DMX 226

Dosing pump

Installation and operating instructions

DMX 226
Installation and operating instructions
(all available languages)
http://net.grundfos.com/qr/i/99558952

GRUNDFOS

DMX 226

English (GB)
Installation and operating instructions 4
Appendix A **32**
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Original installation and operating instructions

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1. General information

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

1.1 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

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 hazard statements are structured in the following way:

SIGNAL WORD
Description of the hazard
Consequence of ignoring the warning
- Action to avoid the hazard.

1.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

Observe these instructions for explosion-proof products.

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

A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.

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

Tips and advice that make the work easier.

1.3 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.

1.4 Introduction

These installation and operating instructions contain all the information required for starting up and handling the DMX 226 dosing pump.

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

1.5 Applications

The DMX 226 pump is suitable for liquid, non-abrasive and non-flammable media strictly in accordance with the instructions in this manual.

WARNING
Toxic material
Death or serious personal injury

- Any usage other than that described here is not intended. Grundfos accepts no liability for any injuries or damage resulting from improper use.

If a pump is explosion-proof, it is marked on the pump and motor nameplates. The declaration of conformity supplied with explosion-proof pumps approved according to the 2014/34/EU directive replaces the declaration of conformity in this manual.

When using explosion-proof pumps in potentially explosive areas according to the 2014/34/EU directive, the instructions "ATEX-approved pumps" as well as the instructions in this manual must be observed.

2. 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.

2.1 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.

2.2 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.

2.3 Safety instructions for the operator and user

WARNING
Electric shock
Death or serious personal injury

- Keep liquids away from the power supply and electrical components.

Before starting work on the pump, make sure the pump is disconnected from the power supply.

The system must be depressurised.

You must follow all safety regulations described here, as well as existing national regulations on health and environment protection, accident prevention, and any internal working, operating and safety regulations regarding the operator.

Hot or cold parts of the pump must be protected to prevent accidental contact.

Information attached to the pump must be observed.

Leakages of dangerous substances must be disposed of in a way that is not harmful to humans, animals or the environment.

Damage caused by electrical energy must be prevented. Observe the regulations of the local electricity supply company.

Only original accessories and original spare parts should be used.

2.4 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.

WARNING
Electric shock
Death or serious personal injury

- The pump housing must only be opened by personnel authorised by Grundfos.
- All electrical connections must be carried out by a qualified electrician in accordance with local regulations.

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.

2.5 Unauthorised modification and manufacture of spare parts

Changes or modifications to the pump are only permitted after consultation with the manufacturer. Original spare parts and accessories should be used.

Grundfos accepts no liability for any damage resulting from incorrect use

2.6 Improper operating methods

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

Related information

3.1.1 Nameplate

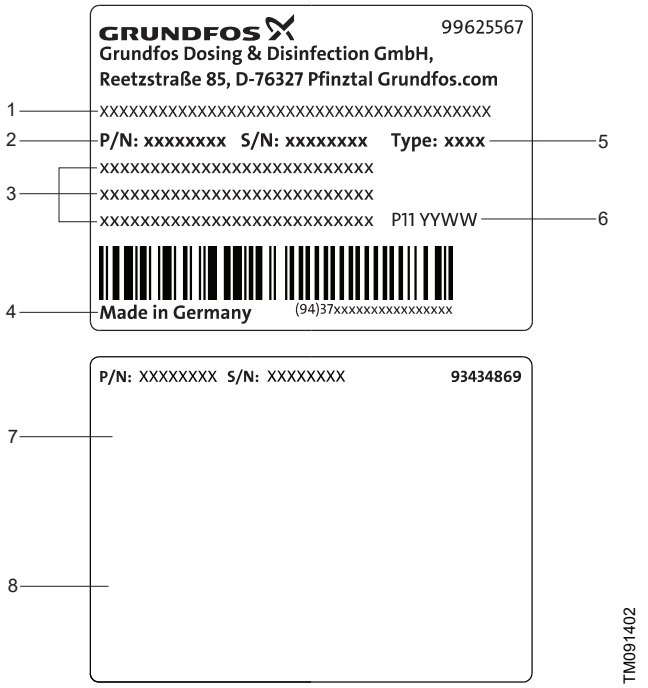
2.7 Safety of the system in the event of a failure in the dosing system

DMX 226 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.

3. Technical data

3.1 Identification

3.1.1 Nameplate



Pos.	Description
1	Type designation
2	Product number, Serial number
3	Pump performance by frequency
4	Country of origin
5	Pump model
6	Production code (year and week)
7	Marks of approval
8	ATEX designation

3.1.2 Type key

The type key is used to identify the precise pump and is not used for configuration purposes.

Type
DMX 132-10D B-PVC/V/C-X-E 1 U3U3 X EM A G

Nominal dosing capacity [l/h]
DMX **132** -10D B-PVC/V/C-X-E 1 U3U3 X EM A G

Max. pressure [bar]	
DMX 132- **10D** B-PVC/V/C-X-E 1 U3U3 X EM A G	
10D	Pumps marked with a "D" after the pressure value are double-head pumps.

Control variant	
DMX 132-10D **B** -PVC/V/C-X-E 1 U3U3 X EM A G	
B	Standard (manual control)
S1	Stroke counter NAMUR, NC output
AR [1]	AR control unit, pump-mounted
AW [1]	AR control unit, wall-mounted
D3	Servomotor, 1AC 115-230 V, 50/60 Hz, 4-20 mA control (without manual operation)
D4	Servomotor, 24 VDC, 4-20 mA control (without manual operation)

[1] It is only for pumps ≤ 0.37 kW

Dosing head variant	
DMX 132-10D B- **PVC** /V/C-X-E 1 U3U3 X EM A G	
PP	Polypropylene
PV	Polyvinylidene fluoride (PVDF)
SS	Stainless steel 1.4571 (EN 10027-2), 316Ti (AISI)
PVC	Polyvinyl chloride
PVCR	PVC with integrated PRV
PVR	PV with integrated PRV

Gasket material	
DMX 132-10D B-PVC/ **V** /C-X-E 1 U3U3 X EM A G	
E	EPDM
V	FKM
T	PTFE

Valve ball material	
DMX 132-10D B-PVC/V/ **C** -X-E 1 U3U3 X EM A G	
G	Glass (from DN 32)
T	PTFE
SS	Stainless steel 1.4401 (EN 10027-2), 316 (AISI)
C	Ceramic (up to DN 20)

Terminal box position (also AR control or VFD position)	
DMX 132-10D B-PVC/V/C- **X** -E 1 U3U3 X EM A G	
X	Opposite side of dosing head (3 o'clock)
D	Towards dosing head (9 o'clock)
S	Towards adjusting knob (6 o'clock)
R	Opposite side of adjusting knob (12 o'clock)

Supply voltage	
DMX 132-10D B-PVC/V/C-X- **E** 1 U3U3 X EM A G	
E	3AC 230/400 V, 50/60 Hz, 440-480 V, 60 Hz (motors < 0.75 kW)
G	1AC 230 V, 50/60 Hz (motors ≤ 0.09 kW) 1AC 230 V, 50 Hz (motors 0.18 - 0.37 kW)
H	1AC 115 V, 50/60 Hz (motors ≤ 0.09 kW) 1AC 115 V, 60 Hz (motors 0.18 - 0.37 kW)
F	Without motor, NEMA flange
0	Without motor, IEC flange
4	3AC 230/400 V, 50 Hz (EX motors)
5	3AC 220/380 V, 60 Hz (EX motors)
K	3AC 500 V, 50 Hz
L	3AC 240/415 V, 50 Hz
P	3AC 240/415 V, 60 Hz
N	3AC 255/440 V, 60 Hz
M	3AC 400/690 V, 50 Hz (standard in power plants)

Valve type (suction/discharge)	
DMX 132-10D B-PVC/V/C-X-E **1** U3U3 X EM A G	
1	Standard valves, not spring-loaded
3	Spring-loaded suction valve (0.05 bar) and discharge valve (0.8 bar)
4	Spring-loaded discharge valve (0.8 bar), suction valve not spring-loaded
5	For abrasive media

Hydraulic connections (first = discharge, second = suction)	
DMX 132-10D B-PVC/V/C-X-E 1 **U3U3** X EM A G	
U3	G 5/4, for hoses with internal diameter 19 or 20 mm and for pipes with external diameter 25 mm
U7	G 5/8, for hoses 0.17" × 1/4", 1/4" × 3/8", 3/8" × 1/2" (PVC, PP, PVDF)
A1	G 5/4, for pipes with internal thread Rp 3/4 (SS)
A8	Flange DN 32, for pipes with internal thread 1 1/4 NPT (PVC, PP, PVDF)
B5	Flange DN 32, for pipes with external diameter 40 mm (PP, PVDF)
A2	G 2, for pipes with internal thread Rp 1 1/4 (SS)
A3	G 5/4, for pipes with internal thread 3/4 NPT (SS)
A7	G 5/4, for pipes with external thread 3/4 NPT (PVC, PVDF)
A4	G 2, for pipes with internal thread 1 1/4 NPT (SS)
K	G 2, for pipes with external diameter 40 mm (PVC)

Power plug (only 1AC motors)	
DMX 132-10D B-PVC/V/C-X-E 1 U3U3 **X** EM A G	
X	No plug
F	EU (Schuko)
B	USA, Canada
I	Australia, New Zealand, Taiwan
E	Switzerland

Motor variant and certification	
DMX 132-10D B-PVC/V/C-X-E 1 U3U3 X **EM** A G	
EM	Standard motor (without certificates)
E0	Motor with PTC for thermal protection (without certificates)
E1	EX motor, type EX II 2G EEx e II T3 (without certificates)
E2	EX motor, type EX II 2GD EEx de IIC T4, without PTC (without certificates)
E5	EX motor, type EX II 2GD EEx de IIC T4, with PTC (without certificates)
FA	VFD (variable frequency drive) (without certificates)
FB	VFD with I/O extension board (without certificates)
FC	VFD with internal Profibus (without certificates)
MP	Standard motor (with certificates)
K0	Motor with PTC for thermal protection (with certificates)
K1	EX motor, type EX II 2G EEx e II T3 (with certificates)
K2	EX motor, type EX II 2GD EEx de IIC T4, without PTC (with certificates)
K5	EX motor, type EX II 2GD EEx de IIC T4, with PTC (with certificates)

Pump housing material	
DMX 132-10D B-PVC/V/C-X-E 1 U3U3 X EM **A** G	
A	Aluminium

Pump design	
DMX 132-10D B-PVC/V/C-X-E 1 U3U3 X EM A **G**	
G	Grundfos
N	Neutral

3.2 Pump models and pump types

The pump nameplate shows various data of the pump like the type designation and the pump model. For an explanation of the nameplate see section Nameplate.

The pump type is the left part of the type designation and consists of the type abbreviation, the nominal dosing capacity and the maximum counterpressure. For an explanation of the type designation see section Type key.

Pump model	Pump type	Dosing head size	Stroke volume [ml]	Motor power [kW]
DMX 226M	DMX 24-8	1	13.8	0.18
	DMX 37-5	2	22	
	DMX 52-8	1	13.8	
	DMX 60-3	3	36	
	DMX 82-5	2	22	
	DMX 100-8	1	13.8	
	DMX 130-3	3	36	
	DMX 142-8	1	13.8	
	DMX 160-5	2	22	
	DMX 224-5	2	22	
	DMX 255-3	3	36	
	DMX 380-3	3	36	
DMX 226L	DMX 67-10	1	18.5	0.37 [2]
	DMX 95-8	2	27.8	
	DMX 132-10	1	18.5	
	DMX 152-6	3	44.6	
	DMX 190-10	1	18.5	
	DMX 199-8	2	27.8	
	DMX 249-3	4	73	
	DMX 280-8	2	27.8	
	DMX 315-3	4	73	
	DMX 321-6	3	44.6	
	DMX 460-6	3	44.6	
	DMX 525-3	4	73	
	DMX 765-3	4	73	

2) With PTC thermistor: 0.55 kW.

Related information

3.1.2 Type key

3.1.1 Nameplate

3.3 Pump performance

3.3.1 Accuracy

- Dosing flow fluctuation: ± 1.5 % within the control range 1:10.
- Linearity deviation: ± 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 de-aerated dosing head
- standard pump version.

3.3.2 Performance

Applies to:

- maximum counterpressure
- water as dosing medium
- flooded suction 0.5 mWC
- fully de-aerated dosing head

Pump type	50 Hz				60 Hz				100 Hz		
	Q [3]	Max. stroke rate	p max. [4]		Q [3]	Max. stroke rate	p max. [4]		Q [3]	Max. stroke rate	p max. [4]
			3 AC	1 AC			3 AC	1 AC			
	[l/h]	[n/min]	[bar]	[bar]	[l/h]	[n/min]	[bar]	[bar]	[l/h]	[n/min]	[bar]
DMX 24-8	24	29	8	8	28	34.8	8	8	48	58	8
DMX 37-5	37	29	5	5	45	34.8	5	5	75	58	5
DMX 52-8	52	63	8	8	62	75.6	8	8	104	126	8
DMX 60-3	60	29	3	3	72	34.8	3	3	120	58	3
DMX 67-10	67	57	10	10	80	68.4	10	10	134	114	10
DMX 82-5	82	63	5	5	98	75.6	5	5	164	126	5
DMX 95-8	95	57	8	8	114	68.4	8	8	190	114	8
DMX 100-8	100	120	8	8	120	144	8	8	-	-	-
DMX 130-3	130	63	3	3	156	75.6	3	3	260	126	3
DMX 132-10	132	120	10	10	158	144	10	10	-	-	-
DMX 142-8	142	168	8	8	-	-	-	-	-	-	-
DMX 152-6	152	57	6	6	182	68.4	6	6	304	114	6
DMX 160-5	160	120	5	5	192	144	5	5	-	-	-
DMX 190-10	190	175	10	8	-	-	-	-	-	-	-
DMX 199-8	199	120	8	8	239	144	8	8	-	-	-
DMX 224-5	224	168	5	5	-	-	-	-	-	-	-
DMX 249-3	249	57	3	3	299	68.4	3	3	498	114	3
DMX 255-3	255	120	3	3	306	144	3	3	-	-	-
DMX 280-8	280	175	8	6	-	-	-	-	-	-	-
DMX 315-3	315	72	3	3	378	86.4	3	3	630	144	3
DMX 321-6	321	120	6	4	385	144	6	-	-	-	-
DMX 380-3	380	168	3	3	-	-	-	-	-	-	-
DMX 460-6	460	175	6	3.5	-	-	-	-	-	-	-
DMX 525-3	525	120	3	3	630	144	3	3	-	-	-
DMX 765-3	765	175	3	-	-	-	-	-	-	-	-

3) Dosing capacity per dosing head; double the capacity for double-head pumps.

