

DMX 221

Ⓒ Installation and operating instructions

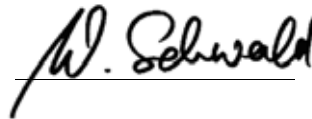


Declaration of Conformity

We **Grundfos Alldos** declare under our sole responsibility that the products **DMX 221**, to which this declaration relates, are in conformity with the Council Directives on the approximation of the laws of the EC Member States relating to

- Machinery (98/37/EC).
Standard used: EN ISO 12100.
- Electromagnetic compatibility (89/336/EEC).
Standards used: EN 61000-3-2: 1995, + A1 + A2, EN 61000-3-3: 1995 and EN 61326: 1997, + A1 + A2, Class B.
- Electrical equipment designed for use within certain voltage limits (73/23/EEC) [95].
Standard used: EN 61010-1: 2002.

Pfinztal, 1st June 2007



W. Schwald
Managing Director

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Warning

These complete installation and operating instructions are also available on www.Grundfosalldos.com.



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

1. General

1.1 Introduction

These installation and operating instructions contain all the information required for starting up and handling the DMX 221 dosing pump.

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

1.2 Service documentation

If you have any questions, please contact the nearest Grundfos Alldos company or service workshop.

2. Installation data

Note

*Please fill in the data below after commissioning.
It will help you and your Grundfos Alldos service partner to make subsequent adjustments to the installation.*

Owner:

Grundfos Alldos customer number:

Contract number:

Order number of pump:

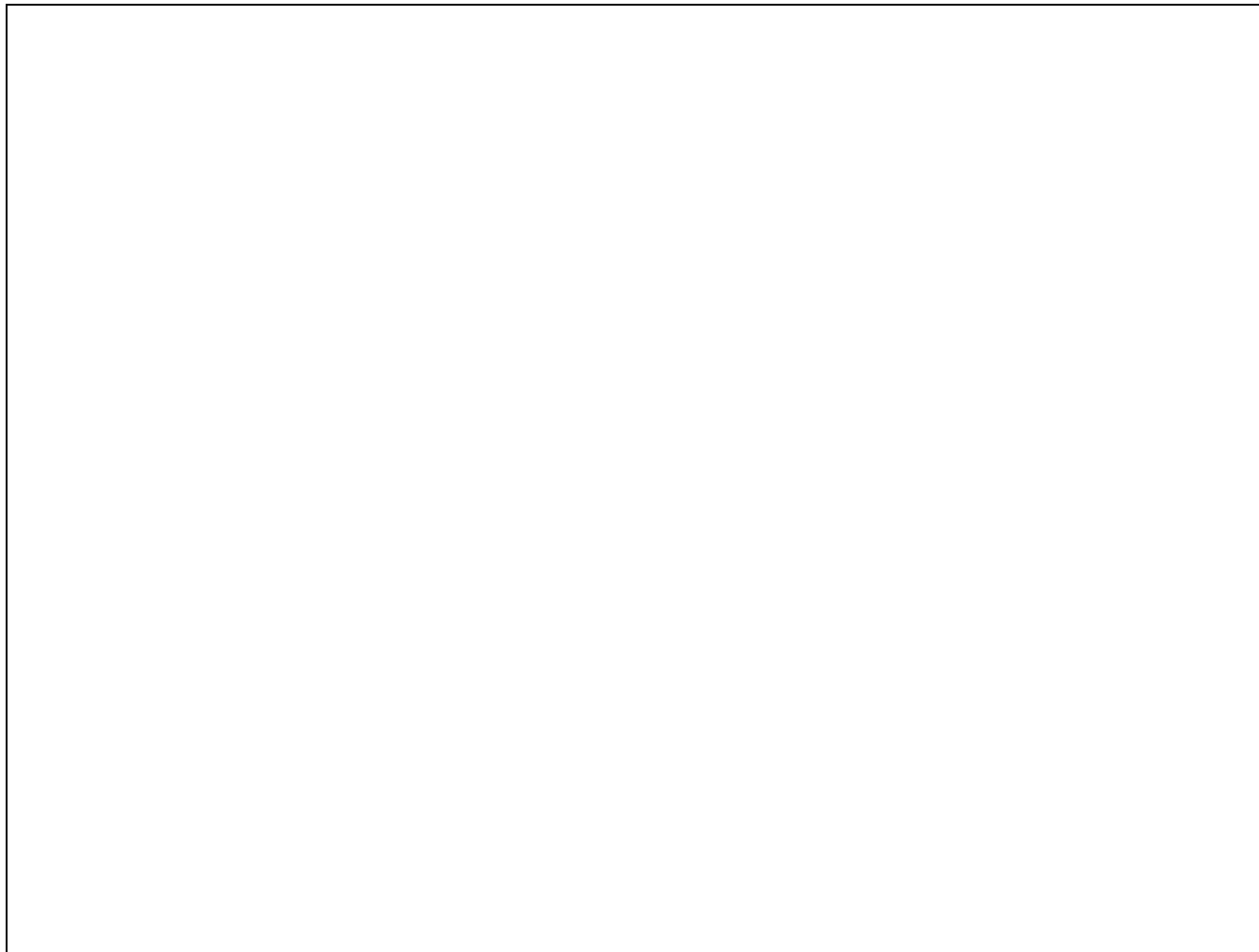
Pump serial number:

Put into service on:

Location of pump:

Used for:

3. Installation sketch



4. General information

4.1 Applications

The DMX 221 pump is suitable for liquid, non-abrasive and non-flammable media strictly in accordance with the instructions in this manual.

The DMX 221 dosing pumps have **not** been approved according to the EC directive 94/9/EC, the so-called ATEX directive. The application of these pumps in potentially explosive environments according to ATEX directive is therefore not permitted.



Warning

Other applications or the operation of pumps in ambient and operating conditions, which are not approved, are considered improper and are not permitted. Grundfos Alldos accepts no liability for any damage resulting from incorrect use.

4.2 Warranty

Warranty in accordance with our general terms of sale and delivery is only valid

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

5. Safety

This manual contains general instructions that must be observed during installation, operation and maintenance of the pump. This manual must therefore be read by the installation engineer and the relevant qualified personnel/operators prior to installation and start-up, and must be available at the installation location of the pump at all times.

It is not only the general safety instructions given in this "Safety" section that must be observed, but also all the specific safety instructions given in other sections.

5.1 Identification of safety instructions in this manual

If the safety instructions or other advice in this manual are not observed, it may result in personal injury or malfunction and damage to the pump. The safety instructions and other advice are identified by the following symbols:



Warning

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

Caution

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

Note

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

Information provided directly on the pump, e.g. labelling of fluid connections, must be observed and must be maintained in a readable condition at all times.

5.2 Qualification and training of personnel

The personnel responsible for the operation, maintenance, inspection and installation must be appropriately qualified for these tasks. Areas of responsibility, levels of authority and the supervision of the personnel must be precisely defined by the operator.

If the personnel do not have the necessary knowledge, the necessary training and instruction must be given. If necessary, training can be performed by the manufacturer/supplier at the request of the operator of the pump. It is the responsibility of the operator to make sure that the contents of this manual are understood by the personnel.

5.3 Risks when safety instructions are not observed

Non-observance of the safety instructions may have dangerous consequences for the personnel, the environment and the pump. If the safety instructions are not observed, all rights to claims for damages may be lost.

Non-observance of the safety instructions may lead to the following hazards:

- failure of important functions of the pump/system
- failure of specified methods for maintenance
- harm to humans from exposure to electrical, mechanical and chemical influences
- damage to the environment from leakage of harmful substances.

5.4 Safety-conscious working

The safety instructions in this manual, applicable national health and safety regulations and any operator internal working, operating and safety regulations must be observed.

5.5 Safety instructions for the operator/user

Hazardous hot or cold parts on the pump must be protected to prevent accidental contact.

Leakages of dangerous substances (e.g. hot, toxic) must be disposed of in a way that is not harmful to the personnel or the environment. Legal regulations must be observed.

Damage caused by electrical energy must be prevented (for more details, see for example the regulations of the VDE and the local electricity supply company).

5.6 Safety instructions for maintenance, inspection and installation work

The operator must ensure that all maintenance, inspection and installation work is carried out by authorised and qualified personnel, who have been adequately trained by reading this manual.

All work on the pump should only be carried out when the pump is stopped. The procedure described in this manual for stopping the pump must be observed.

Pumps or pump units which are used for media that are harmful to health must be decontaminated.

All safety and protective equipment must be immediately restarted or put into operation once work is complete.

Observe the points described in the initial start-up section prior to subsequent start-up.

Warning



Electrical connections must only be carried out by qualified personnel!

The pump housing must only be opened by personnel authorised by Grundfos Alldos!

5.7 Unauthorised modification and manufacture of spare parts

Modification or changes to the pump are only permitted following agreement with the manufacturer. Original spare parts and accessories authorised by the manufacturer are safe to use. Using other parts can result in liability for any resulting consequences.

5.8 Improper operating methods

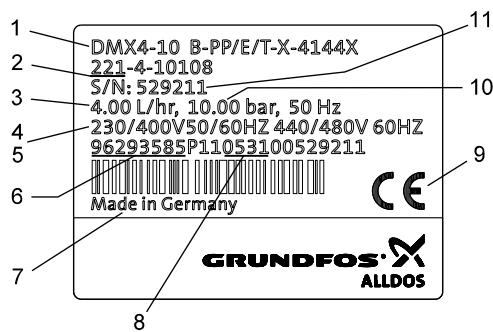
The operational safety of the supplied pump is only ensured if it is used in accordance with section 1. *General*. The specified limit values must under no circumstances be exceeded.

5.9 Safety of the system in the event of a failure in the dosing system

DMX 221 dosing pumps are designed according to the latest technologies and are carefully manufactured and tested. However, a failure may occur in the dosing system. Systems in which dosing pumps are installed must be designed in such a way that the safety of the entire system is still ensured following a failure of the dosing pump. Provide the relevant monitoring and control functions for this.

6. Technical data

6.1 Identification



TMO3 8599 2207

Fig. 1 DMX pump nameplate

Pos.	Description
1	Type designation
2	Model
3	Maximum capacity [l/h]
4	Voltage [V]
5	Frequency [Hz]
6	Product number
7	Country of origin
8	Year and week code
9	Marks of approval, CE mark, etc.
10	Maximum pressure [bar]
11	Serial number

6.2 Type key

Example: **DMX 115 - 3 B PP /E /T -X -E 1 QQ X E0**

Type range

Maximum flow [l/h]

Maximum counter-pressure [bar]

Control variant

B	Standard - manual control
AR*	Analog/pulse control
AT0	Prepared for servomotor
AT3	Servomotor, 1 x 230 V, 50/60 Hz supply, 4-20 mA control
AT5	Servomotor, 1 x 115 V, 50/60 Hz supply, 4-20 mA control
AT8	Servomotor, 1 x 230 V, 50/60 Hz supply, 1 kΩ potentiometer control
AT9	Servomotor, 1 x 115 V, 50/60 Hz supply, 1 kΩ potentiometer control

Dosing head variant

PP	Polypropylene
PV	PVDF (polyvinylidene fluoride)
PVC	Polyvinyl chloride
SS	Stainless steel, DIN 1.4401
PV-R	PVDF + integrated relief valve
PVC-R	PVC + integrated relief valve
PP-L	PP + integrated diaphragm leakage detection
PV-L	PVDF + integrated diaphragm leakage detection
PVC-L	PVC + integrated diaphragm leakage detection
SS-L	SS + integrated diaphragm leakage detection
PV-RL	PVDF + integrated relief valve and diaphragm leakage detection
PVC-RL	PVC + integrated relief valve and diaphragm leakage detection

Gasket material

E	EPDM
V	FKM
T	PTFE

Valve ball material

G	Glass
T	PTFE
SS	Stainless steel, DIN 1.4401

Control panel position

F	Front-mounted (opposite to the dosing head)
S	Side-mounted (same side as the stroke-length adjustment knob)
Sx	Side-mounted (side opposite to the stroke-length adjustment knob)
W	Wall-mounted
X	No control panel

