

# DME, Variant AR

16 to 248 gph (60-940 l/h)

Installation and operating instructions



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## Warning

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

## 1. LIMITED WARRANTY

Products manufactured by GRUNDFOS PUMPS CORPORATION (Grundfos) are warranted to the original user only to be free of defects in material and workmanship for a period of 24 months from date of installation, but not more than 30 months from date of manufacture. Grundfos' liability under this warranty shall be limited to repairing or replacing at Grundfos' option, without charge, F.O.B. Grundfos' factory or authorized service station, any product of Grundfos' manufacture. Grundfos will not be liable for any costs of removal, installation, transportation, or any other charges which may arise in connection with a warranty claim. Products which are sold but not manufactured by Grundfos are subject to the warranty provided by the manufacturer of said products and not by Grundfos' warranty. Grundfos will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with Grundfos' printed installation and operating instructions.

To obtain service under this warranty, the defective product must be returned to the distributor or dealer of Grundfos' products from which it was purchased together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, the distributor or dealer will contact Grundfos or an authorized service station for instructions. Any defective product to be returned to Grundfos or a service station must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Material Authorization must be included if so instructed.

**GRUNDFOS WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, OR EXPENSES ARISING FROM INSTALLATION, USE, OR ANY OTHER CAUSES. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH EXTEND BEYOND THOSE WARRANTIES DESCRIBED OR REFERRED TO ABOVE.**

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages and some jurisdictions do not allow limit actions on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.

## 2. Safety instructions

These installation and operating instructions contain general instructions that must be observed during installation, operation and maintenance of the pump. It must therefore be read by the installation engineer and the relevant qualified operator prior to installation and start-up, and must be available at the installation location at all times.

### 2.1 Symbols used in this document



Warning

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



If these safety instructions are not

observed, it may result in malfunction or damage to the equipment.



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

### 2.2 Qualification and training of personnel

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

#### Risks of not observing the safety instructions

Non-observance of the safety instructions may have dangerous consequences for the personnel, the environment and the pump and may result in the loss of any claims for damages.

It may lead to the following hazards:

- Personal injury from exposure to electrical, mechanical and chemical influences.
- Damage to the environment and personal injury from leakage of harmful substances.

## 2.3 Safety instructions for the operator/ user

The safety instructions described in these instructions, existing national regulations on health protection, environmental protection and for accident prevention and any internal working, operating and safety regulations of the operator must be observed. Information attached to the pump must be observed. Leakages of dangerous substances must be disposed of in a way that is not harmful to the personnel or the environment.

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

### Caution

Before starting work on the pump, the pump must be disconnected from the mains. The system must be pressureless!

### Note

The mains plug is the separator separating the pump from the mains.

Only original accessories and original spare parts should be used. Using other parts can result in exemption from liability for any resulting consequences.

## 2.4 Safety of the system in the event of a failure in the dosing pump

The dosing pump was designed according to the latest technologies and is carefully manufactured and tested.

If it fails regardless of this, the safety of the overall system must be ensured. Use the relevant monitoring and control functions for this.

### Caution

Make sure that any chemicals that are released from the pump or any damaged lines do not cause damage to system parts and buildings.

The installation of leak monitoring solutions and drip trays is recommended.

## 2.5 Dosing chemicals

### Warning

Before switching the supply voltage back on, the dosing lines must be connected in such a way that any chemicals in the dosing head cannot spray out and put people at risk.

The dosing medium is pressurized and can be harmful to health and the environment.



### Warning

When working with chemicals, the accident prevention regulations applicable at the installation site should be applied (e.g. wearing protective clothing).

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



### Warning

The pump must be equipped with a diaphragm leakage detection when used for crystallizing media.



### Caution

A deaeration hose, which is routed into a container, e.g. a drip tray, must be connected to the deaeration valve.

### Caution

The dosing medium must be in liquid aggregate state!

Observe the freezing and boiling points of the dosing medium!

The resistance of the parts that come into contact with the dosing medium, such as the dosing head, valve ball, gaskets and lines, depends on the medium, media temperature and operating pressure.

### Caution

Ensure that parts in contact with the dosing medium are resistant to the dosing medium under operating conditions, see data booklet!

Should you have any questions regarding the material resistance and suitability of the pump for specific dosing media, please contact Grundfos.

## 2.6 Diaphragm breakage

If the diaphragm leaks or is broken, dosing liquid escapes from the drain opening (fig. 2) on the dosing head. Observe section [9.4 Diaphragm breakage](#).

### Warning

Danger of explosion, if dosing liquid has entered the pump housing!

Operation with damaged diaphragm can lead to dosing liquid entering the pump housing.

In case of diaphragm breakage, immediately separate the pump from the power supply!

Make sure the pump cannot be put back into operation by accident!

Dismantle the dosing head without connecting the pump to the power supply and make sure no dosing liquid has entered the pump housing. Proceed as described in section [9.4.1 Dosing liquid in the pump housing](#).



To avoid any danger resulting from diaphragm breakage, observe the following:

- Perform regular maintenance. See section [9.1 Regular maintenance](#).
- Never operate the pump with blocked or soiled drain opening.
  - If the drain opening is blocked or soiled, proceed as described in section [9.6 Repairs](#).
- Never attach a hose to the drain opening. If a hose is attached to the drain opening, it is impossible to recognize escaping dosing liquid.
- Take suitable precautions to prevent harm to health and damage to property from escaping dosing liquid.
- Never operate the pump with damaged or loose dosing head screws.

## 2.7 Operation with loose dosing head screws

### Warning

Danger of explosion, if dosing liquid has entered the pump housing!

Operation with damaged or loose dosing head screws can lead to dosing liquid entering the pump housing.

If the pump was operated with damaged or loose dosing head screws, immediately separate the pump from the power supply!

Make sure the pump cannot be put back into operation by accident!

Dismantle the dosing head without connecting the pump to the power supply and make sure no dosing liquid has entered the pump housing. Proceed as described in section [9.4.1 Dosing liquid in the pump housing](#).



### 3. General description

The Grundfos DME dosing pump is a self-priming diaphragm pump.

The pump consists of:

- a **cabinet** incorporating the drive unit and electronics,
- a **dosing head** with back plate, diaphragm, valves, connections and vent valve,
- a **control panel** incorporating display and buttons. The control panel is fitted either to the front or to the side of the cabinet.

The motor is controlled in such a way that the dosing gets as even and constant as possible, irrespective of the capacity range in which the pump is operating.

This is carried out as follows:

The speed of the suction stroke is kept constant and the stroke relatively short, irrespective of the capacity. Contrary to conventional pumps, which generate the dosing stroke as a short pulse, the duration of the dosing stroke will be as long as possible. Thus, an even dosing without peak values is ensured. As the pump is always dosing at full stroke length, it ensures the same high accuracy and suction capability, irrespective of the capacity, which is infinitely variable in the ratio of 1:800.

The pump features an LCD display and a user-friendly control panel which gives access to the pump functions.

### 3.1 Applications

The pump is suitable for liquid, non-abrasive, non-flammable and non-combustible media strictly in accordance with the instructions in these installation and operating instructions.

#### Areas of application (among others)

- drinking water treatment
- wastewater treatment
- cooling water treatment
- washing systems
- process water treatment
- chemical industry.

### 3.2 Improper operating method

The operational safety of the pump is only guaranteed if it is used in accordance with section [3.1 Applications](#).