4) Dosing capacity per dosing head; double the capacity for double-head pumps.

3.4 Suction heights

3.4.1 Media with a viscosity similar to water

Applies to:

- counterpressure of 1.5 to 3 bar
- non-degassing and non-abrasive media
- temperature of 20 °C
- stroke length 100 %
- standard pump version.

Pump type	50 Hz		60 Hz		100 Hz		Max. suction line length
	Suction height [5]	Suction lift [6]	Suction height [5]	Suction lift [6]	Suction height [5]	Suction lift [6]	
	[mWC]	[mWC]	[mWC]	[mWC]	[mWC]	[mWC]	[m]
DMX 24-8	3	1	2.5	1	2.5	1	4
DMX 37-5	3	1	2.5	1	2	1	3
DMX 52-8	3	1	2.5	1	2.5	1	4
DMX 60-3	2	1	2	1	1.5	1	3
DMX 67-10	3	1	2.5	1	2.5	1	4
DMX 82-5	3	1	2.5	1	2	1	3
DMX 95-8	3	1	2.5	1	2	1	3
DMX 100-8	3	1	2.5	1	-	-	4
DMX 130-3	2	1	2	1	1.5	1	3
DMX 132-10	3	1	2.5	1	-	-	4
DMX 142-8	3	1	-	-	-	-	4
DMX 152-6	2	1	2	1	1.5	1	3
DMX 160-5	3	1	2.5	1	-	-	3
DMX 190-10	3	1	-	-	-	-	4
DMX 199-8	3	1	2.5	1	-	-	3
DMX 224-5	3	1	-	-	-	-	3
DMX 249-3	1.5	1	1	0.5	1	0.5	2
DMX 255-3	2	1	2	1	-	-	3
DMX 280-8	3	1	-	-	-	-	3
DMX 315-3	1.5	1	1	0.5	-	-	2
DMX 321-6	2	1	2	1	-	-	3
DMX 380-3	2	1	-	-	-	-	3
DMX 460-6	2	1	-	-	-	-	3
DMX 525-3	1	0.5	1	0.5	-	-	2
DMX 765-3	0	0	-	-	-	-	2

5) Suction line and dosing head filled (continuous operation).
With stronger restoring spring, the values for dosing head size 1 are increased by 2 metres, and for dosing head sizes 2 and 3 by 1 metre.

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

3.4.2 Suction heights for media with maximum permissible viscosity

Applies to:

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

Pump type	Maximum viscosity	Suction height
	[m Pas]	[mWC]
DMX 24-8	1000	1
DMX 37-5	600	1
DMX 52-8	700	1
DMX 60-3	500	0
DMX 67-10	700	1
DMX 82-5	500	1
DMX 95-8	500	1
DMX 100-8	400	1
DMX 130-3	400	0
DMX 132-10	400	1
DMX 142-8	200	0
DMX 152-6	400	0
DMX 160-5	200	0
DMX 190-10	200	0
DMX 199-8	200	0
DMX 224-5	150	0
DMX 249-3	100	0
DMX 255-3	100	0
DMX 280-8	150	0
DMX 315-3	100	0
DMX 321-6	100	0
DMX 380-3	50	0
DMX 460-6	50	0
DMX 525-3	50	0
DMX 765-3	10	0

3.5 Ambient and operating conditions

CAUTION
Hot surface
Minor or moderate personal injury

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

The installation site must be under cover.

Ensure that the enclosure class of motor and pump are not affected by the atmospheric conditions. Pumps with electronics are only suitable for indoor use.

Do not install the pump outdoors.

- Permissible ambient temperature: 0 °C to +40 °C.
- Permissible storage temperature: -20 °C to +50 °C.
- Permissible air humidity: max. relative humidity (non-condensing): 70 % at +40 °C, 90 % at +35 °C.
- Sound pressure level: ± 55 dB(A), testing according to DIN 45635-01-KL3
- Minimum counterpressure: 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).

3.6 Dosing medium

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

The dosing medium must have the following basic characteristics:

- liquid
- non-abrasive
- non-flammable.

3.6.1 Permissible media temperature

WARNING
Chemical hazard
Death or serious personal injury

- Observe the freezing and boiling points of the dosing medium.

Dosing head material	Temperature range p < 10 bar
PVC	0 °C to +40 °C
Stainless steel [7)]	-10 °C to +70 °C
PP	0 °C to +40 °C
PVDF	-10 °C to +60 °C
	+70 °C at 9 bar

7) For SIP/CIP applications (not with ATEX): A temperature of 145 °C at a counterpressure of max. 2 bar is permitted for a short period (15 minutes).

3.7 Electrical data

3.7.1 Enclosure class

The enclosure class depends on the motor variant selected. See the nameplate of the motor.

The specified protection class can only be guaranteed if the power supply cable with the same protection class is connected.

Pumps with electronics: The protection class is only guaranteed if the sockets are protected. Plugs must be inserted correctly and caps must be screwed on tightly.

3.7.2 Motor

The motor design can be found on the nameplates of the motor and the pump.

3.8 AR control unit

Functions of pumps with electronics:

- **Continuous operation** button for function test and dosing head de-aeration,
- memory function (stores a maximum of 65,000 pulses),
- two-level tank-empty signal, for example with a Grundfos tank-empty sensor,
- stroke signal and adjustable low-level signal, for example as a feedback to the control room,
- dosing controller function (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.

3.8.1 AR control unit

Functions of pumps with electronics

- **Continuous operation** button for function test and dosing head de-aeration,
- memory function (stores a maximum of 65,000 pulses),
- two-level tank-empty signal, for example with a Grundfos tank-empty sensor,
- stroke signal and adjustable low-level signal, for example as a feedback to the control room,
- dosing controller function (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.

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-level 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 per stroke: 200 ms
Low-level signal	Maximum ohmic load: 50 VDC / 75 VAC, 0.5 A

AR control unit factory settings

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

3.9 Materials

Pump

- Pump housing: Al 226
- Diaphragm flanges: GG 25
- Stroke-length adjustment knob: ABS.

AR control unit enclosure

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

Optoelectronic diaphragm sensor

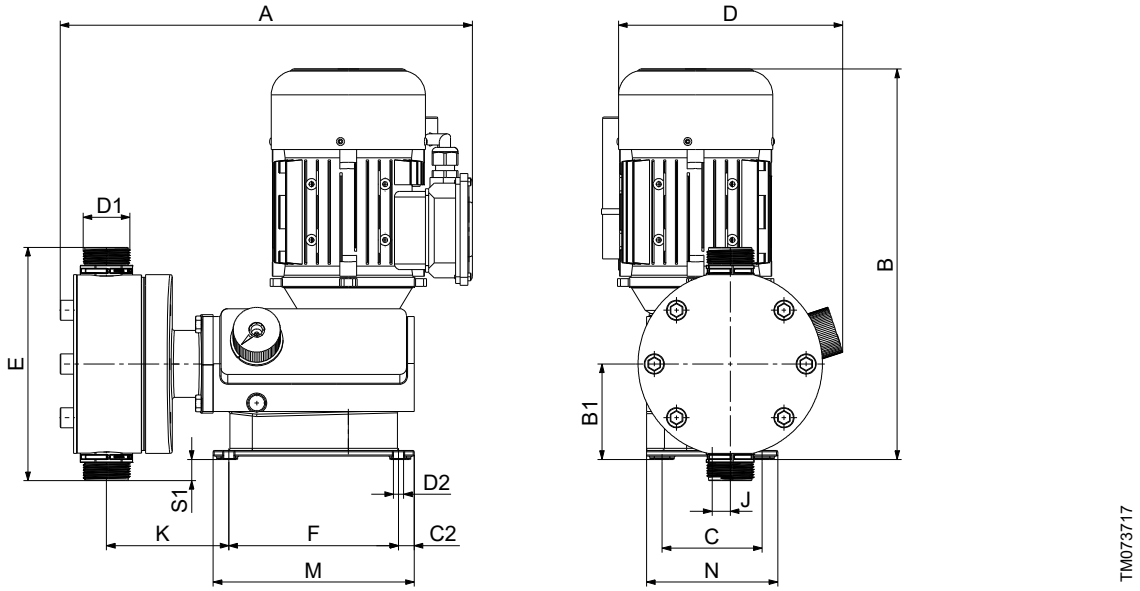
- Housing: ABS.

3.10 Weights

Single pump	Approx. weight [kg]		Double pump	Approx. weight [kg]	
	Dosing head material			Dosing head material	
	PVC	Stainless steel		PVC	Stainless steel
DMX 24-8	15	21	DMX 24-8D	24	36
DMX 37-5	15	21	DMX 37-5D	24	36
DMX 52-8	15	21	DMX 52-8D	24	36
DMX 60-3	15	21	DMX 60-3D	24	36
DMX 67-10	21	30	DMX 67-10D	30	48
DMX 82-5	15	21	DMX 82-5D	24	36
DMX 95-8	21	30	DMX 95-8D	30	48
DMX 100-8	15	21	DMX 100-8D	24	36
DMX 130-3	15	21	DMX 130-3D	24	36
DMX 132-10	21	30	DMX 132-10D	30	48
DMX 142-8	15	21	DMX 142-8D	24	36
DMX 152-6	21	30	DMX 152-6D	30	48
DMX 160-5	15	21	DMX 160-5D	24	36
DMX 190-8	21	30	DMX 190-8D	30	48
DMX 190-10	21	30	DMX 190-10D	30	48
DMX 199-8	21	30	DMX 199-8D	30	48
DMX 224-5	15	21	DMX 224-5D	24	36
DMX 249-3	21	30	DMX 249-3D	30	48
DMX 255-3	15	21	DMX 255-3D	24	36
DMX 280-6	21	30	DMX 280-6D	30	48
DMX 280-8	21	30	DMX 280-8D	30	48
DMX 315-3	21	30	DMX 315-3D	30	48
DMX 321-4	21	30	DMX 321-4D	30	48
DMX 321-6	21	30	DMX 321-6D	30	48
DMX 380-3	15	21	DMX 380-3D	24	36
DMX 460-3,5	21	30	DMX 460-3,5D	30	48
DMX 460-6	21	30	DMX 460-6D	30	48
DMX 525-3	21	30	DMX 525-3D	30	48
DMX 765-3	21	30	DMX 765-3D	30	48

3.11 Dimensional sketches

3.11.1 Dimensions of DMX 226M single-head pumps

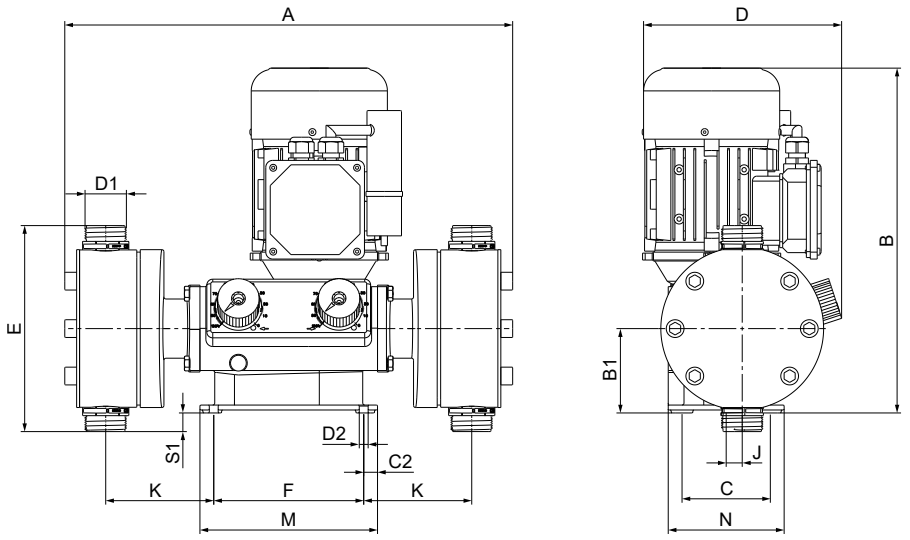


All dimensions are in mm, except for the thread designations.