Motor variant

E0	PTC motor for frequency control
E1	Motor type EEx de C T3, 3 x 400 V, 50 Hz (only DMX-B or DMX-AT)
E2	Motor type EEx de C T4, 3 x 400 V, 50 Hz (only DMX-B or DMX-AT)

Mains plug

F	EU (Schuko)
B	USA, Canada
I	Australia, New Zealand, Taiwan
E	Switzerland
X	No plug

Connection, suction/discharge

4	Tube 6/9 mm
B1	Tube 6/12 mm/ cementing d. 12 mm
6	Tube 9/12 mm
B2	Tube 13/20 mm/ cementing d. 25 mm
Q	Tube 19/27 mm and 25/34 mm
R	Tube 1/4" / 3/8"
S	Tube 3/8" / 1/2"
C5	Hose clamp 1/2"
A	Threaded Rp 1/4
A1	Threaded Rp 3/4
V	Threaded 1/4" NPT, female
A9	Threaded 1/2" NPT, male
A3	Threaded 3/4" NPT, female
A7	Threaded 3/4" NPT, male
B3	Welding, diameter 16 mm
B4	Welding, diameter 25 mm

Valve type

1	Standard valve
	Spring-loaded
3	0.05 bar suction opening pressure
	0.8 bar discharge opening pressure
4	Spring-loaded, discharge side only
	0.8 bar opening pressure
5	Valve for abrasive media

Supply voltage

G	1 x 230 V, 50/60 Hz
H	1 x 120 V, 50/60 Hz
E	3 x 230/400 V, 50/60 Hz
	or 3 x 440/480 V, 60 Hz
F	Without motor, NEMA flange (US)
0	Without motor, IEC flange

* Only pumps up to and including 0.37 kW and only single-phase pumps

6.3 Pump performance

6.3.1 Accuracy

- Dosing flow fluctuation: $\pm 1.5\%$ within the control range 1:10
- Linearity deviation: $\pm 4\%$ of the full-scale value.
Adjustment from max. to min. stroke length, within the control range 1:5.

Applies to:

- water as dosing medium
- fully deaerated dosing head
- measurement according to Grundfos Alldos factory standard no. 0010/0011
- standard pump version.

6.3.2 Performance

Applies to:

- maximum counter-pressure
- water as dosing medium
- flooded suction 0.5 mWC
- fully deaerated dosing head
- three-phase 400 V motor.

Pump type	Stroke volume V	50 Hz			60 Hz				
		Q**	p max.*	Max. stroke rate	Q**		p max.**		Max. stroke rate
	[cm ³]	[l/h]	[bar]*	[n/min]	[l/h]	[US gph]	[bar]*	[psi]*	[n/min]
DMX 4-10	2.2	4	10	29	5	1.3	10	145	35
DMX 7-10	3.8	7	10	29	8	2.1	10	145	35
DMX 9-10	4.9	9	10	29	11	2.9	10	145	35
DMX 12-10	6.9	12	10	29	14	3.7	10	145	35
DMX 17-4	10.4	17	4	29	20	5.3	4	58	35
DMX 25-3	16	27	3	29	32	8.5	3	43	35
DMX 7.2-16**	1.9	7.2	16	63	10	2.6	16	232	75
DMX 8-10	2.2	8	10	63	10	2.6	10	145	75
DMX 14-10	3.8	14	10	63	17	4.5	10	145	75
DMX 18-10	4.9	18	10	63	22	5.8	10	145	75
DMX 26-10	6.9	26	10	63	31	8.2	10	145	75
DMX 39-4	10.4	39	4	63	47	12.4	4	58	75
DMX 60-3	16	60	3	63	72	19.0	3	43	75
DMX 13.7-16**	1.9	13.7	16	120	19	5.0	16	232	144
DMX 16-10	2.2	16	10	120	19	5.0	10	145	144
DMX 27-10	3.8	27	10	120	32	8.5	10	145	144
DMX 35-10	4.9	35	10	120	42	11.1	10	145	144
DMX 50-10	6.9	50	10	120	60	15.8	8	116	144
DMX 75-4	10.4	75	4	120	90	23.8	3.5	50	144
DMX 115-3	16	115	3	120	138	36.5	2.5	36	144

* Maximum counter-pressure.

** When operating with a counter-pressure of 16 bar, the life of the dosing diaphragm will be reduced.

6.4 Suction heights

6.4.1 Media with a viscosity similar to water

Applies to:

- counter-pressure of 1.5 to 3 bar
- non-degassing and non-abrasive media
- temperature of 20 °C
- stroke length 100 %.

Pump type	50 Hz		60 Hz		Maximum length of suction line [m]
	Suction height* [mWC]	Intake height** [mWC]	Suction height* [mWC]	Intake height** [mWC]	
DMX 4-10	4	4	4	4	5
DMX 7-10	4	4	4	4	5
DMX 9-10	3	3	3	3	4
DMX 12-10	3	2.5	3	2.5	4
DMX 17-4	1	1	1	1	2
DMX 25-3	1	1	1	1	2
DMX 7.2-16	4	3	4	3	5
DMX 8-10	4	4	4	4	5
DMX 14-10	4	3	4	4	5
DMX 18-10	3	3	3	3	4
DMX 26-10	3	2.5	3	2.5	4
DMX 39-4	1	1	1	1	2
DMX 60-3	1	1	1	1	2
DMX 13.7-16	4	3	3.5	2.5	5
DMX 16-10	4	3	3.5	2.5	5
DMX 27-10	4	3	3.5	2.5	5
DMX 35-10	3	2	2.5	2	4
DMX 50-10	3	2	2.5	1.5	4
DMX 75-4	1	1	0.5	0.5	2
DMX 115-3	1	1	0.5	0.5	2

* Suction line and dosing head filled (continuous operation)

** Suction line and dosing head not filled, but dosing head and valves moistened (start-up)

6.4.2 Suction heights for media with maximum permissible viscosity

Applies to:

- Newtonian liquids
- non-degassing and non-abrasive media
- temperature of 20 °C.

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

6.5 Ambient and operating conditions

- Permissible ambient temperature: 0 °C to +40 °C.
- Permissible storage temperature: -20 °C to +50 °C.
- Permissible air humidity: max. relative humidity: 70 % at 40 °C, 90 % at 35 °C.

The installation site must be under cover! Ensure that the enclosure class of motor and pump are not affected by the atmospheric conditions.

Caution

Pumps with electronics are only suitable for indoor use! Do not install outdoors!

Warning

Risk of hot surfaces!

Pumps with AC motors may become hot. Allow a minimum space of 100 mm above the fan cover!



- Sound pressure level: ± 55 dB(A), testing according to DIN 45635-01-KL3.
- Minimum counter-pressure: 1 bar at the pump discharge valve. Pay attention to the pressure losses along the way to the injection point inclusively.

Pumps with AR control unit only

Maximum permissible mains impedance: 0.084 + j 0.084 Ω (testing according to EN 61000-3-11).

6.6 Dosing medium

In the event of questions regarding the material resistance and suitability of the DMX 221 for specific dosing media, please contact Grundfos Alldos.

Caution

The dosing medium must have the following basic characteristics:

- liquid
- non-abrasive
- non-inflammable.

6.6.1 Permissible media temperature

Dosing head material	Temperature range	
	p < 10 bar	p < 16 bar
PVC	0 °C to 40 °C	0 °C to 20 °C
Stainless steel, DIN 1.4571*	-10 °C to 70 °C	-10 °C to 70 °C
Stainless steel, DIN 2.4610*	-10 °C to 70 °C	-10 °C to 70 °C
PP	0 °C to 40 °C	-
PVDF	-10 °C to 60 °C*	-10 °C to 20 °C
	*70 °C at 9 bar	

* For SIP/CIP applications: A temperature of 145 °C at a counter-pressure of max. 2 bar is permitted for a short period (15 minutes).

Caution

Observe the freezing and boiling points of the dosing medium!

6.7 Electrical data

6.7.1 Enclosure class

The enclosure class depends on the motor variant selected, see motor nameplate.

The specified enclosure class can only be ensured if the power supply cable is connected with the same degree of protection.

Pumps with electronics: The enclosure class is only met if the sockets are protected! The data regarding the enclosure class applies to pumps with correctly inserted plugs or screwed-on caps.

6.7.2 Motor

Version: see motor and pump nameplates.

6.8 AR control unit

Functions of pumps with electronics:

- "Continuous operation" button for function test and dosing head deaeration
- memory function (stores a maximum of 65,000 pulses)
- two-stage tank-empty signal (e.g. via Grundfos Alldos tank empty sensor)
- stroke signal/pre-empty signal (adjustable), e.g. as a feedback to the control room
- dosing controller function (only with sensor – optional)
- diaphragm leakage detection (only with sensor – optional)
- access-code-protected settings
- remote on/off
- Hall sensor
- operating hours counter
- motor monitoring.

Operating modes:

- manual
Stroke frequency: manually adjustable between zero and maximum
- contact signal control
Multiplier (1:n) and divisor (n:1)
- current signal control 0-20 mA / 4-20 mA
Adjustment of stroke frequency proportional to the current signal.
Weighting of current input.

6.8.1 Inputs and outputs

Inputs	
Contact signal	Maximum load: 12 V, 5 mA
Current 0-20 mA	Maximum load: 22 Ω
Remote on/off	Maximum load: 12 V, 5 mA
Two-stage tank-empty signal	Maximum load: 12 V, 5 mA
Dosing controller and diaphragm leakage sensor	
Outputs	
Current 0-20 mA	Maximum load: 350 Ω
Error signal	Maximum ohmic load: 50 VDC / 75 VAC, 0.5 A
Stroke signal	Contact time/stroke: 200 ms
Pre-empty signal	Maximum ohmic load: 50 VDC / 75 VAC, 0.5 A

AR control unit factory settings

- Inputs and outputs: NO (normally open)
or
- inputs and outputs: NC (normally closed).

6.9 Materials

- Upper part of enclosure: PPO blend
- Lower part of enclosure: PP, glass-fibre-reinforced
- Stroke-length adjustment knob: ABS.

AR control unit enclosure

- Upper part of enclosure: PPO blend
- Lower part of enclosure: aluminium.