#### 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 cannot be held liable for any damage resulting from incorrect use.

#### Warning



The pump must be equipped with a diaphragm leakage detection when used for crystallizing media.

#### Warning



The pump is NOT approved for operation in potentially explosive areas!

#### Warning



A sunscreen is required for outdoor installation!

### 3.3 Identification

#### 3.3.1 Type key

(Cannot be used for pump configuration.)

Code	Example	DME	60 -	10	AR -	PP/	E/	C -	F -	2	1	A3/A3	B
	Pump range												
	<b>Maximum capacity [l/h]:</b> 60 150 375 940												
	<b>Maximum pressure [bar]:</b> 4 10												
	<b>Control variant:</b> AR Standard AP Standard + Profibus												
	<b>Dosing head material:</b> PP Polypropylene PV PVDF SS 316 stainless steel												
	<b>Gasket material:</b> E EPDM T PTFE V FKM												
	<b>Valve ball material:</b> C Ceramics G Glass SS 316 stainless steel T PTFE (only 375 and 940) Y Hastelloy												
	<b>Control panel:</b> F Front-fitted S Side-fitted												
	<b>Voltage:</b> 2 1 x 120 V, 60 Hz 3 1 x 100-240 V, 50/60 Hz												
	<b>Valves:</b> 1 Standard valve 2 Spring-loaded valve												
	<b>Connection, suction/discharge:</b> A3 3/4" FNPT A4 1 1/4" FNPT												
	<b>Mains plug:</b> B USA												

## 3.3.2 Nameplate

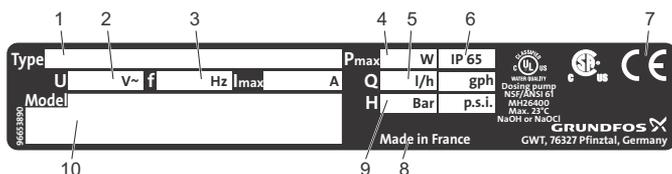


Fig. 1 Nameplate

Pos.	Description	Pos.	Description
1	Type designation	6	Enclosure class
2	Voltage	7	Marks of approval
3	Frequency	8	Country of origin
4	Power consumption	9	Max. operating pressure
5	Max. dosing flow	10	Model

## 4. Technical data

## 4.1 Mechanical data

	DME 60	DME 150	DME 375	DME 940
Maximum capacity* <sup>1</sup> [gph (l/h)]	15.8 (60)	39.6 (150)	99.2 (376)	248.0 (940)
Maximum capacity with anti-cavitation 75 %* <sup>1</sup> [gph (l/h)]	11.9 (45)	29.6 (112)	74.2 (282)	186.0 (705)
Maximum capacity with anti-cavitation 50 %* <sup>1</sup> [gph (l/h)]	8.8 (33.4)	22.0 (83.5)	55.4 (210)	138.5 (525)
Maximum capacity with anti-cavitation 25 %* <sup>1</sup> [gph (l/h)]	4.2 (16.1)	10.7 (40.4)	26.6 (101)	66.5 (252)
Maximum pressure [psi (bar)]	145 (10)	58 (4)	145 (10)	58 (4)
Maximum stroke rate per minute [strokes/min.]	160			
Maximum suction lift during operation [ft (m)]	19.6 (6)			
Maximum suction lift when priming with wet valves [ft (m)]	4.9 (1.5)			
Maximum viscosity with spring-loaded valves [mPa s] <sup>*2</sup>	3000 [mPa s] at 50 % capacity			
Maximum viscosity without spring-loaded valves [mPa s] <sup>*2</sup>	200			
Diaphragm diameter [mm]	79	106	124	173
Liquid temperature [°F (°C)]	32 to 122 (0 to 50)			
Ambient temperature [°F (°C)]	32 to 113 (0 to 45)			
Accuracy of repeatability	± 1 %			
Sound pressure level [dB(A)]	< 70			

\*<sup>1</sup> Irrespective of counter pressure\*<sup>2</sup> Maximum suction lift 1 meter

## 4.2 Electrical data

	DME 60	DME 150	DME 375	DME 940
Supply voltage [VAC]	1 x 100-240 V			
Maximum current consumption [A]	at 100 V	1.25	2.4	
	at 230 V	0.67	1.0	
Maximum power consumption P <sub>1</sub> [W]	67.1		240	
Frequency [Hz]				50/60
Enclosure class				IP65
Installation category				II
Pollution degree				2
Insulation class				B
Supply cable	1.5 m H05RN-F with plug			

## 4.3 Input/output data

The pump offers various input and output options, depending on control variant.

Signal input	
Voltage in level sensor input [VDC]	5
Voltage in pulse input [VDC]	5
Minimum pulse-repetition period [ms]	3.3
Impedance in analog 0/4-20 mA input [Ω]	
The analog input requires a signal which is isolated from frame. Min. resistance to frame: 50 kΩ	250
Maximum loop resistance in pulse signal circuit [Ω]	250
Maximum loop resistance in level signal circuit [Ω]	250
Signal output	
Maximum load of alarm relay output, at ohmic load [A]	2
Maximum voltage, alarm relay output [V]	42

## 4.4 Approvals

Approvals	CE, CSA-US, EAC, NSF61*
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- \* NSF61 is only valid for DME 375 and DME 940 standard range (without spring loaded valves).  
 Certification is based upon a dose rate that yields a sodium hydroxide (NaOH) concentration in potable water that does not exceed 200 mg/L.  
 Certification is based upon a dose rate that yields a sodium hypochlorite (NaOCl) concentration in potable water that does not exceed 84 mg/L.  
 Certification of this product has been performed to the health effects requirements of NSF/ANSI Standard 61, which assesses the acceptability of potential extractants from the chemical pump. No evaluation has been performed on the strength or efficacy of the chemical feed. The specified chemicals are not certified by UL to NSF/ANSI Standard 60, so the operation, maintenance and the consistency of the source ingredients may affect the performance of the dosing pump.

## 4.5 Dimensions

See dimensions at the end of these instructions.

All dimensions are in inches (mm).

## 5. Installation

### 5.1 Safety instructions



- Liquid is under pressure and may be hazardous.
- When working with chemicals, local safety rules and regulations must be observed (e.g. wear protective clothes).
- Before starting work on the dosing pump and system, disconnect the electricity supply to the pump, ensuring that it cannot be accidentally switched on. Before reconnecting the electricity supply, make sure that the dosing hose is positioned in such a way that any chemical left in the dosing head is not ejected, thereby exposing persons to danger.
- If the vent valve in the dosing head is used, it must be connected to a hose which is led back to the tank.
- When changing a chemical, make sure that the materials of the dosing pump and system are resistant to the new chemical. If there is any risk of chemical reaction between the two types of chemicals, clean the pump and system thoroughly before adding the new chemical. Proceed as follows:

Place the suction tube in water and press the  button until residual chemical has been removed.

**Note:** When the buttons  and  are pressed simultaneously, the pump can be set to run for a specific number of seconds at maximum capacity. The remaining number of seconds will appear in the display. The maximum value is 300 seconds.

### 5.2 Installation environment

- Exposure to direct sunlight should be avoided. This applies especially to pumps with plastic dosing heads, as this material can be damaged by sunlight.
- If the pump is installed outside, an enclosure or similar protection is required to protect the pump against rain and similar weather.

### 5.3 Installation of pump

- See also the installation example in section [5.4 Installation example](#).