Pump type	A	B	C	C2	D	D1	D2	F	B1	K	M	N	J
All	302	310	97.5	24.5	190	G1 1/4	9	152	85.5	104.5	180	118	16

Pump type	E	S1
DMX 24-8	178	4
DMX 37-5	188	9
DMX 52-8	178	4
DMX 60-3	208	19
DMX 82-5	188	9
DMX 100-8	178	4
DMX 130-3	208	19
DMX 142-8	178	4
DMX 160-5	188	9
DMX 224-5	188	9
DMX 255-3	208	19
DMX 380-3	208	19

3.11.2 Dimensions of DMX 226M double-head pumps

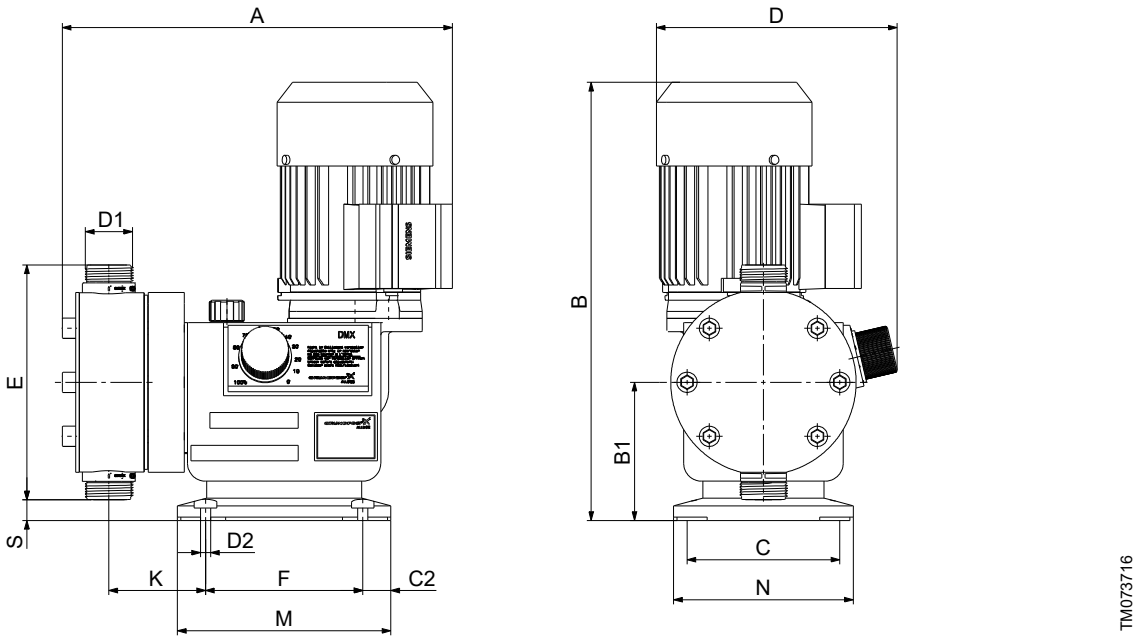


All dimensions are in mm, except for the thread designations.

Pump type	A	B	C	C2	D	D1	D2	F	B1	K	M	N	J
All	425	310	97.5	24.5	190	G1 1/4	9	152	85.5	104.5	180	118	16

Pump type	E	S1
DMX 24-8D	178	4
DMX 37-5D	188	9
DMX 52-8D	178	4
DMX 60-3D	208	19
DMX 82-5D	188	9
DMX 100-8D	178	4
DMX 130-3D	208	19
DMX 142-8D	178	4
DMX 160-5D	188	9
DMX 224-5D	188	9
DMX 255-3D	208	19
DMX 380-3D	208	19

3.11.3 Dimensions of DMX 226L single-head pumps

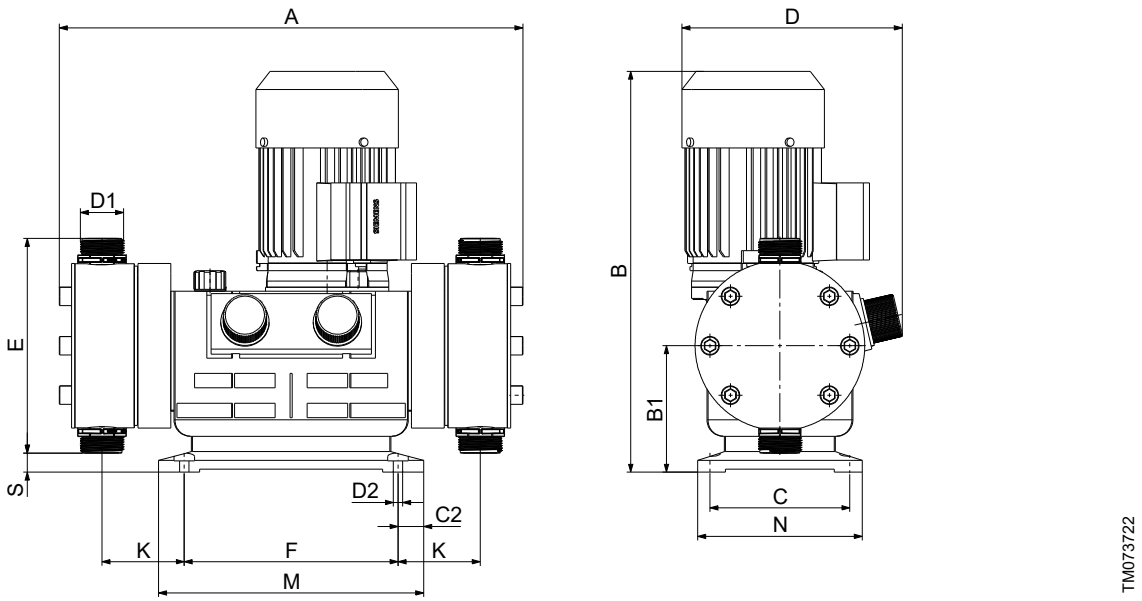


All dimensions are in mm, except for the thread designations.

Pump type	C	C2	D	D2	F	B1	M	N
All	136	25	222	9	140	123	190	160

Pump type	A	B	D1	E	K	S
DMX 95-8	366	372	G1 1/4	188	80	29
DMX 132-10	366	372	G1 1/4	178	80	34
DMX 152-6	381	372	G1 1/4	208	83	19
DMX 190-8	366	372	G1 1/4	178	80	34
DMX 190-10	366	372	G1 1/4	178	80	34
DMX 199-8	366	372	G1 1/4	188	80	29
DMX 249-3	395	390	G2	240	92	3
DMX 280-6	366	372	G1 1/4	188	80	29
DMX 280-8	366	372	G1 1/4	188	80	29
DMX 315-3	395	390	G2	240	92	3
DMX 321-4	381	372	G1 1/4	208	83	19
DMX 321-6	381	372	G1 1/4	208	83	19
DMX 460-3,5	381	372	G1 1/4	208	83	19
DMX 460-6	381	372	G1 1/4	208	83	19
DMX 525-3	395	390	G2	240	92	3
DMX 765-3	395	390	G2	240	92	3
DMX 67-10	366	372	G1 1/4	178	80	34

3.11.4 Dimensions of DMX 226L double-head pumps



All dimensions are in mm, except for the thread designations.

Pump type	C	C2	D	D2	F	B1	M	N
All	136	25	222	9	208	123	258	160

Pump type	A	B	D1	E	K	S
DMX 67-10D	440	372	G1 1/4	178	80	34
DMX 95-8D	444	372	G1 1/4	188	80	29
DMX 132-10D	440	372	G1 1/4	178	80	34
DMX 152-6D	453	372	G1 1/4	208	83	19
DMX 190-8D	440	372	G1 1/4	178	80	34
DMX 190-10D	440	372	G1 1/4	178	80	34
DMX 199-8D	444	372	G1 1/4	188	80	29
DMX 249-3D	498	390	G2	240	92	3
DMX 280-6D	444	372	G1 1/4	188	80	29
DMX 280-8D	444	372	G1 1/4	188	80	29
DMX 315-3D	498	390	G2	240	92	3
DMX 321-4D	453	372	G1 1/4	208	83	19
DMX 321-6D	453	372	G1 1/4	208	83	19
DMX 460-3,5D	453	372	G1 1/4	208	83	19
DMX 460-6D	453	372	G1 1/4	208	83	19
DMX 525-3D	498	390	G2	240	92	3
DMX 765-3D	498	390	G2	240	92	3

4. 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.
- Do not use the protective packaging as transport packaging.
- Observe the permissible storage temperature.

4.1 Delivery

The DMX 226 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.

4.2 Intermediate storage

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

4.3 Unpacking

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

4.4 Return

WARNING
Toxic material
Death or serious personal injury

- Grundfos accepts no liability for damage caused by incorrect transportation or missing or unsuitable packaging of the pump.
- If the pump has been used for a medium which is dangerous to health or toxic, the pump will be classified as contaminated.

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.

Before returning the pump to Grundfos 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.

If Grundfos 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.

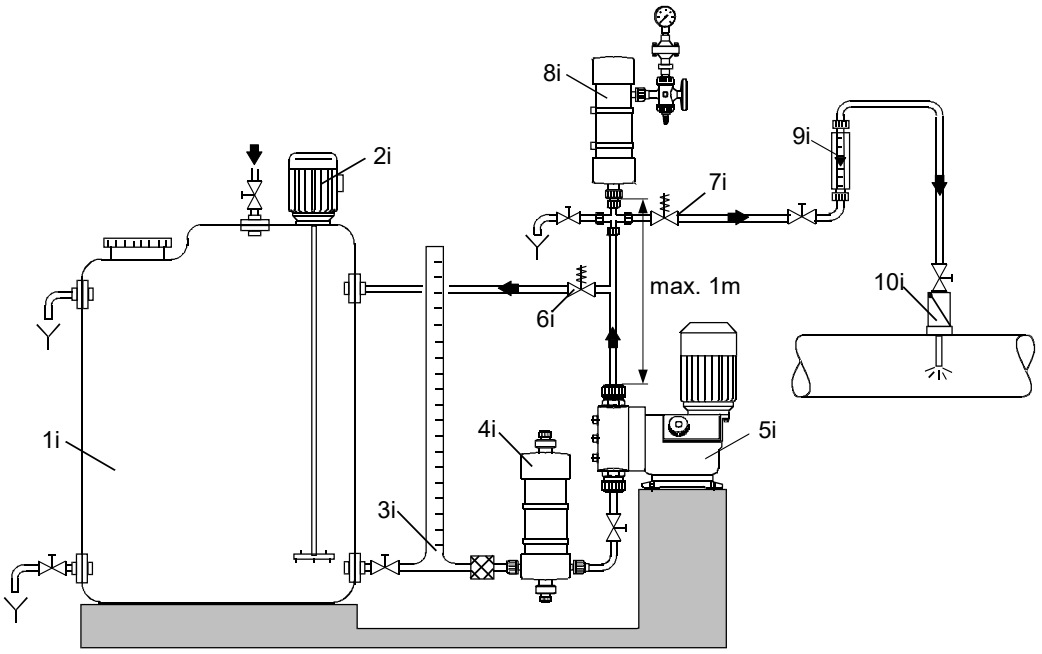
If proper cleaning is not possible, all relevant information about the chemical must be provided.

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

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

5. Installation

5.1 Optimum installation



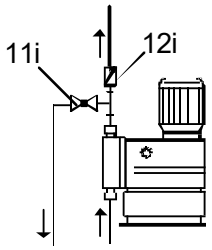
Example of optimum installation

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

5.2 Installation tips

CAUTION
Hot surface
Minor or moderate personal injury
- Pumps with AC motors may become hot. Allow a minimum space of 100 mm above the fan cover.

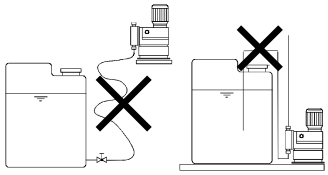
- For easy de-aeration of the dosing head, install a ball valve (11i) with bypass line (back to the dosing tank) immediately after the discharge valve.
- In the case of long discharge lines, install a non-return valve (12i) in the discharge line.



TM036297

Installation with ball valve and non-return valve

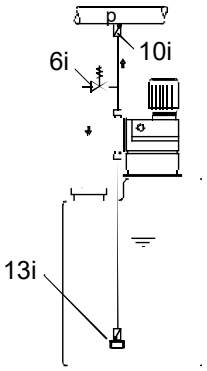
- When installing the suction line, observe the following:
  - Keep the suction line as short as possible. Prevent it from becoming tangled.
  - If necessary, use swept bends instead of elbows.
  - Always route the suction line up towards the suction valve.
  - Avoid loops which may cause air bubbles.



TM036298

Installation of suction line

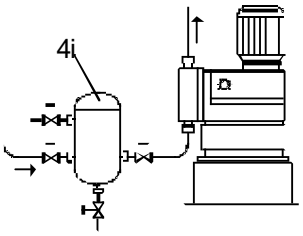
- For non-degassing media with a viscosity similar to water, the pump can be mounted on the tank (observe the maximum suction height).
- Flooded suction preferred.
- For media with a tendency to sedimentation, install the suction line with filter (13i) so that the suction valve remains a few millimetres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



TM036299

Tank installation

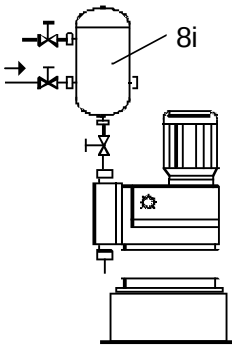
- Note for suction-side installation: In dosing systems with a suction line longer than 1 metre, depending on the dosing flow, it may be necessary to install a properly sized pulsation damper (4i) immediately before the pump suction valve.



TM036300

Installation with suction-side pulsation damper

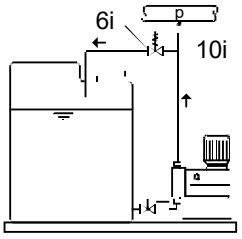
- Note for discharge-side installation: To protect the piping, use a pulsation damper (8i) for rigid piping longer than 3 metres and tubing longer than 5 metres.



TM036301

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.



