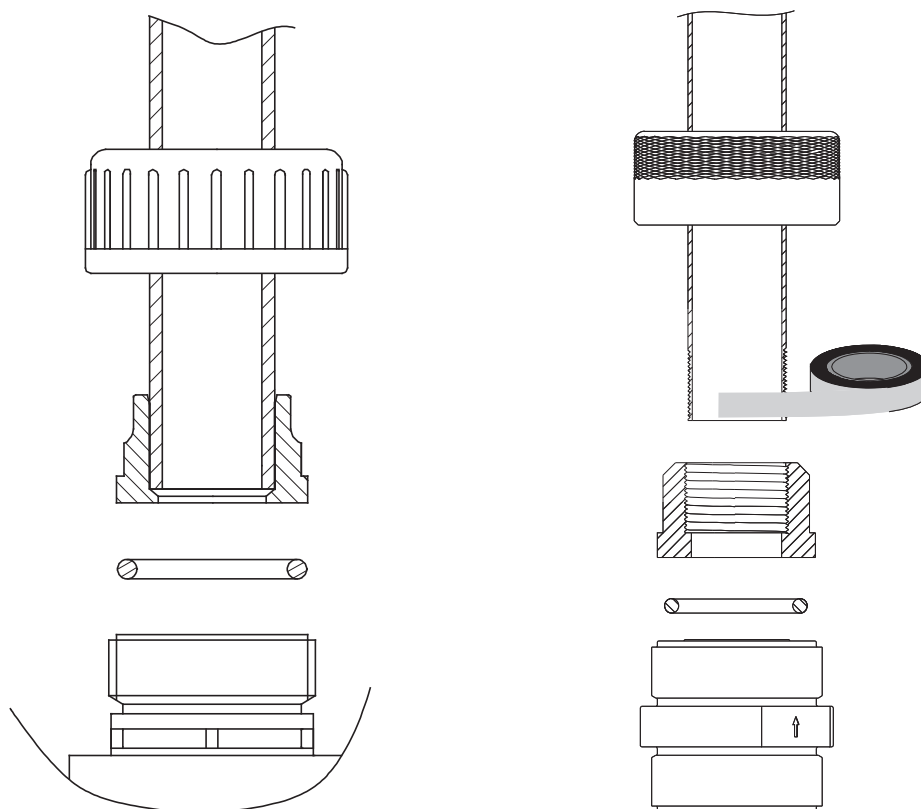
1. Make sure the valve gasket is placed correctly.
2. Push the hose firmly onto the nipple or nozzle.
3. Secure the hose with the connection counterpart or a hose clip.
4. Screw the union nut onto the valve and tighten it.

#### Related information

- [2.1.1 Installation requirements](#)

#### 2.2.2.2 Connecting pipes

Pipes are to be connected to the valves with a connection piece.



1. Make sure the valve gasket is placed correctly.
2. Mount the pipe line according to the material:
  - PVC: Glue the pipe into the connection.
  - PP, PVDF: Weld the pipe into the connection.
  - Stainless steel: Apply a sealing to the pipe thread, e.g. PTFE tape. Screw the pipe into the connection.
3. Screw the union nut onto the valve and tighten it.

#### Related information

- [2.1.1 Installation requirements](#)

## 2.3 Electrical connection

### 2.3.1 Safety instructions and requirements for electrical connection



#### **DANGER**

##### **Electric shock**

Death or serious personal injury

- All electrical connections must be carried out by qualified persons.
- Do not open the pump housing.
- Switch off the power supply before making any electrical connections.



#### **WARNING**

##### **Chemical hazard**

Death or serious personal injury

- Make sure the pump has been correctly installed and is ready to be started before you switch on the power supply.
- Make sure the power supply specified on the nameplate matches the local conditions.
- Protect the cable connections and plugs against corrosion and humidity.
- Isolate the power supply electrically from the signal inputs and outputs.
- Observe the direction of rotation of the motor.
- Provide the motor with a protective circuit breaker and set it to the rated motor current.
- Three-phase motors are factory-set for star connection.
- When the pump is used with a frequency converter, make the connection according to the voltage of the frequency converter.
- Observe the relevant sections or instructions when connecting electronic components.

### 2.3.2 Making electrical connection with mains plug

1. Switch off the power supply to the power socket.
2. Insert the mains plug of the pump into the power socket.

#### Related information

- [2.3.1 Safety instructions and requirements for electrical connection](#)

### 2.3.3 Making electrical connection without mains plug

- Observe section Safety instructions and requirements for electrical connection.
  1. Switch off the power supply.
  2. Open the terminal box on the motor.
  3. Connect the motor according to the wiring diagram printed on the inside of the terminal box cover.
  4. Close the terminal box on the motor.

#### Related information

- [2.3.1 Safety instructions and requirements for electrical connection](#)

## 3. Starting up the product

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### 3.1 Preparing the pump for startup

- Observe section Safety instructions and requirements for startup.
- Make sure the pump has been connected electrically by a qualified person.
- Make sure the power supply specified on the nameplate matches the local conditions.
- Check that all pipe or hose connections have been tightened properly and tighten them, if necessary.
- Check that the dosing head screws have been tightened with the specified torque and tighten them, if necessary.
- Check that the vent plug on the pump housing is open.
- For pumps with integral relief valve: Check that the overflow line is connected properly to the integral relief valve.
- For pumps with diaphragm leakage sensor: Check that the diaphragm leakage sensor is functioning correctly.

#### Related information

- [3.2 Safety instructions and requirements for startup](#)
- [3.3 Starting up the pump](#)
- [11.1.4 Checking the diaphragm leakage sensor](#)

### 3.2 Safety instructions and requirements for startup



#### WARNING

##### Chemical hazard

Death or serious personal injury

- Observe the material safety data sheet of the dosing medium.
- Wear protective clothing when working on the dosing head, connections or lines.
- Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.
- Make sure the pump has been correctly installed and is ready to be started before you switch on the power supply.



#### WARNING

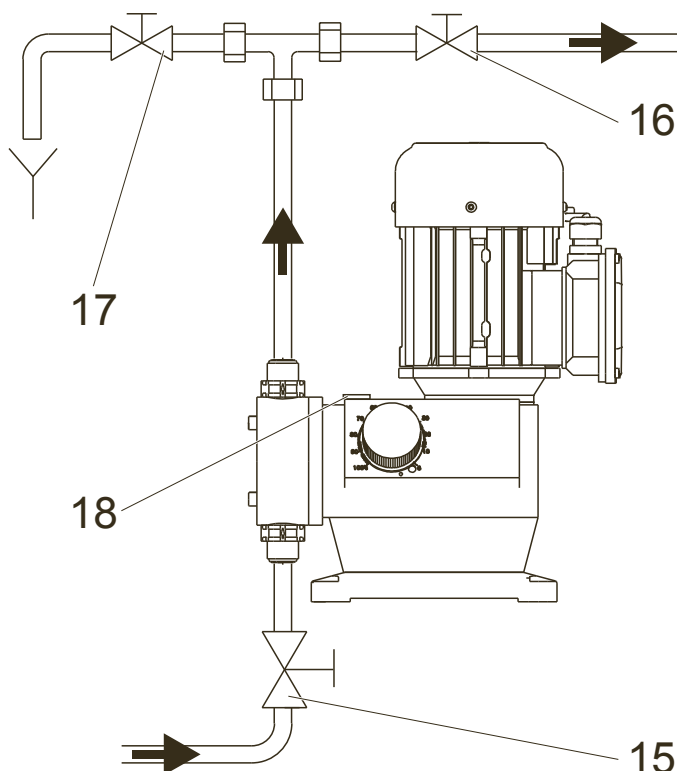
##### Chemical hazard

Death or serious personal injury

- Tighten the dosing head screws after initial startup and every time the dosing head has been opened. After 6-10 operating hours or two days, retighten the dosing head screws using a torque wrench.
- The vent plug must be open while the pump is running.
- Only adjust the stroke length while the pump is running.

### 3.3 Starting up the pump

- Observe section Preparing the pump for startup
- Observe section Safety instructions and requirements for startup
- Make sure the pump is switched off, unpressurised and empty.



Pos.	Description
15	Isolating valve
16	Isolating valve
17	Deaeration valve
18	Vent plug

1. Open the vent plug (18) in the pump housing.  
The vent plug must be open while the pump is running.
  2. Open the isolating valves on the inlet side and outlet side (15, 16), if installed.
  3. Relieve the counterpressure so that air can escape and dosing medium can flow out.
    - Open the deaeration valve (17), if installed.
    - Open the relief valve, if installed.
  4. Switch on the power supply.
  5. For pumps with AR control unit: Press the start/stop button and keep pressing it for continuous operation during the deaeration process.
  6. Set the stroke-length adjusting knob to 100 %.
  7. Let the pump run until the dosing medium is free of air bubbles.  
The pump has been deaerated.
  8. Reactivate the deaeration valve or relief valve.
    - Close the deaeration valve (17), if installed.
    - Reactivate the relief valve, if installed.
  9. Cross-tighten the dosing head screws with the correct torque.
- The pump is now started up. Make the required operating settings.



**Related information**

- [3.1 Preparing the pump for startup](#)
- [3.2 Safety instructions and requirements for startup](#)
- [3.9 Opening and reactivating the integral relief valve](#)

**3.4 Stopping and starting dosing**

Make sure the pump was installed and started up correctly.

1. To stop dosing:
  - For pumps with AR control unit, press the start/stop button.
  - Switch off the power supply.
2. To start dosing:
  - Switch on the power supply.
  - For pumps with AR control unit, press the start/stop button.

**Related information**

- [3.1 Preparing the pump for startup](#)
- [3.3 Starting up the pump](#)

**3.5 Deaerating the pump during operation**

Make sure the pump was installed and started up correctly.

**WARNING****Chemical hazard**

Death or serious personal injury

- Wear protective clothing when working on the dosing head, connections or lines.
- Before relieving the pressure from the outlet side, make sure escaping dosing medium cannot cause any harm to persons or equipment.
- Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.

1. Relieve the counterpressure so that air can escape and dosing medium can flow out.
  - Open the deaeration valve (17), if installed.
  - Open the relief valve, if installed.
2. Switch on the power supply.
3. For pumps with AR control unit: Press the start/stop button and keep pressing it for continuous operation during the deaeration process.
4. Set the stroke-length adjusting knob to 100 %.
5. Let the pump run until the dosing medium is free of air bubbles.  
The pump has been deaerated.
6. Reactivate the deaeration valve or relief valve.
  - Close the deaeration valve (17), if installed.
  - Reactivate the relief valve, if installed.
7. Change back to operating settings of the pump.

**Related information**

- [3.3 Starting up the pump](#)
- [3.4 Stopping and starting dosing](#)
- [9.3.1 Torque values](#)

### 3.6 Adjusting the zero point

Make sure the pump was installed and started up correctly.



#### WARNING

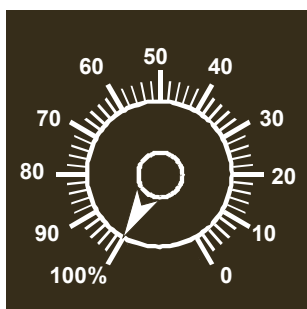
##### Chemical hazard

Death or serious personal injury

- Wear protective clothing when working on the dosing head, connections or lines.
- Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.



Only adjust the stroke length while the pump is running.



The zero point is factory-set to a counterpressure of 3 bar. If the operating counterpressure at the outlet valve deviates considerably from this value, we recommend that you readjust the zero point to obtain more precise values.

1. Install a transparent hose with dosing medium in the inlet valve, or use the scaled pulsation damper, if installed on the inlet side.
2. For pumps with level control unit, deactivate the function.
3. Start dosing.
4. Set the dosing flow to 15 %.
5. Turn the adjusting knob slowly towards the zero point until the dosing flow stops.  
The medium level stops falling in the transparent hose.
6. Stop dosing.
7. Unscrew the locking screw below the stroke-length adjusting knob.
8. Without changing the position of the adjusting knob, remove the plug placed in the middle of the adjusting knob.
9. Unscrew the screw in the adjusting knob together with the spiral spring.
10. Gently and without turning it, pull off the adjusting knob.
11. Fit it back in such a way that the arrow on the adjusting knob is pointing to zero on the dial.
12. Refit the spiral spring and the screw in the adjusting knob. Tighten the screw until the spring is slightly preloaded.  
Even when turning the adjusting knob to 100 %, the spiral spring must remain preloaded.
13. Screw in the locking screw below the stroke-length adjusting knob.

#### Related information

- [3.2 Safety instructions and requirements for startup](#)
- [9.6 Dosing curves](#)

### 3.7 Adjusting the dosing flow via the stroke length

Make sure the pump was installed and started up correctly.



Only adjust the stroke length while the pump is running.

- To increase the dosing flow, turn the adjusting knob slowly to the left.
- To decrease the dosing flow, turn the adjusting knob slowly to the right.

#### Related information

- [3.2 Safety instructions and requirements for startup](#)
- [5.1.1 DMX 221 components](#)
- [5.1.2 Functional principle of the pump](#)
- [9.6 Dosing curves](#)

### 3.8 Adjustment of the stroke rate with a frequency converter

If a frequency converter is connected, the dosing flow can be adjusted by changing the stroke rate. This can only be done in the range of 10-100 % of the maximum stroke rate.

For more information, read the installation and operating instructions of the frequency converter.

#### Related information

- [11.2 Pumps with VFD](#)

### 3.9 Opening and reactivating the integral relief valve

- Make sure the pump was installed and started up correctly.
- Make sure the pump is running during this task.



#### WARNING

##### Chemical hazard

Death or serious personal injury

- Wear protective clothing when working on the dosing head, connections or lines.
- Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.

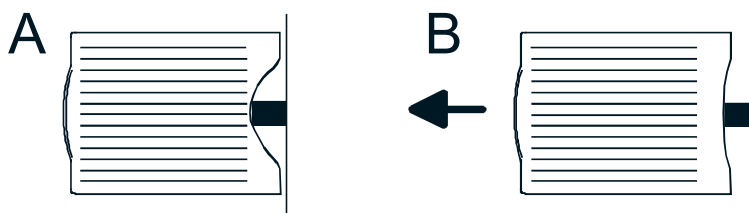


Fig. 3.9-1 Knob positions

1. To open the relief valve, turn the relief-valve knob to position B.  
The relief valve is open. Dosing medium and air can flow out through the overflow line.
2. To reactivate the relief valve, turn the relief-valve knob to position A.  
The relief valve is reactivated and will open at the set opening pressure.

#### Related information

- [3.10 Setting the opening pressure of the integral relief valve](#)

### 3.10 Setting the opening pressure of the integral relief valve

- Make sure a pressure gauge is installed between the pump and an isolating valve in the outlet line.
- Make sure the pump was installed and started up correctly.
- Make sure the pump is running during this task.

#### WARNING

##### Chemical hazard

Death or serious personal injury



- Do not set the opening pressure higher than the maximum counterpressure of the pump.
- Wear protective clothing when working on the dosing head, connections or lines.
- Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.