The dosing head may contain water from the factory test. If a liquid which must not come into contact with water is to be dosed, it is recommended to let the pump run with another liquid to remove the water from the dosing head before installation.

#### Caution

Cross-tighten the dosing head screws with a torque wrench once before commissioning and again after 2-5 operating hours at torque 4.06 ft·lb (+ 0.37/- 0 ft·lb) (5.5 Nm (+ 0.5/- 0 Nm)).

#### Caution

- Always install the pump on the supporting foot with vertical suction and discharge ports.
- Always use suitable tools for the mounting of plastic parts. Never apply unnecessary force.
- Make sure that the dosing pump and system are designed in such a way that neither system equipment nor buildings are damaged in case of leakage from the pump or rupture of hoses/pipes. The installation of leakage hoses and collecting tanks is recommended.
- Make sure that the drain hole in the dosing head points downwards, see fig. 2.

#### Caution

Never attach a hose to the drain opening.

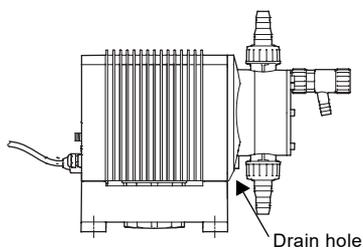


Fig. 2

## 5.4 Installation example

The drawing in fig. 3 shows an installation example.

The DME pump can be installed in many different ways. The sketch below shows an example with side-fitted control panel. The tank is a Grundfos chemical tank with a Grundfos level control unit.

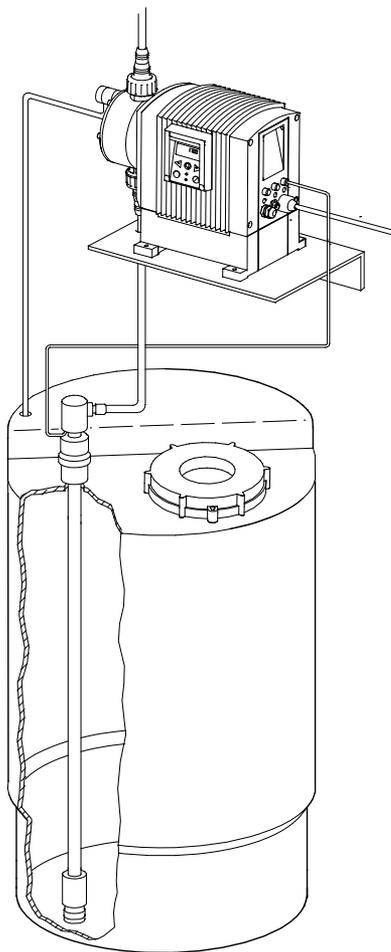


Fig. 3

## 5.5 Electrical connection

- The electrical connection of the pump should be carried out by qualified persons in accordance with local regulations.
- For electrical data of the pump, see section [4.2 Electrical data](#).
- Do not lay signal cables, if any, together with power cables.
- Do not plug DME 375 or 940 pumps into a GFCI outlet or GFCI breaker.

### Warning

Danger to life due to non-tripping of the residual current device (RCD)!

If the pump is connected to an electric installation where a residual current device (RCD) is used as an additional protection, this RCD must trip when ground fault currents with DC content (pulsating DC) and smooth DC ground fault currents occur. This means that a RCD type B, sensitive to universal current, must be used.



5.6 Connection overview

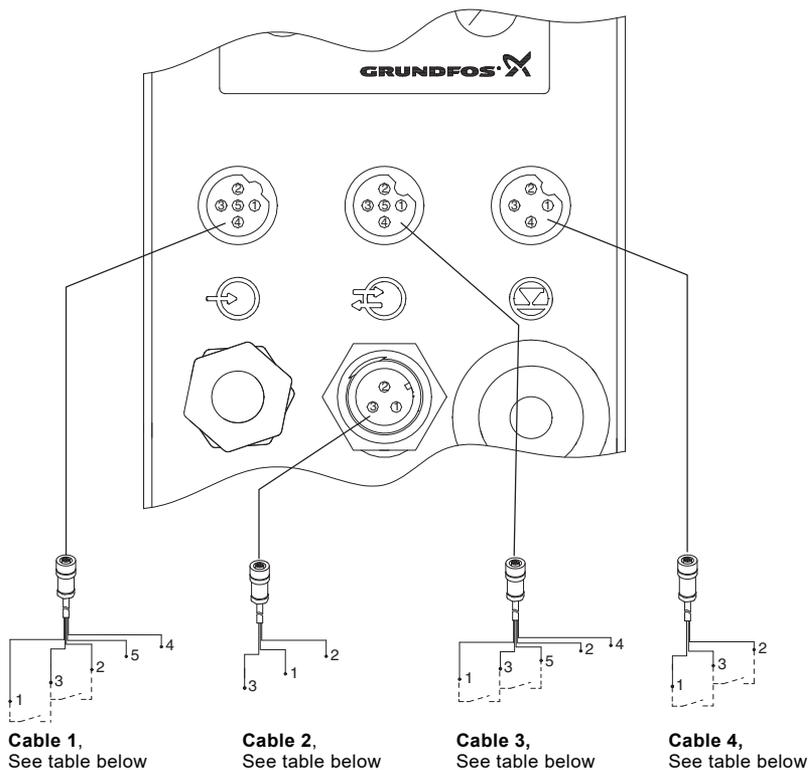


Fig. 4

**Cable 1: Input for analog signal, pulse signal and diaphragm leakage**

Number / color	1 / brown	2 / white	3 / blue	4 / black	5 / grey
Function					
Analog				(-) 4-20 mA input	(+) 4-20 mA input
Pulse	Potential-free		Potential-free		
Pulse	5 V			Ground	
Number / color	2 / black	3 / brown	4 / blue		
Diaphragm leakage*	5 V	PNP	Ground		

\* Grundfos diaphragm leakage sensor, product number 96534443.

**Cable 2: Alarm relay output**

Number / color	1 / brown	2 / white	3 / blue
Function			
Alarm relay	Common	Normally open	Normally closed

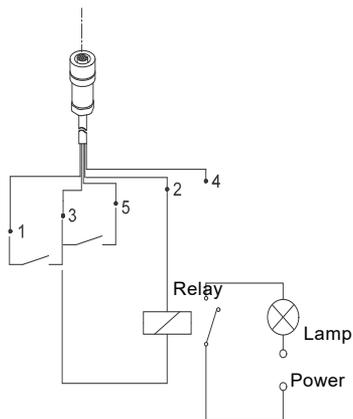
TM02 7069 0307

**Table 3: Input for dosing stop and dosing monitoring or dosing output**

Number / color	1 / brown	2 / white	3 / blue	4 / black	5 / grey
<b>Function</b>					
Dosing stop (input)	5 V		Ground		
Dosing stop (input)	Potential-free		Potential-free		
Dosing monitoring			Potential-free		Potential-free
Dosing monitoring			Ground		5 V
Dosing output (pump running)	Open collector (NPN)*		Ground		

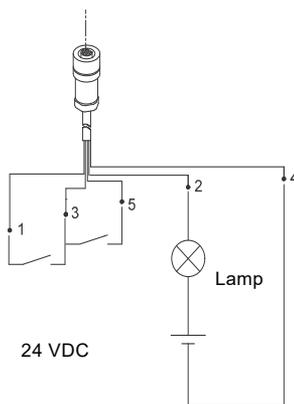
\* Open collector (NPN) can be used for a relay or a lamp.