TM036302

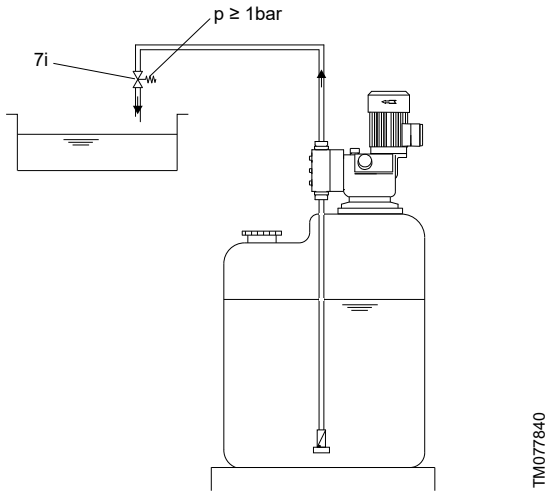
Installation with relief valve

With open outflow of the dosing medium or a counterpressure below 1 bar

- Install a pressure-loading valve (7i) immediately before the outlet or the injection unit.

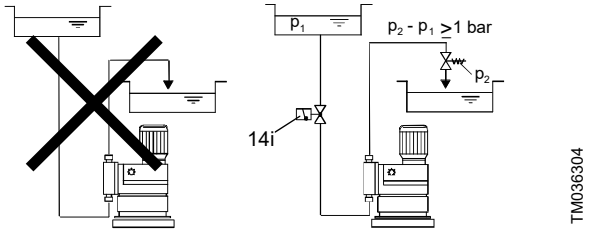
A positive pressure difference of at least 1 bar must be ensured between the counterpressure at the injection point and the pressure of the dosing medium at the pump suction valve.

- If this cannot be ensured, install a pressure-loading valve (7i) in the discharge line.



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.



Installation to avoid the siphon effect

5.3 Mounting

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

- Mount the pump horizontally on the tank or on a console using four M8 screws.
- Replace the screw plugs by the de-aeration screws supplied with the pump.

5.4 Hose and pipe lines

5.4.1 General

WARNING
Toxic material
Death or serious personal injury

- 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.
- Observe the safety data sheets and safety instructions of the chemical manufacturer when handling chemicals.

- 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 hoses.
- Keep the suction line as short as possible to avoid cavitation.
- If necessary, use swept bends instead of elbows.
- Make sure the pump is suitable for the dosing medium.
- The flow must run in the opposite direction to gravity.

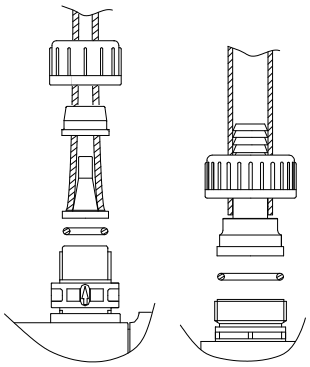
5.5 Connecting the suction and discharge lines

WARNING
Chemical hazard
Death or serious personal injury
- 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.

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.

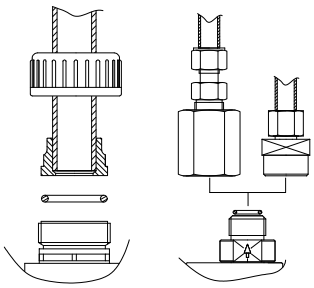


TM036456

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.

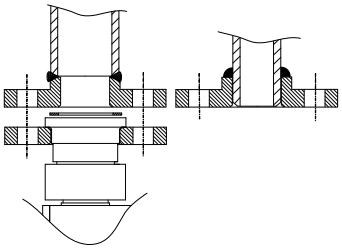


TM036457

Connection of DN 20 pipe lines

Connection of DN 32 pipe lines

- Depending on the pipe material, fit the pipe to the welding neck flange and weld it (stainless steel) or insert it into the headed bush and weld it (PP, PVDF).

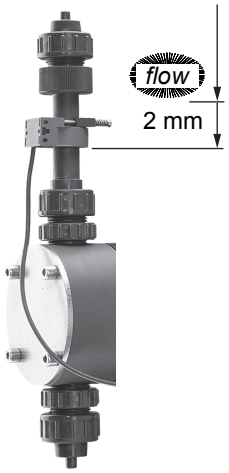


TM03_6458_4506

Connection of DN 32 pipe lines

Using a dosing controller

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



TM036379

Dosing controller

6. Electrical connections

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

WARNING
Electric shock
Death or serious personal injury

- All electrical connections must be carried out by a qualified electrician in accordance with local regulations.
- Disconnect the pump from the power supply before connecting the power supply cable and the relay contacts.
- Do not switch on the power supply until the pump is going to be started.
- The pump housing must only be opened by persons authorised by Grundfos.
- The power supply must be electrically isolated from the signal inputs and outputs.
- Observe the local safety regulations.

Protect the cable connections and plugs against corrosion and humidity.

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

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

6.1 Versions with power plug

1. Insert the power plug into the power socket.

6.2 Versions without mains plug

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.

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.

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

7. Commissioning

7.1 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.

7.2 Start-up

Before start-up, replace the screw plug by the de-aeration screw.

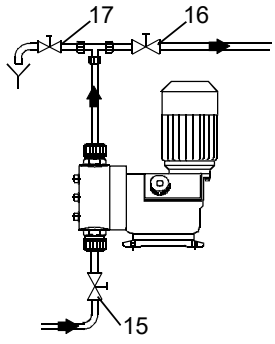
During transport, the de-aeration opening must be closed with the screw plug.

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

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 de-aeration 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 counterpressure.
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 de-aeration valve (17), if installed.

The pump is now ready for operation.



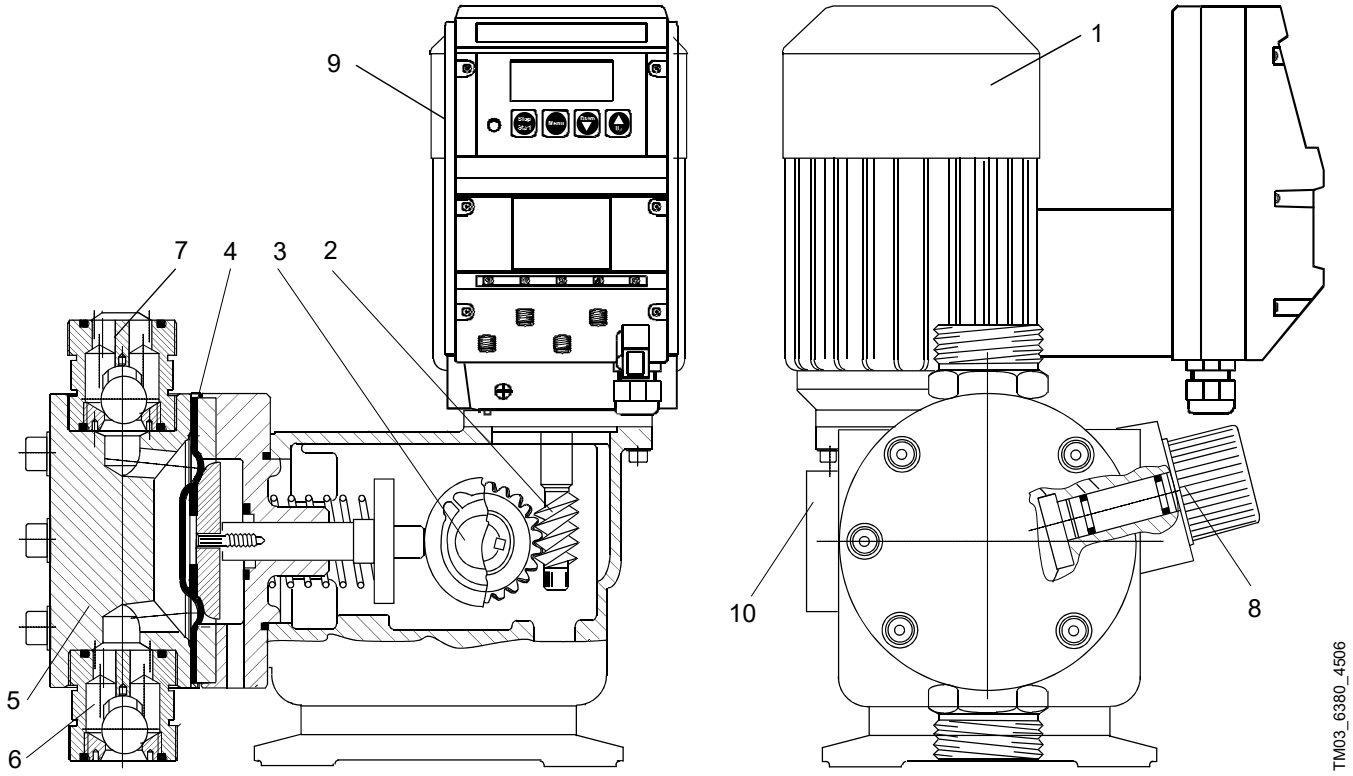
TM036307

Initial start-up

8. Operation

In the event of a diaphragm leakage, the dosing liquid 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 liquid for a short time (depending on the type of liquid) by the housing sealing. It is necessary to check regularly (daily) if liquid is leaking out of the intermediate flange.

8.1 Description of the pump



DMX 226

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 positive 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.

8.2 Switching on/off

Before switching on the pump, check that it is installed correctly. Observe sections about installation and commissioning.

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

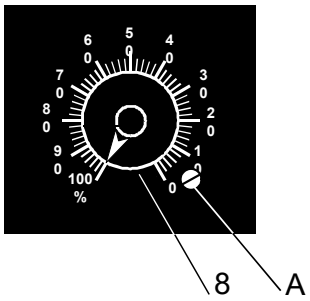
Related information

5.1 Optimum installation
7.1 Checks before start-up

8.3 Adjusting the dosing flow via the stroke length

Adjust the stroke length only while the pump is running

- Slacken the locking screw (A) on the stroke-length adjustment knob (8) a little using a screwdriver.
- 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.
- Gently retighten the locking screw (A) using a screwdriver.



TM037203

Stroke-length adjustment knob

8.4 Stroke-length adjustment

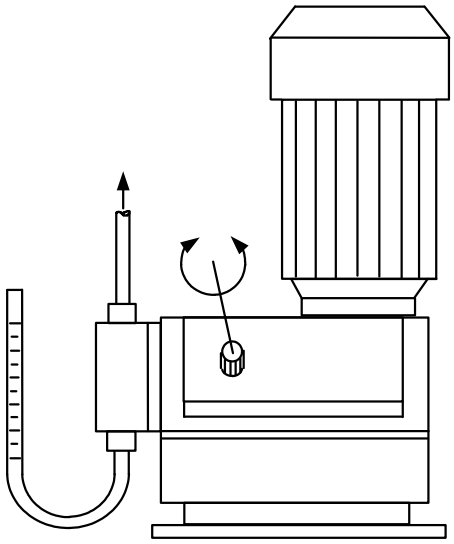
WARNING
Toxic material
Death or serious personal injury
- Wear personal protective equipment when handling chemicals.

Adjust the stroke length only while the pump is running.

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

If the operating counterpressure 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 pipe at the suction valve.
   - If such a pipe 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. Remove the locking screw (A) from the stroke-length adjustment knob (8) using a screwdriver. See fig. Stroke-length adjustment knob.
6. Turn the adjustment knob slowly clockwise (towards the zero point) until the medium level stops falling in the measuring jug or pipe.
7. 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.
8. 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.
9. 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.
10. Insert the locking screw (A) using a screwdriver and tighten gently.



TM036310

Stroke-length adjustment

Related information

8.3 Adjusting the dosing flow via the stroke length
13. Dosing curves

8.5 Adjustment of stroke rate using a frequency converter

WARNING
Electric shock
Death or serious personal injury
- Observe the manufacturer's instructions. All connections must be carried out to these instructions.

The dosing rate can only be adjusted in the range 1:10 if a frequency converter is installed. See installation and operating instructions for the frequency converter.

Settings of frequency converter when used with Grundfos 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!

8.6 Using the AR control unit

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

9. Operation with other electronics

Observe section Operation. The following section only describes the additional functions.

Related information

8. Operation

9.1 Electronic 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.

10. Integral relief valve

10.1 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.

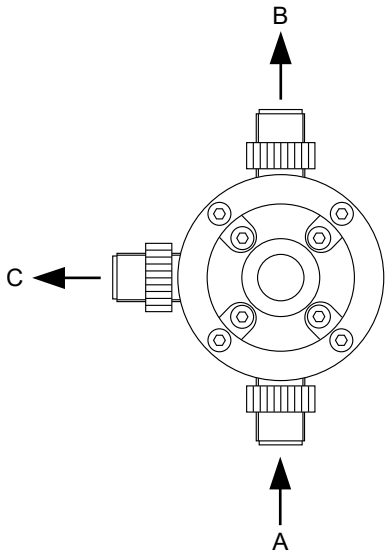
10.2 Permissible media

WARNING
Toxic material
Death or serious personal injury
- Dosing heads with integral relief valve must not be used for abrasive or crystallising media.

10.3 Connections

WARNING
Toxic material
Death or serious personal injury
- Do not start the pump if the overflow line is incorrectly connected to the relief valve.

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.



TM036311

Connections

10.4 Setting of opening pressure

10.4.1 General

WARNING
Toxic material
Death or serious personal injury
- All work on the the relief valve must be carried out by qualified and trained experts.
- Never set the opening pressure to values higher than the maximum permissible operating pressure of the dosing system and dosing pump.
- Observe the safety data sheets and safety instructions of the chemical manufacturer when handling chemicals.
- Wear personal protective equipment when handling chemicals.

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.