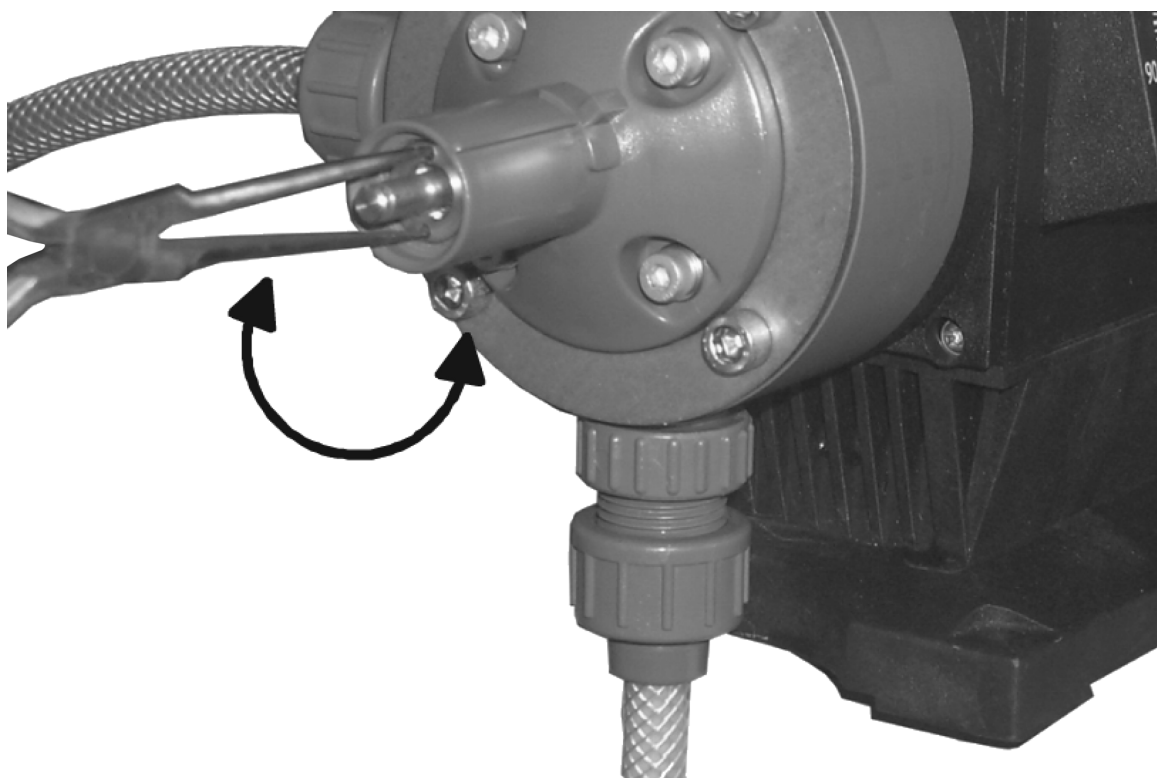


Fig. 3.10-1 Setting the opening pressure of the relief valve using a pair of pointed pliers

1. Remove the cap from the relief valve.
2. Close the isolating valve.
3. When the relief valve opens, read the pressure on the pressure gauge.
4. Set the opening pressure of the relief valve:
  - To increase the opening pressure, turn the knob clockwise using a pair of pointed pliers until the desired pressure is reached. Do not set the opening pressure higher than the maximum counterpressure of the pump.
  - To reduce the opening pressure, turn the knob counter-clockwise using a pair of pointed pliers until the desired pressure is reached.
5. Open the isolating valve.
6. Refit the cap.

#### Related information

- [3.1 Preparing the pump for startup](#)
- [3.3 Starting up the pump](#)

### 3.11 Operating the pump with electronics

Observe the installation and operating instructions supplied with the AR control unit, Servomotor or VFD in addition to the instructions in this manual.

- AR control unit: <http://net.grundfos.com/qr/i/91834764>
- Servomotor: <http://net.grundfos.com/qr/i/95721057>
- VFD supplier manual: <https://www.nord.com>

#### Related information

- 11.1 Diaphragm leakage sensor
- 11.2 Pumps with VFD

## 4. Handling and storing the product

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### 4.1 Handling the product



Close the vent plug when taking the pump out of operation for transport, storage or service.

- Retain the packaging for future storage or transport, or dispose of the packaging in accordance with local regulations.  
The packaging depends on the pump type and the scope of delivery.
- Make sure the product is suitably protected during transport and intermediate storage.
- Keep the product in an upright position.
- Do not throw or drop the product.

### 4.2 Storing the product



Close the vent plug when taking the pump out of operation for transport, storage or service.

- Store the pump in an upright position so that the grease cannot leak out.
- Store the pump in a dry and clean place.
- Observe the permissible ambient conditions.

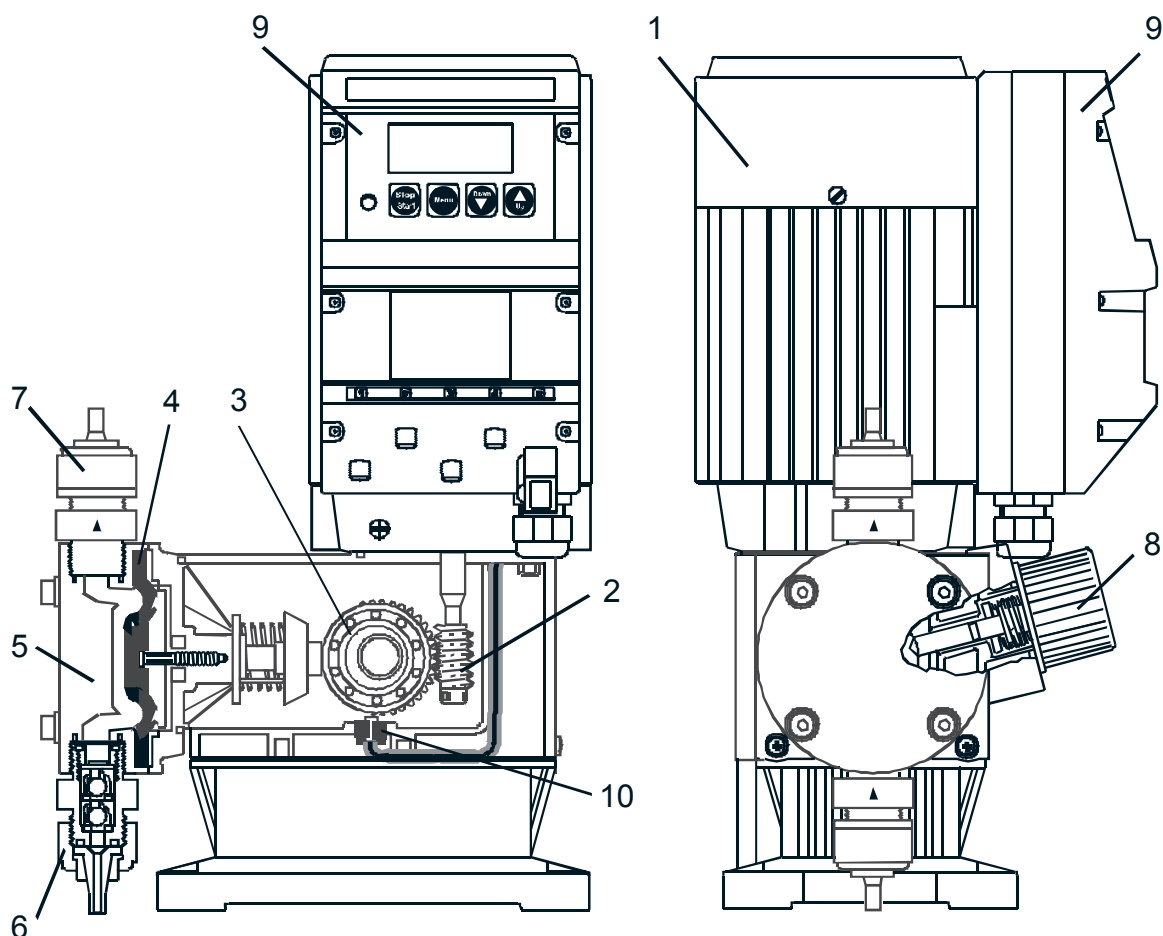
#### Related information

- [9.1 Ambient conditions](#)

## 5. Product introduction

### 5.1 Product description

#### 5.1.1 DMX 221 components



Pos.	Description
1	Motor
2	Gears
3	Eccentric
4	Dosing diaphragm
5	Dosing head
6	Inlet valve
7	Outlet valve
8	Stroke-length adjusting knob
9	AR control unit (optional)
10	Stroke sensor

### 5.1.2 Functional principle of the pump

DMX pumps are reciprocating displacement pumps with electric motor and a mechanical diaphragm.

- Alternating strokes cause the diaphragm to increase and decrease the size of the dosing chamber and by that draw in and force out dosing medium through the inlet and outlet valves.
- The dosing strokes are generated by an eccentric, which moves the diaphragm by means of a tappet.
- The suction strokes are activated by the return movement of the spring.
- The stroke volume and thus the dosing flow can be adjusted by adjusting the stroke length.

#### Dosing flow control

- Flow control via the stroke length: The flow can be controlled either by turning the stroke-length adjusting knob manually, or by means of an optional servomotor. The volume of each stroke is increased or decreased, the stroke rate remains constant.
- Flow control via frequency converter (VFD): The flow can be controlled via an integrated or external frequency converter. The volume of each stroke remains constant, the stroke rate is increased or decreased.
- Flow control via AR control unit: The flow of DMX pumps with AR control unit can be controlled by adjusting the interval between strokes. This is done via analog or pulse signals or by manually adjusting the stroke frequency.

### 5.1.3 AR control unit

The AR control unit offers various operating modes, control functions and monitoring functions. The AR control unit has an IP65 plastic housing. The AR control unit is available for pumps with single-phase motors.



Observe the installation and operating instructions for the AR control unit.

#### Related information

- <http://net.grundfos.com/qr/i/91834764>

### 5.1.4 Functional principle of the integral relief valve

Some dosing head variants have an integral relief valve. The opening pressure of the integral relief valve is factory-set to the maximum counterpressure stated on the pump nameplate. During operation, the opening pressure depends on various factors, such as the flow, the stroke frequency or the counterpressure in the dosing system. The integral relief valve can be adapted to the local conditions.

- If the pressure in the dosing head rises above the set opening pressure, the integral relief valve will open. The dosing medium will flow through the overflow line, and it can be returned into the dosing tank.
- The integral relief valve will protect the outlet side from an excessive pressure build-up by the pump. The integral relief valve will also protect the pump if the outlet valve is dirty or blocked.
- The integral relief valve can be opened manually. This function can be used to deaerate the dosing head and the inlet line.

#### Related information

- [5.3.2 Type key](#)
- [3.10 Setting the opening pressure of the integral relief valve](#)



### 5.1.5 Stroke sensor

The stroke sensor is a two-wire inductive proximity switch for signalling the strokes.

- Sensor type: PNP
- Supply voltage  $U_B$ : 10-30 V
- Switching function: NO (Normally Open) contact.

## 5.2 Applications

### 5.2.1 Intended use

DMX 221 pumps are suitable for dosing liquid, non-flammable and non-combustible media strictly in accordance with these installation and operating instructions. Do not use DMX 221 pumps in potentially explosive environments.

DMX dosing pumps can only be operated in a safe and effective way, if they are installed properly and the required ambient conditions are provided. Observe sections Location and Technical data.

#### Incorrect use

- The operational safety of the pump is only ensured if it is used in accordance with section Intended use.
- The limit values specified in section Technical data must not be exceeded.
- The pump is not approved for operation in potentially explosive areas.

### 5.2.2 Safety of the system in case of a failure in the dosing pump



Design your dosing system with monitoring and control functions to safeguard the entire system.



#### WARNING

##### Chemical hazard

Death or serious personal injury

- Check on a monthly basis that dosing medium is not leaking out of the pump.
- In case of a diaphragm leakage, dosing medium may leak out of the hole in the intermediate flange between the pump and the dosing head. The parts inside the housing are protected from the dosing medium for a short time (depending on the type of medium) by the housing sealing.
- Check monthly if medium is leaking out of the intermediate flange. In case of a diaphragm leakage, immediately stop the operation of the pump and close the isolating valves on the inlet side and outlet side.
- For maximum safety, we recommend the pump version with diaphragm leakage sensor.

## 5.3 Identification

### 5.3.1 Nameplate



Pos.	Description
1	Type designation
2	Product number
3	Model
4	Serial number
5	Flow rate [l/h] at maximum counterpressure [bar]
6	Power consumption
7	Enclosure class
8	Voltage [V]
9	Frequency [Hz]
10	Marks of approval, CE mark, etc.
11	Week and year code
12	Country of origin

### 5.3.2 Type key

**Example: DMX 4-10 B-PP/E/T-X-E1B3B3E0**

Position	Designation	Code	Description
1	Type range	DMX	Motor-driven diaphragm dosing pump
2	Flow rate	4-	Flow rate [l/h] at maximum counterpressure
3	Pressure	10	Maximum counterpressure [bar]
4	Control variant	B-	Standard version with manual control
5	Dosing head variant	PP	Polypropylene
6	Gasket	E	EPDM
7	Valve ball	T	PTFE
8	Control unit	X	No control unit
9	Supply voltage	E	3 x 230/400 V, 50/60 Hz; 3 x 440/480 V, 60 Hz
10	Valve variant	1	Standard valve, inlet and outlet side, not spring-loaded
11	Connection, inlet and outlet	B3B3	PP or PVDF, G 5/8, for pipe $\varnothing$ 16, inlet and outlet
12	Mains plug (only standard, single-phase motors)		No cable, no plug
13	Motor variant	E0	Motor with PTC sensor, prepared for operation with frequency converter

**Example: DMX 4-10 B-PP/E/T-X-E1B3B3E0**

#### Position 1: Type range

Code	Description
DMX	Motor-driven diaphragm dosing pump

**Example: DMX 4-10 B-PP/E/T-X-E1B3B3E0**

#### Position 2: Flow rate

Code	Description
4, 7, etc.	Flow rate [l/h] at maximum counterpressure

**Example: DMX 4-10 B-PP/E/T-X-E1B3B3E0**

#### Position 3: Pressure

Code	Description
3, 4, 10, 12, 16	Maximum counterpressure [bar]

**Example: DMX 4-10 B-PP/E/T-X-E1B3B3E0**

#### Position 4: Control variant

Code	Description
B	Standard version with manual control
S2	Stroke sensor, PNP
Bx	Stroke counter
AR	AR control unit
ARX	AR control unit and servomotor
AT3	Servomotor, 1 x 230 V, 50/60 Hz, 4-20 mA control signal
AT5	Servomotor, 1 x 115 V, 50/60 Hz, 4-20 mA control signal
AT4	Servomotor, 1 x 24 V, 50/60 Hz, 4-20 mA control signal

Code	Description
AT8	Servomotor, 1 x 230 V, 50/60 Hz, 1 K $\Omega$ potentiometer control
AT9	Servomotor, 1 x 115 V, 50/60 Hz, 1 K $\Omega$ potentiometer control
ATP	Servomotor, 1 x 24 V, 50/60 Hz, 1 K $\Omega$ potentiometer control

**Example:** DMX 4-10 B-PP/E/T-X-E1B3B3E0

#### Position 5: Dosing head variant

Code	Description
PP	Polypropylene
PV	Polyvinylidene difluoride (PVDF)
PVC	Polyvinyl chloride
SS	Stainless steel, 1.4571 (EN 10027-2), 316Ti (AISI)
PP-L	PP dosing head with diaphragm leakage sensor
PV-L	PVDF dosing head with diaphragm leakage sensor
PVC-L	PVC dosing head with diaphragm leakage sensor
SS-L	Stainless steel dosing head with diaphragm leakage sensor
SS-HC	Stainless steel dosing head with liquid-heated flange
PVC-R	PVC dosing head with integral relief valve
PV-R	PVDF dosing head with integral relief valve
PV-RL	PVDF dosing head with integral relief valve and diaphragm leakage sensor
PVC-RL	PVC dosing head with integral relief valve and diaphragm leakage sensor

**Example:** DMX 4-10 B-PP/E/T-X-E1B3B3E0

#### Position 6: Gasket

Code	Description
E	EPDM
V	FKM
T	PTFE

**Example:** DMX 4-10 B-PP/E/T-X-E1B3B3E0

#### Position 7: Valve ball

Code	Description
G	Glass
T	PTFE
SS	Stainless steel, 1.4401 (EN 10027-2), 316Ti (AISI)
C	Ceramic

**Example:** DMX 4-10 B-PP/E/T-X-E1B3B3E0

#### Position 8: Control unit

Code	Description
X	No control unit
F	VFD or AR on the opposite side of the dosing pump in relation to the dosing head
S	VFD or AR on the same side of the dosing pump as the stroke-length adjusting knob
W	AR control unit to be mounted on the wall

**Example:** DMX 4-10 B-PP/E/T-X-E1B3B3E0

**Position 9: Supply voltage**

Code	Description
E	3 x 230/400 V, 50/60 Hz, 460 V, 60 Hz
G	1 x 230 V, 50/60 Hz (motors ≤ 0.09 kW)
H	1 x 115 V, 50/60 Hz (motors ≤ 0.09 kW)
F	Without motor, with NEMA flange
0	Without motor, with IEC motor flange
K	3 x 500 V, 50 Hz
X	Others

**Example:** DMX 4-10 B-PP/E/T-X-E1B3B3E0

**Position 10: Valve variant**

Code	Description
1	Standard valves, inlet and outlet side, not spring-loaded
3	Spring-loaded valves, inlet valve 0.05 bar, outlet valve 0.8 bar
4	Spring-loaded outlet valve 0.8 bar, standard inlet valve, not spring-loaded
5	Valves for abrasive media
7	Inlet valve larger than outlet valve, none of them spring-loaded

**Example:** DMX 4-10 B-PP/E/T-X-E1**B3B3**E0

**Position 11: Connection, inlet and outlet**

Code	Description
B1	PVC, G 5/8, for 6/12 mm hose and for Ø12 pipe
A	SS, G 5/8, female, for threaded Rp ¼ pipe
B3	PP or PVDF, G 5/8, for Ø16 pipe
B2	PVC, G 5/4, for 13/20 mm hose and Ø25 pipe
A1	SS, G 5/4, female, for threaded Rp ¾ pipe
B4	PP or PVDF, G 5/4, for Ø25 pipe
4	PE, G 5/8, for 6/9 mm hose
6	PE, G 5/8, for 9/12 mm hose
B9	PVC, G 5/4, for 19/27 mm hose
S	PE, G 5/8, for 0.375"/0.5" tubing
V	SS, G 5/8, female, for threaded NPT 1/4" pipe
A9	PVC or PVDF, male, G 5/8, for threaded NPT 1/2" pipe
A7	PVC or PVDF, male, G 5/4, for threaded NPT 3/4" pipe
A3	SS, G 5/4, female, for threaded NPT 3/4" pipe
C6	PP, for 6/12 mm tubing

**Example:** DMX 4-10 B-PP/E/T-X-E1B3B3E0

**Position 12: Mains plug**

Code	Description
	No cable, no plug, for three-phase motors
X	Cable without plug, for single-phase motors with AR control unit

Code	Description
F	Safety plug type F (Schuko), for single-phase motors with AR control unit
B	Plug for the USA and Canada, for single-phase motors with AR control unit
E	Plug for Switzerland, for single-phase motors with AR control unit

**Example:** DMX 4-10 B-PP/E/T-X-E1B3B3E0

**Position 13: Motor variant**

Code <sup>*1</sup>				Description
Without certificate	With certificate for the motor	With certificate for the pump	With certificate for the motor and the pump	
-	GM	HP	MP	Standard motor
E0	G0	H0	K0	Motor with PTC sensor, prepared for operation with frequency converter
E4				Motor, single-phase, with on/off switch
FA	GA	HA	KA	VFD (variable frequency drive)
FB	GB	HB	KB	VFD with IO extension board
FC	GC	HC	KC	VFD with internal Profibus
FD	GD	HD	KD	VFD with external Profibus
FE	GE	HE	KE	VFD with external Profinet

\*1 The motor variant code indicates if inspection certificates 3.1 according to EN 10204 are provided for the motor or the pump.