**1. Using the internal 5 VDC power supply:  
Max. current: 100 mA**



TM03 7868 5006

**2. Using an external power supply:  
Max. 24 VDC - 100 mA**



TM03 7869 5006

**Fig. 5****Table 4: Level input**

Number / color	1 / brown	2 / white	3 / blue	4 / black
<b>Function</b>				
Empty tank	Potential-free*		Potential-free*	
Empty tank	5 V		Ground	
Low level	Potential-free*		Potential-free*	
Low level	5 V		Ground	

\* The function of the potential-free contact sets can be selected via the control panel (NO = normally open and NC = normally closed), see section [6.21 Input setup](#).

## 6. Functions

### 6.1 Control panel

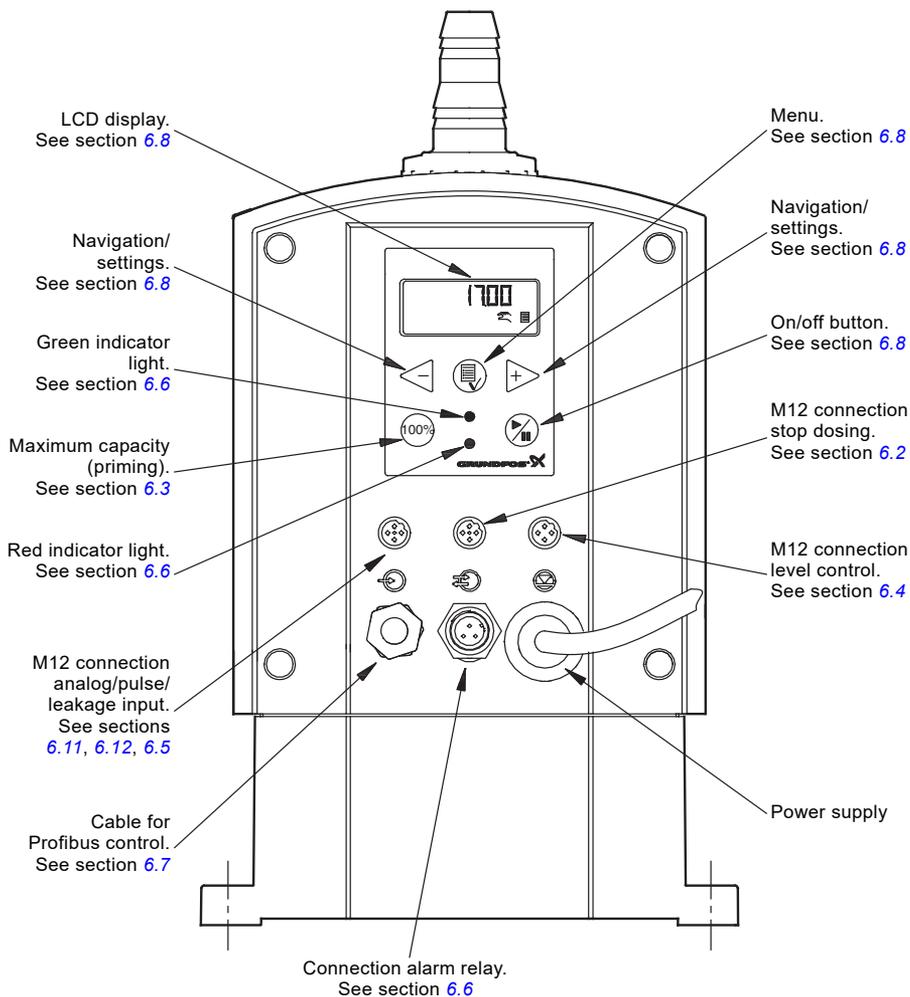


Fig. 6

## 6.2 Start/stop of pump

The pump can be started/stopped in two different ways:

- Locally on the pump control panel.
- By means of an external on/off switch.  
See connection overview in section [5.6 Connection overview](#).

## 6.3 Priming/venting of pump

The pump control panel incorporates a  button. Press this button if the maximum pump capacity is required over a short period, e.g. during start-up. When the button is released, the pump automatically returns to the previous operating mode.

During priming/venting, it is recommended to let the pump run without a counter pressure or to open the vent valve.

**Note:** When the buttons  and  are pressed simultaneously, the pump can be set to run for a specific number of seconds at maximum capacity. The remaining number of seconds will appear in the display. The maximum value is 300 seconds.

## 6.4 Level control

The pump can be fitted with a level control unit for monitoring of the chemical level in the tank.

The pump can react to two level signals. The pump will react differently, depending on the influence on the individual level sensors.

Level sensors	Pump reaction
Upper sensor activated (closed contact)	<ul style="list-style-type: none"> <li>• Red indicator light is on.</li> <li>• Pump <b>running</b>.</li> <li>• Alarm relay activated.</li> </ul>
Lower sensor activated (closed contact)	<ul style="list-style-type: none"> <li>• Red indicator light is on.</li> <li>• Pump <b>stopped</b>.</li> <li>• Alarm relay activated.</li> </ul>

For connection of the level control unit and alarm output, see section [5.6 Connection overview](#).

## 6.5 Diaphragm leakage sensor

The pump can be fitted with a diaphragm leakage sensor, which detects diaphragm leakage.

The sensor should be connected to the drain hole in the dosing head.

In case of diaphragm leakage, the signal from the sensor generates an alarm and the alarm relay will be activated. See also section [6.6 Alarm output and indicator lights](#).

For connection of the diaphragm leakage sensor, see section [5.6 Connection overview](#).

## 6.6 Alarm output and indicator lights

The green and red indicator lights on the pump are used for operating and fault indication.

In control variant "AR", the pump can activate an external alarm signal by means of a built-in alarm relay which must only be connected to a safety extra low voltage (SELV) connection.

**Note**

Connect the alarm relay only to voltages which comply with the SELV requirements in EN/IEC 60 335-1.

The alarm signal is activated by means of an internal potential-free contact.

The functions of the indicator lights and the built-in alarm relay appear from the table below.

Condition	Green LED	Red LED	Display	Alarm output
Pump running	On	Off	Normal indication	
Set to stop	Flashing	Off	Normal indication	
Pump fault	Off	On	EEPROM	
Supply failure	Off	Off	Off	
Pump running, low chemical level* <sup>1</sup>	On	On	LOW	
Empty tank* <sup>1</sup>	Off	On	EMPTY	
Analog signal < 2 mA	Off	On	NO mA	
The pump is running, but the dosed quantity is too small according to the signal from the dosing monitor* <sup>2</sup>	On	On	NO FLOW	
Overheating	Off	On	MAX. TEMP.	
Internal communication fault	Off	On	INT. COM.	
Internal Hall fault* <sup>3</sup>	Off	On	HALL	
Diaphragm leakage* <sup>4</sup>	Off	On	LEAKAGE	
Maximum pressure exceeded* <sup>4</sup>	Off* <sup>5</sup>	On	OVERLOAD	

Condition	Green LED	Red LED	Display	Alarm output
More pulses than capacity	On	On	MAX. FLOW	
No motor rotation detected* <sup>3</sup>	Off	On	ORIGO	

\*<sup>1</sup> Requires connection to level sensors. See section [6.22 Empty tank \(alarm\)](#).

\*<sup>2</sup> Requires activation of the dosing monitoring function and connection to a dosing monitor.