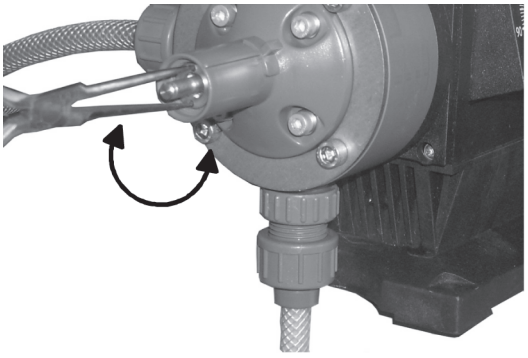
The opening pressure of the relief valve is factory-set to the maximum pump counterpressure specified in the technical data. The opening pressure during operation depends on various factors, for example the flow, the stroke frequency of the pump, or the counterpressure. If an exact setting is required,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

10.4.2 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.



TM036312

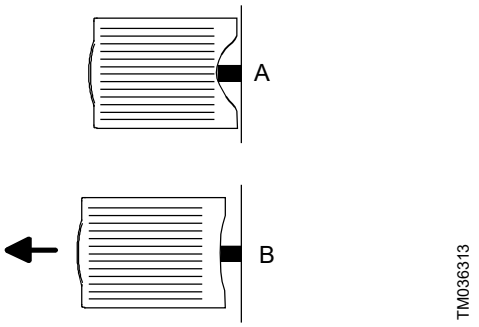
Setting of opening pressure

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.

10.5 Venting

The relief valve can also be opened manually, thus serving as a venting valve at the same time. If manual venting is required (for example, 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".



Pos.	Description
A	Operating
B	Venting

Knob position

10.6 There is permanent output from the relief valve.

Cause	Remedy
The discharge line is blocked.	• Check and possibly correct the discharge-side dosing system.
Relief valve is set incorrectly.	• Set the relief valve to a higher opening pressure.
The diaphragm is faulty.	• Replace the diaphragm.
The relief valve is dirty.	• Clean the relief valve.

11. Maintenance

11.1 General notes

WARNING
Chemical hazard
Death or serious personal injury

- Observe the safety data sheets and safety instructions of the chemical manufacturer when handling chemicals.
- Wear personal protective equipment when working with chemicals.
- Collect and dispose of all chemicals in a way that is not harmful to humans, animals or the environment.

WARNING
Electric shock
Death or serious personal injury

- The pump housing must only be opened by personnel authorised by Grundfos.
- All repairs on the pump must be carried out by authorised and qualified personnel.
- Make sure the pump is disconnected from the power supply before starting any maintenance work or repairs.

During transport, the de-aeration opening must be closed with the screw plug.

Before start-up, replace the screw plug by the de-aeration screw.

11.2 Cleaning and maintenance intervals

In the event of a diaphragm leakage, the dosing liquid 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 liquid for a short time (depending on the type of liquid) by the housing sealing. It is necessary to check regularly (daily) if liquid is leaking out of the intermediate flange.

11.2.1 Changing the gear grease

The gear grease must only be changed by authorised and qualified personnel. For this purpose, send the pump to Grundfos 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.

11.2.2 Cleaning the diaphragm and valves

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

- At least every 12 months or after 4,000 operating hours. When operating with a counterpressure of 16 bar, every six months or after 2,000 operating hours.
- In the event of a fault.

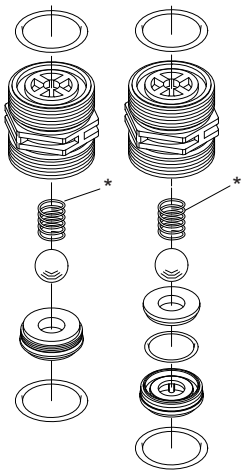
11.3 Cleaning the suction and discharge valves

CAUTION
Toxic material
Minor or moderate personal injury
- Rinse the dosing head with water, if your dosing medium is compatible with water.

The O-rings must be correctly placed in the specified groove.
Observe the flow direction (indicated by an arrow on the valve).

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

1. Unscrew the valve.
2. Unscrew the screw part resp. valve seat with round pliers.
3. Clean all parts. Replace faulty parts by new ones.
4. Re-assemble the valve.
5. Replace the O-rings by new ones. Refit the valve. Observe the direction arrow on the valve.



TM036470

*Stainless-steel or plastic valve DN 20, * spring-loaded as an option*

11.4 Maintenance of the relief valve

11.4.1 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.

11.4.2 Replacing the diaphragm of the relief valve

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

11.5 Replacing the diaphragm

CAUTION
Toxic material
Minor or moderate personal injury
- Rinse the dosing head with water, if your dosing medium is compatible with water..

Adjust the stroke length only while the pump is running.
During transport, the de-aeration opening must be closed with the screw plug.

11.5.1 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.

11.5.2 Replacing the diaphragm

Before start-up, replace the screw plug by the de-aeration screw.
After initial start-up and after each time the diaphragm is changed, tighten the dosing head screws.
Cross-tighten the dosing head screws using a torque wrench after approximately 6-10 operating hours or two days. Maximum torque: 6 Nm.

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. De-aerate and start the dosing pump.

12. Fault finding

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

12.1 The dosing pump does not work

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.

12.2 The dosing pump does not suck in liquid

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

12.3 No dosing flow

Cause	Remedy
There is air in the suction line and the dosing head.	• Wait until the pump has de-aerated.
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.

12.4 The dosing flow of the pump is inaccurate.

Cause	Remedy
Dosing head not fully de-aerated.	• Repeat the de-areation.
The dosing medium is degassing.	• Check the installation.
The valves are dirty.	• Clean the valves.
Zero point misadjusted.	• Adjust the zero point to the actual counterpressure.
Counterpressure fluctuations.	• Install a pressure-loading valve and a pulsation damper.
Suction height fluctuations.	• Keep the suction level constant.
There is a siphoning effect (the inlet pressure is higher than counterpressure).	• Install a pressure-loading valve.
The suction line or discharge line is leaking.	• Replace the suction line or discharge line.
Parts in contact with the medium are not resistant to it.	• Replace with resistant materials.
The dosing diaphragm is worn.	• Replace the diaphragm. Observe the maintenance instructions.
There are fluctuations in the supply voltage.	• Decrease the counterpressure of the pump.
There is variation in the density or the viscosity of the dosing medium.	• Check the concentration. Use an agitator, if necessary.

13. Dosing curves

The dosing curves in the appendix are trend curves. See appendix: Dosing curves

They apply to:

- performance of single pump (the flow rate is doubled for the double pump),
- water as dosing medium,
- 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

Related information

A.1. Curves

14. 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.

The crossed-out wheelie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local waste disposal authorities. The separate collection and recycling of such products will help protect the environment and human health.

See also end-of-life information at *www.grundfos.com/product-recycling*.

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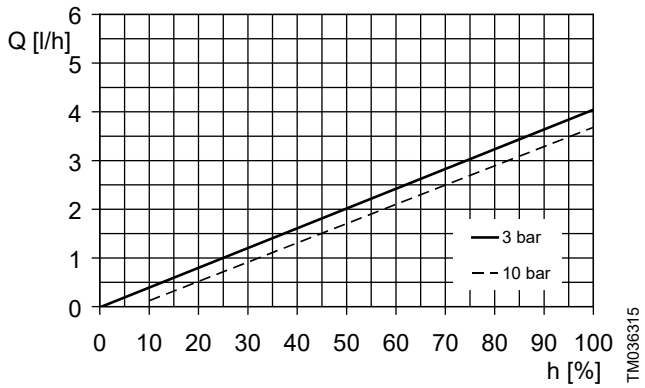
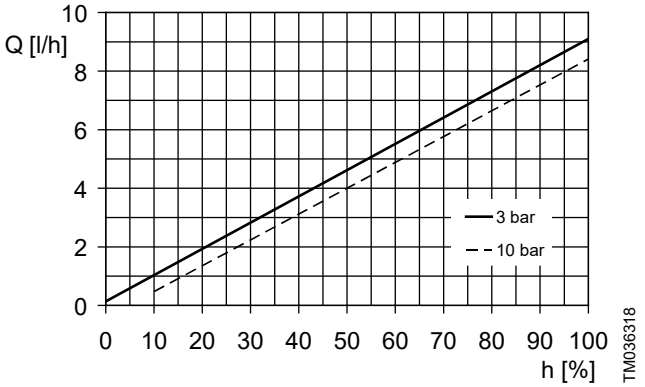
A.1. Curves