## 6. Taking the product out of operation

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### WARNING

#### Chemical hazard

Death or serious personal injury

- Observe the material safety data sheet of the dosing medium.
- Wear protective clothing when working on the dosing head, connections or lines.
- Before relieving the pressure from the outlet side, make sure escaping dosing medium cannot cause any harm to persons or equipment.
- Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.



### DANGER

#### Electric shock

Death or serious personal injury

- Electrical disconnection must be carried out by qualified persons.
- Do not open the pump housing.
- Switch off the power supply before making any electrical connections.




Close the vent plug when taking the pump out of operation for transport, storage or service.

1. Flush the dosing head with water, if possible.
  2. Stop dosing:
    - For pumps with AR control unit, press the start/stop button on the AR control unit and switch off the power supply to the pump.
    - For pumps without AR control unit, switch off the power supply to the pump.
  3. Close the vent plug.
  4. Depressurise the pressure side of the dosing system.
  5. Close the isolating valves on the inlet side and outlet side, if installed.
  6. Make sure no dosing medium can flow back from the outlet side.
  7. Make sure the returning dosing medium is safely collected.
  8. Disconnect the inlet line and the outlet line.
  9. Disconnect the pump electrically.
    - For pumps with a mains plug, remove the mains plug from the power socket.
    - For pumps without mains plug, proceed as follows:
      - a. Open the terminal box on the motor.
      - b. Disconnect the motor.
      - c. Close the terminal box on the motor.
- The pump is now ready for storage or transport.

## 7. Maintaining the product

### 7.1 Maintenance schedule

Maintenance interval	Task
Monthly	Check that dosing medium is not leaking out of the pump.
Monthly	Clean the product with a soft cloth and pay special attention to the fan cover.
With a counterpressure up to 10 bar <ul style="list-style-type: none"> <li>every 12 months</li> <li>every 4000 operating hours</li> <li>in case of fault.</li> </ul>	Clean or replace the dosing diaphragm, inlet valve and outlet valve.
With a counterpressure of 10 to 16 bar <ul style="list-style-type: none"> <li>every 6 months</li> <li>every 2000 operating hours</li> <li>in case of fault.</li> </ul>	Clean or replace the dosing diaphragm, inlet valve and outlet valve.
<ul style="list-style-type: none"> <li>every 12 months</li> <li>every 8000 operating hours</li> <li>in case of fault.</li> </ul>	Clean or replace the diaphragm of the integral relief valve.
In case of fault	Check the diaphragm leakage sensor.
Every 5 years or every 20000 operating hours	Have the gear grease changed.   Only qualified persons authorised by Grundfos are allowed to change the gear grease. Send the pump to Grundfos or an authorised service workshop.

#### Related information

- [7.3 Preparing for maintenance of the dosing diaphragm or the valves](#)
- [7.4 Cleaning or replacing the inlet and outlet valves](#)
- [7.5 Cleaning or replacing the dosing diaphragm](#)
- [7.6 Cleaning or replacing the diaphragm of the integral relief valve](#)
- [11.1.5 Maintaining the diaphragm leakage sensor](#)
- [7.7 Returning the product](#)



## 7.2 Safety instructions for maintaining the dosing diaphragm or the valves



### WARNING

#### Chemical hazard

Death or serious personal injury

- Observe the material safety data sheet of the dosing medium.
- Wear protective clothing when working on the dosing head, connections or lines.
- Before relieving the pressure from the outlet side, make sure escaping dosing medium cannot cause any harm to persons or equipment.
- Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.



### DANGER

#### Electric shock

Death or serious personal injury

- Only qualified persons are allowed to service the pump.
- Do not open the pump housing.

#### Related information

- [7.3 Preparing for maintenance of the dosing diaphragm or the valves](#)

## 7.3 Preparing for maintenance of the dosing diaphragm or the valves



Only adjust the stroke length while the pump is running.



Close the vent plug when taking the pump out of operation for transport, storage or service.

1. Flush the dosing head with water, if possible.
2. While the pump is running, set the stroke-length adjusting knob to 100 %.
3. Switch off the pump and disconnect it from the power supply.
4. Close the vent plug.
5. Depressurise the pressure side of the dosing system.
6. Make sure no dosing medium can flow back from the outlet side.
7. Make sure the returning dosing medium is safely collected.  
The pump is now ready for maintenance.

#### Related information

- [7.2 Safety instructions for maintaining the dosing diaphragm or the valves](#)

## 7.4 Cleaning or replacing the inlet and outlet valves

- Observe section Safety instructions for maintaining the dosing diaphragm or the valves
- Observe section Preparing for maintenance of the dosing diaphragm or the valves

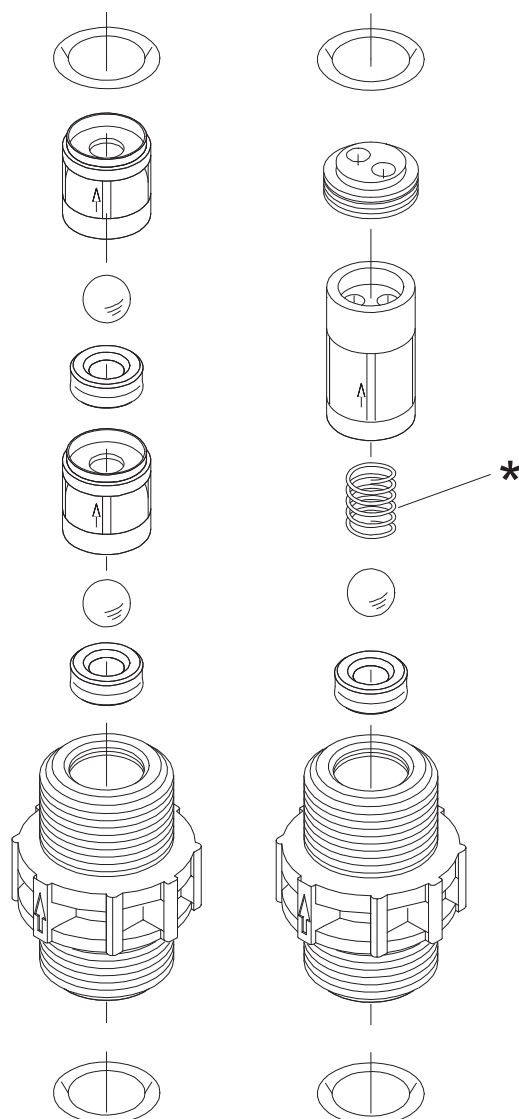


Fig. 7.4-1 Exploded view of inlet and outlet valves DN 8

Pos.	Description
*	Spring-loaded as an option.

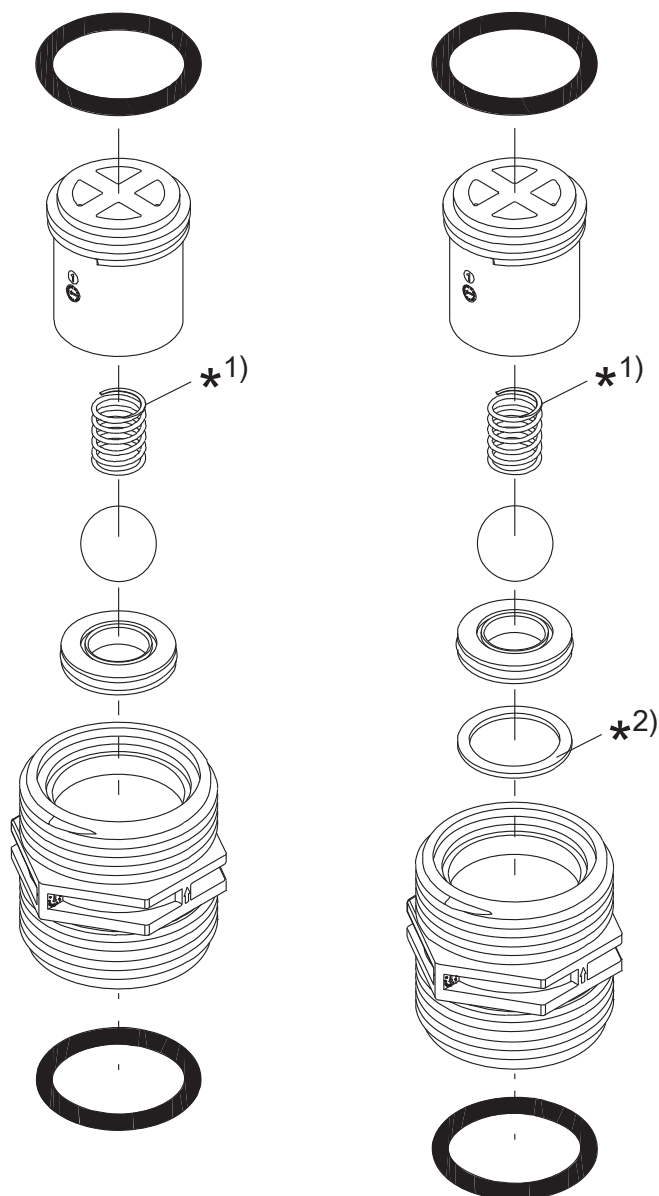


Fig. 7.4-2 Exploded view of inlet and outlet valves DN 20

Pos.	Description
*1)	Spring-loaded as an option.
*2)	Stainless steel (SS)

1. Unscrew the valve.
2. Disassemble the valve.
  - DN 8, not spring-loaded: Press out the valve cartridge and remove the valve seat from the ball cage.
  - DN 8, spring-loaded: Unscrew the ball cage with a pair of round pliers.
  - DN 20: Unscrew the ball cage with a pair of round pliers.
3. Clean all parts and check that the parts are intact.
4. Replace faulty parts with new ones.
5. Replace the O-rings with new ones.
 

The O-rings must be correctly placed in the specified grooves.
6. Re-assemble the valve.
7. Refit the valve in correct orientation.
 

The direction arrow on the valve must point in the flow direction (upwards).

**Related information**

- [7.3 Preparing for maintenance of the dosing diaphragm or the valves](#)
- [7.2 Safety instructions for maintaining the dosing diaphragm or the valves](#)

**7.5 Cleaning or replacing the dosing diaphragm**

- Observe section Safety instructions for maintaining the dosing diaphragm or the valves
- Observe section Preparing for maintenance of the dosing diaphragm or the valves
  1. Unscrew the dosing head screws.
  2. Remove the dosing head.
  3. Turn the motor fan blades until the diaphragm reaches the front dead centre.  
The diaphragm will detach itself from the diaphragm flange.
  4. Turn the diaphragm counter-clockwise to unscrew the diaphragm from the tappet.
  5. Clean all parts and check that the parts are intact.
  6. Replace faulty parts with new ones.
  7. Screw in the diaphragm completely. Then turn it back until the holes in the diaphragm and the flange are aligned.
  8. Turn the motor fan blades until the diaphragm reaches the back dead centre.  
The diaphragm is moved towards the diaphragm flange.
  9. Refit the dosing head.
  10. Cross-tighten the dosing head screws with the correct torque.
  11. After 6-10 operating hours or two days, retighten the screws with the correct torque.

**Related information**

- [7.2 Safety instructions for maintaining the dosing diaphragm or the valves](#)
- [7.3 Preparing for maintenance of the dosing diaphragm or the valves](#)
- [9.3.1 Torque values](#)

**7.6 Cleaning or replacing the diaphragm of the integral relief valve**

- Observe section Safety instructions for maintaining the dosing diaphragm or the valves
- Observe section Preparing for maintenance of the dosing diaphragm or the valves
- Make sure a return flow or overpressure cannot occur.
  1. Unscrew the four screws of the integral relief valve.
  2. Remove the top part of the integral relief valve.
  3. Remove the diaphragm.
  4. Clean all parts and check that the parts are intact.
  5. Replace faulty parts with new ones.
  6. Insert the diaphragm.
  7. Refit the top part of the integral relief valve.
  8. Cross-tighten the screws with the correct torque.
  9. After approximately 48 operating hours, retighten the screws with the correct torque.

**Related information**

- [7.2 Safety instructions for maintaining the dosing diaphragm or the valves](#)
- [7.3 Preparing for maintenance of the dosing diaphragm or the valves](#)
- [9.3.1 Torque values](#)

## 7.7 Returning the product

There are two situations when a pump must be sent to Grundfos or an authorised service workshop:

- every five years for gear grease exchange
- whenever you request service on the pump.



### **WARNING**

#### **Chemical hazard**

Death or serious personal injury

- Observe the material safety data sheet of the dosing medium.
- Wear protective clothing when working on the dosing head, connections or lines.
- Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.

Grundfos can refuse to accept the product for service, if it is not cleaned from chemicals or if the "Safety declaration" is not provided.

1. Clean the pump thoroughly before returning it. Make sure there are no traces of toxic or hazardous chemicals remaining on the pump.

If proper cleaning is not possible, provide all relevant information about the chemical.

2. Fill out the "Safety declaration" and attach it to the pump in a visible position.

You can find the "Safety declaration" at the end of this document.

3. Make sure the product is suitably protected during transport.

### **Related information**

- [6. Taking the product out of operation](#)
- [4.1 Handling the product](#)

## 8. Fault finding the product

### 8.1 The dosing pump does not run

Cause	Remedy
The pump is not connected to the power supply.	Connect the power supply cable.
Incorrect supply voltage.	Replace the dosing pump.
Electrical failure in the motor or the pump control unit.	Return the pump for repair.
The level sensor in the supply tank has stopped the pump, because the tank is empty.	Refill the tank and start the pump.
The diaphragm leakage sensor has stopped the pump, because there is a leakage.	Replace the diaphragm and start the pump.

### 8.2 The dosing pump does not suck in

Cause	Remedy
The inlet line is leaking.	Check and seal or replace the inlet line.
The inlet line is too small or too long.	Check with Grundfos specifications and adapt the inlet line to the specifications.
The inlet line is clogged.	Clean or replace the inlet line.
The foot valve is covered by sediment.	Clean the foot valve. Clean the tank from the sediment or shorten the inlet line.
The inlet line is buckled.	Install the inlet line correctly. Check for damage.
There are crystalline deposits in the valves.	Clean the valves.
The dosing diaphragm is broken.	Replace the dosing diaphragm.

### 8.3 No dosing flow

Cause	Remedy
There is air in the inlet line and the dosing head.	Wait until the pump has deaerated.
The stroke-length adjusting knob is set to zero.	Turn the stroke-length adjusting knob.
The viscosity of the dosing medium is too high.	Make sure the dosing pump and the installation are suitable for the viscosity of the dosing medium.
There are crystalline deposits in the valves.	Clean the valves.
The valves are not assembled correctly.	Assemble the valve parts in the right order. Ensure correct flow direction.
The injection point is blocked.	Ensure correct flow direction (injection unit). Remove the obstruction.
The lines and peripheral equipment are installed incorrectly.	Install the lines and peripheral equipment correctly. Ensure free passage.