\*<sup>3</sup> Please contact a Grundfos service center.

\*<sup>4</sup> Alarms can be reset (🔄) when the faults have been corrected.

\*<sup>5</sup> The pump will make 10 attempts to restart before going into permanent OFF mode.

## 6.7 Fieldbus communication

The pump can be configured for fieldbus applications (Profibus). Apart from the usual installation and operating instructions, Profibus pumps are supplied with a special Profibus installation and operating instructions.



## 6.9 Operating modes

**Note:** The displayed l and ml values are only reliable if the pump has been calibrated to the actual installation, see section 8. *Calibration*.

The pump can run in five different operating modes:

- Manual
- Pulse
- Analog
- Timer (internal batch control)
- Batch (external batch control)

See description in the following sections.

### 6.10 Manual

The pump is dosing as constantly and evenly as possible, without any external signals.

Set the quantity to be dosed in l/h or ml/h. The pump automatically changes between the measuring units.

Setting range:

DME 60: 0.0198 - 15.8 gph (75 ml/h - 60 l/h)

DME 150: 0.0528 - 39.2 gph (200 ml/h - 150 l/h)

DME 375: 0.132 - 99 gph (500 ml/h - 375 l/h)

DME 940: 0.317 - 248.3 gph (1200 ml/h - 940 l/h)

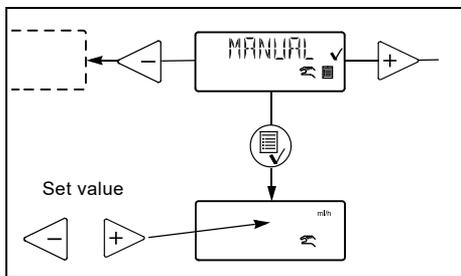


Fig. 8

### 6.11 Pulse

The pump is dosing according to an external pulse signal, i.e. a water meter with pulse output or a controller.

Set the quantity to be dosed per pulse in ml/pulse. The pump adjusts its capacity according to two factors:

- Frequency of external pulses.
- The set quantity per pulse.

The pump measures the time between two pulses and then calculates the speed giving the capacity required (set quantity per pulse multiplied by the pulse frequency).

The pump does not start until it has received the second pulse, and thus it delivers a constant flow as in the case of "manual" control. The pump calculates a speed for each pulse received.

The pump stops

- when the time between two pulses is three times longer than the time between the two previous pulses, or
- if the time between two pulses exceeds 2 minutes.

The pump will operate at the latest calculated speed until one of the two cases occurs.

The pump stops at the point reached in its duty cycle and starts at this point again having received two new pulses.

Setting range:

DME 60: 0.000625 ml/pulse - 120 ml/pulse

DME 150: 0.00156 ml/pulse - 300 ml/pulse

DME 375: 0.00392 ml/pulse - 750 ml/pulse

DME 940: 0.00980 ml/pulse - 1880 ml/pulse

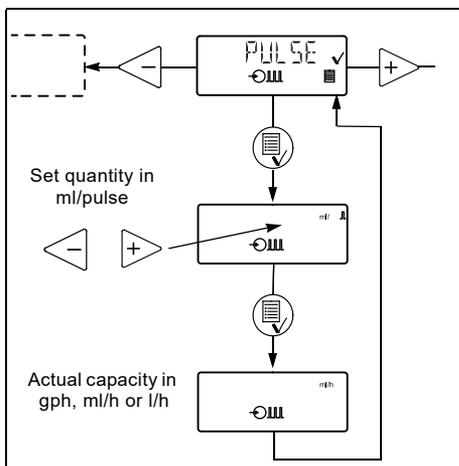


Fig. 9

If the set quantity per pulse multiplied by the pulse frequency exceeds the pump capacity, the pump will run at maximum capacity. Excess pulses will be ignored and "MAX. FLOW" will appear in the display.

### 6.12 Analog

The pump is dosing according to an external analog signal. The dosed quantity is proportional to the input value in mA.

4-20 (default):	4 mA = 0 %.
	20 mA = 100 %.
20-4:	4 mA = 100 %.
	20 mA = 0 %.
0-20:	0 mA = 0 %.
	20 mA = 100 %.
20-0:	0 mA = 100 %.
	20 mA = 0 %.

See fig. 10.

The capacity limitation will influence the capacity. 100 % corresponds to the maximum capacity of the pump or the set maximum capacity, see section 6.16 Capacity limitation.

The analog input requires a signal which is isolated from frame. Min. resistance to frame: 50 kΩ.

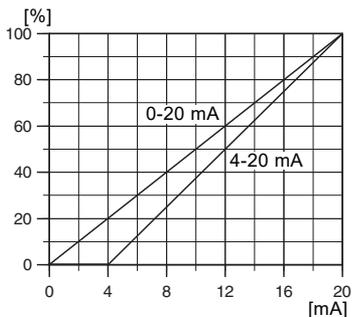


Fig. 10

TM02 4498 1102

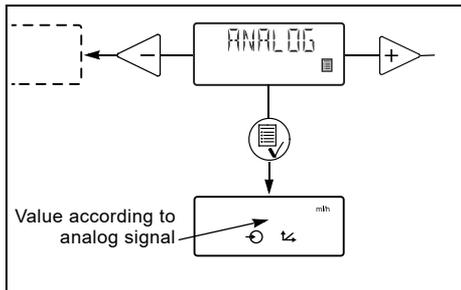


Fig. 11

If 4-20 mA or 20-4 mA is selected and the signal falls below 2 mA, the pump will indicate a fault. This situation occurs if the connection is interrupted, for instance if the wire is damaged.

Change the analog mode as illustrated in fig. 12:

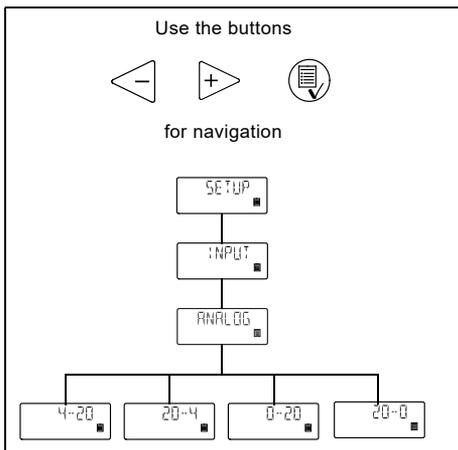


Fig. 12

### 6.13 Timer

The pump is dosing the set quantity in batches at the maximum capacity or the set maximum capacity, see section 6.16 [Capacity limitation](#).

The time until the first dosing "NX" and the following sequences "IN" can be set in minutes, hours and days. The maximum time limit is 9 days, 23 hours and 59 minutes (9:23:59). The lowest acceptable value is 1 minute. The internal timer continues even if the pump is stopped by means of the on/off button, empty tank or stop signal, see fig. 13.

During operation, "NX" will always count down from "IN" to zero. In this way, the remaining time until the next batch can always be read.

"IN" must be higher than the time required to perform one batch. If "IN" is lower, the next batch will be ignored.

In case of supply failure, the set quantity to be dosed, the "IN" time and the remaining "NX" time are stored. When the supply is reconnected, the pump will start up with the "NX" time at the time of the supply failure. In this way, the timer cycle will continue, but it has been delayed by the duration of the supply failure.