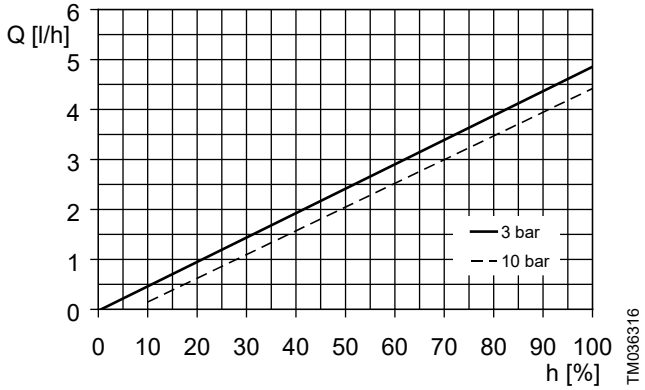
DMX 4-10 (50 Hz) Q_0 = 3 bar



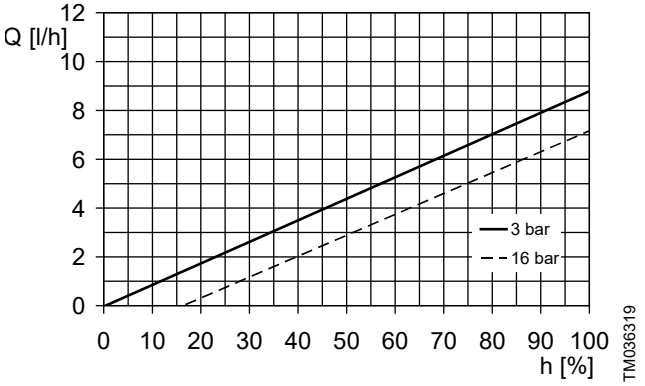
DMX 7-10 (60 Hz) Q_0 = 3 bar



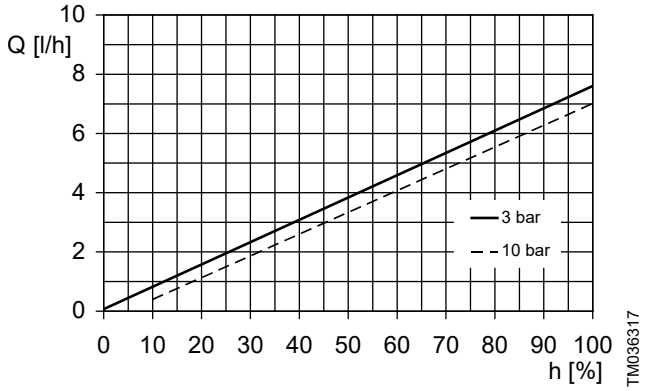
DMX 4-10 (60 Hz) Q_0 = 3 bar



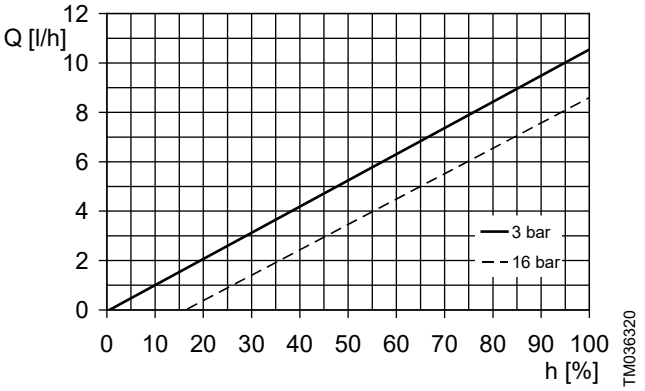
DMX 7,2-16 (50 Hz) Q_0 = 3 bar



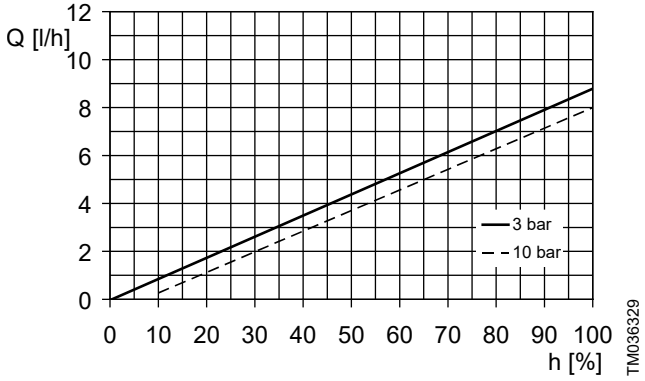
DMX 7-10 (50 Hz) Q_0 = 3 bar



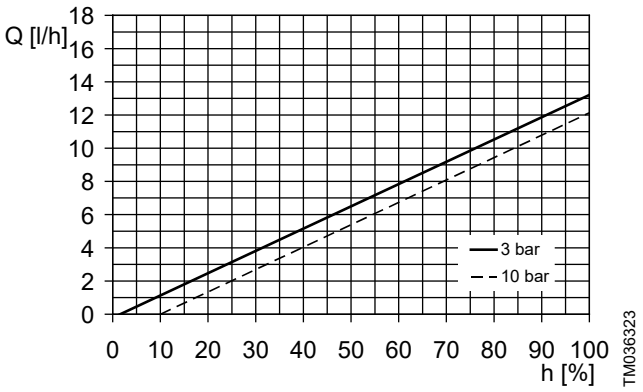
DMX 7,2-16 (60 Hz) Q_0 = 3 bar



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



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



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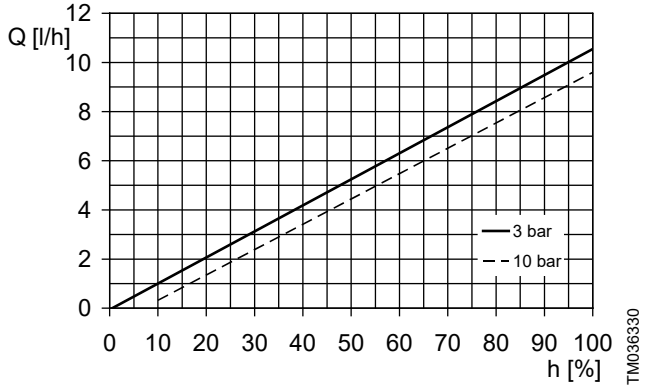
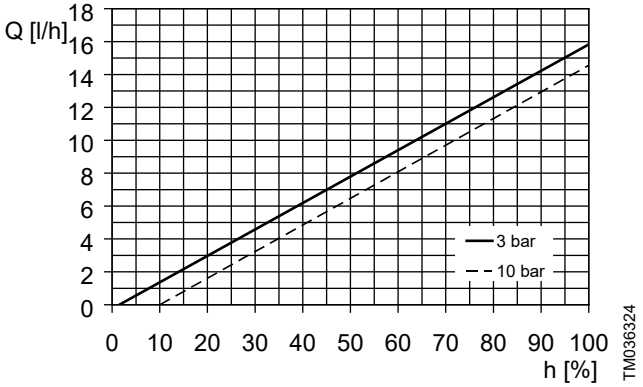
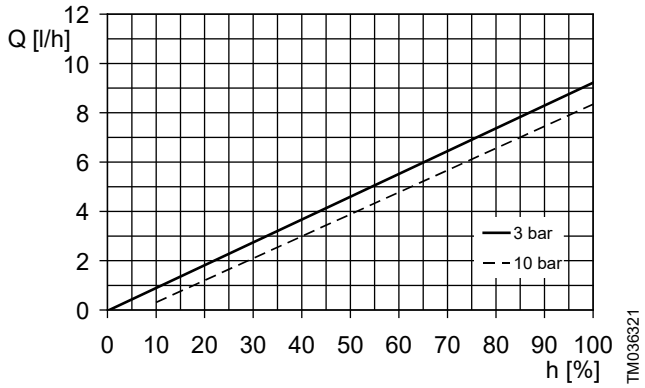


DMX 12-10 (60 Hz) Q_0 = 3 bar



DMX 9-10 (50 Hz) Q_0 = 3 bar



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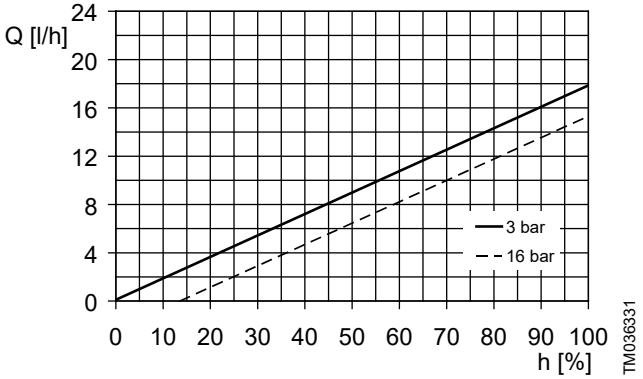
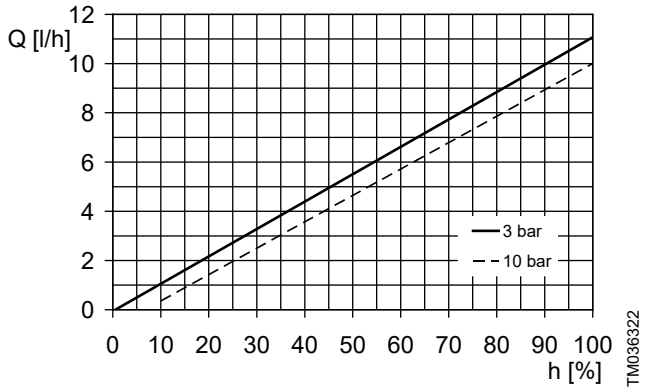
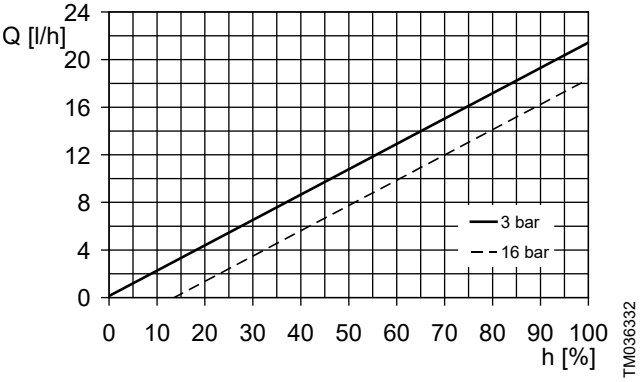