6.10 Weights

Pump type	Weight	
	Plastics [kg]	DIN 1.4571 [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 27-10	5	7
DMX 35-10	5	7
DMX 50-10	5	7
DMX 75-4	7.5	12
DMX 115-3	8	13

6.11 Dimensional sketches

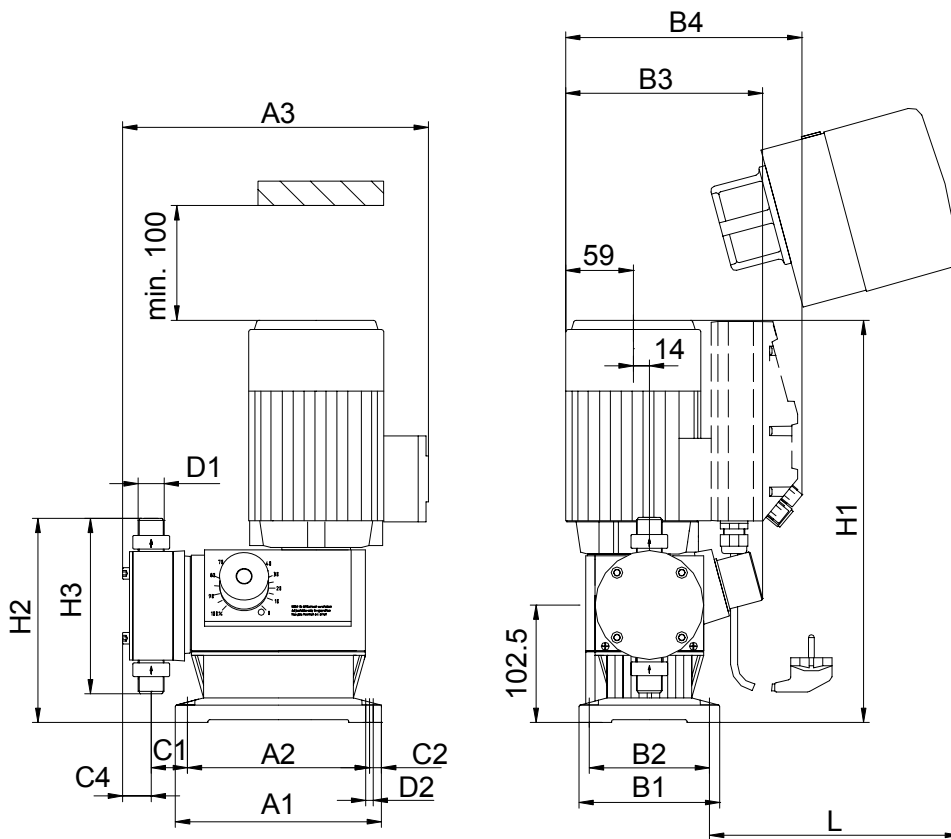


Fig. 2 Dimensional sketches of DMX 221

TM03 6295 4506

Pump type	A1	A2	A3	B1	B2	B3	B4	L	C1	C2	C4	D1	D2	H1	H2	H3
DMX 4-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 7-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 7.2-16	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 9-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 12-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 17-4	180	159	323	123	105	175	205	227	64	10.5	38	R 1 1/4	6.5	319	192	177
DMX 25-3	180	159	330	123	105	175	205	227	80	10.5	40	R 1 1/4	6.5	319	197	188
DMX 8-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 13.7-16	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 14-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 18-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 26-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 39-4	180	159	323	123	105	175	205	227	64	10.5	38	R 1 1/4	6.5	319	192	177
DMX 60-3	180	159	330	123	105	175	205	227	80	10.5	40	R 1 1/4	6.5	319	197	188
DMX 16-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 27-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 35-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 50-10	180	159	275	123	105	175	205	227	32	10.5	25	R 5/8	6.5	319	179	153
DMX 75-4	180	159	323	123	105	175	205	227	64	10.5	38	R 1 1/4	6.5	319	192	177
DMX 115-3	180	159	330	123	105	175	205	227	80	10.5	40	R 1 1/4	6.5	319	197	188

Measurements in mm.

7. Transport and storage

Do not throw or drop the pump.

Store the pump in a dry and cool place.

Store the pump in upright position so that the gear grease cannot leak out.

Caution

Do not use the protective packaging as transport packaging.

Observe the permissible storage temperature!

7.1 Delivery

The DMX 221 dosing pumps are supplied in different packaging, depending on pump type and the overall delivery. For transport and intermediate storage, use the correct packaging to protect the pump against damage.

7.2 Intermediate storage

- Permissible storage temperature: -20 °C to +50 °C.
- Permissible air humidity: max. relative humidity: 92 % (non-condensing).

7.3 Unpacking

Retain the packaging for future storage or return, or dispose of the packaging in accordance with local regulations.

7.4 Return

Return the pump in its original packaging or equivalent.

The pump must be thoroughly cleaned before it is returned or stored. It is essential that there are no traces of toxic or hazardous media remaining on the pump.

Caution

Grundfos Alldos accepts no liability for damage caused by incorrect transportation or missing or unsuitable packaging of the pump!

Before returning the pump to Grundfos Alldos for service, the **safety declaration** at the end of these instructions must be filled in by authorised personnel and attached to the pump in a visible position.

Caution

If a pump has been used for a medium which is injurious to health or toxic, the pump will be classified as contaminated.

If Grundfos Alldos is requested to service the pump, it must be ensured that the pump is free from substances that can be injurious to health or toxic. If the pump has been used for such substances, the pump must be cleaned before it is returned.

If proper cleaning is not possible, all relevant information about the chemical must be provided.

If the above is not fulfilled, Grundfos Alldos can refuse to accept the pump for service. Costs of returning the pump are paid by the customer.

The safety declaration can be found at the end of these instructions.

Caution

The replacement of the supply cable must be carried out by an authorised Grundfos Alldos service workshop.

8. Installation

8.1 Optimum installation

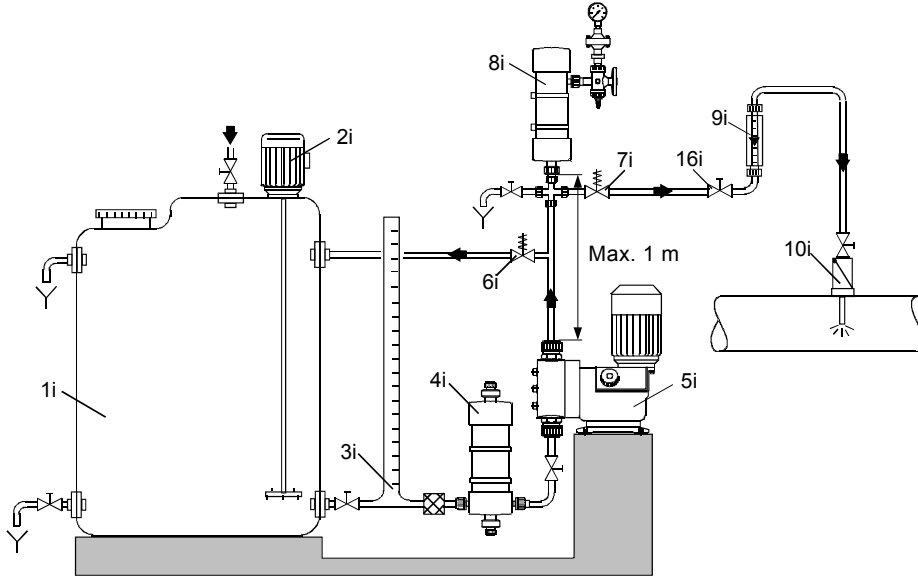


Fig. 3 Example of optimum installation

Pos.	Components
1i	Dosing tank
2i	Electric agitator
3i	Extraction device
4i	Suction pulsation damper
5i	Dosing pump
6i	Relief valve
7i	Pressure-loading valve
8i	Pulsation damper
9i	Measuring glass
10i	Injection unit

- For non-degassing media with a viscosity similar to water, the pump can be mounted on the tank (observe the maximum suction height).
- Flooded suction preferred.
- For media with a tendency to sedimentation, install the suction line with filter (13i) so that the suction valve remains a few millimetres above the possible level of sedimentation.

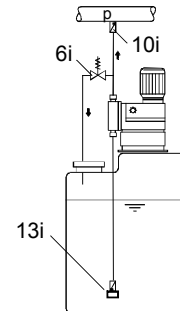


Fig. 6 Tank installation

8.2 Installation tips

- For easy deaeration of the dosing head, install a ball valve (11i) with bypass line (back to the dosing tank) immediately after the discharge valve.
- In the case of long discharge lines, install a non-return valve (12i) in the discharge line.

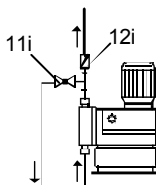


Fig. 4 Installation with ball valve and non-return valve

- When installing the suction line, observe the following:
 - Keep the suction line as short as possible. Prevent it from becoming tangled.
 - If necessary, use swept bends instead of elbows.
 - Always route the suction line up towards the suction valve.
 - Avoid loops which may cause air bubbles.

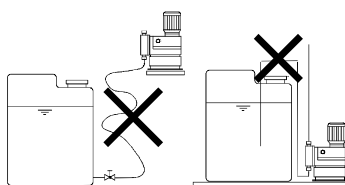


Fig. 5 Installation of suction line

- Note for suction-side installation: In dosing systems with a suction line longer than 1 metre, depending on the dosing flow, it may be necessary to install a properly sized pulsation damper (4i) immediately before the pump suction valve.

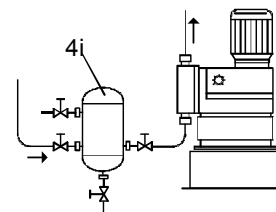


Fig. 7 Installation with suction-side pulsation damper

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- Note for discharge-side installation: To protect the piping, use a pulsation damper (8i) for rigid piping longer than 3 metres and tubing longer than 5 metres.

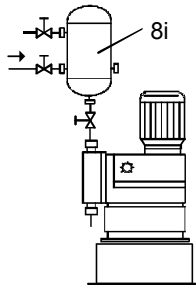


Fig. 8 Installation with discharge-side pulsation damper

- For degassing and viscous media: flooded suction.
- To protect the dosing pump and the discharge line against excessive pressure build-up, install a relief valve (6i) in the discharge line.

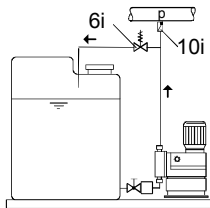


Fig. 9 Installation with relief valve

With open outflow of the dosing medium or a counter-pressure below 1 bar

- Install a pressure-loading valve (7i) immediately before the outlet or the injection unit.
- A positive pressure difference of at least 1 bar must be ensured between the counter-pressure at the injection point and the pressure of the dosing medium at the pump suction valve.
- If this cannot be ensured, install a pressure-loading valve (7i) in the discharge line.

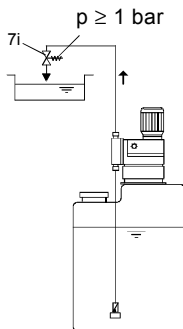


Fig. 10 Installation with pressure-loading valve

- To avoid the siphon effect, install a pressure-loading valve (7i) in the discharge line and, if necessary, a solenoid valve (14i) in the suction line.

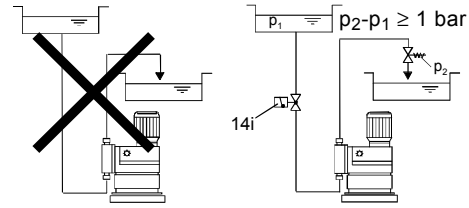


Fig. 11 Installation to avoid the siphon effect

Warning

Risk of hot surfaces!

Pumps with AC motors may become hot.

Allow a minimum space of 100 mm to the fan cover!



8.3 Mounting

- Mount the pump horizontally on the tank or on a console using four M8 screws.

Caution

Gently tighten the screws in order not to damage the plastic enclosure!

8.4 Tube / pipe lines

8.4.1 General

Warning

To protect the dosing pump against excessive pressure build-up, install a relief valve in the discharge line.

Only use the prescribed line types!

All lines must be free from strain!

Avoid loops and buckles in the tubes!

Keep the suction line as short as possible to avoid cavitation!

If necessary, use swept bends instead of elbows.

Observe the chemical manufacturer's safety instructions when handling chemicals!

Make sure that the pump is suitable for the actual dosing medium!

The flow must run in the opposite direction to gravity!

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

Caution

8.5 Connecting the suction and discharge lines



Warning

All lines must be free from strain!

Only use the prescribed line types!

- Connect the suction line to the suction valve.
 - Install the suction line in the tank so that the foot valve remains 5 to 10 mm above the bottom of the tank or the possible level of sedimentation.
- Connect the discharge line to the discharge valve.

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Connection of hose lines

- Push the hose firmly onto the connection nipple and, depending on the connection, secure using a connection counterpart or hose support clip.
- Fit the gasket.
- Screw onto the valve using the union nut.

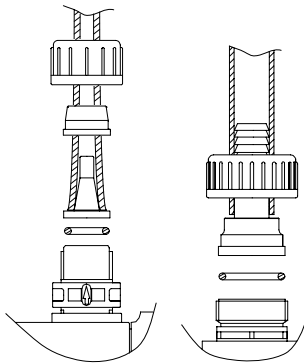


Fig. 12 Connection of hose lines

Connection of DN 20 pipe lines

- Depending on the pipe material and connection, glue it (PVC), weld it (PP, PVDF or stainless steel) or press it in (stainless steel).
- Fit the gasket.
- Screw onto the valve using the union nut.