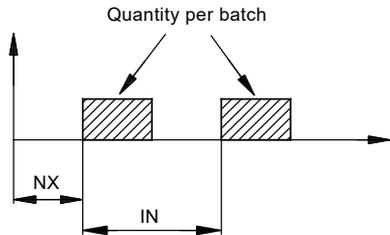


Fig. 13

Setting range, adjustable volume per batch:

DME 60: 0.0017 to 31.7 gal (6.25 ml - 120 l)

DME 150: 0.0041 to 79.3 gal (15.6 ml - 300 l)

DME 375: 0.01 to 198.1 gal (39.1 ml - 750 l)

DME 940: 0.025 to 496.7 gal (97.9 ml - 1880 l)

Only values corresponding to complete dosing strokes (according to the calibration factor) can be selected. The minimum setting depends on the calibration factor. The minimum setting shown above corresponds to the default calibration value.

#### Example:

If the calibration factor is 625 (= 6.25 ml/stroke), the minimum settable value in timer or batch mode will be 6.25 ml (= 1 stroke) -> the next will be 12.5 ml (= 2 strokes), etc.

These steps will continue up to a value corresponding to 100 dosing strokes. Above this value, the setting range has standard steps as in other operating modes.

If the calibration factor is changed after the setting of timer or batch mode, the pump will automatically recalculate a new number of dosing strokes per batch and change the display value to the nearest possible value compared to the first one set.

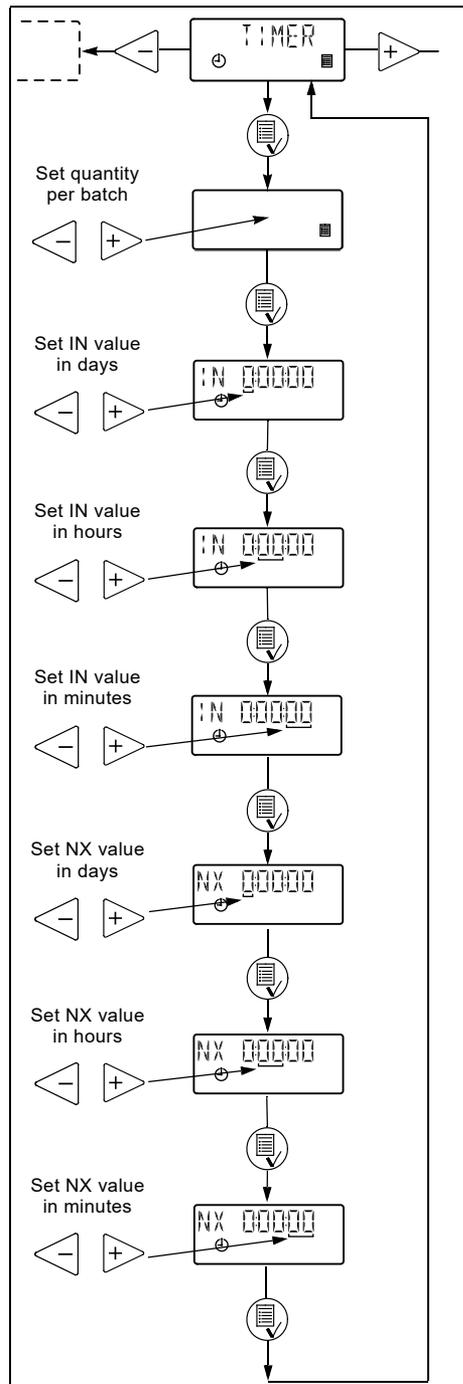


Fig. 14

### 6.14 Batch

The pump is dosing the set quantity in batches at the maximum capacity or the set maximum capacity, see section [6.16 Capacity limitation](#).

The quantity is dosed every time the pump receives an external pulse.

If the pump receives new pulses before the previous batch is performed, these pulses will be ignored.

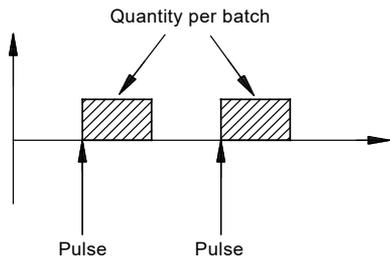


Fig. 15

The setting range is the same as for Timer, see section [6.13 Timer](#).

TM01 8947 0900

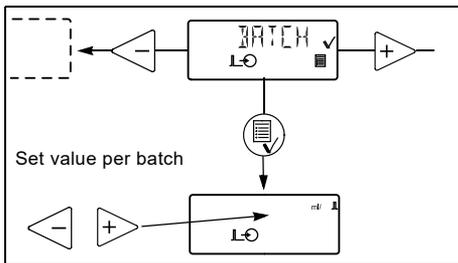


Fig. 16

### 6.15 Anti-cavitation

The pump features an anti-cavitation function. When this function is selected, the pump extends its suction stroke, resulting in optimized priming.

The anti-cavitation function is used:

- when pumping liquids of high viscosity
- in the case of a long suction tube
- in the case of a high suction lift.

Depending on the circumstances, the motor speed during the suction stroke can be reduced by 75 %, 50 % or 25 % compared to the normal motor speed during the suction stroke.

The maximum pump capacity is reduced when the anti-cavitation function is selected. See section [4.1 Mechanical data](#).

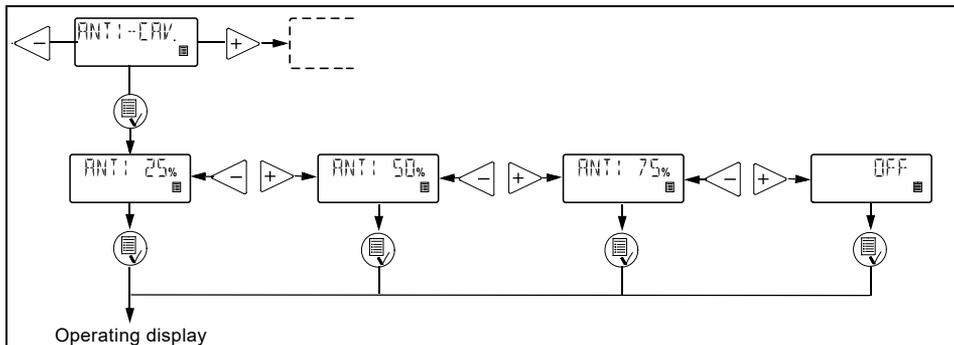


Fig. 17

## 6.16 Capacity limitation

This function offers the possibility of reducing the maximum pump capacity (MAX. CAP.). It influences the functions in which the pump is normally operating at maximum capacity.

Under normal operating conditions, the pump cannot operate at a capacity which is higher than the one stated in the display. This does not apply to the maximum capacity button  $\text{100\%}$ , see section [6.3 Priming/venting of pump.](#)

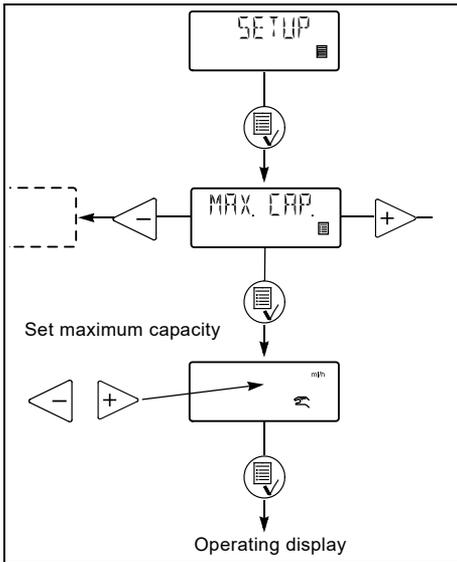


Fig. 18

## 6.17 Counters

The pump can display "non-resettable" counters for:

- **"QUANTITY"**  
Accumulated value of dosed quantity in liters or US gallons.
- **"STROKES"**  
Accumulated number of dosing strokes.
- **"HOURS"**  
Accumulated number of operating hours.
- **"POWER ON"**  
Accumulated number of times the electricity supply has been switched on.