## 8.4 The dosing flow is inaccurate

Cause	Remedy
There is gas in the dosing head.	Deaerate the dosing head.
There are crystalline deposits in the valves.	Clean the valves.
The zero point is set incorrectly.	Adjust the zero point to match the actual counterpressure.
The counterpressure is fluctuating.	Install a pressure-loading valve and a pulsation damper.
The pressure in the inlet line is fluctuating.	Keep a constant level in the dosing tank by installing a break tank. Install a pulsation damper.
The inlet or outlet line is too small or too long.	Install a pulsation damper.
There is siphon effect.	Install a pressure-loading valve.
The inlet line or outlet line is leaking or porous.	Check and replace the inlet line or outlet line.
Parts in contact with the dosing medium are not resistant to it.	Replace with parts made of a resistant material.
The dosing diaphragm is worn (incipient rips).	Replace the dosing diaphragm.
The dosing pump is used at the high end of its performance range in an installation with fluctuating supply voltage.	Lower the counterpressure of the pump.
The density or the viscosity of the dosing medium varies.	Make sure the density or the viscosity of the dosing medium does not vary. Use a stirrer.

## 8.5 Permanent leakage from the integral relief valve

Cause	Remedy
The outlet valve or the outlet line is blocked.	Clean the outlet valve and the outlet line.
The opening pressure of the integral relief valve is set too low.	Set the opening pressure of the integral relief valve correctly.
The diaphragm of the integral relief valve is defective.	Replace the diaphragm of the integral relief valve.
The ball or seat of the integral relief valve is defective.	Replace the defective parts.
The integral relief valve is dirty.	Clean the integral relief valve.

## 8.6 The diaphragm leakage sensor does not operate properly

Cause	Remedy
Malfunction in the sensor.	Clean the sensor. If the sensor is not working after cleaning, replace it with new one.
The AR control unit or the electronic unit for optical sensor does not operate properly.	Contact Grundfos for service.

## 9. Technical data

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### 9.1 Ambient conditions

#### Ambient conditions for operation

Parameter	Value
Ambient temperature	0-40 °C
Maximum relative air humidity	70 % at 40 °C, 90 % at 35 °C

#### Ambient conditions for storage

Parameter	Value
Ambient temperature	-20 to + 50 °C
Maximum relative air humidity	92 % (non-condensing)



## 9.2 Dosing medium

### Dosing medium characteristics

The dosing medium must have the following basic characteristics:

- liquid
- non-flammable.

For pumps with integral relief valve, the dosing medium must have the following characteristics in addition:

- non-crystallizing.

Make sure the dosing medium is not freezing or boiling at operation conditions.

In case of questions regarding the material resistance and suitability of the pump for a specific dosing medium, contact Grundfos.

### Medium temperature for pumps with PVC dosing head

Maximum counterpressure	Medium temperature
Up to 12 bar	0-40 °C
Up to 16 bar	0-20 °C

### Medium temperature for pumps with stainless-steel dosing head

Maximum counterpressure	Medium temperature
Up to 16 bar	-10 to +70 °C
For SIP or CIP applications (up to 2 bar, maximum 15 minutes)	up to 145 °C

### Medium temperature for pumps with PP dosing head

Maximum counterpressure	Medium temperature
Up to 10 bar	0-40 °C

### Medium temperature for pumps with PVDF dosing head

Maximum counterpressure	Medium temperature
Up to 9 bar	-10 to +70 °C
Up to 10 bar	-10 to +60 °C
Up to 16 bar	-10 to +20 °C

### Maximum viscosity

The values apply to dosing media with the following characteristics:

- Newtonian liquid
- non-degassing and non-abrasive liquid.

Parameter	Value
Maximum viscosity	100-400 mPa s (depending on the pump type)

### Related information

- [9.3.4 Suction lift](#)
- [https://en.wikipedia.org/wiki/Newtonian\\_fluid](https://en.wikipedia.org/wiki/Newtonian_fluid)

## 9.3 Mechanical data

### 9.3.1 Torque values

#### Torque values for the dosing head screws

Use a torque wrench with an accuracy of  $\pm 4\%$  to tighten the screws.

Pump type	Torque
	[Nm]
DMX 4-10	6-8
DMX 7-10	6-8
DMX 9-10	6-8
DMX 12-10	6-8
DMX 17-4	5-6
DMX 25-3	5-6
DMX 7.2-16	6-8
DMX 8-10	6-8
DMX 14-10	6-8
DMX 18-10	6-8
DMX 26-10	6-8
DMX 39-4	5-6
DMX 60-3	5-6
DMX 13.7-16	6-8
DMX 16-10	6-8
DMX 16-12	6-8
DMX 27-10	6-8
DMX 27-12	6-8
DMX 35-10	6-8
DMX 50-10	6-8
DMX 75-4	5-6
DMX 115-3	5-6

#### Torque values for the screws of the integral relief valve

Use a torque wrench with an accuracy of  $\pm 4\%$  to tighten the screws.

Pump type	Torque
	[Nm]
DMX with integral relief valve	3-4

### 9.3.2 Housing materials

<b>Pump</b>	<b>Material</b>
Upper part of pump housing	PPE + PA, glass-fibre reinforced
Lower part of pump housing	PP, glass-fibre reinforced
Stroke-length adjusting knob	ABS

<b>AR control unit</b>	<b>Material</b>
Upper part of AR housing	PPE + PS, glass-fibre reinforced
Lower part of AR housing	Aluminium

### 9.3.3 Pump performance

#### Dosing flow and maximum counterpressure

The values in the table below apply to the following conditions:

- maximum counterpressure at the outlet valve. Take the pressure losses along the outlet line to the injection point into account.
- dosing medium with viscosity and density similar to those of water
- flooded suction 0.5 m
- fully deaerated dosing head
- stroke length 100 %
- three-phase 400 V motor.

Pump type	Maximum dosing flow			Maximum counterpressure	
	50 Hz	60 Hz		[bar]	[psi]
	[l/h]	[l/h]	[US gph]		
DMX 4-10	4	5	1.3	10	145
DMX 7-10	7	8	2.1	10	145
DMX 9-10	9	11	2.9	10	145
DMX 12-10	12	14	3.7	10	145
DMX 17-4	17	20	5.3	4	58
DMX 25-3	27	32	8.5	3	43
DMX 7.2-16*1	7.2	9	2.3	16	232
DMX 8-10	8	10	2.6	10	145
DMX 14-10	14	17	4.5	10	145
DMX 18-10	18	22	5.8	10	145
DMX 26-10	26	31	8.2	10	145
DMX 39-4	39	47	12.4	4	58
DMX 60-3	60	72	19.0	3	43
DMX 13.7-16 *1	13.7	16	4.3	16	232
DMX 16-10	16	19	5.0	10	145
DMX 16-12	15.7	19	5.0	12	174
DMX 27-10	27	32	8.5	10	145
DMX 27-12	26.8	32	8.5	12	174
DMX 35-10	35	42	11.1	10	145
DMX 50-10	50	60	15.8	10	145
DMX 75-4	75	90	23.8	4	58
DMX 115-3	115	138	36.5	3	43

\*1 Operating the pump at a counterpressure of 16 bar will reduce the life of the dosing diaphragm.

#### Stroke volume and stroke rate

The values in the table below apply to the following conditions:

- maximum counterpressure
- dosing medium with viscosity and density similar to those of water
- flooded suction 0.5 m
- fully deaerated dosing head
- stroke length 100 %
- three-phase 400 V motor.

Pump type	Stroke volume [cm <sup>3</sup> ]	Maximum stroke rate	
		50 Hz	60 Hz
		[n/min]	[n/min]
DMX 4-10	2.2	29	35
DMX 7-10	3.8	29	35
DMX 9-10	4.9	29	35
DMX 12-10	6.9	29	35
DMX 17-4	10.4	29	35
DMX 25-3	16	29	35
DMX 7.2-16	1.9	63	75
DMX 8-10	2.2	63	75
DMX 14-10	3.8	63	75
DMX 18-10	4.9	63	75
DMX 26-10	6.9	63	75
DMX 39-4	10.4	63	75
DMX 60-3	16	63	75
DMX 13.7-16	1.9	120	144
DMX 16-10	2.2	120	144
DMX 16-12	2.2	120	144
DMX 27-10	3.8	120	144
DMX 27-12	3.8	120	144
DMX 35-10	4.9	120	144
DMX 50-10	6.9	120	144
DMX 75-4	10.4	120	144
DMX 115-3	16	120	144

#### Outlet pressure

Parameter	Value
Minimum counterpressure	1 bar at the pump outlet valve

#### Accuracy

The values in the table below apply to the following conditions:

- dosing medium with viscosity and density similar to those of water
- fully deaerated dosing head
- standard pump version.

<b>Parameter</b>	<b>Value</b>
Dosing flow fluctuation	$\pm 1.5$ % within the control range 1:10
Linearity deviation	$\pm 4$ % of the full-scale value. Adjustment from maximum to minimum stroke length within the control range 1:5.

### 9.3.4 Suction lift

The suction lift is the height difference between the medium level in the tank and the inlet valve.

#### Suction lift for dosing medium with viscosity similar to that of water

The values in the table below apply to the following conditions:

- Newtonian liquid
- density similar to that of water.  
The values in the table are in m, they have to be decreased for dosing media with higher density.
- non-degassing and non-abrasive liquid
- stroke length: 100 %
- counterpressure: 1.5 to 3 bar
- inlet line and dosing head filled (continuous operation).  
For priming with wetted valves with inlet line and dosing head not filled, the values have to be reduced by approximately 1 m.

Pump type	Maximum primed suction lift	
	50 Hz	60 Hz
	[m]	[m]
DMX 4-10	4	4
DMX 7-10	4	4
DMX 9-10	3	3
DMX 12-10	3	3
DMX 17-4	1	1
DMX 25-3	1	1
DMX 7.2-16	4	4
DMX 8-10	4	4
DMX 14-10	4	4
DMX 18-10	3	3
DMX 26-10	3	3
DMX 39-4	1	1
DMX 60-3	1	1
DMX 13.7-16	4	3.5
DMX 16-10	4	3.5
DMX 16-12	4	3.5
DMX 27-10	4	3.5
DMX 27-12	4	3.5
DMX 35-10	3	2.5
DMX 50-10	3	2.5
DMX 75-4	1	0.5
DMX 115-3	1	0.5

#### Suction lift for dosing medium with maximum viscosity

The values in the table below apply to the following conditions:

- Newtonian liquid
- density similar to that of water

The values in the table are in m, they have to be decreased for dosing media with higher density

- non-degassing and non-abrasive liquid
- stroke length: 100 %
- counterpressure: 1.5 to 3 bar
- inlet line and dosing head filled (continuous operation).

Pump type	Maximum primed suction lift	Maximum viscosity
	[m]*1	[mPa s]
DMX 4-10	1	400
DMX 7-10x	1	400
DMX 9-10	1	200
DMX 12-10	1	200
DMX 17-4	-1	200
DMX 25-3	-1	200
DMX 7.2-16	1	400
DMX 8-10	1	400
DMX 14-10	1	400
DMX 18-10	1	200
DMX 26-10	-1	200
DMX 39-4	1	100
DMX 60-3	1	100
DMX 13.7-16	1	200
DMX 16-10	1	200
DMX 16-12	1	200
DMX 27-10	1	200
DMX 27-12	1	200
DMX 35-10	1	100
DMX 50-10	1	100
DMX 75-4	-1	100
DMX 115-3	-1	100

\*1 Value -1 means 1 m flooded suction

#### Related information

- [9.2 Dosing medium](#)

#### 9.3.5 Sound pressure level

The sound pressure level was tested according to DIN 45635-01-KL3.

Parameter	Value
Sound pressure level	± 55 dB(A)



## 9.4 Electrical data

### Enclosure class

- The enclosure class depends on the motor variant selected and is stated on the motor nameplate.
- The specified enclosure class can only be ensured if the power supply cable is connected with the same degree of protection.
- For pumps with electronics, the specified enclosure class applies to pumps with correctly inserted plugs or screwed-on caps. The specified enclosure class can only be ensured if the sockets are protected.

### Motor data

The motor data depends on the motor variant selected and is stated on the motor and pump nameplate.

### Electrical data of pump electronics

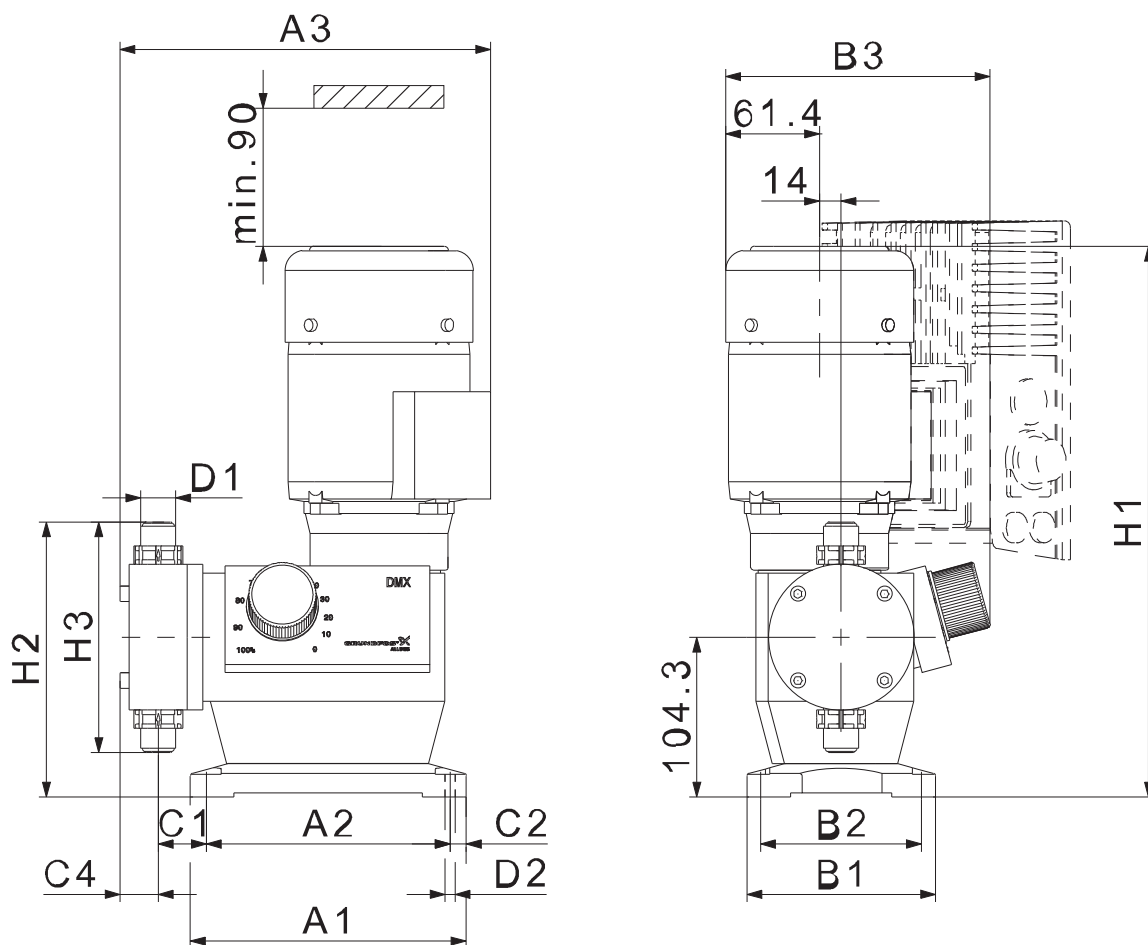
For pumps equipped with an AR control unit, VFD or Servomotor, separate installation and operating instructions including the electrical data of the electronics are supplied with the pump.