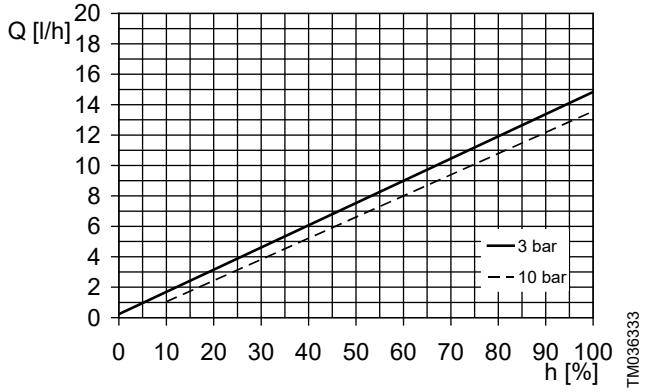
DMX 9-10 (60 Hz) Q_0 = 3 bar



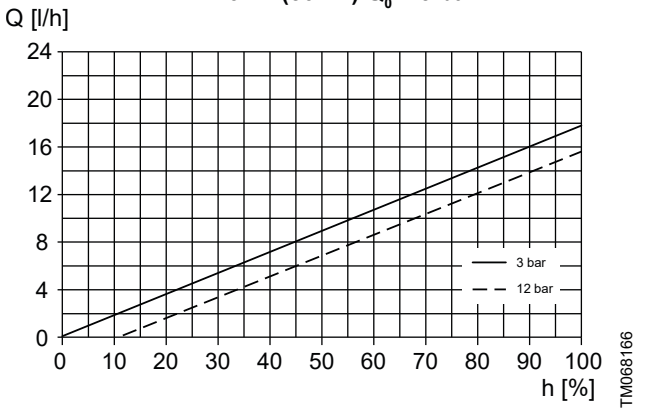
DMX 13,7-16 (60 Hz) Q_0 = 3 bar



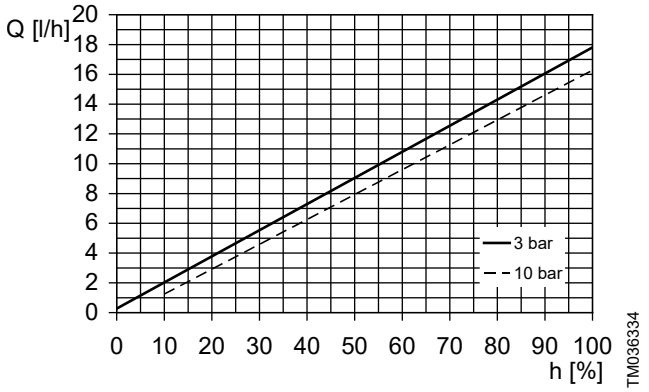
DMX 14-10 (50 Hz) Q_0 = 3 bar



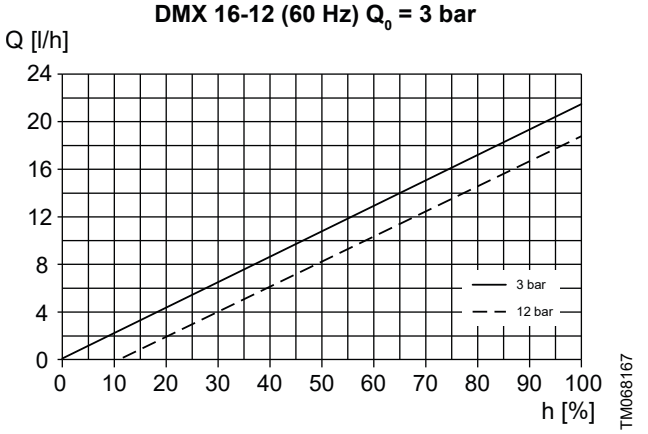
DMX 16-12 (50 Hz) Q_0 = 3 bar



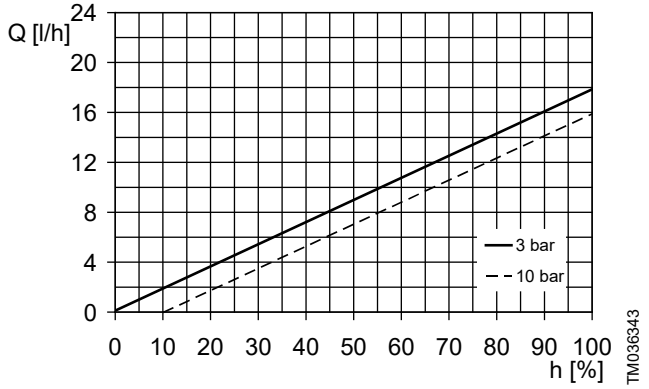
DMX 14-10 (60 Hz) Q_0 = 3 bar



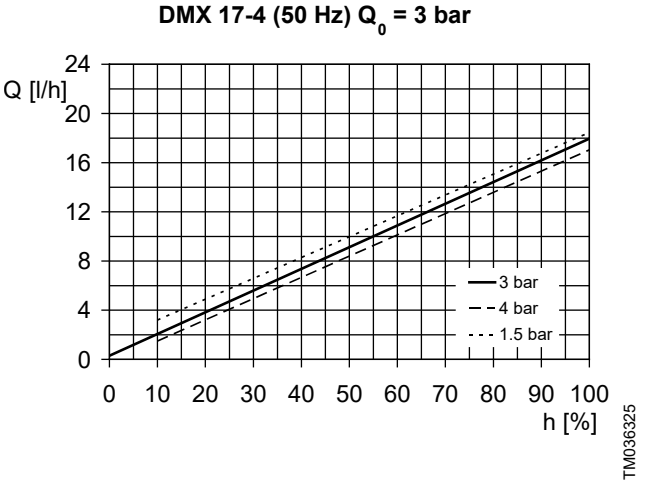
DMX 16-12 (60 Hz) Q_0 = 3 bar



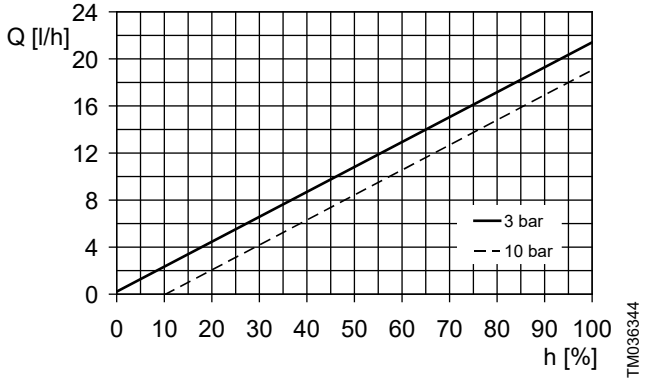
DMX 16-10 (50 Hz) Q_0 = 3 bar



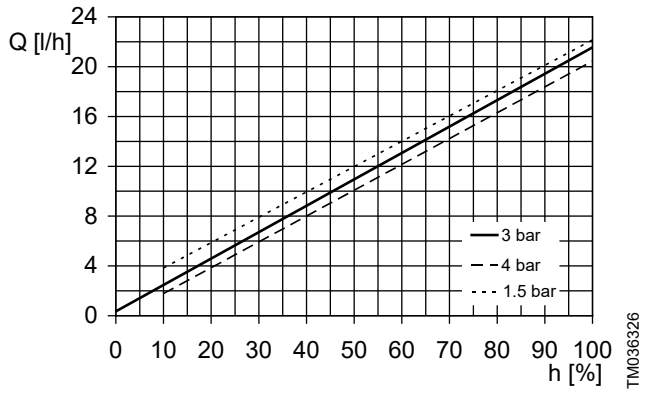
DMX 17-4 (50 Hz) Q_0 = 3 bar



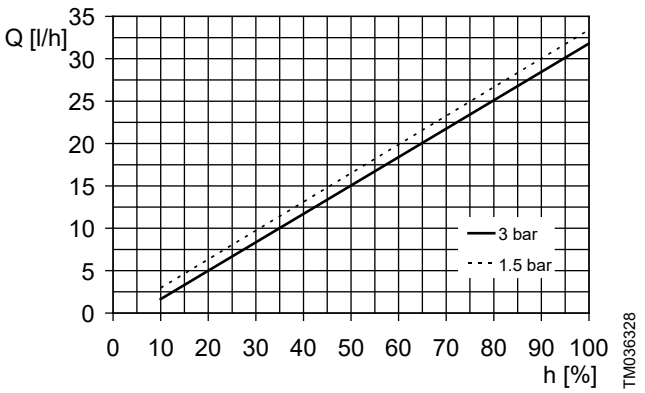
DMX 16-10 (60 Hz) Q_0 = 3 bar



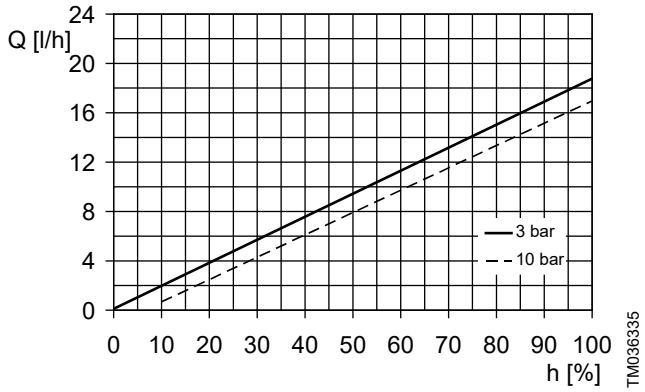
DMX 17-4 (60 Hz) Q_0 = 3 bar



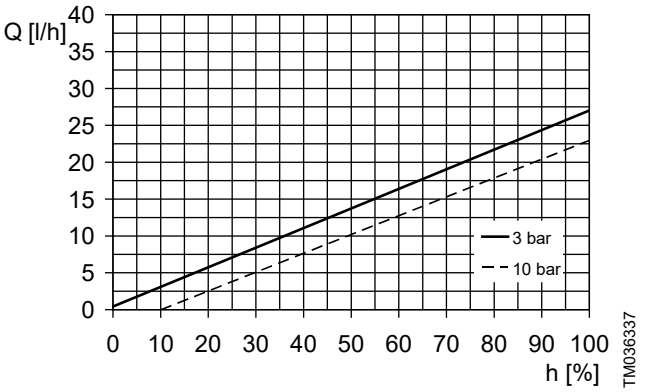
DMX 25-3 (60 Hz) Q_0 = 3 bar



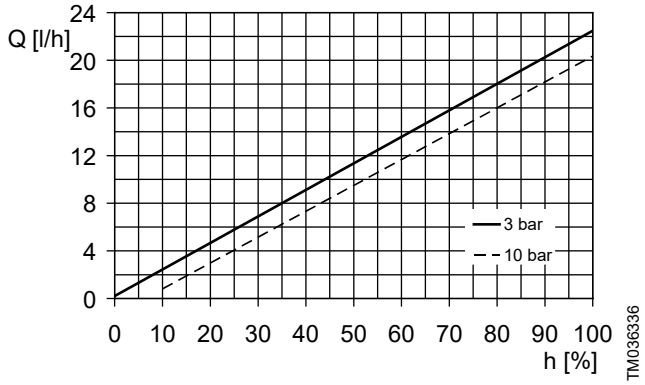
DMX 18-10 (50 Hz) Q_0 = 3 bar



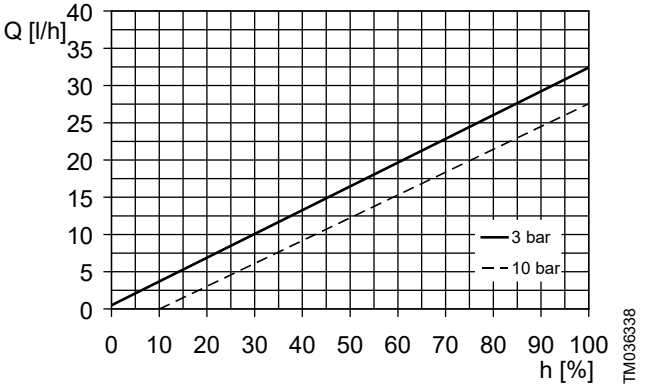
DMX 26-10 (50 Hz) Q_0 = 3 bar



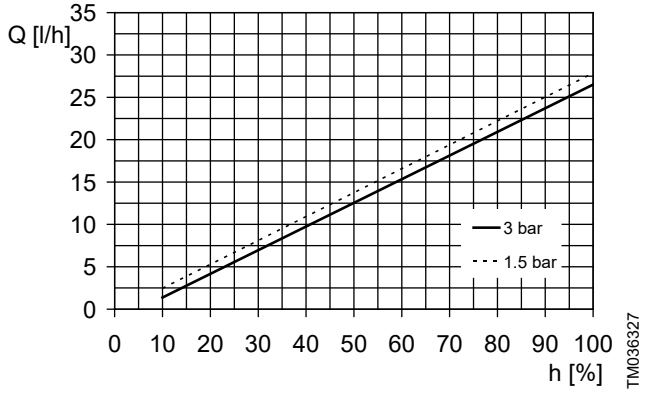
DMX 18-10 (60 Hz) Q_0 = 3 bar



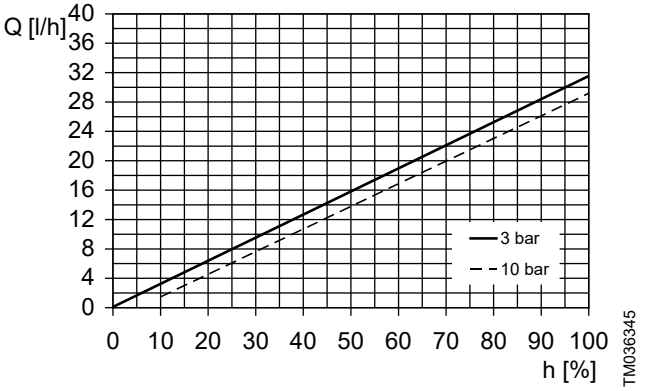
DMX 26-10 (60 Hz) Q_0 = 3 bar



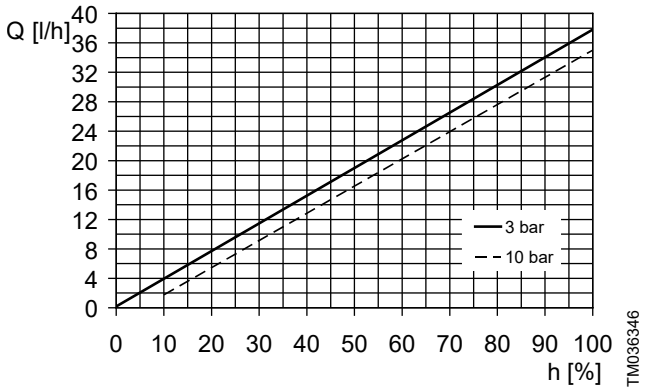
DMX 25-3 (50 Hz) Q_0 = 3 bar



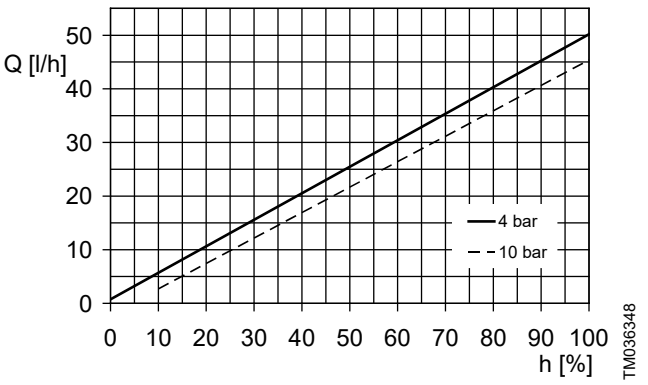
DMX 27-10 (50 Hz) Q_0 = 3 bar



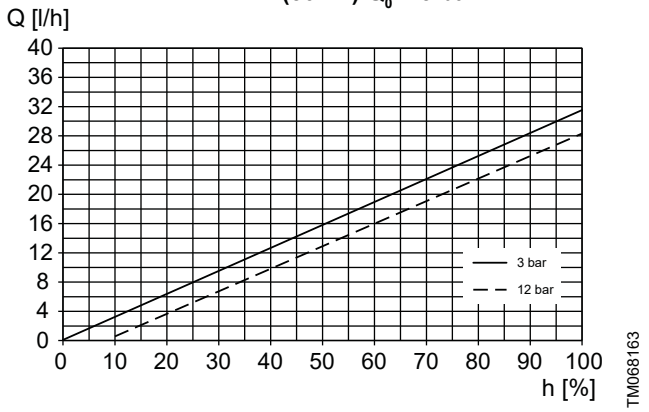
DMX 27-10 (60 Hz) Q_0 = 3 bar



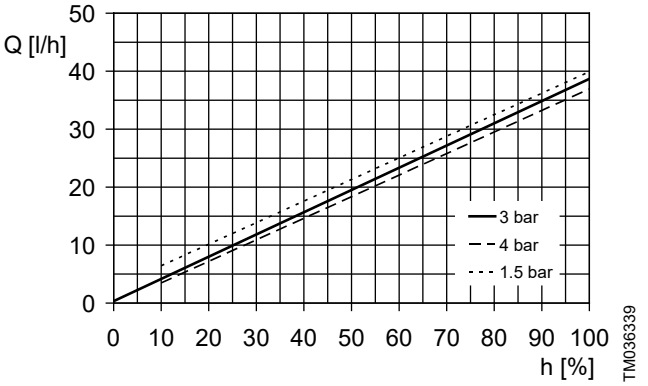
DMX 35-10 (60 Hz) Q_0 = 4 bar



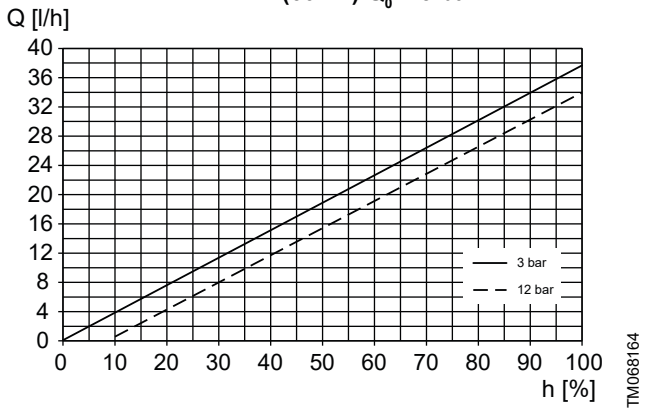
DMX 27-12 (50 Hz) Q_0 = 3 bar



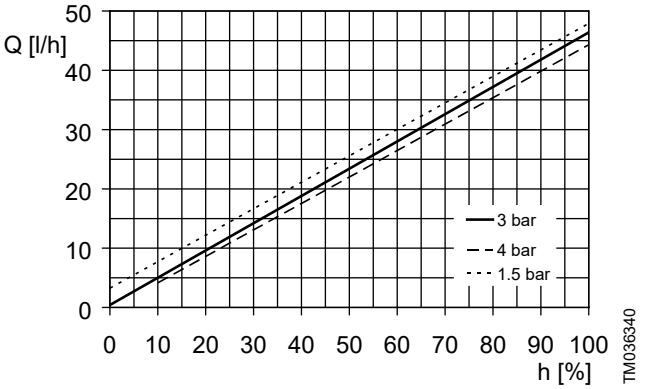
DMX 39-4 (50 Hz) Q_0 = 3 bar



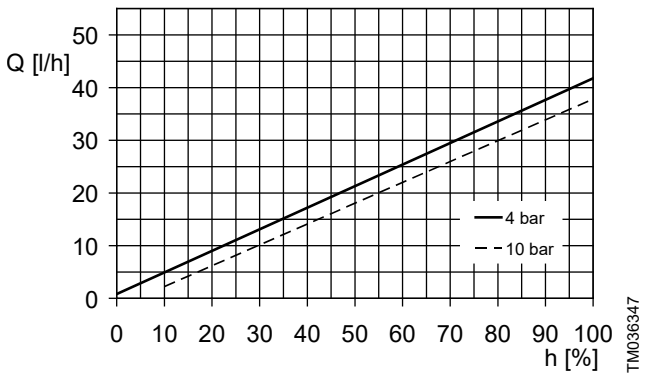
DMX 27-12 (60 Hz) Q_0 = 3 bar



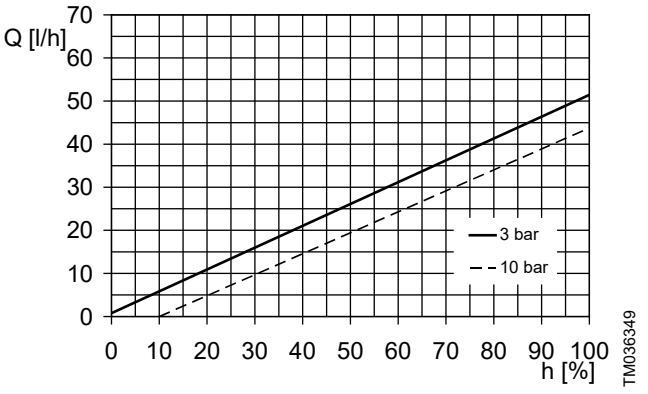
DMX 39-4 (60 Hz) Q_0 = 3 bar



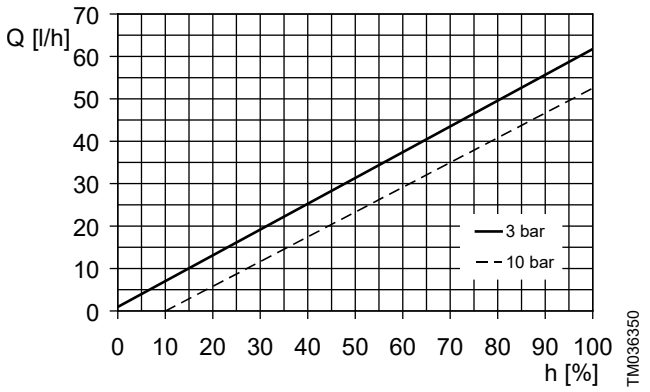
DMX 35-10 (50 Hz) Q_0 = 4 bar



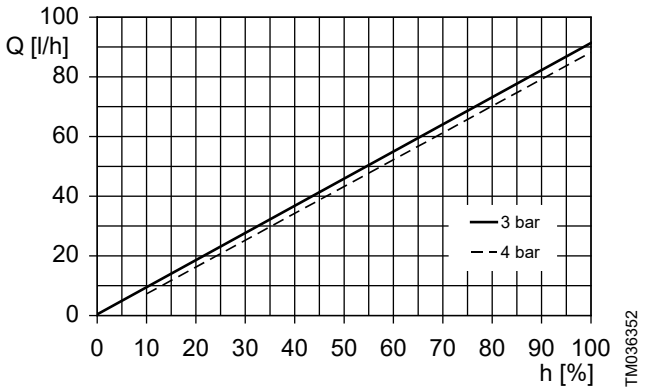
DMX 50-10 (50 Hz) Q_0 = 3 bar



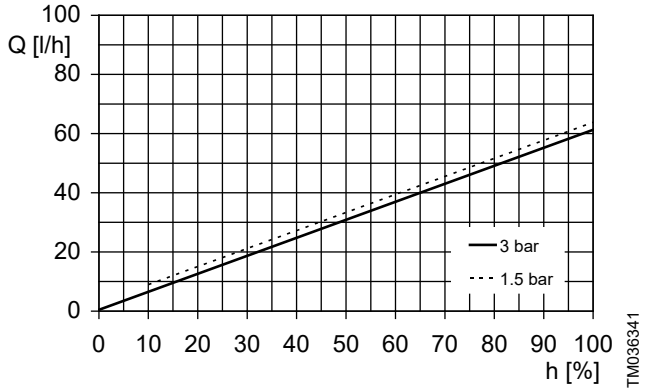
DMX 50-10 (60 Hz) Q_0 = 3 bar



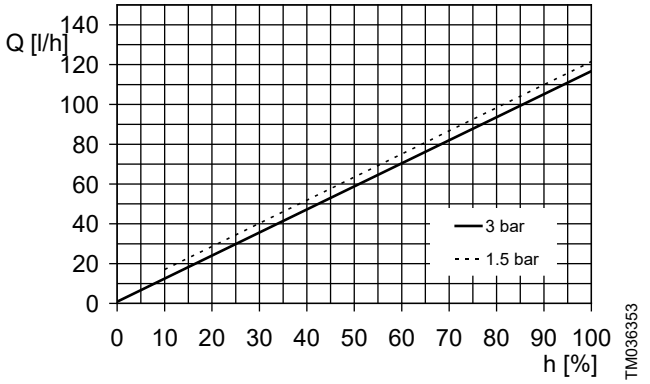
DMX 75-4 (60 Hz) Q_0 = 3 bar



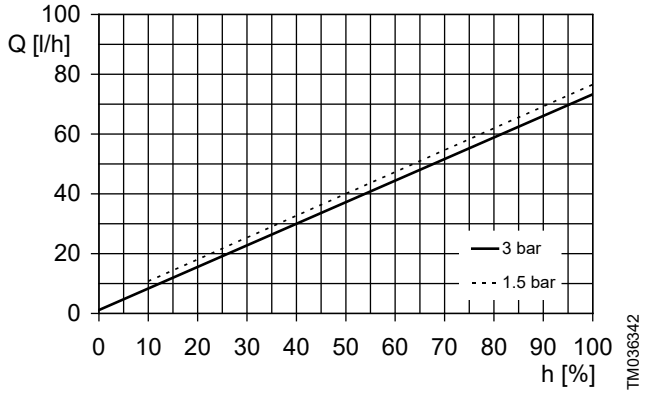
DMX 60-3 (50 Hz) Q_0 = 3 bar



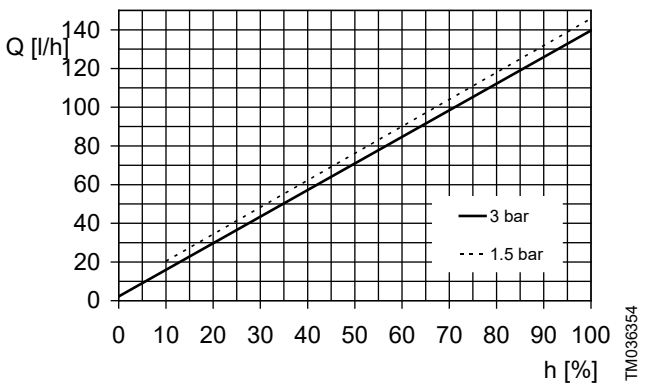
DMX 115-3 (50 Hz) Q_0 = 3 bar



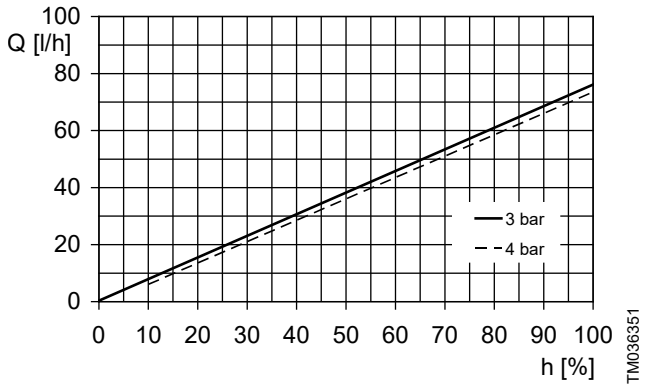
DMX 60-3 (60 Hz) Q_0 = 3 bar



DMX 115-3 (60 Hz) Q_0 = 3 bar



DMX 75-4 (50 Hz) Q_0 = 3 bar



Appendix B

B.1. Safety declaration

- Please copy, fill in and sign this sheet and attach it to the product 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 and indicate if the diaphragm is damaged:

TM074682

Declaration

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

Type designation (see nameplate):
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:

Argentina
Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500industin
1619 - Garín Pcia. de B.A.
Tel.: +54-3327 414 444
Fax: +54-3327 45 3190

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

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

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

Bosnia and Herzegovina
GRUNDFOS Sarajevo
Zmaja od Bosne 7-7A
BiH-71000 Sarajevo
Tel.: +387 33 592 480
Fax: +387 33 590 465
www.ba.grundfos.com
E-mail: grundfos@bih.net.ba

Brazil
BOMBAS GRUNDFOS DO BRASIL
Av. Humberto de Alencar Castelo Branco, 630
CEP 09850 - 300
São Bernardo do Campo - SP
Tel.: +55-11 4393 5533
Fax: +55-11 4343 5015

Bulgaria
Grundfos Bulgaria EOOD
Slatina District
Iztochna Tangenta street no. 100
BG - 1592 Sofia
Tel.: +359 2 49 22 200
Fax: +359 2 49 22 201
E-mail: bulgaria@grundfos.bg

Canada
GRUNDFOS Canada inc.
2941 Brighton Road
Oakville, Ontario
L6H 6C9
Tel.: +1-905 829 9533
Fax: +1-905 829 9512

China
GRUNDFOS Pumps (Shanghai) Co. Ltd.
10F The Hub, No. 33 Suhong Road
Minhang District
Shanghai 201106 PRC
Tel.: +86 21 612 252 22
Fax: +86 21 612 253 33

Colombia
GRUNDFOS Colombia S.A.S.
Km 1.5 vía Siberia-Cota Conj. Potrero Chico,
Parque Empresarial Arcos de Cota Bod. 1A.
Cota, Cundinamarca
Tel.: +57(1)-2913444
Fax: +57(1)-8764586

Croatia
GRUNDFOS CROATIA d.o.o.
Buzinski prilaz 38, Buzin
HR-10010 Zagreb
Tel.: +385 1 6595 400
Fax: +385 1 6595 499
www.hr.grundfos.com

Czech Republic
GRUNDFOS Sales Czechia and Slovakia s.r.o.
Čajkovského 21
779 00 Olomouc
Tel.: +420-585-716 111

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

Estonia
GRUNDFOS Pumps Eesti OÜ
Peterburi tee 92G