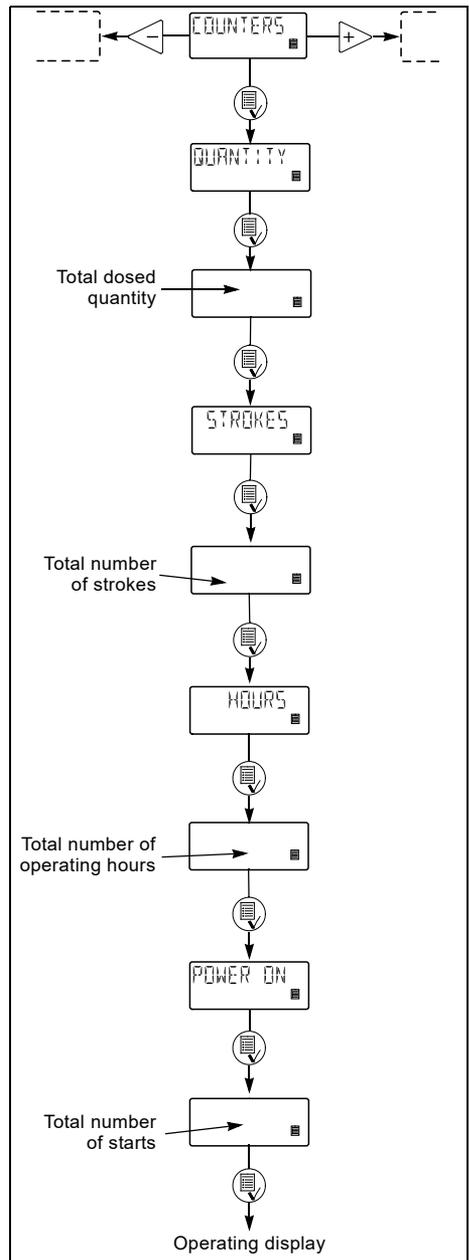


Fig. 19

## 6.18 Resetting

When "DEFAULT" is activated, the pump will return to the factory settings.

**Note:** The calibration is also set back to the default setting. This means that a new calibration is required when the "DEFAULT" function has been used.

Default settings are the factory settings of standard pumps. Select "DEFAULT" in the "SETUP" menu.

### Default settings:

Operating mode:	Manual
Capacity:	Maximum capacity
Control panel lock:	Unlocked
Default lock code:	2583
Anti-cavitation:	Not active
Analog signal:	4-20 mA
Digital inputs:	NO (normally open)
Capacity limitation:	Maximum capacity
Alarm reset required to restart the pump	
Dosing monitoring:	Off
Language:	English
Units:	Metric

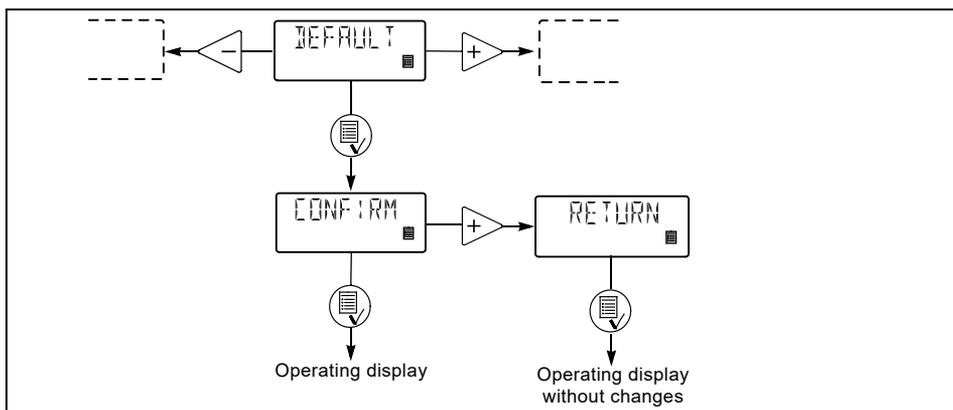


Fig. 20

## 6.19 Return



Fig. 21

The "RETURN" function makes it possible to return from any level in the menu to the operating display without changes after the menu functions have been used.

## 6.20 Language

The display text can be displayed in one of the following languages:

- English
- German
- French
- Italian
- Spanish
- Portuguese
- Dutch
- Swedish
- Finnish
- Danish
- Czech
- Slovak
- Polish
- Russian.

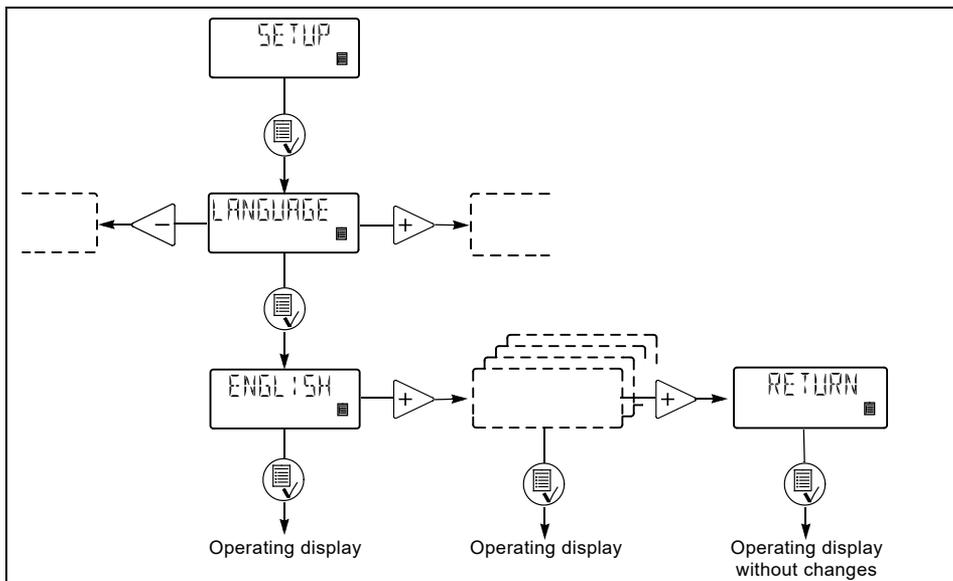


Fig. 22

## 6.21 Input setup

Fig. 23 shows all possible settings.

The inputs for level, stop dosing and diaphragm leakage can be changed from NO (normally open) to NC (normally closed) function. If changed, the inputs must be short-circuited in normal operation.

The dosing monitoring input can be changed from "OFF" to "ON".

For the analog input, one of the following signal types can be selected:

- 4-20 mA (default)
- 20-4 mA
- 0-20 mA
- 20-0 mA.

See also section [6.12 Analog](#).