### Related information

- [11.1.6 Technical data of the electronic unit for optical sensor](#)
- [11.2.5 Technical data of DMX pumps with VFD](#)

## 9.5 Dimensions and weights

### 9.5.1 Dimensional sketch



Pump type	A1	A2	B1	B2	B3	B4	C2	D2	H1
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
all	180	159	123	105	175	225	10.5	6.5	max. 366

Pump type	A3	C1	C4	D1	H2	H3
	[mm]	[mm]	[mm]		[mm]	[mm]
DMX 4-10	275	32	25	G 5/8	179	153
DMX 7-10	275	32	25	G 5/8	179	153
DMX 9-10	275	32	25	G 5/8	179	153
DMX 12-10	275	32	25	G 5/8	179	153
DMX 17-4	323	64	38	G 1¼	192	177
DMX 25-3	330	80	40	G 1¼	197	188
DMX 7.2-16	275	32	25	G 5/8	179	153
DMX 8-10	275	32	25	G 5/8	179	153
DMX 14-10	275	32	25	G 5/8	179	153

Pump type	A3	C1	C4	D1	H2	H3
	[mm]	[mm]	[mm]		[mm]	[mm]
DMX 18-10	275	32	25	G 5/8	179	153
DMX 26-10	275	32	25	G 5/8	179	153
DMX 39-4	323	64	38	G 1¼	192	177
DMX 60-3	330	80	40	G 1¼	197	188
DMX 13.7-16	275	32	25	G 5/8	179	153
DMX 16-10	275	32	25	G 5/8	179	153
DMX 16-12	275	32	25	G 5/8	179	153
DMX 27-10	275	32	25	G 5/8	179	153
DMX 27-12	275	32	25	G 5/8	179	153
DMX 35-10	275	32	25	G 5/8	179	153
DMX 50-10	275	32	25	G 5/8	179	153
DMX 75-4	323	64	38	G 1¼	192	177
DMX 115-3	330	80	40	G 1¼	197	188

### 9.5.2 Weights

The values in the table below apply to pumps without AR control unit, Servomotor or VFD.

Pump type	Plastic dosing head	Stainless steel dosing head
	Weight	Weight
	[kg]	[kg]
DMX 4-10	5	7
DMX 7-10	5	7
DMX 9-10	5	7
DMX 12-10	5	7
DMX 17-4	7.5	12
DMX 25-3	8	13
DMX 7.2-16	5	7
DMX 8-10	5	7
DMX 14-10	5	7
DMX 18-10	5	7
DMX 26-10	5	7
DMX 39-4	7.5	12
DMX 60-3	8	13
DMX 13.7-16	5	7
DMX 16-10	5	7
DMX 16-12	5	7
DMX 27-10	5	7
DMX 27-12	5	7
DMX 35-10	5	7
DMX 50-10	5	7
DMX 75-4	7.5	12
DMX 115-3	8	13

## 9.6 Dosing curves

The dosing curves are approximated curves showing the dependency between pump performance, counterpressure and stroke length. The stated values apply to the following conditions:

- Newtonian liquid
- density similar to that of water
- inlet line with foot valve
- flooded suction, 0.5 m
- zero point of pump for specified pressure
- standard pump version.

Abbreviation	Description
Q	Dosing flow
Q <sub>0</sub>	Zero point of the pump.
Q [l/h]	Dosing flow in litres per hour
h	Stroke length
h [%]	Stroke length in percent of maximum stroke length
Hz	Frequency of the alternating current power supply in Hz = 1/s
bar	Counterpressure at the pump outlet valve in bar

### Related information

- [A.1. Curves](#)

## 10. Disposing of the product

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### 10.1 Disposing of hazardous or toxic materials

**WARNING****Chemical hazard**

Death or serious personal injury

- Observe the material safety data sheet of the dosing medium.
- Wear protective clothing when working on the dosing head, connections or lines.
- Rinse the parts that have been in contact with the dosing medium.
- Collect and dispose of all chemicals in a way that is not harmful to persons or the environment.

The materials used in DMX pumps do not pose any health risk to the person handling them. To identify the specific materials, check the type key on the product nameplate and read the explanation in the section Type key.

Observe also the product recycling page on <http://www.grundfos.com/products/product-sustainability/dmx.html>

**Related information**

- [5.3.2 Type key](#)

### 10.2 Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way.

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

**Related information**

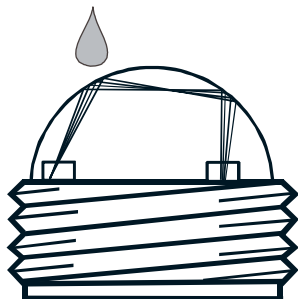
- [6. Taking the product out of operation](#)

## 11. Pump options and variants

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### 11.1 Diaphragm leakage sensor

Pumps prepared for diaphragm leakage sensor have a special dosing head flange with an optical sensor. The sensor contains an infrared transmitter and an infrared receiver.



In case of a diaphragm leakage, dosing medium will seep out into the dosing head flange and the light refraction in the optical sensor will change. The sensor produces a signal that can trigger an alarm device or switch off the pump via one of the following devices:

- AR control unit
- electronic unit for optical sensor.

#### Diaphragm leakage sensor with AR control unit



Observe the installation and operating instructions for the AR control unit.

### 11.1.1 Function of the electronic unit for optical sensor

#### Relay outputs

The electronic unit for optical sensor has two relay outputs:

- Relay 1 (C1): potential-loaded output, AC mains voltage, 230 V or 115 V, depending on the model  
C1 can be used to switch off the pump in case of a diaphragm leakage.
- Relay 2 (C2): potential-free output  
C2 can be used to trigger an alarm device in case of diaphragm leakage.

#### LEDs

The electronic unit for optical sensor has two LEDs.

- Green LED:
  - The green LED indicates that the system is ready for operation.
  - The green LED is on when the sensor is connected to the electronic unit. If the LED is off, the sensor is defective or wrongly connected.
  - The green LED stays on when the red LED is on.
- Red LED:
  - The red LED indicates that a diaphragm leakage has been detected.

### 11.1.2 Mounting the electronic unit for optical sensor

Have a screwdriver for the plastic screws in the cover of the electronic unit available. You also need four 4.5 x 35 mm screws and a suitable screwdriver for fastening the unit to the wall. The four screws are not included in the scope of delivery.

The diaphragm leakage sensor with electronic unit for optical sensor is supplied with a 5 m cable. Mount the electronic unit on the wall close to the pump.

1. Drill four Ø6 holes according to the drilling scheme.
2. Unscrew the plastic screws in the cover of the electronic unit.
3. Remove the cover with the plastic screws from the electronic unit.
4. Mount the electronic unit on the wall by means of the four screws.
5. Tighten the screws gently in order not to damage the electronic unit.
6. Fit the cover to the electronic unit and fasten it with the plastic screws.

#### Related information

- [11.1.6.1 Dimensional sketch of the electronic unit for optical sensor](#)

### 11.1.3 Electrical connection



#### DANGER

#### Electric shock

Death or serious personal injury

- All electrical connections must be carried out by qualified persons.
- Switch off the power supply before making any electrical connections.
- Make sure the power supply specified on the nameplate matches the local conditions.
- Provide relay outputs on site with appropriate backup fuses.
- To ensure electromagnetic compatibility (EMC), the input cables and current output cables must be screened.
- Route input cables, current output cables and power supply cables in separate ducts.

#### 11.1.3.1 Connecting the diaphragm leakage sensor electrically with the AR control unit

If the pump is equipped with an AR control unit, the diaphragm leakage sensor has a 1 m cable with an M12 plug.



Observe the installation and operating instructions for the AR control unit.



Insert the plug of the diaphragm leakage sensor into socket 1 of the AR control unit.

### Related information

- [11.1.3 Electrical connection](#)

#### 11.1.3.2 Connecting the diaphragm leakage sensor electrically with the electronic unit for optical sensor

Observe section Electrical connection.

If the diaphragm leakage sensor is used with an electronic unit for optical sensor, the diaphragm leakage sensor has a 3 m cable.

Connecting the diaphragm leakage sensor to the electronic unit:

1. Unscrew the plastic screws in the cover of the electronic unit.
2. Remove the cover with the plastic screws from the electronic unit.
3. Lead the sensor cable through cable gland on the right side of the electronic unit.
4. Connect the cable screen at one end to PE.
5. Connect the cable wires to the sensor connection T2 as listed below, and tighten the screws.
  - a. Connect the green wire to GN.
  - b. Connect the yellow wire to YE.
  - c. Connect the white wire to WH.

See the wiring diagram below.

6. Tighten the cable gland.

Connecting the relay outputs:

7. Connect the contact outputs C1 and C2 according to the individual needs.



### **DANGER** **Electric shock**

Death or serious personal injury

- Switch off the power supply before connecting contact 1.

The relay output connection depends on the application and the connected actuators.

If required, mount an additional cable gland in the bottom of the electronic unit.

8. Lead the cables through the cable glands on the right side of the bottom of the electronic unit.
9. Connect the wires to contact output C1 and C2 and tighten the screws.  
See the wiring diagram below.
10. Tighten the cable gland.

Connecting the power supply:

11. Lead the cable through the left cable gland in the bottom of the electronic unit.
12. Connect the power supply to T1.  
See the wiring diagram below.

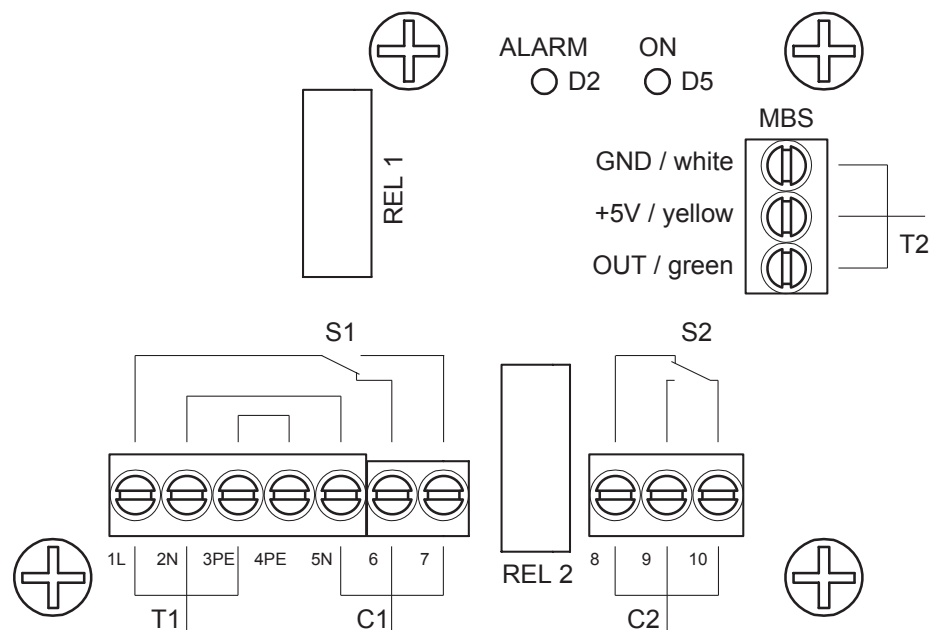


Fig. 11.1.3.2-1 Wiring diagram

Pos.	Description	
T1	Power connection	Terminals 1, 2, 3: 230 V AC / 115 V AC
C1	Contact output 1	Terminals 5, 6, 7: potential-loaded, 230 V AC / 115 V AC
S1	Relay 1	
C2	Contact output 2	Terminals 8, 9, 10: potential-free
S2	Relay 2	
T2	Sensor connection	Terminals GN (OUT / green), YE (+5 V / yellow), WH (GND / white)
D2	Alarm LED (red)	The LED lights up if a diaphragm leakage is detected.
D5	Sensor LED (red/green)	The LED shows green light when the sensor is connected.

13. Tighten the cable gland.

14. Fit the cover to the electronic unit and fasten it with the plastic screws.

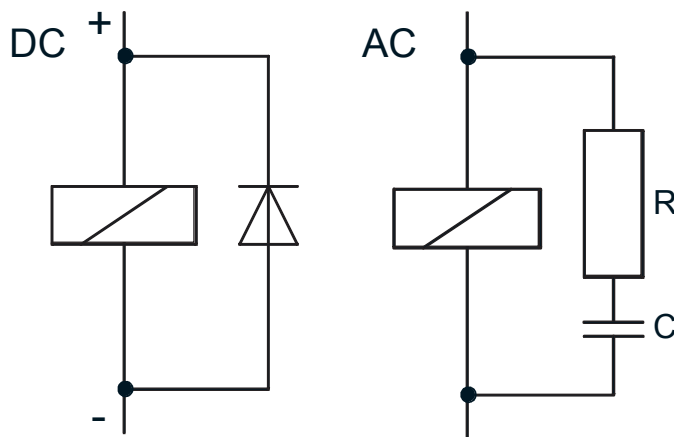
#### Related information

- [11.1.3 Electrical connection](#)

#### 11.1.3.3 Interference suppression of inductive loads

- Inductive loads on the electronic unit for optical sensor will damage relays and contactors.
- Inductive loads on the electronic unit can be eliminated by means of a suppressor circuit as the one described below.

#### Suppressor circuit DC or AC



- With DC voltage, connect a free-wheeling diode parallel to the relay or the contactor.
- With AC voltage, choose capacitor and resistor corresponding to the input current:

Current up to ...	Capacitor (C)	Resistor (R)
60 mA	10 mF, 275 V	390 Ω, 2 W
70 mA	47 mF, 275 V	22 Ω, 2 W
150 mA	100 mF, 275 V	47 Ω, 2 W
1.0 A	220 mF, 275 V	47 Ω, 2 W

#### 11.1.4 Checking the diaphragm leakage sensor

It depends on the electronic unit used, how the signals from a connected diaphragm leakage sensor are indicated.

- If you use an AR control unit, observe the installation and operating instructions for the AR control unit.
- If you use an electronic unit for optical sensor, observe section Function of the electronic unit for optical sensor.

1. Remove the diaphragm leakage sensor from the flange.

2. Check that the sensor is in good condition. Clean it with a cloth.

3. Dip the sensor into water.

- The electronic unit indicates that the diaphragm is leaky:  
Proceed with the functional check.
- The electronic unit does not indicate that the diaphragm is leaky or that a sensor is connected:

The sensor or the electronic unit is defective:

- If the sensor is defective, replace it with a new one.
- If the electronic unit is defective, call Grundfos service.

4. Dry the sensor carefully.

- The electronic unit indicates that a sensor is connected:  
Screw the sensor into the hole of the dosing head flange (M14 x 1.5).  
The sensor and the electronic unit are ready for operation.
- The electronic unit does not indicate that a sensor is connected:  
The sensor or the electronic unit is defective:
  - If the sensor is defective, replace it with a new one.
  - If the electronic unit is defective, call Grundfos service.

#### Related information

- [11.1.1 Function of the electronic unit for optical sensor](#)

### 11.1.5 Maintaining the diaphragm leakage sensor



#### **DANGER**

#### **Electric shock**

Death or serious personal injury

- Do not work on the electronic device of the diaphragm leakage sensor.

1. Check the diaphragm leakage sensor.
2. If the sensor is defective, replace it with a new one.
3. If the electronic unit is defective, call Grundfos service.  
The electronic unit is maintenance-free.

#### **Related information**

- [11.1.4 Checking the diaphragm leakage sensor](#)

### 11.1.6 Technical data of the electronic unit for optical sensor

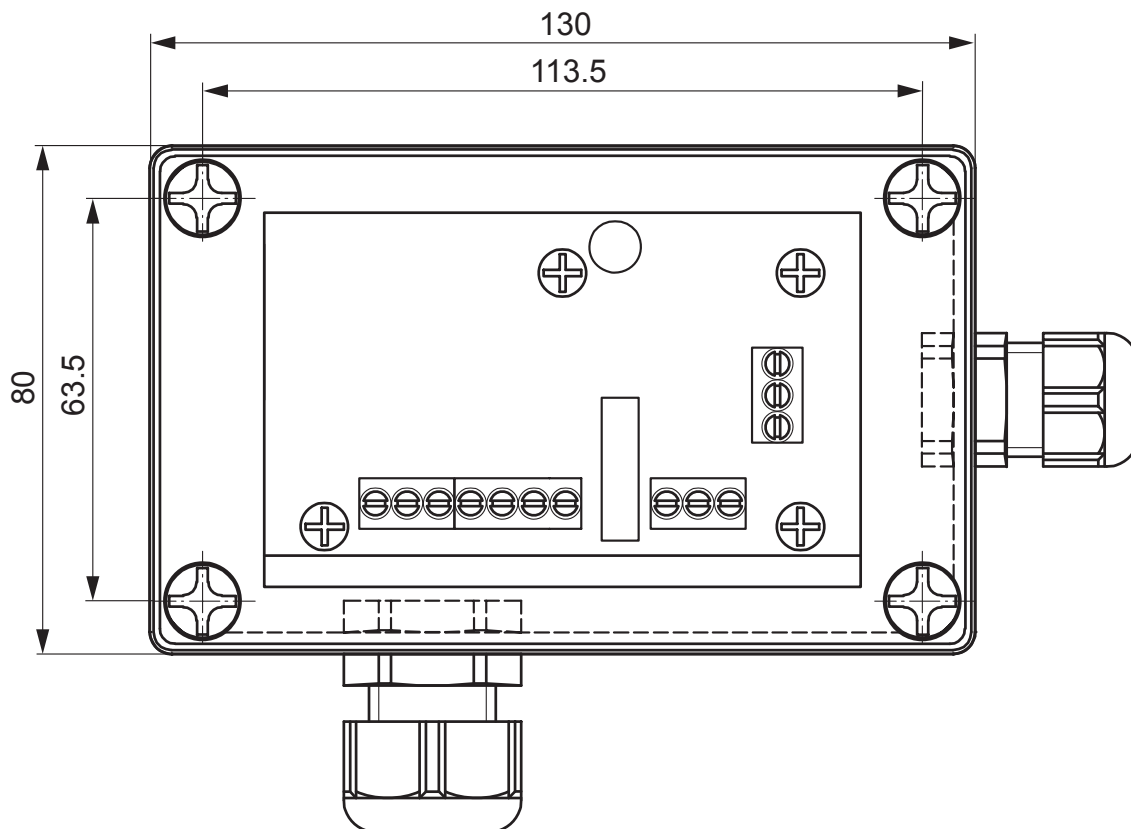
<b>Parameter</b>	<b>Value</b>
Maximum mains voltage deviation	± 10 %
Contact load	250 V / 6 A, maximum 550 VA
Power consumption	1.15 VA
Enclosure class	IP65
Permissible ambient temperature	0-40 °C

#### **Models**

<b>Product number</b>	<b>Mains voltage</b>
96725701	230 V, AC
91835310	115 V, AC

#### 11.1.6.1 Dimensional sketch of the electronic unit for optical sensor

Dimensions and drilling scheme for the electronic unit for optical sensor. All measurements in [mm].