11415 Tallinn
Tel.: + 372 606 1690
Fax: + 372 606 1691

Finland
OY GRUNDFOS Pumput AB
Trukkikuja 1
FI-01360 Vantaa
Tel.: +358-(0) 207 889 500

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

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

Greece
GRUNDFOS Hellas A.E.B.E.
20th km. Athinon-Markopoulou Av.
P.O. Box 71
GR-19002 Peania
Tel.: +0030-210-66 83 400
Fax: +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
Tel.: +852-27861706 / 27861741
Fax: +852-27858664

Hungary
GRUNDFOS South East Europe Kft.
Tópark u. 8
H-2045 Törökbálint
Tel.: +36-23 511 110
Fax: +36-23 511 111

India
GRUNDFOS Pumps India Private Limited
118 Old Mahabalipuram Road
Thoraipakkam
Chennai 600 097
Tel.: +91-44 2496 6800

Indonesia
PT GRUNDFOS Pompa
Graha intirub Lt. 2 & 3
Jln. Cililitan Besar No.454. Makasar,
Jakarta Timur
ID-Jakarta 13650
Tel.: +62 21-469-51900
Fax: +62 21-460 6910 / 460 6901

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

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

Japan
GRUNDFOS Pumps K.K.
1-2-3, Shin-Miyakoda, Kita-ku
Hamamatsu
431-2103 Japan
Tel.: +81 53 428 4760
Fax: +81 53 428 5005

Kazakhstan
Grundfos Kazakhstan LLP
7' Kyz-Zhibek Str., Kok-Tobe micr.
KZ-050020 Almaty Kazakhstan
Tel.: +7 (727) 227-98-55/56

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

Latvia
SIA GRUNDFOS Pumps Latvia
Deglava biznesa centrs
Augusta Deglava ielā 60
LV-1035, Rīga,
Tel.: + 371 714 9640, 7 149 641
Fax: + 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
Tel.: +60-3-5569 2922
Fax: +60-3-5569 2866

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

Netherlands
GRUNDFOS Netherlands
Veluwezoom 35
1326 AE Almere
Postbus 22015
1302 CA ALMERE
Tel.: +31-88-478 6336
Fax: +31-88-478 6332
E-mail: info_gnl@grundfos.com

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

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

Poland
GRUNDFOS Pompy Sp. z o.o.
ul. Klonowa 23
Baranowo k. Poznania
PL-62-081 Przeźmierowo
Tel.: (+48-61) 650 13 00
Fax: (+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
Fax: +351-21-440 76 90

Romania
GRUNDFOS Pompe România SRL
S-PARK BUSINESS CENTER, Clădirea A2, etaj 2
Str. Tipografilor, Nr. 11-15, Sector 1, Cod 013714
Bucuresti, Romania
Tel.: 004 021 2004 100
E-mail: romania@grundfos.ro

Serbia
Grundfos Srbija d.o.o.
Omladinskih brigada 90b
11070 Novi Beograd
Tel.: +381 11 2258 740
Fax: +381 11 2281 769
www.rs.grundfos.com

Singapore
GRUNDFOS (Singapore) Pte. Ltd.
25 Jalan Tukang
Singapore 619264
Tel.: +65-6681 9688
Faxax: +65-6681 9689

Slovakia
GRUNDFOS s.r.o.
Prievozská 4D 821 09 BRATISLAVA
Tel.: +421 2 5020 1426
sk.grundfos.com

Slovenia
GRUNDFOS LJUBLJANA, d.o.o.
Leskoškova 9e, 1122 Ljubljana
Tel.: +386 (0) 1 568 06 10
Fax: +386 (0)1 568 06 19
E-mail: tehnika-si@grundfos.com

South Africa
GRUNDFOS (PTY) LTD
16 Lascelles Drive, Meadowbrook Estate
1609 Germiston, Johannesburg
Tel.: (+27) 10 248 6000
Fax: (+27) 10 248 6002
E-mail: lgradidge@grundfos.com

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

Sweden
GRUNDFOS AB
Box 333 (Lunnagårdsgatan 6)
431 24 Mölndal
Tel.: +46 31 332 23 000
Fax: +46 31 331 94 60

Switzerland
GRUNDFOS Pumpen AG
Bruggacherstrasse 10
CH-8117 Fällanden/ZH
Tel.: +41-44-806 8111
Fax: +41-44-806 8115

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

Thailand
GRUNDFOS (Thailand) Ltd.
92 Chaloem Phrakiat Rama 9 Road
Dokmai, Pravej, Bangkok 10250
Tel.: +66-2-725 8999
Fax: +66-2-725 8998

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

Ukraine
ТОВ "ГРУНДФОС УКРАЇНА"
Бізнес Центр Європа
Столичне шосе, 103
м. Київ, 03131, Україна
Tel.: (+38 044) 237 04 00
Fax: (+38 044) 237 04 01
E-mail: ukraine@grundfos.com

United Arab Emirates
GRUNDFOS Gulf Distribution
P.O. Box 16768
Jebel Ali Free Zone, Dubai
Tel.: +971 4 8815 166
Fax: +971 4 8815 136

United Kingdom
GRUNDFOS Pumps Ltd.
Grovebury Road
Leighton Buzzard/Beds. LU7 4TL
Tel.: +44-1525-850000
Fax: +44-1525-850011

U.S.A.
Global Headquarters for WU
856 Koomey Road
Brookshire, Texas 77423 USA
Phone: +1-630-236-5500

Uzbekistan
Grundfos Tashkent, Uzbekistan
The Representative Office of Grundfos Kazakhstan in Uzbekistan
38a, Oybek street, Tashkent
Tel.: (+998) 71 150 3290 / 71 150 3291
Fax: (+998) 71 150 3292

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