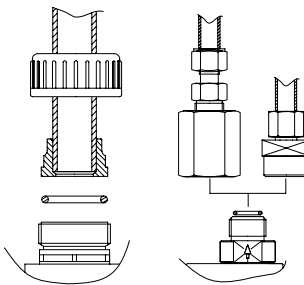


Fig. 13 Connection of DN 20 pipe lines

Using a dosing controller

- Screw the dosing controller onto the discharge valve.
- Connect the discharge line to the dosing controller.

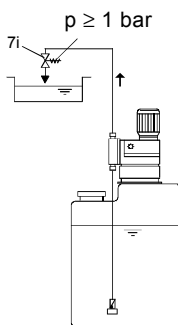


Fig. 14 Dosing controller

9. Electrical connections

Make sure that the pump is suitable for the electricity supply on which it will be used.

Warning



Electrical connections must only be carried out by qualified personnel!

Disconnect the power supply before connecting the power supply cable and the relay contacts!

Observe the local safety regulations!

Warning



The pump housing must only be opened by personnel authorised by Grundfos Alldos!

Warning



Protect the cable connections and plugs against corrosion and humidity.

Only remove the protective caps from the sockets that are being used.

Caution

The power supply must be electrically isolated from the signal inputs and outputs.

The pump is switched off by switching off the power supply.

Note

Do not switch on the power supply until the pump is going to be started.

9.1 Versions with mains plug

- Insert the mains plug in the mains socket.

9.2 Versions without mains plug

- Connect the motor according to the wiring diagram in the terminal box.

Observe the direction of rotation!

A motor protector, adjusted to the rated motor current, must be provided by the customer. This is also necessary for versions with AR control unit!

Caution

When the pump is used with a frequency converter, the jumpers in the terminal box have to be set according to the converter voltage.

The jumpers of three-phase motors are factory-set for star connection.

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10. Commissioning

10.1 Checks before start-up

- Check that the rated voltage stated on the pump nameplate corresponds to the local conditions!
- Check that all connections are secure and tighten, if necessary.
- Check that the dosing head screws are tightened with the specified torque and tighten, if necessary.
- Check that all electrical connections are correct.

10.2 Start-up

Before start-up, open the venting cartridge (pull cap approx. 5 mm).

Caution

For transport or cleaning, the venting cartridge must be closed.

After initial start-up and after each time the diaphragm is changed, tighten the dosing head screws.

Caution

After approximately 6-10 operating hours or two days, cross-tighten the dosing head screws using a torque wrench.

Maximum torque: 6 Nm.

1. Open the suction and discharge isolating valves (15, 16), if installed.
2. Open the deaeration valve (17), if installed, in the discharge line, or relieve the pressure on the discharge side so that the medium can run out without a counter-pressure.
3. Switch on the power supply.
4. Pumps with AR control unit only: Press the "Start/Stop" button and keep it pressed.
 - The pump switches to continuous operation.
5. Set the stroke-length adjustment knob to 100 %.
6. Leave the pump running until the dosed medium is free of air bubbles.
7. Close the deaeration valve (17), if installed.
 - The pump is now ready for operation.

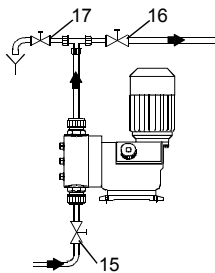


Fig. 15 Initial start-up

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11. Operation

11.1 Description of the pump

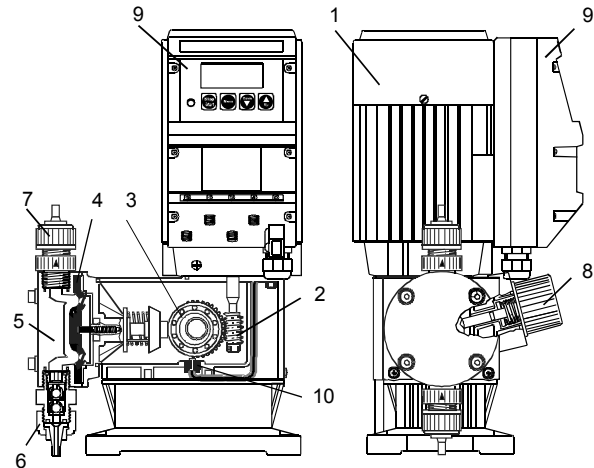


Fig. 16 DMX 221

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Pos.	Components
1	Motor
2	Gears
3	Eccentric
4	Dosing diaphragm
5	Dosing head
6	Suction valve
7	Discharge valve
8	Stroke-length adjustment knob
9	AR control unit (optional)
10	Stroke sensor

Functional principle

- Reciprocating displacement pump with electric motor and mechanical diaphragm control.
- The rotation of the motor is transformed into the reciprocating movement of the dosing diaphragm by the eccentric and the tappet.
- The dosing flow can be set by adjusting the stroke length of the tappet.

11.2 Switching on/off

Caution

Before switching on the pump, check that it is installed correctly. Refer to sections 8. Installation and 10. Commissioning.

- To start the pump, switch on the power supply.
- To stop the pump, switch off the power supply.

11.3 Adjusting the dosing flow via the stroke length

Caution *Adjust the stroke length only while the pump is running!*

- To increase the dosing flow, turn the stroke-length adjustment knob (8) slowly to the left until the desired dosing flow is reached.
- To decrease the dosing flow, turn the stroke-length adjustment knob (8) slowly to the right until the desired dosing flow is reached.

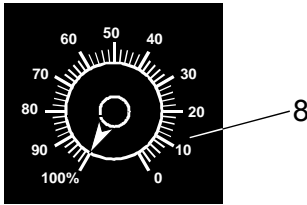


Fig. 17 Stroke-length adjustment knob

11.4 Stroke-length adjustment



Warning
Wear protective clothing (gloves and goggles) when working on the dosing head, connections or lines!

Caution *Adjust the stroke length only while the pump is running!*

The zero point (no dosing) of the dosing pump is factory-set to a counter-pressure of 3 bar. See section 16. *Dosing curves*.

If the operating counter-pressure at the injection unit deviates considerably from this value, it is advisable to readjust the zero point to obtain more precise values.

1. Install a graduated tube at the suction valve.
 - If such a tube is not available, insert the suction line into a graduated measuring jug.
2. Start the dosing pump.
3. Set the dosing flow to 15 %.
4. For pumps with tank-empty indication, remove the electric plug of the tank-empty indication.
5. Turn the adjustment knob slowly clockwise (towards the zero point) until the medium level stops falling in the measuring jug or tube.
6. Remove the plug with a small screwdriver without changing the position of the adjustment knob and unscrew the cheese-head screw together with the flat spiral spring.
7. Gently pull off the adjustment knob and fit it on the adjusting spindle so that the zero line on the scale and the mark on the adjustment knob coincide.
8. Screw in the cheese-head screw and the spiral spring until the spring is preloaded, but does not block. Even when adjusted to 100 %, the spring of the adjustment knob must remain preloaded.

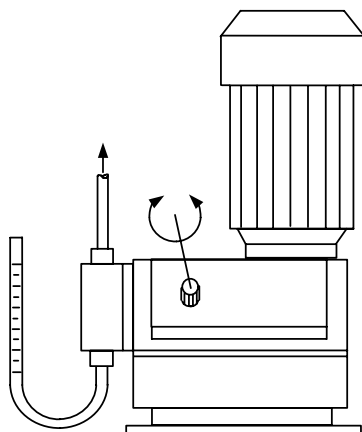


Fig. 18 Stroke-length adjustment

11.5 Adjustment of stroke rate using a frequency converter

If a frequency converter is connected, the stroke rate can only be adjusted in the range 10-100 % of max. stroke rate. See installation and operating instructions for the frequency converter!



Warning
Observe the manufacturer's instructions! The connections must be carried out according to these instructions.

Settings of frequency converter when used with Grundfos Allidos dosing pumps

Pay special attention to the following parameters of the frequency converter:

- P013 (maximum motor frequency):
 - Set the frequency converter to maximum 100 Hz.
 - Due to this setting, the maximum stroke frequency of the pump cannot be exceeded.
- P086 (motor current limit):
 - Do not change the default setting (150 %).
 - The motor is protected by a PTC resistor. Therefore, this parameter is not necessary.
- P081 - P085 (motor data):
 - Set these parameters to the values stated on the motor nameplate.
 - Observe the manufacturer's instructions!

11.6 Using the AR control unit

When using the AR control unit, observe the installation and operating instructions for "AR control unit" in addition to the instructions in this manual.

12. Operation with other electronics

Caution *First refer to the general section 11. Operation. This section only describes the additional functions.*

12.1 Electronics version stroke sensor

Pump type with inductive-proximity switch of two-wire design according to NAMUR DIN 19234 for signalling the strokes.

The sensor can be installed in potentially explosive atmospheres if PTB-approved isolating switching amplifiers with an intrinsically safe control circuit [EExia] or [EExib] are connected. The sensor can be used up to zone 1 depending on the isolating amplifier. The specifications in the declaration of conformity for the isolating amplifier must be observed.

Supply voltage U_B : 7.7 to 10 V.

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13. Integral relief valve

13.1 Function

If the pump is the only pump in the system, the integral relief valve (optional) protects the complete discharge side of the discharge line system from an excessive pressure build-up.

The valve opens if the pressure rises above its set opening pressure, and the dosing medium can return to the dosing tank. In contrast to relief valves connected in series, the integral valve also provides pump protection if the discharge valve is dirty or blocked.

13.2 Permissible media



Warning
Dosing heads with integral relief valve must not be used for abrasive or crystallising media.

13.3 Connections

1. Connect the suction line to the suction valve (A).
2. Connect the discharge line to the discharge valve (B).
3. Connect the overflow line to the relief valve (C) and allow the medium to flow by gravity into the tank or to an appropriate overflow.

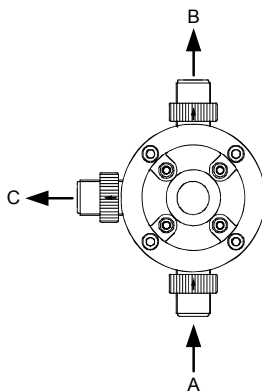


Fig. 19 Connections



Warning
Never start the pump if the overflow line is not correctly connected to the relief valve.

13.4 Setting of opening pressure

13.4.1 General

The opening pressure can only be set if a pressure gauge is installed in the system between the pump and the next isolating valve or pressure-loading valve.



Warning
Settings on the relief valve must only be carried out by authorised and qualified personnel!

The opening pressure of the relief valve is factory-set to the maximum pump counter-pressure specified in the technical data. The opening pressure during operation depends on various factors, e.g. the flow, the stroke frequency of the pump, or the counter-pressure. If an exact setting is required, the relief valve must be adapted to the local conditions.



Warning
Never set the opening pressure to values higher than the maximum permissible operating pressure of the dosing system and dosing pump.



Warning

When dosing dangerous media, observe the corresponding safety precautions!
Wear protective clothing (gloves and goggles) when working on the dosing head, connections or lines!

13.4.2 Setting the valve opening pressure

To change the factory-set opening pressure, proceed as follows:
The pump must be running.

1. Remove the cap from the top part of the relief valve.
2. Close the isolating valve after the pressure gauge.
3. When overflowing of the dosing medium is heard, read the current opening pressure on the pressure gauge.