## 11.2 Pumps with VFD



Observe the installation and operating instructions for the pump and the supplier manual "BU 0180" for the VFD on <https://www.nord.com>. Pay attention to the special VFD parameter settings for DMX.

### VFD variants used with DMX pumps

The supplier offers a wide range of VFD variants. DMX pumps are available with the following VFD variants:

- VFD mounted on the pump motor
- VFD with IP66 housing
- VFD with potentiometer
- VFD without braking resistor (BW)
- VFD without ATEX approval.

### 11.2.1 Identification of pumps with VFD

Pumps with motors with PTC sensor and VFD are available in different variants which are shown on the nameplate and explained in the type key. The last two letters of the type designation indicate the VFD variant.

#### Related information

- [5.3.2 Type key](#)

### 11.2.2 Connecting the VFD to the power supply



**CAUTION**  
**Automatic startup**

Minor or moderate personal injury

- Make sure the pump has been correctly installed and is ready to be started before you switch on the power supply.



Read the supplier manual "BU 0180" for the VFD supplied with the product.

The VFD is connected to the pump on delivery, so you only need to connect the power supply. As soon as the power supply is connected to the VFD and switched on, the pump can automatically start operating depending on the potentiometer setting. Make sure the power supply to the VFD is only switched on when the pump is ready for startup and operation.

There is no need to take special safety measures on the mains input side of the frequency converter. We advise you to use ordinary mains fuses and a main switch or a circuit breaker.

Isolate the connector from the power supply simultaneously for all the poles (L1/L2/L2 or L1/N).

Requirements for the power cable cross section:

- 0.2 - 4/6 mm<sup>2</sup> rigid / flexible cable AWG 24-10
- To loop the mains voltage up to a cable cross section of 2 x 2.5 mm<sup>2</sup>, use double-wire end sleeves.

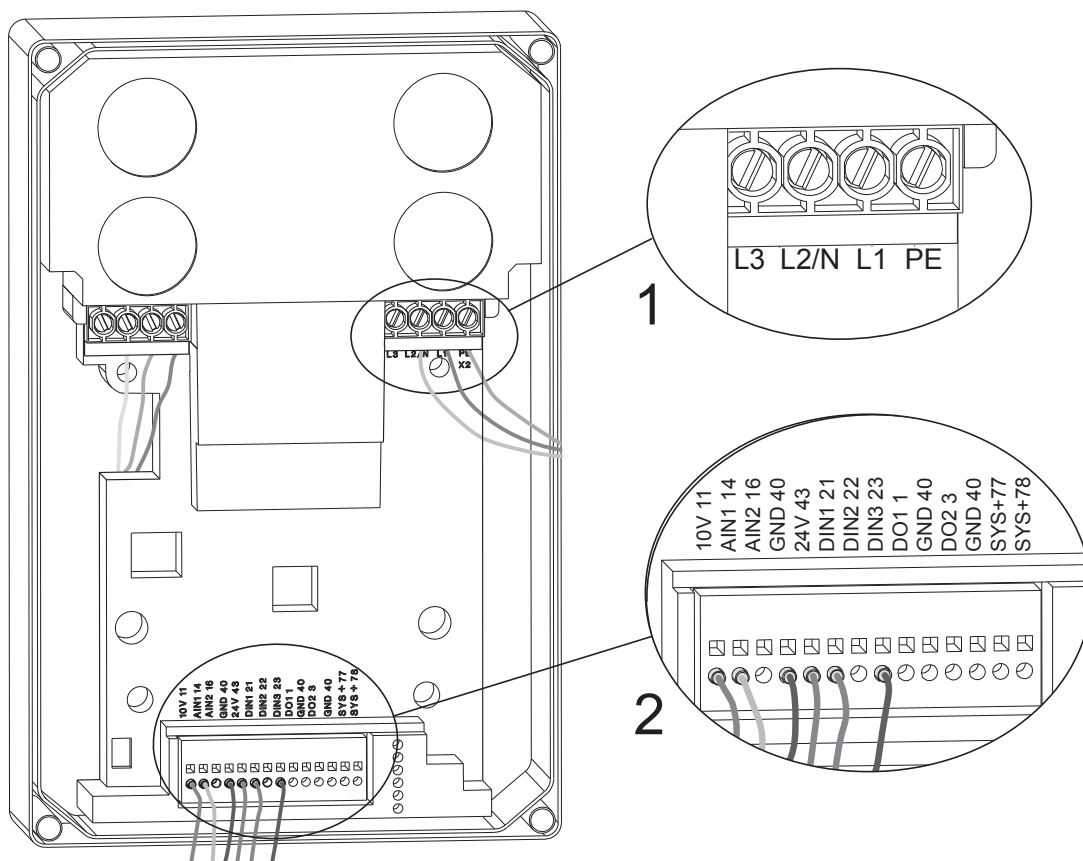


Fig. 11.2.2-1 Electrical connection of the VFD

Pos.	Description
1	VFD mains connection
2	VFD terminals

1. Switch off the power supply.
2. Unscrew the screws of the front cover of the VFD power unit and remove the front cover.

3. Lead the power supply cable through a cable gland.
4. Strip the cable sheath to a length of approx. 3-5 cm and the wires to a length of 7 mm.
5. Connect the wires to the power supply terminals according to the wiring diagrams printed in the VFD.
  - Single-phase VFD variant: connect phase line (L1) to L1, neutral line (N) to L2/N, protective earth (PE) to PE.
  - Three-phase VFD variant: connect phase lines (L1, L2, L3) to L1, L2/N and L3, protective earth (PE) to PE.

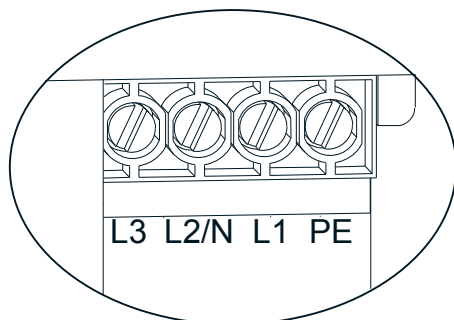


Fig. 11.2.2-2 Mains connection of the VFD

Tighten the screws with 0.5 - 0.6 Nm.

6. Tighten the cable gland.
7. Refit the front cover of the VFD power unit and tighten the screws.  
Tighten the screws with 3.5 Nm  $\pm$  20 %.

#### Related information

- [3.1 Preparing the pump for startup](#)
- [11.2.5 Technical data of DMX pumps with VFD](#)

### 11.2.3 Operating modes



Read the supplier manual "BU 0180" for the VFD supplied with the product.

The selection of the operating mode (manual or analog) can be made via a central control unit.

- If analog input 1 (AIN 1) is activated, manual mode is selected. The VFD is operated via the potentiometer.
- If analog input 2 (AIN 2) is activated, analog mode is selected. The VFD is operated via analog signal 4-20 mA.

#### Permanent setting of operating mode (VFD variant A)

If there is no central control unit, the operating mode can be set permanently to manual or analog. The VFD is default set to manual operation via the potentiometer.

#### Manual operation via the integrated potentiometer (default)

- Terminals 43 and 22 are connected with a jumper.
  - Digital input 2 is activated.
  - AIN 1, which is assigned to the potentiometer, is activated.
- Speed control is only possible via the potentiometer.

For 4-20 mA analog operation, make the settings described below.

#### Changing operating mode to analog operation (optional)

- Disconnect the jumper from terminal 22 and connect it to terminal 23.
  - Digital input 3 is activated.
  - AIN 2 is activated.
- Signal input is made via the terminals 40 (-) and 16 (+).

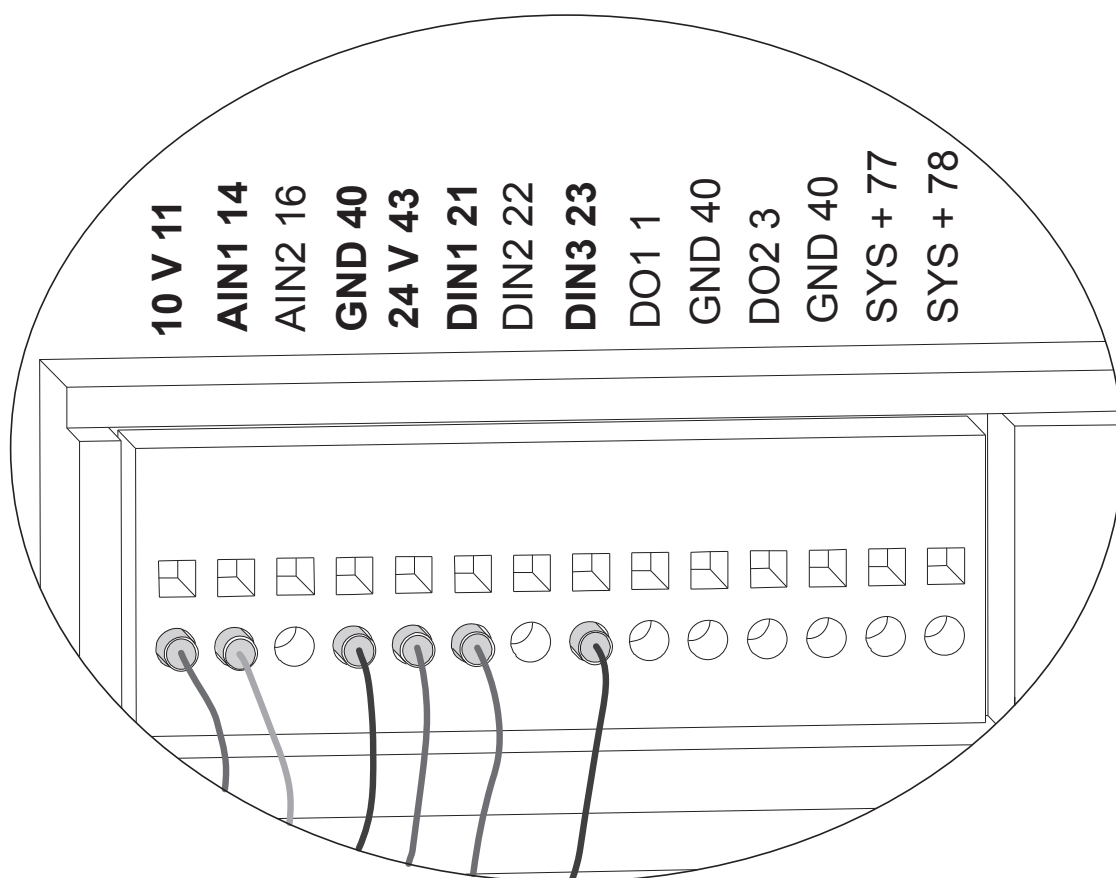


Fig. 11.2.3-1 VFD terminals

**Operating modes for other VFD variants (B - E)**





Read the supplier manual "BU 0180" for the VFD when setting the operating mode for a VFD variants B-E.

#### 11.2.4 Special VFD parameter settings for DMX

- Some parameters have been adapted to DMX pumps. These parameters differ from the default settings mentioned in the supplier manual for the VFD.
- Do not change the special parameter settings of the VFD for operation with DMX pumps.
- When resetting the VFD to default settings, the special parameter settings for DMX will be overwritten. The special parameters must be set again.

##### Mandatory settings

- Do not set P506, "automatic fault acknowledgement", to 6, "always". In case of an active error, such as leakage to earth or short circuit, the VFD will restart continuously and cause damage to the system because P428 is set to 1, "on".
- Do not change the following settings as this may lead to malfunction of the DMX pump with VFD.

##### Basic parameters

Code	Parameter	Value for DMX
P102	Startup time	5 s
P105	Maximum frequency	100 Hz

##### Control terminals

Code	Index	Parameter	Value for DMX
P400	-02	Setpoint input function. Analog input 2 (AIN 2)	01 = Setpoint frequency
P401	-01	Analog mode ON. Analog input 1 (AIN 1)	2 = 0-10 V, monitored
P401	-02	Analog mode ON. AIN 2	2 = 0-10 V, monitored
P402	-01	Adjustment: 0 %. AIN 1	1.36 V <sup>*1</sup>
P402	-02	Adjustment: 0 %. AIN 2	1 V
P403	-02	Adjustment: 100 %. AIN 2	5 V
P420	-01	Digital input function. Digital input 1 (DIN 1)	02 = Enable left (left-handed rotation)
P420	-02	Digital input function. Digital input 2 (DIN 2)	19 = Setpoint 1 on/off
P420	-03	Digital input function. Digital input 3 (DIN 3)	20 = Setpoint 2 on/off
P428		Automatic starting after power supply has been switched OFF	1 = On (enable with level)

\*1 The minimum frequency for the VFD is set to approx. 5 Hz.

##### Extra functions

Code	Parameter	Value for DMX
P504	Pulse frequency	8 kHz
P540	Mode phase sequence	3 = only counter-clockwise (CCW) direction of rotation.

Modifications of other parameters and adaptation of the inputs and outputs can be made by means of the optional "parameter box" or the "NordCon" software. Read the supplier manual "BU 0180" for the VFD provided with the product.

## 11.2.5 Technical data of DMX pumps with VFD

### General technical data

- Observe the values stated on the nameplates and in the installation and operating instructions.
- For technical data, ambient conditions and operating conditions, see section Technical data.

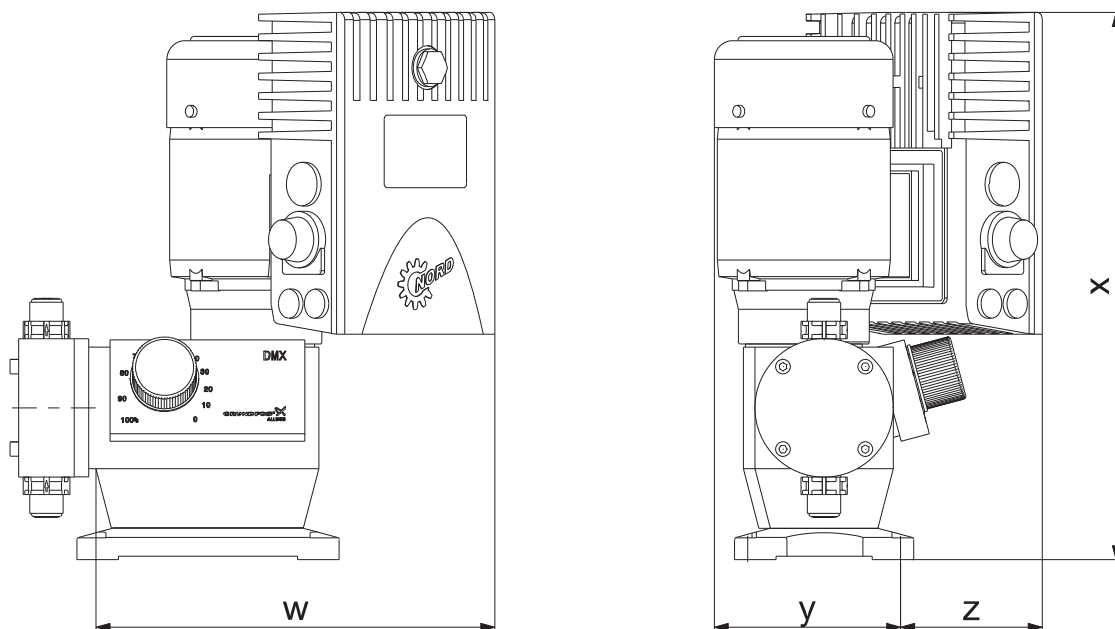
### Electrical data of the VFD

Parameter	Value
Type of current	1 AC (single-phase)
Mains voltage	200-240 V $\pm$ 10 %
Mains frequency	47-63 Hz
VFD power	0.25 kW
Motor power	0.18 kW

For electrical data, such as current consumption, see the nameplates of the motor and the VFD.

### 11.2.5.1 Dimensional sketch of DMX pumps with VFD

For all other dimensions, see section "Dimensional sketch".



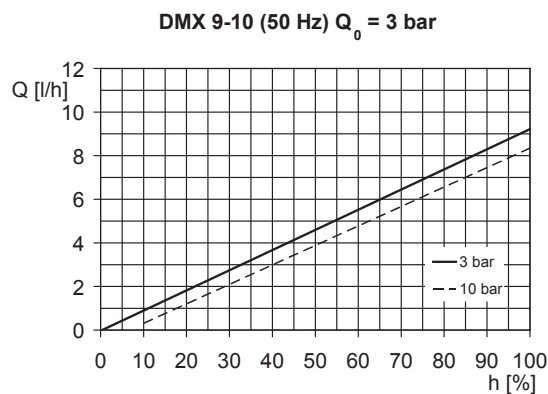
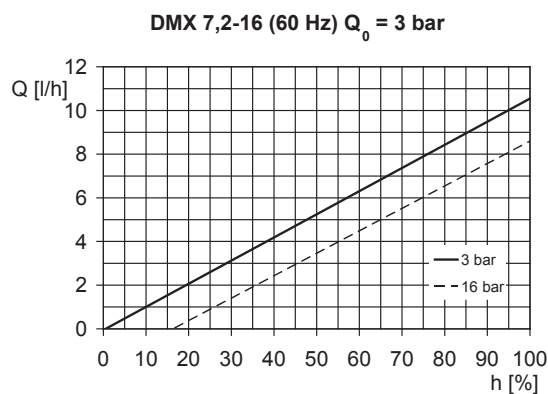
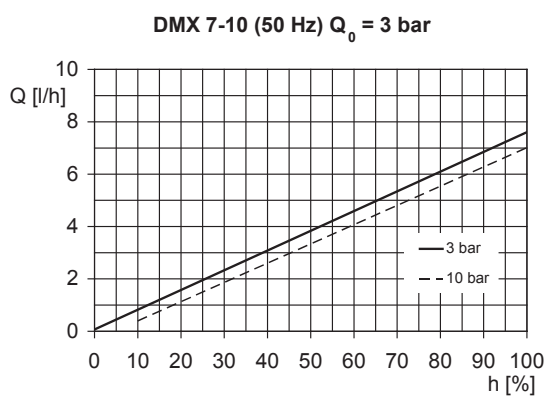
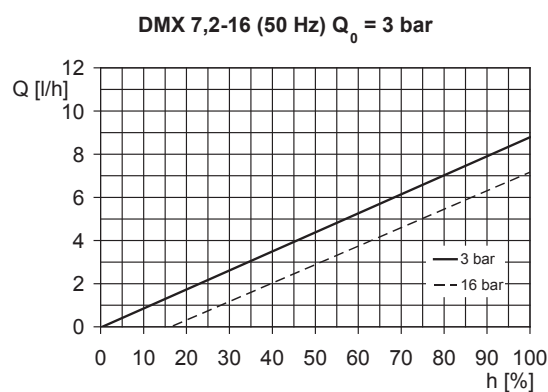
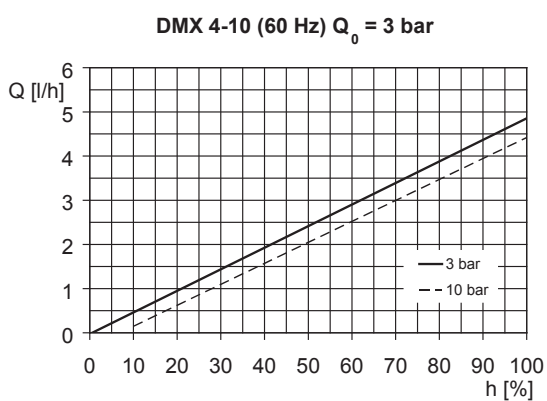
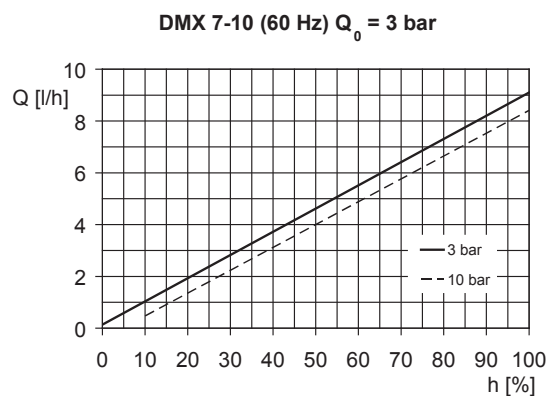
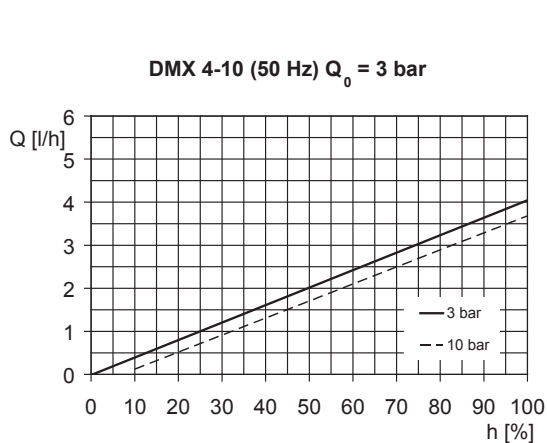
Pump type	x	w	y	z
	[mm]	[mm]	[mm]	[mm]
all	376	276	128	97

### Related information

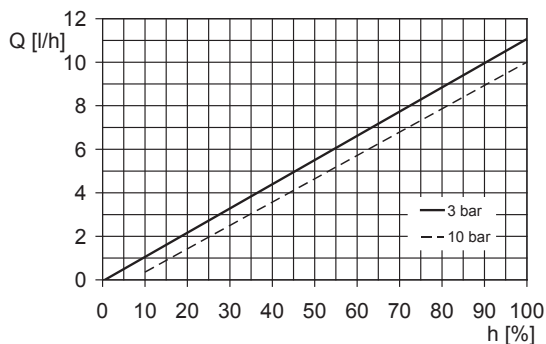
- [9.5.1 Dimensional sketch](#)

Subject to alterations.

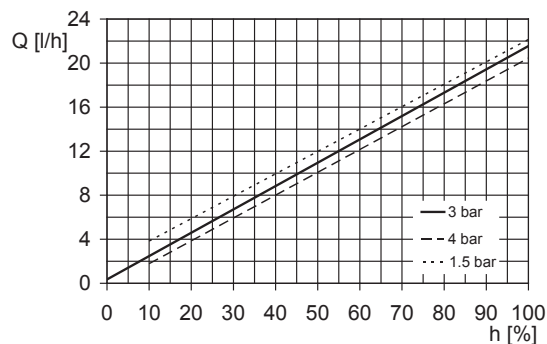
## A.1. Curves



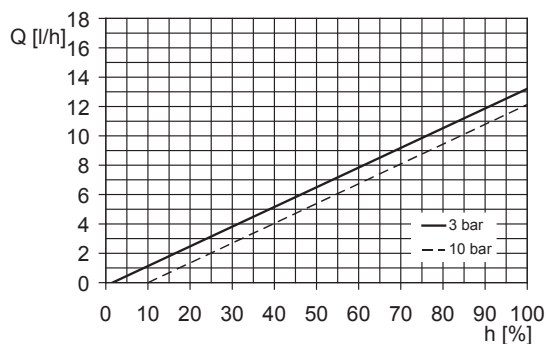
**DMX 9-10 (60 Hz)  $Q_0 = 3$  bar**



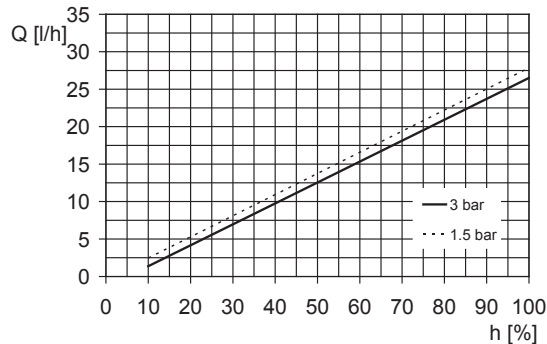
**DMX 17-4 (60 Hz)  $Q_0 = 3$  bar**



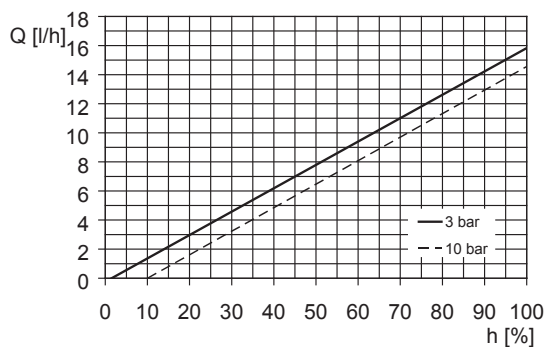
**DMX 12-10 (50 Hz)  $Q_0 = 3$  bar**



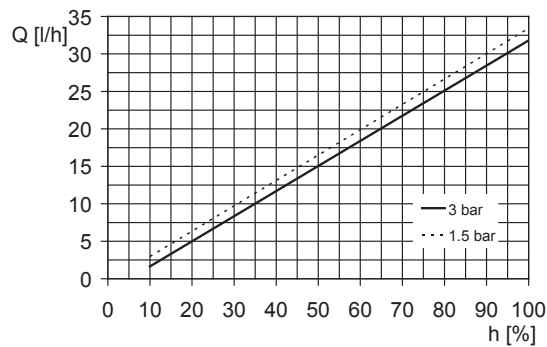
**DMX 25-3 (50 Hz)  $Q_0 = 3$  bar**



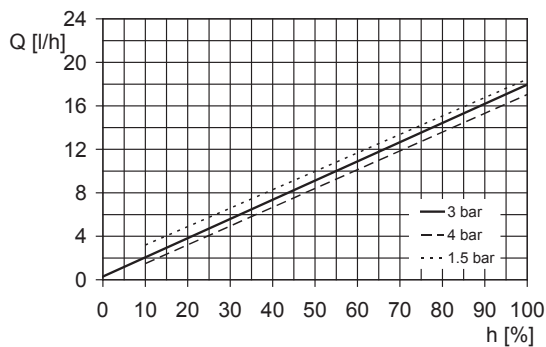
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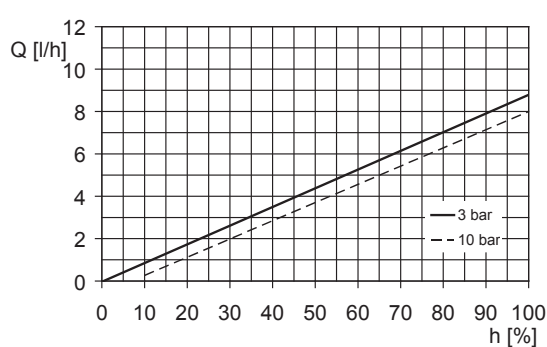
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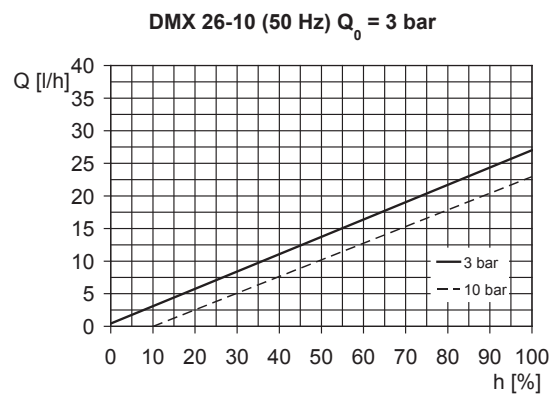
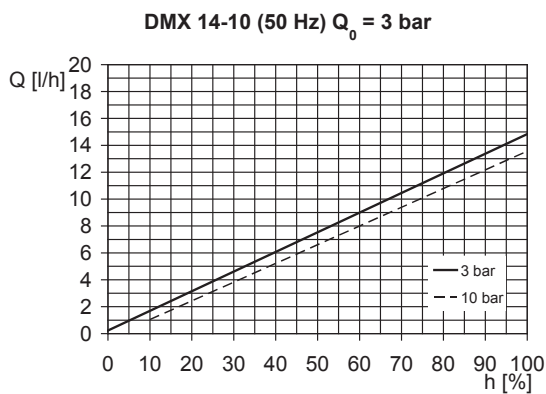
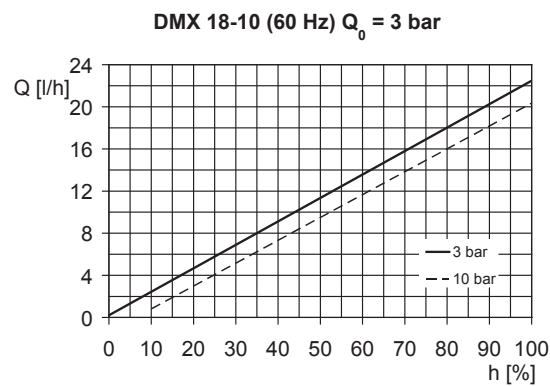
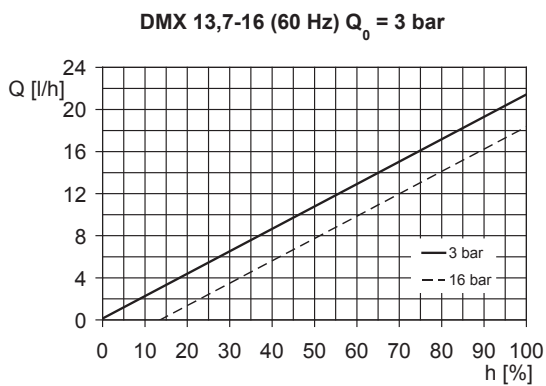
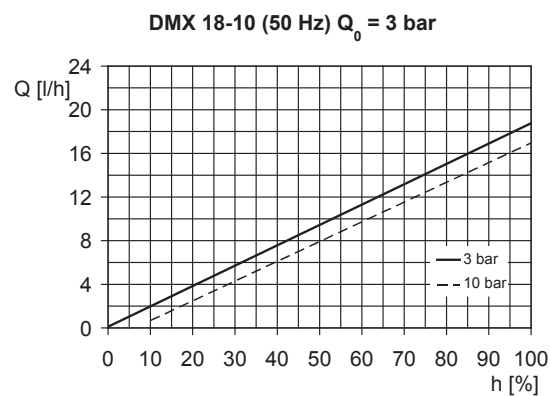
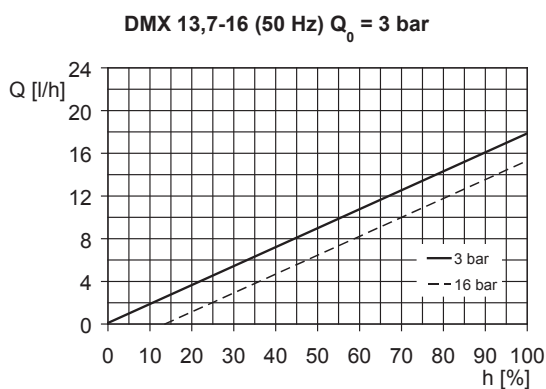
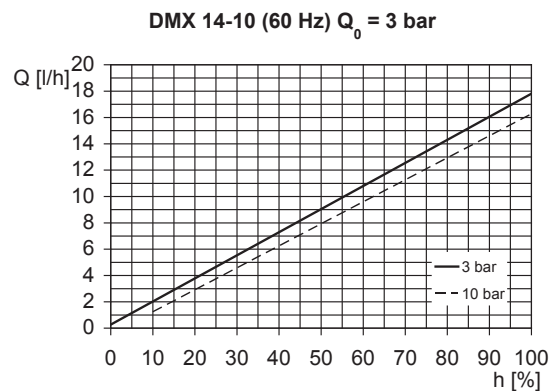
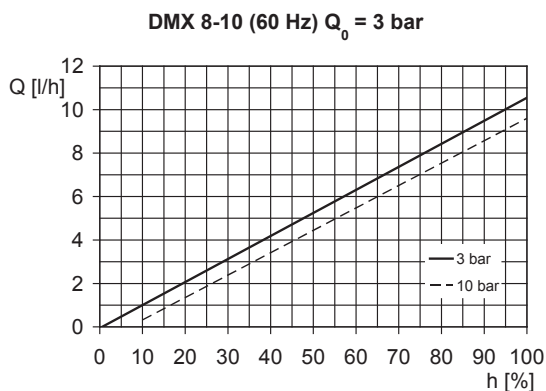