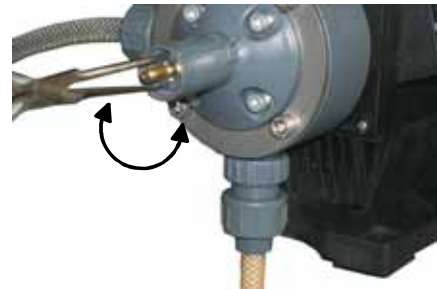


Fig. 20 Setting of opening pressure

4. Change the pressure as follows:
 - To increase the pressure, turn the knob clockwise using pointed pliers until the desired opening pressure is reached.
 - To reduce the pressure, turn the knob counter-clockwise using pointed pliers until the desired opening pressure is reached.
5. Open the isolating valve after the pressure gauge.
6. Refit the cap.

13.5 Venting

The relief valve can also be opened manually, thus serving as a venting valve at the same time. If manual venting is required (e.g. during start-up or when the tank has been replaced), proceed as follows:

- Turn the knob so that the smaller cut-out rests on the nub of the dosing head (the rotary knob is then further away from the dosing head). The valve spring is unloaded (position B).
- Once the pump has been completely vented, turn the knob back into position A "Operating".

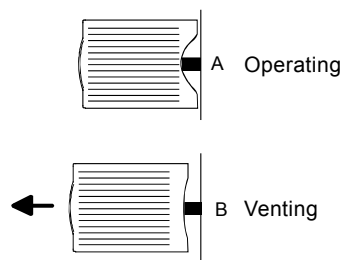


Fig. 21 Knob position

13.6 Fault finding chart

Fault	Cause	Remedy
Permanent output from the relief valve.	Discharge line blocked.	Check and possibly correct the discharge-side dosing system.
	Relief valve incorrectly set (too low).	Set the relief valve to a higher opening pressure.
	Diaphragm faulty.	Replace the diaphragm.
	Relief valve dirty.	Clean the relief valve.

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TM03 6313 4506

14. Maintenance

14.1 General notes

Warning

When dosing dangerous media, observe the corresponding safety precautions!



Risk of chemical burns!

Wear protective clothing (gloves and goggles) when working on the dosing head, connections or lines!

Do not allow any chemicals to leak from the pump. Collect and dispose of all chemicals correctly!

Warning

The pump housing must only be opened by personnel authorised by Grundfos Alldos! Repairs must only be carried out by authorised and qualified personnel!



Switch off the pump and disconnect it from the power supply before carrying out maintenance work and repairs!

For transport or cleaning, the venting cartridge must be closed.

Caution

Before start-up, open the venting cartridge (pull cap approx. 5 mm).

14.2 Changing the gear grease

Warning

The gear grease must only be changed by authorised and qualified personnel.



For this purpose, send the pump to Grundfos Alldos or an authorised service workshop.

To ensure trouble-free operation, it is recommended to have the gear grease changed after five years or after 20,000 operating hours.

14.2.1 Cleaning and maintenance intervals

Clean the diaphragm and valves, or replace if necessary (with stainless-steel valves: inner valve parts):

- regularly every 12 months or after 4,000 operating hours. When operating with a counter-pressure of 16 bar, every six months or after 2,000 operating hours, or
- in case of malfunction.

14.3 Cleaning the suction and discharge valves

Caution *If possible, rinse the dosing head, e.g. by supplying it with water.*

If the pump loses capacity, clean the suction and discharge valves as follows:

- Unscrew the valve.
 - DN 20
Unscrew the screw part resp. valve seat with round pliers.
 - DN 8
Press out the valve cartridge and remove the valve seat from the ball cage.
- Clean all parts. Replace faulty parts by new ones.
- Re-assemble the valve.
- Replace the O-rings by new ones. Refit the valve. Observe the direction arrow on the valve.

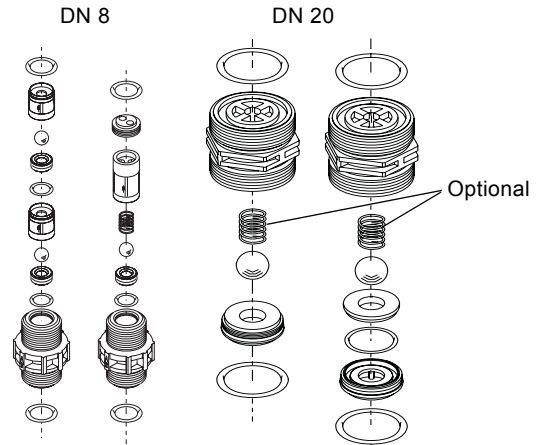


Fig. 22 Exploded view of the valves

The O-rings must be correctly placed in the specified groove.

Caution

Observe the flow direction (indicated by an arrow on the valve)!

14.4 Maintenance of the relief valve

14.4.1 Cleaning and maintenance intervals

Clean the relief valve, and replace the diaphragm, if necessary.

- At least every 12 months or after 8,000 operating hours.
- In the event of a fault.

14.4.2 Replacing the diaphragm of the relief valve

- Switch off the pump and disconnect it from the power supply.
- Make it impossible for a return flow or overpressure to occur.
- Loosen the four screws on the top part of the relief valve.
- Remove the top part of the relief valve.
- Remove the diaphragm.
- Insert a new diaphragm.
- Refit the top part of the relief valve and cross-tighten the screws.
Maximum torque: 6 Nm.
- Start up the dosing system.
- Tighten the screws on the top part of the relief valve after 48 operating hours.
Maximum torque: 6 Nm.

14.5 Replacing the diaphragm

Caution *Adjust the stroke length only while the pump is running!*

Caution *For transport or cleaning, the venting cartridge must be closed.*

Note *If possible, rinse the dosing head, e.g. by supplying it with water.*

14.5.1 Switching off the pump

1. While the pump is running, set the stroke-length adjustment knob to 100 %.
2. Switch off the pump and disconnect it from the power supply.
3. Depressurise the system.
4. Take suitable steps to ensure that the returning dosing medium is safely collected.

14.5.2 Replacing the diaphragm

1. Loosen the six dosing head screws.
2. Remove the dosing head.
3. Turn the fan blades until the diaphragm reaches the front dead centre (the diaphragm detaches itself from the diaphragm flange).
4. Unscrew the diaphragm by manually turning it counter-clockwise.
5. Check the parts and replace by new ones, if necessary.
6. Screw in the new diaphragm completely. Then turn it back until the holes in the diaphragm and the flange coincide.
7. Turn the fan blades until the diaphragm reaches the bottom dead centre (the diaphragm is pulled onto the diaphragm flange).
8. Refit the dosing head carefully and cross-tighten the screws. Maximum torque: 6 Nm.
9. Deaerate and start the dosing pump.

Caution *Before start-up, open the venting cartridge (pull cap approx. 5 mm).*

After initial start-up and after each time the diaphragm is changed, tighten the dosing head screws.

Caution *After approximately 6-10 operating hours or two days, cross-tighten the dosing head screws using a torque wrench.
Maximum torque: 6 Nm.*

15. Fault finding chart

Fault	Cause	Remedy	
1. Dosing pump does not run.	a) Not connected to the power supply.	Connect the power supply cable.	
	b) Incorrect supply voltage.	Replace the dosing pump.	
	c) Electrical failure.	Return the pump for repair.	
	d) The empty indication has responded.	Remove the cause.	
	e) The diaphragm leakage detection has responded.	Replace the diaphragm.	
2. Dosing pump does not suck in.	a) Leaking suction line.	Replace or seal the suction line.	
	b) Cross-section of the suction line too small or suction line too long.	Check with Grundfos Alldos specification.	
	c) Clogged suction line.	Rinse or replace the suction line.	
	d) Foot valve covered by sediment.	Suspend the suction line from a higher position.	
	e) Buckled suction line.	Install the suction line correctly. Check for damage.	
	f) Crystalline deposits in the valves.	Clean the valves.	
	g) Diaphragm broken or diaphragm tappet torn out.	Replace the diaphragm.	
	3. Dosing pump does not dose.	a) Air in the suction line and dosing head.	Wait, until the pump has deaerated.
		b) Stroke-length adjustment knob set to zero.	Turn the adjustment knob in the "+" direction.
c) Viscosity or density of medium too high.		Check the installation.	
d) Crystalline deposits in the valves.		Clean the valves.	
e) Valves not correctly assembled.		Assemble the inner valve parts in the right order and check and possibly correct the flow direction.	
4. Dosing flow of the pump is inaccurate.	f) Injection point blocked.	Check and possibly correct the flow direction (injection unit), or remove the obstruction.	
	g) Incorrect installation of lines and peripheral equipment.	Check the lines for free passage and correct installation.	
	a) Dosing head not fully deaerated.	Repeat the deaeration.	
	b) Degassing medium.	Check the installation.	
	c) Parts of the valves covered in dirt or incrusted.	Clean the valves.	
	d) Zero point misadjusted.	Adjust the zero point to the actual counter-pressure.	
	e) Counter-pressure fluctuations.	Install a pressure-loading valve and a pulsation damper.	
	f) Suction height fluctuations.	Keep the suction level constant.	
	g) Siphon effect (inlet pressure higher than counter-pressure).	Install a pressure-loading valve.	
	h) Leaking or porous suction line or discharge line.	Replace the suction line or discharge line.	
	i) Parts in contact with the medium are not resistant to it.	Replace with resistant materials.	
j) Dosing diaphragm worn (incipient tears).	Replace the diaphragm. Also observe the maintenance instructions.		
k) Supply voltage fluctuations.	Decrease the counter-pressure of the pump.		
l) Variation of the dosing medium (density, viscosity).	Check the concentration. Use an agitator, if necessary.		

Caution For further error signals for the control unit, refer to the relevant section.

16. Dosing curves

The dosing curves on the following pages are trend curves.

They apply to:

- performance of simple pump (the flow rate is doubled for the double pump)
- water as dosing medium
- suction line with foot valve, 0.5 m flooded suction
- zero point of pump Q_0 for specified pressure, see table below
- standard pump version.

Abbreviation	Description
Q	Dosing flow
Q_0	Zero point of the pump The pumps are calibrated so that Q is 0 at 3 bar.
h	Stroke length

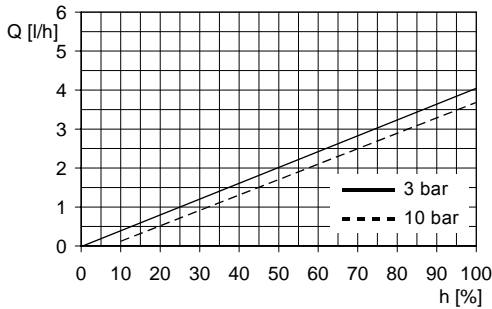


Fig. 23 DMX 4-10 (50 Hz)

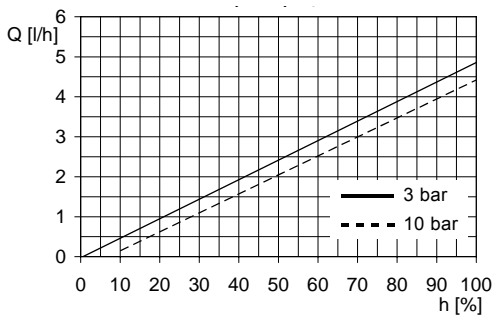


Fig. 24 DMX 4-10 (60 Hz)

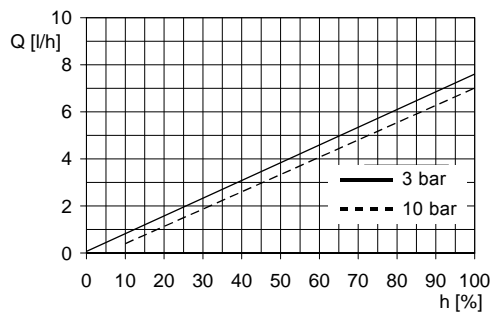


Fig. 25 DMX 7-10 (50 Hz)

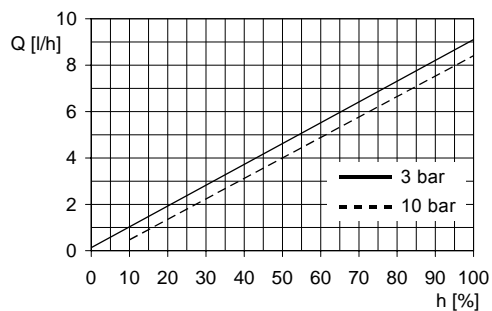


Fig. 26 DMX 7-10 (60 Hz)