**DMX 17-4 (50 Hz)  $Q_0 = 3$  bar**

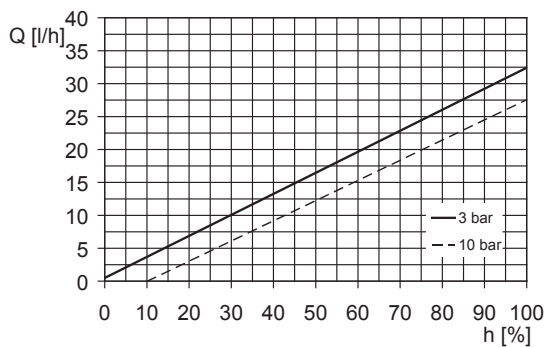


**DMX 8-10 (50 Hz)  $Q_0 = 3$  bar**

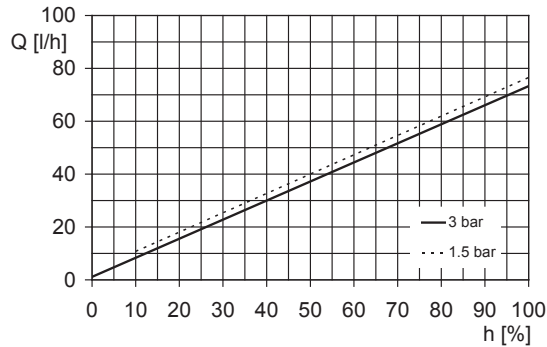




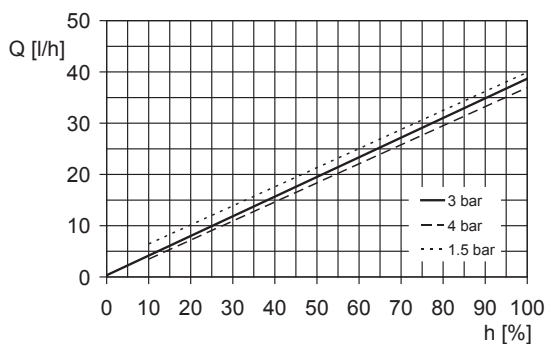
**DMX 26-10 (60 Hz)  $Q_0 = 3$  bar**



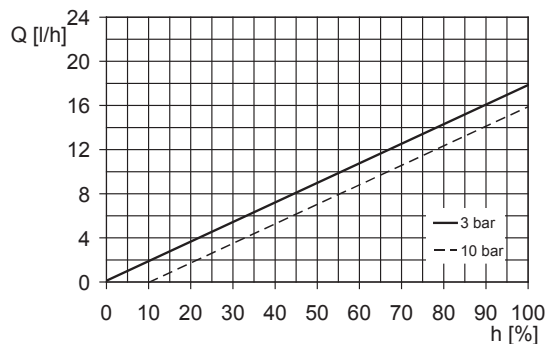
**DMX 60-3 (60 Hz)  $Q_0 = 3$  bar**



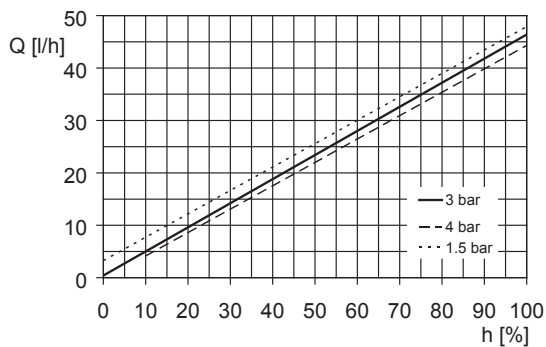
**DMX 39-4 (50 Hz)  $Q_0 = 3$  bar**



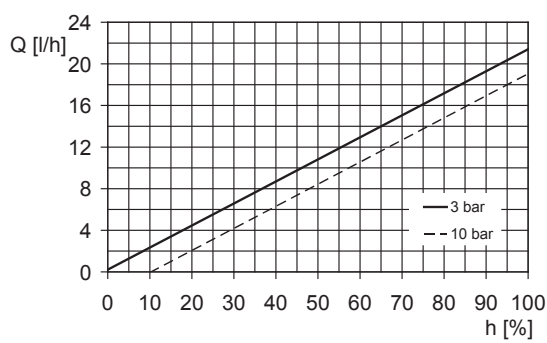
**DMX 16-10 (50 Hz)  $Q_0 = 3$  bar**



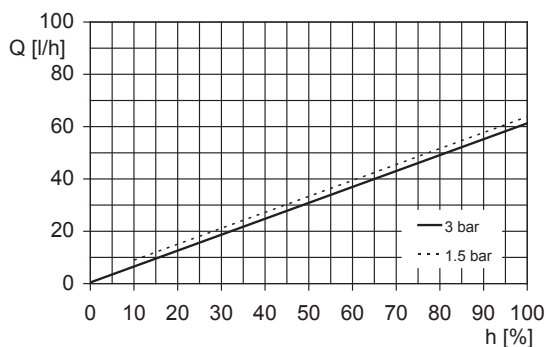
**DMX 39-4 (60 Hz)  $Q_0 = 3$  bar**



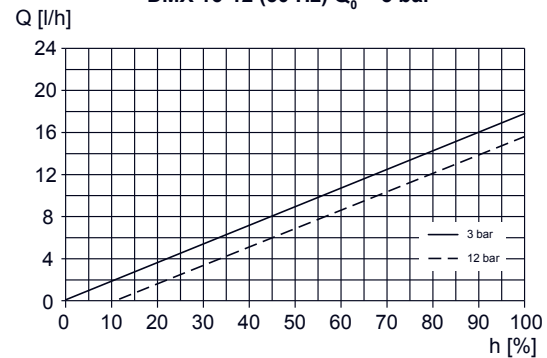
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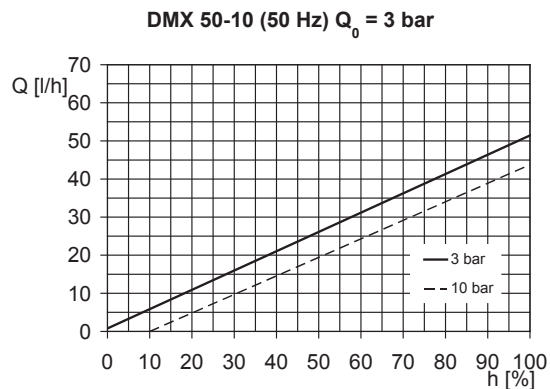
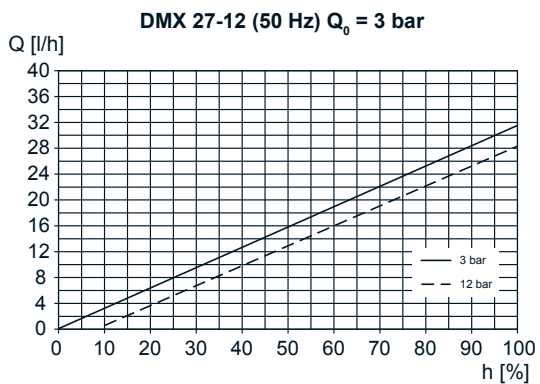
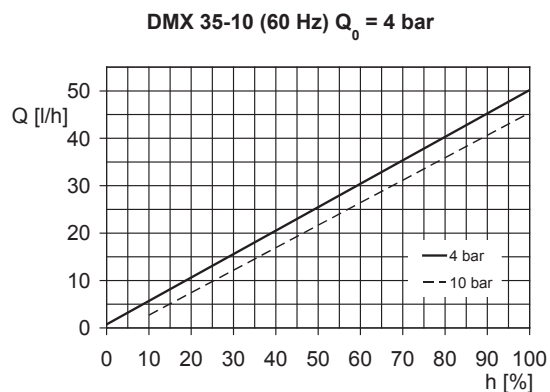
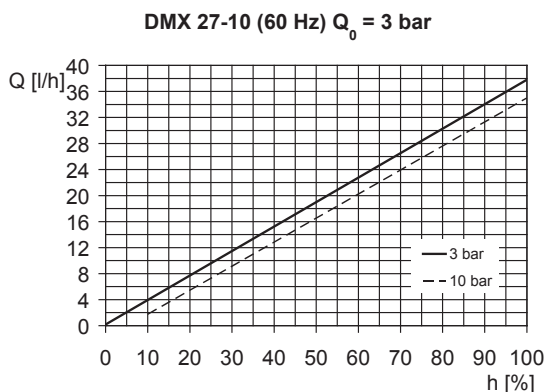
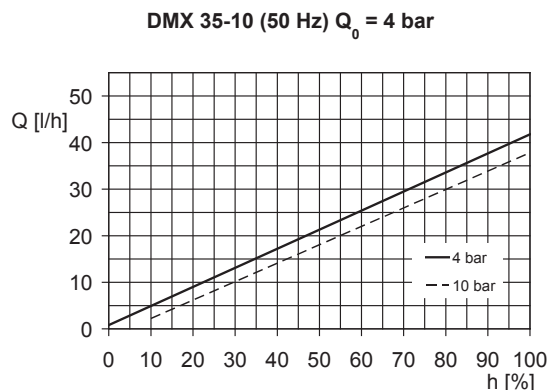
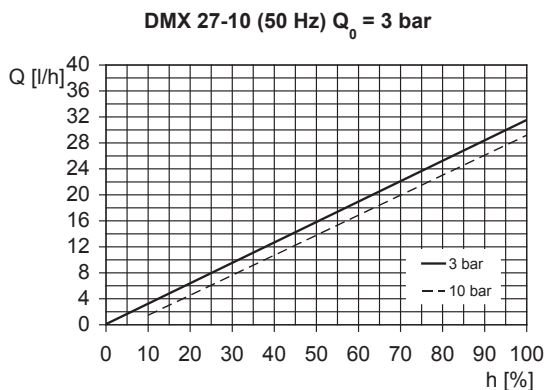
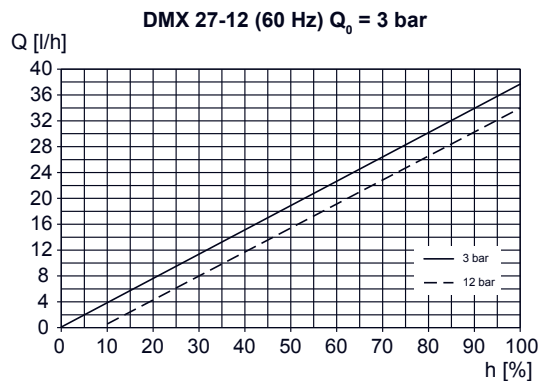
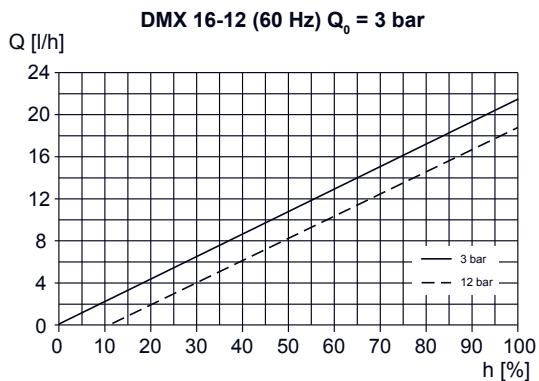


**DMX 60-3 (50 Hz)  $Q_0 = 3$  bar**

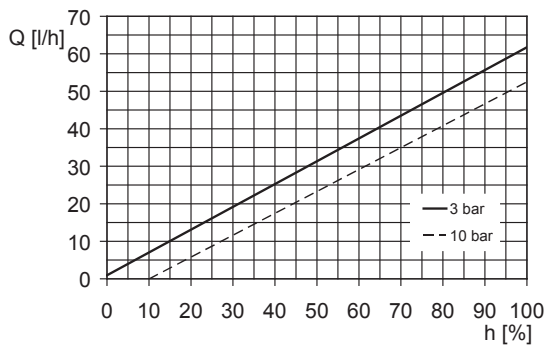


**DMX 16-12 (50 Hz)  $Q_0 = 3$  bar**

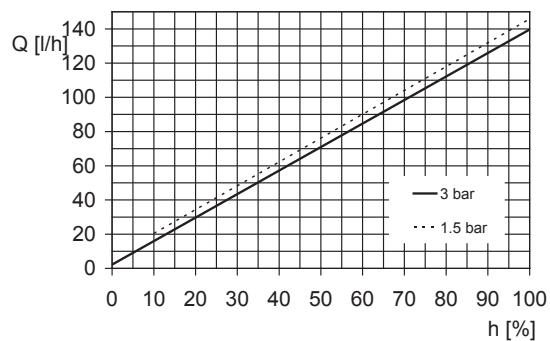




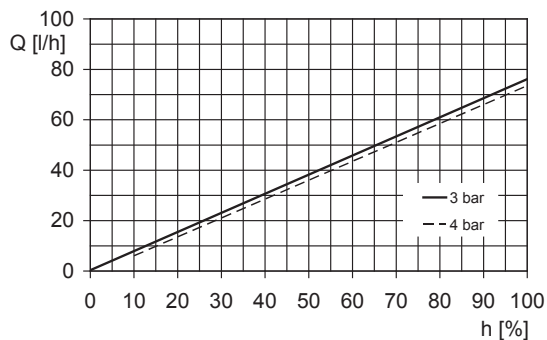
**DMX 50-10 (60 Hz)  $Q_0 = 3 \text{ bar}$**



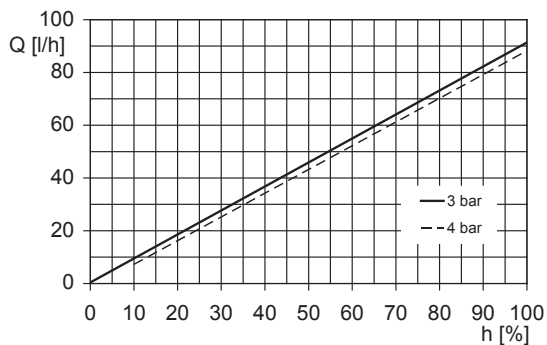
**DMX 115-3 (60 Hz)  $Q_0 = 3 \text{ bar}$**



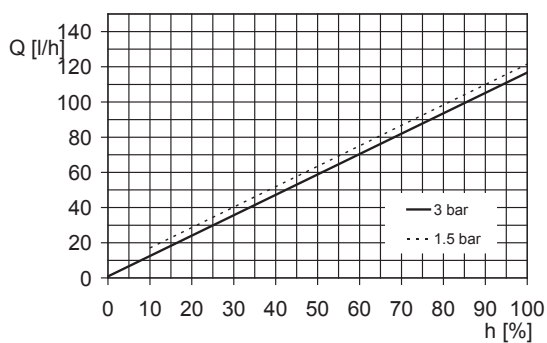
**DMX 75-4 (50 Hz)  $Q_0 = 3 \text{ bar}$**



**DMX 75-4 (60 Hz)  $Q_0 = 3 \text{ bar}$**



**DMX 115-3 (50 Hz)  $Q_0 = 3 \text{ bar}$**





## B.1. Safety declaration

---

- Please copy, fill in and sign this sheet and attach it to the pump returned for service.
- Fill in this document using English or German language.

### Fault description

- Please make a circle around the damaged part.
- In the case of an electrical or functional fault, please mark the cabinet.
- Please give a short description of the fault:



### Declaration

We hereby declare that this product is free from hazardous chemicals, biological and radioactive substances (see pump nameplate):

\_\_\_\_\_

Type designation:

\_\_\_\_\_

Product number:

\_\_\_\_\_

The product was used with the following dosing medium:

\_\_\_\_\_

No dosing medium or water:

\_\_\_\_\_

A chemical solution, name:

\_\_\_\_\_

Date and signature:

\_\_\_\_\_

Company stamp:



<b>91834765 0317</b>
ECM: 1203452