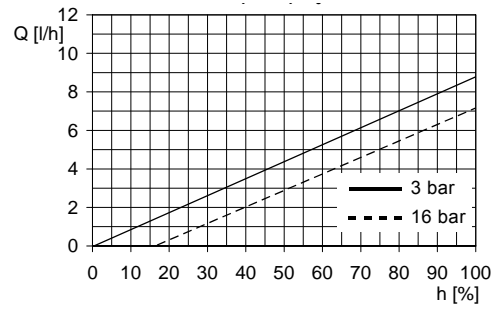


Fig. 27 DMX 7.2-16 (50 Hz)

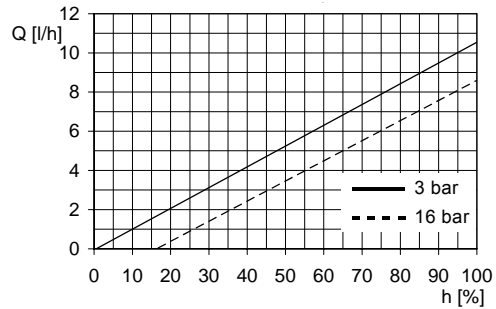


Fig. 28 DMX 7.2-16 (60 Hz)

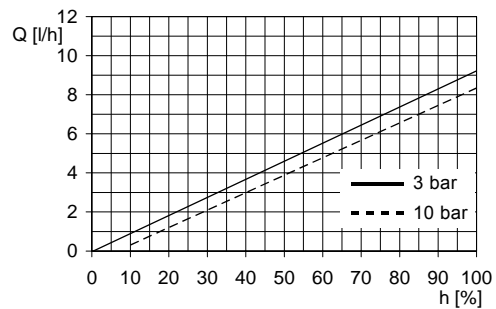


Fig. 29 DMX 9-10 (50 Hz)

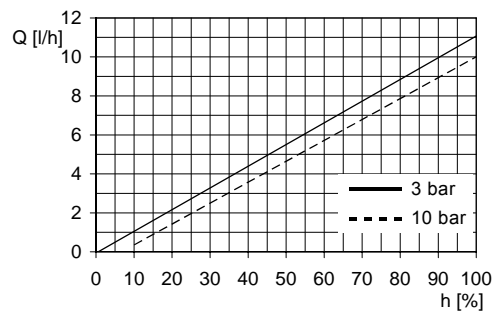


Fig. 30 DMX 9-10 (60 Hz)

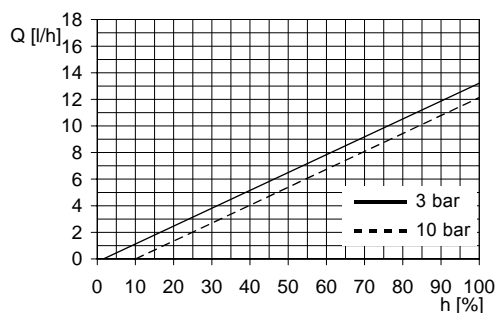


Fig. 31 DMX 12-10 (50 Hz)

TM03 6319 4506

TM03 6320 4506

TM03 6321 4506

TM03 6322 4506

TM03 6323 4506

TM03 6315 4506

TM03 6316 4506

TM03 6317 4506

TM03 6318 4506

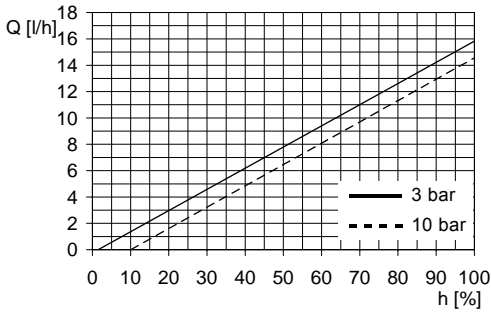


Fig. 32 DMX 12-10 (60 Hz)

TM03 6324 4506

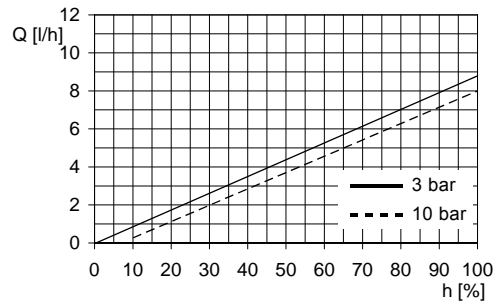


Fig. 37 DMX 8-10 (50 Hz)

TM03 6329 4506

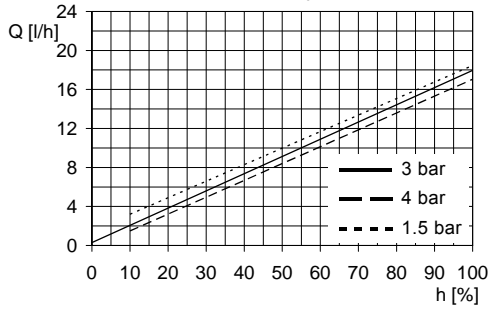


Fig. 33 DMX 17-4 (50 Hz)

TM03 6325 4506

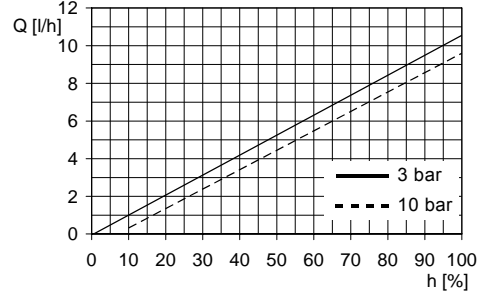


Fig. 38 DMX 8-10 (60 Hz)

TM03 6330 4506

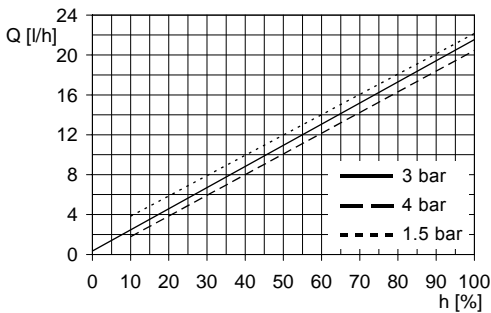


Fig. 34 DMX 17-4 (60 Hz)

TM03 6326 4506

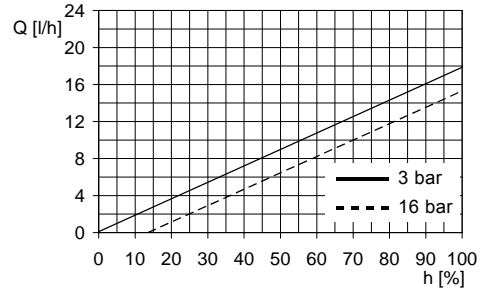


Fig. 39 DMX 13.7-16 (50 Hz)

TM03 6331 4506

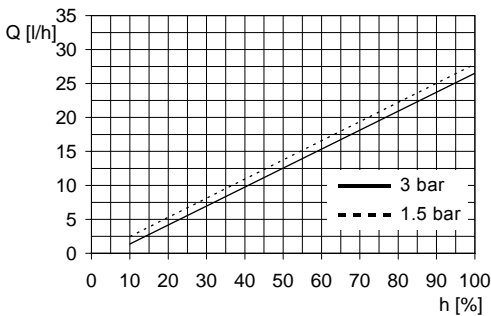


Fig. 35 DMX 25-3 (50 Hz)

TM03 6327 4506

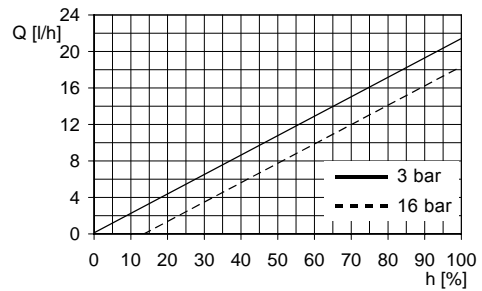


Fig. 40 DMX 13.7-16 (60 Hz)

TM03 6332 4506

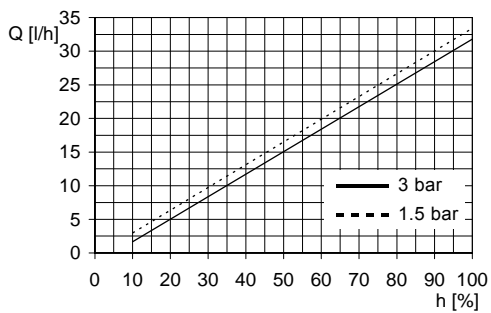


Fig. 36 DMX 25-3 (60 Hz)

TM03 6328 4506

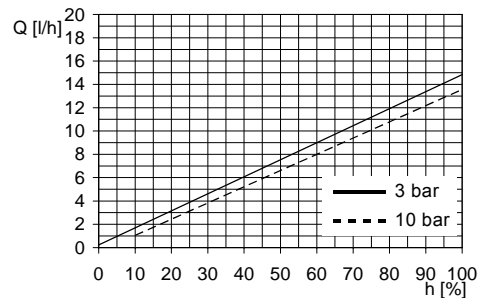


Fig. 41 DMX 14-10 (50 Hz)

TM03 6333 4506

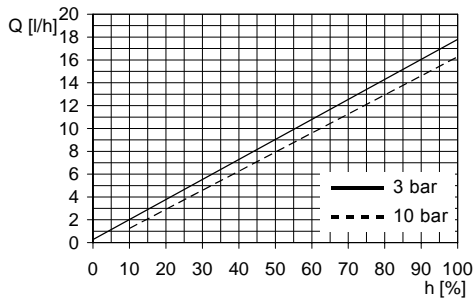


Fig. 42 DMX 14-10 (60 Hz)

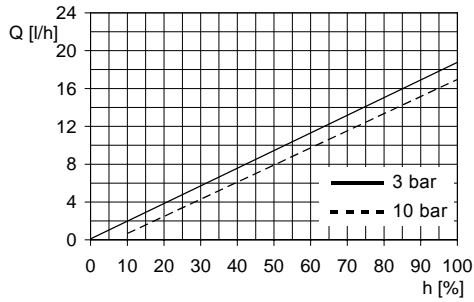


Fig. 43 DMX 18-10 (50 Hz)

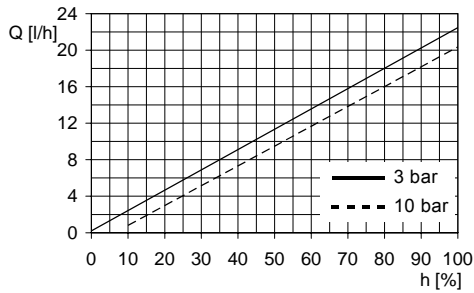


Fig. 44 DMX 18-10 (60 Hz)

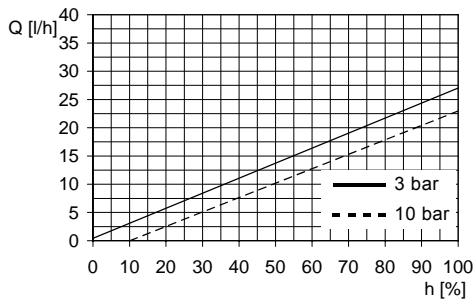


Fig. 45 DMX 26-10 (50 Hz)

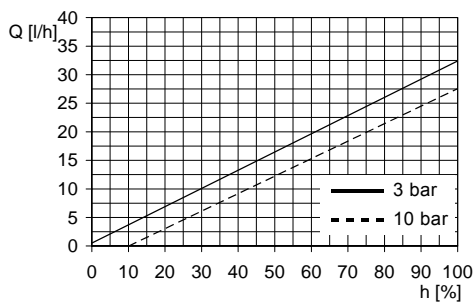


Fig. 46 DMX 26-10 (60 Hz)

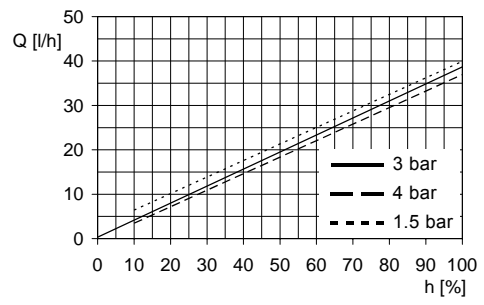


Fig. 47 DMX 39-4 (50 Hz)

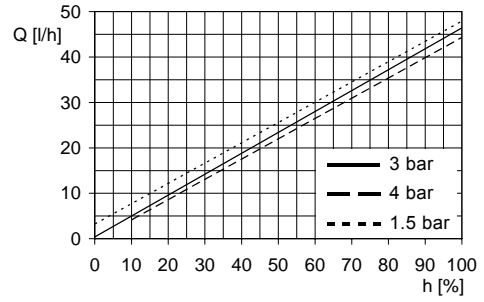


Fig. 48 DMX 39-4 (60 Hz)

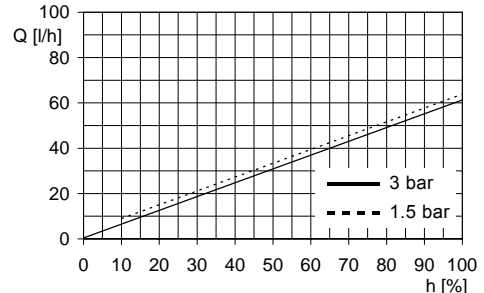


Fig. 49 DMX 60-3 (50 Hz)

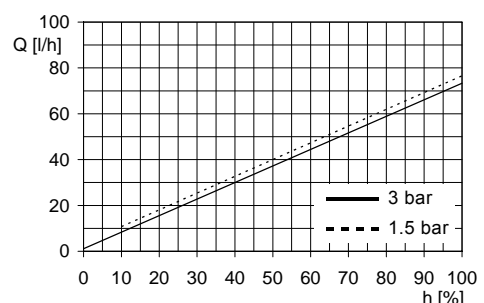


Fig. 50 DMX 60-3 (60 Hz)

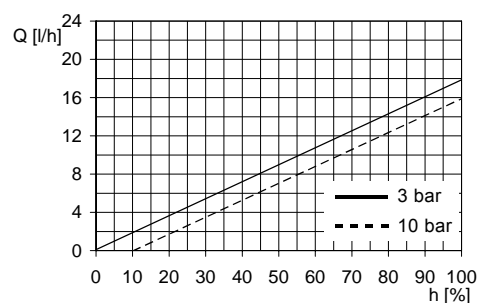


Fig. 51 DMX 16-10 (50 Hz)

TM03 6334 4506

TM03 6335 4506

TM03 6336 4506

TM03 6337 4506

TM03 6338 4506

TM03 6339 4506

TM03 6340 4506

TM03 6341 4506

TM03 6342 4506

TM03 6343 4506

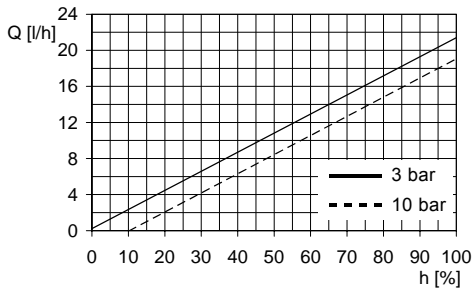


Fig. 52 DMX 16-10 (60 Hz)

TM03 6344 4506

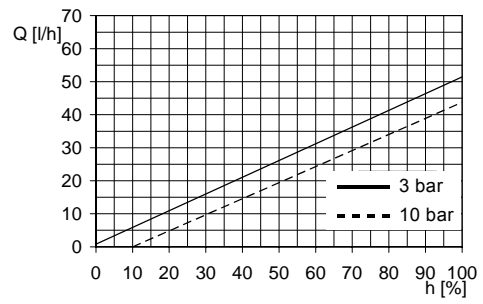


Fig. 57 DMX 50-10 (50 Hz)

TM03 6349 4506

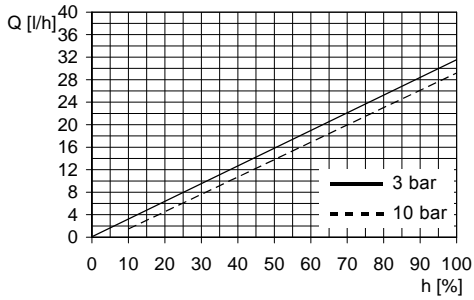


Fig. 53 DMX 27-10 (50 Hz)

TM03 6345 4506

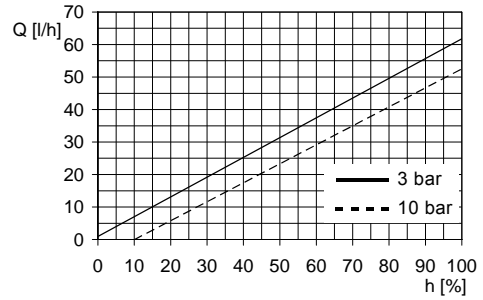


Fig. 58 DMX 50-10 (60 Hz)

TM03 6350 4506

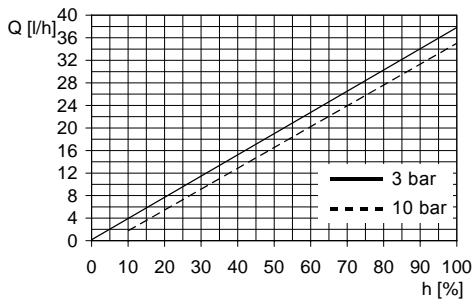


Fig. 54 DMX 27-10 (60 Hz)

TM03 6346 4506

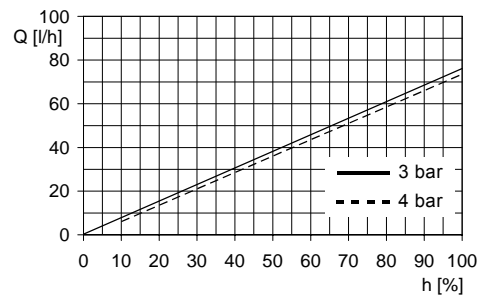


Fig. 59 DMX 75-4 (50 Hz)

TM03 6351 4506

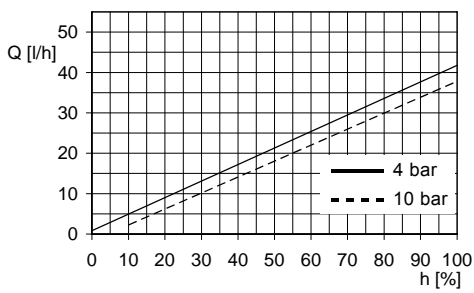


Fig. 55 DMX 35-10 (50 Hz)

TM03 6347 4506

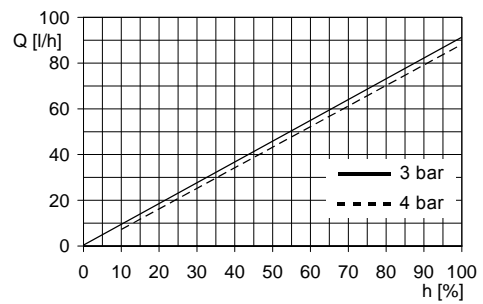


Fig. 60 DMX 75-4 (60 Hz)

TM03 6352 4506

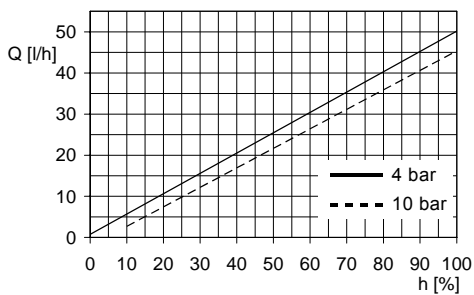


Fig. 56 DMX 35-10 (60 Hz)

TM03 6348 4506

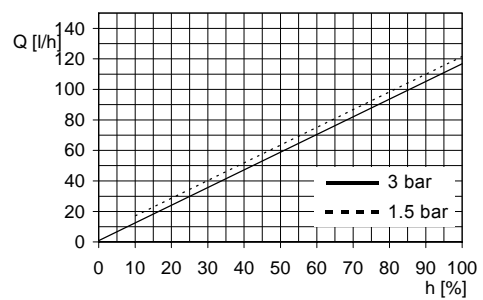
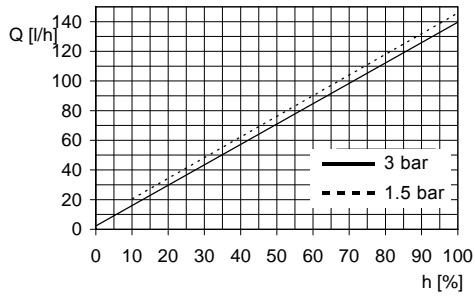


Fig. 61 DMX 115-3 (50 Hz)

TM03 6353 4506



TM03 6354 4506

Fig. 62 DMX 115-3 (60 Hz)

17. Disposal

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

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

Safety declaration

Please copy, fill in and sign this sheet and attach it to the pump returned for service.

We hereby declare that this product is free from hazardous chemicals, biological and radioactive substances:

Product type: _____

Model number: _____

No media or water: _____

A chemical solution, name: _____

(see pump nameplate)

Fault description

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



GrA3476

Please give a short description of the fault:

Date and signature

Company stamp

Denmark
GRUNDFOS DK A/S
Martin Bachs Vej 3
DK-8850 Bjerringbro
Tlf.: +45-87 50 50 50
Telefax: +45-87 50 51 51
E-mail: info_GDK@grundfos.com
www.grundfos.com/DK

Argentina
Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500 Lote 34A
1619 - Garin
Pcia. de Buenos Aires
Phone: +54-3327 414 444
Telefax: +54-3327 411 111

Australia
Grundfos Alldos
Dosing & Disinfection
ALLDOS Oceania Pty. Ltd.
Unit 3 / 74 Murdoch Circuit
Acacia Ridge QLD 4100
Phone: +61 (0)7 3712 6888
Telefax: +61 (0)7 3272 5188
E-mail: alldos.au@alldos.com

Australia
GRUNDFOS Pumps Pty. Ltd.
P.O. Box 2040
Regency Park
South Australia 5942
Phone: +61-8-8461-4611
Telefax: +61-8-8340 0155

Austria
GRUNDFOS Pumpen Vertrieb Ges.m.b.H.
Grundfosstraße 2
A-5082 Grödig/Salzburg
Tel.: +43-6246-883-0
Telefax: +43-6246-883-30

Belgium
N.V. GRUNDFOS Bellux S.A.
Boomsesteenweg 81-83
B-2630 Aartselaar
Tél.: +32-3-870 7300
Télécopie: +32-3-870 7301

Belorussia
Представительство ГРУНДФОС в Минске
220090 Минск ул.Опешева 14
Телефон: (8632) 62-40-49
Факс: (8632) 62-40-49

Bosnia/Herzegovina
GRUNDFOS Sarajevo
Paromlinska br. 16,
BiH-71000 Sarajevo
Phone: +387 33 713290
Telefax: +387 33 231795

Brazil
Mark GRUNDFOS Ltda.
Av. Humberto de Alencar Castelo Branco,
630
CEP 09850 - 300
São Bernardo do Campo - SP
Phone: +55-11 4393 5533
Telefax: +55-11 4343 5015

Bulgaria
GRUNDFOS Pumpen Vertrieb
Representative Office - Bulgaria
Bulgaria, 1421 Sofia
Lozenetz District
105-107 Arsenalski blvd.
Phone: +359 2963 3820, 2963 5653
Telefax: +359 2963 1305

Canada
GRUNDFOS Canada Inc.
2941 Brighton Road
Oakville, Ontario
L6H 6C9
Phone: +1-905 829 9533
Telefax: +1-905 829 9512

China
Grundfos Alldos
Dosing & Disinfection
ALLDOS (Shanghai) Water Technology Co.
Ltd.
West Unit, 1 Floor, No. 2 Building (T 4-2)
278 Jinhua Road, Jin Qiao Export Processing
Zone
Pudong New Area
Shanghai, 201206
Phone: +86 21 5055 1012
Telefax: +86 21 5032 0596
E-mail: alldos.cn@alldos.com

China
GRUNDFOS Pumps (Shanghai) Co. Ltd.
22 Floor, Xin Hua Lian Building
755-775 Huai Hai Rd., (M)
Shanghai 200020
PRC
Phone: +86-512-67 61 11 80
Telefax: +86-512-67 61 81 67

Croatia
GRUNDFOS predstavništvo Zagreb
Cebini 37, Buzin
HR-10000 Zagreb
Phone: +385 1 6595 400
Telefax: +385 1 6595 499

Czech Republic
GRUNDFOS s.r.o.
Čapkovského 21
779 00 Olomouc
Phone: +420-585-716 111
Telefax: +420-585-716 299

Estonia
GRUNDFOS Pumps Eesti OÜ
Peterburi tee 44
11415 Tallinn
Tel: + 372 606 1690
Fax: + 372 606 1691

Finland
OY GRUNDFOS Pumpat AB
Mestarintie 11
FIN-01730 Vantaa
Phone: +358-3066 5650
Telefax: +358-3066 56550

France
Grundfos Alldos
Dosing & Disinfection
ALLDOS S.A.R.L.
7, rue Gutenberg
F-67610 La Wantzenau
Tél.: +33-3 88 59 26 26
Télécopie: +33-3 88 59 26 00
E-mail : alldos.fr@alldos.com

France
Pompes GRUNDFOS Distribution S.A.
Parc d'Activités de Chesnes
57, rue de Malacombe
F-38290 St. Quentin Fallavier (Lyon)
Tél.: +33-4 74 82 15 15
Télécopie: +33-4 74 94 10 51

Germany
Grundfos Alldos
Dosing & Disinfection
ALLDOS Eichler GmbH
Reetzstraße 85
D-76327 Pfinztal (Söllingen)
Tel.: +49 7240 61-0
Telefax: +49 7240 61-177
E-mail: alldos.de@alldos.com

Germany
GRUNDFOS GMBH
Schlüterstr. 33
D-40699 Erkrath
Tel.: +49-(0) 211 929 69-0
Telefax: +49-(0) 211 929 69-3799
E-mail: infoservice@grundfos.de
Service in Deutschland:
E-mail: kundendienst@grundfos.de

Greece
GRUNDFOS Hellas A.E.B.E.
20th km. Athinon-Markopoulou Av.
P.O. Box 71
GR-19002 Peania
Phone: +0030-210-66 83 400
Telefax: +0030-210-66 46 273

Hong Kong
GRUNDFOS Pumps (Hong Kong) Ltd.
Unit 1, Ground floor
Siu Wai Industrial Centre
29-33 Wing Hong Street &
68 King Lam Street, Cheung Sha Wan
Kowloon
Phone: +852-27861706 / 27861741
Telefax: +852-27858664

Hungary
GRUNDFOS Hungária Kft.
Park u. 8
H-2045 Törökbálint,
Phone: +36-23 511 110
Telefax: +36-23 511 111

India
GRUNDFOS Pumps India Private Limited
118 Old Mahabalipuram Road
Thoraiakkam
Chamiers Road
Chennai 600 096
Phone: +91-44 2496 6800

Indonesia
PT GRUNDFOS Pompa
Jl. Rawa Sumur III, Blok III / CC-1
Kawasan Industri, Pulogadung
Jakarta 13930
Phone: +62-21-460 6909
Telefax: +62-21-460 6910 / 460 6901

Ireland
GRUNDFOS (Ireland) Ltd.
Unit A, Merrywell Business Park
Ballymount Road Lower
Dublin 12
Phone: +353-1-4089 800
Telefax: +353-1-4089 830

Italy
GRUNDFOS Pompe Italia S.r.l.
Via Gran Sasso 4
I-20060 Truccazzano (Milano)
Tel.: +39-02-95838112
Telefax: +39-02-95309290 / 95838461

Japan
GRUNDFOS Pumps K.K.
Gotanda Metalion Bldg. 5F,
5-21-15, Higashi-gotanda
Shiagawa-ku, Tokyo,
141-0022 Japan
Phone: +81 35 448 1391
Telefax: +81 35 448 9619

Korea
GRUNDFOS Pumps Korea Ltd.
6th Floor, Aju Building 679-5
Yeoksam-dong, Kangnam-ku, 135-916
Seoul, Korea
Phone: +82-2-5317 600
Telefax: +82-2-5633 725

Latvia
SIA GRUNDFOS Pumps Latvia
Deglava biznesa centrs
Augusta Deglava ielā 60, LV-1035, Rīga,
Tālr.: + 371 714 9640, 7 149 641
Fakss: + 371 914 9646

Lithuania
GRUNDFOS Pumps UAB
Smolensko g. 6
LT-03201 Vilnius
Tel: + 370 52 395 430
Fax: + 370 52 395 431

Malaysia
GRUNDFOS Pumps Sdn. Bhd.
7 Jalan Peguam U1/25
Glenmarie Industrial Park
40150 Shah Alam
Selangor
Phone: +60-3-5569 2922
Telefax: +60-3-5569 2866

México
Bombas GRUNDFOS de México S.A. de
C.V.
Boulevard TLC No. 15
Parque Industrial Stiva Aeropuerto
Apodaca, N.L. 66600
Phone: +52-81-8144 4000
Telefax: +52-81-8144 4010

Netherlands
Grundfos Alldos
Dosing & Disinfection
ALLDOS BV
Leerlooiersstraat 6
NL-8601 WK Sneek
Tel.: +31-51 54 25 789
Telefax: +31-51 54 30 550
E-mail: alldos.nl@alldos.com

Netherlands
GRUNDFOS Nederland B.V.
Postbus 104
NL-1380 AC Weesp
Tel.: +31-294-492 211
Telefax: +31-294-492244/492299

New Zealand
GRUNDFOS Pumps NZ Ltd.
17 Beatrice Tinsley Crescent
North Harbour Industrial Estate
Albany, Auckland
Phone: +64-9-415 3240
Telefax: +64-9-415 3250

Norway
GRUNDFOS Pumper A/S
Strømsveien 344
Postboks 235, Leirdal
N-1011 Oslo
Tlf.: +47-22 90 47 00
Telefax: +47-22 32 21 50

Poland
GRUNDFOS Pompy Sp. z o.o.
ul. Klonowa 23
Baranowo k. Poznania
PL-62-081 Przeźmierowo
Phone: (+48-61) 650 13 00
Telefax: (+48-61) 650 13 50

Portugal
Bombas GRUNDFOS Portugal, S.A.
Rua Calvet de Magalhães, 241
Apartado 1079
P-2770-153 Paço de Arcos
Tel.: +351-21-440 76 00
Telefax: +351-21-440 76 90

România
GRUNDFOS Pompe România SRL
Bd. Biruintei, nr 103
Pantelimon county Ilfov
Phone: +40 21 200 4100
Telefax: +40 21 200 4101
E-mail: romania@grundfos.ro

Russia
ООО Грундфос
Россия, 109544 Москва, Школьная 39
Тел. (+7) 095 737 30 00, 564 88 00
Факс (+7) 095 737 75 36, 564 88 11
E-mail grundfos.moscow@grundfos.com

Serbia
GRUNDFOS Predstavništvo Beograd
Dr. Milutina Ivkovića 2a/29
YU-11000 Beograd
Phone: +381 11 26 47 877 / 11 26 47 496
Telefax: +381 11 26 48 340

Singapore
GRUNDFOS (Singapore) Pte. Ltd.
24 Tuas West Road
Jurong Town
Singapore 638381
Phone: +65-6865 1222
Telefax: +65-6861 8402

Slovenia
GRUNDFOS PUMPEN VERTRIEB
Ges.m.b.H.,
Podružnica Ljubljana
Blatnica 1, SI-1236 Trzin
Phone: +386 1 563 5338
Telefax: +386 1 563 2098
E-mail: slovenia@grundfos.si

South Africa
Grundfos Alldos
Dosing & Disinfection
ALLDOS (Pty) LTD
98 Matroosberg Road, Waterkloof Park
P.O. Box 38509, Menlo Park 0102
0181 ZA Pretoria
E-mail: alldos.za@alldos.com

Spain
Bombas GRUNDFOS España S.A.
Camino de la Fuentequilla, s/n
E-28110 Algete (Madrid)
Tel.: +34-91-848 8800
Telefax: +34-91-628 0465

Sweden
GRUNDFOS AB
Lunnagårdsgatan 6
431 90 Mölndal
Tel.: +46-0771-32 23 00
Telefax: +46-31 331 94 60

Switzerland
Grundfos Alldos
Dosing & Disinfection
ALLDOS International AG
Schönmattdstraße 4
CH-4153 Reinach
Tel.: +41-61-717 5555
Telefax: +41-61-717 5500
E-mail: alldos.ch@alldos.com

Switzerland
GRUNDFOS Pumpen AG
Bruggacherstrasse 10
CH-8117 Fällanden/ZH
Tel.: +41-1-806 8111
Telefax: +41-1-806 8115

Taiwan
GRUNDFOS Pumps (Taiwan) Ltd.
7 Floor, 219 Min-Chuan Road
Taichung, Taiwan, R.O.C.
Phone: +886-4-2305 0868
Telefax: +886-4-2305 0878

Thailand
GRUNDFOS (Thailand) Ltd.
947/168 Moo 12, Bangna-Trad Rd., K.M. 3,
Bangna, Phrakonong
Bangkok 10260
Phone: +66-2-744 1785 ... 91
Telefax: +66-2-744 1775 ... 6

Turkey
GRUNDFOS POMPA San. ve Tic. Ltd. Sti.
Gebze Organize Sanayi Bölgəsi
İhsan dede Caddesi,
2. yol 200. Sokak No. 204
41490 Gebze/ Kocaeli
Phone: +90 - 262-679 7979
Telefax: +90 - 262-679 7905
E-mail: satis@grundfos.com

Ukraine
ТОВ ГРУНДФОС Україна
ул. Владимирская, 71, оф. 45
г. Киев, 01033, Украина,
Тел. +380 44 289 4050
Факс +380 44 289 4139

United Arab Emirates
GRUNDFOS Gulf Distribution
P.O. Box 16768
Jebel Ali Free Zone
Dubai
Phone: +971-4- 8815 166
Telefax: +971-4-8815 136

United Kingdom
Grundfos Alldos
Dosing & Disinfection
ALLDOS Ltd.
39 Gravelly Industrial Park, Tyburn Road
Birmingham B24 8TG
Phone: +44-121-3283336
Telefax: +44-121-3284332
E-mail: alldos.uk@alldos.com

United Kingdom
GRUNDFOS Pumps Ltd.
Grovebury Road
Leighton Buzzard/Beds. LU7 8TL
Phone: +44-1525-850000
Telefax: +44-1525-850011

U.S.A.
GRUNDFOS Pumps Corporation
17100 West 118th Terrace
Olathe, Kansas 66061
Phone: +1-913-227-3400
Telefax: +1-913-227-3500

Usbekistan
Представительство ГРУНДФОС в
Ташкенте
700000 Ташкент ул.Усмана Носира 1-й
тулик 5
Телефон: (3712) 55-68-15
Факс: (3712) 53-36-35

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