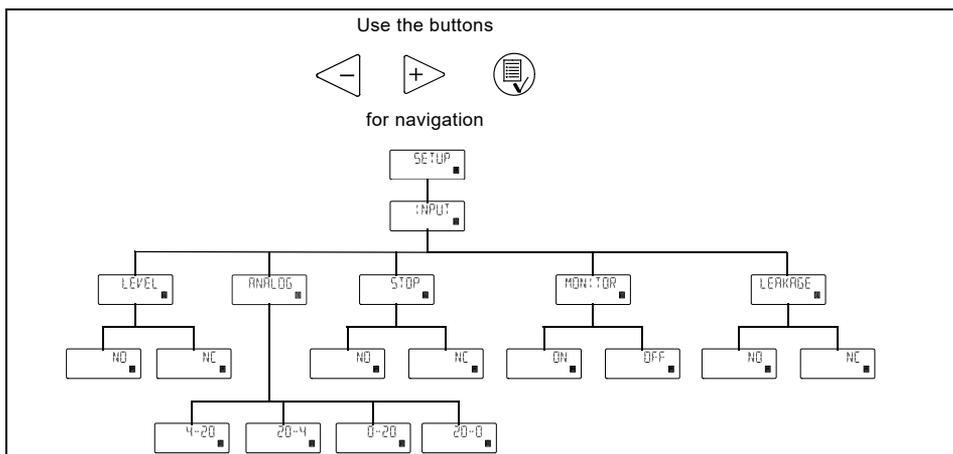


Fig. 23

## 6.22 Empty tank (alarm)

The alarm function can be set to "AUT. RES." or "MAN. RES.". This function is used when the level sensor indicates "EMPTY".

The alarm can be reset automatically (AUT. RES.) or manually (MAN. RES.).

For more information about other alarm functions, see section [6.6 Alarm output and indicator lights](#).

## 6.23 Measuring units

It is possible to select metric units (liter/milliliter) or US units (gallons/milliliter).

### Metric measuring units:

- **In manual and analog modes**, set the quantity to be dosed in liters per hour (l/h) or milliliters per hour (ml/h).
- **In pulse mode**, set the quantity to be dosed in ml/pulse. The actual capacity is indicated in liters per hour (l/h) or milliliters per hour (ml/h).
- **For calibration**, set the quantity to be dosed in ml per 100 strokes.
- **In timer and batch modes**, set the quantity to be dosed in liters (l) or milliliters (ml).
- Under the "QUANTITY" menu item in the "COUNTERS" menu, the dosed quantity is indicated in liters.

### US measuring units:

- **In manual and analog modes**, set the quantity to be dosed in gallons per hour (gph).
- **In pulse mode**, set the quantity to be dosed in ml/pulse. The actual capacity is indicated in gallons per hour (gph).
- **For calibration**, set the quantity to be dosed in ml per 100 strokes.
- **In timer and batch modes**, set the quantity to be dosed in gallons (gal).
- Under the "QUANTITY" menu item in the "COUNTERS" menu, the dosed quantity is indicated in US gallons (gal).

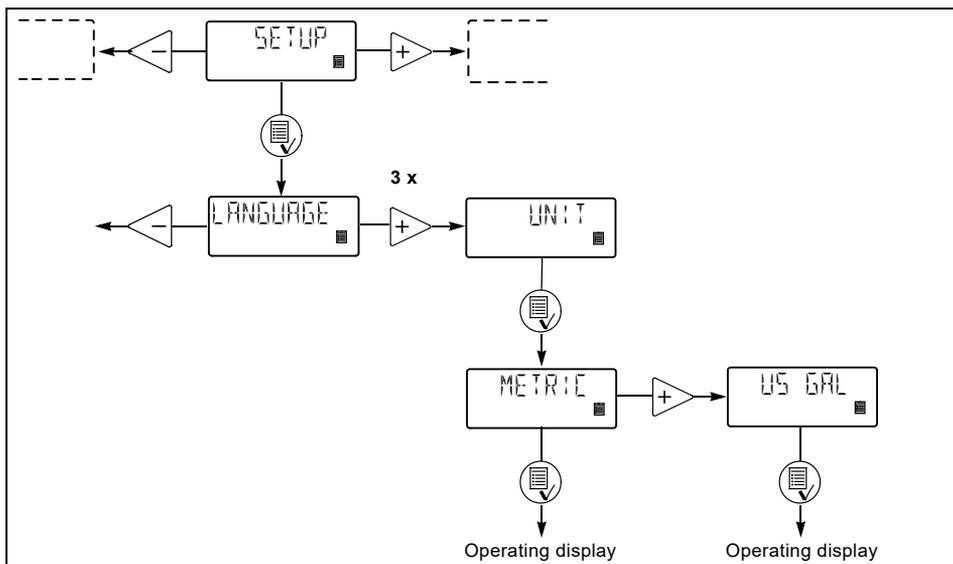


Fig. 24

## 6.24 Dosing monitoring

The pump incorporates a dosing monitoring input (see connection overview in fig. 4).

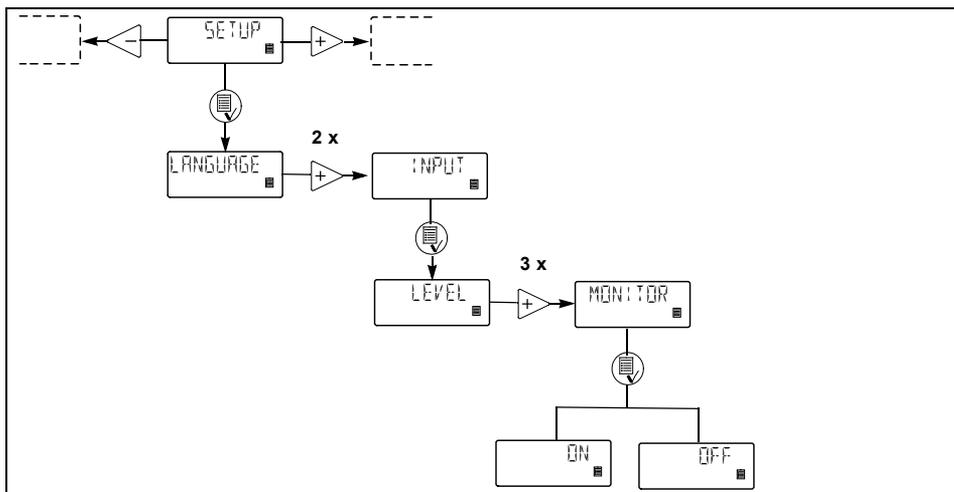


Fig. 25

The pump can be fitted with a dosing monitor, which detects ineffective dosing strokes.

The dosing monitor is designed to monitor the dosing of liquids which may cause gas accumulation in the dosing head, thus stopping the dosing process even if the pump is still operating.

During the dosing process, the dosing monitor gives pulse signals to the monitor input so that the pump can compare performed dosing strokes (from internal stroke sensor) with externally measured physical strokes (from the dosing monitor). If an external dosing stroke is not measured as a result of the internal dosing stroke, this is considered a fault that may have been provoked by empty tank or gas in the dosing head.

The dosing monitor should be connected to the input for dosing monitoring. This input must be configured for dosing monitoring. Once the input has been set to dosing monitoring and a dosing monitor has been connected and set, the dosing monitoring function will be active.

## 6.25 Control panel lock

It is possible to lock the buttons on the control panel to prevent malfunction of the pump. The locking function can be set to "ON" or "OFF". The default setting is "OFF".

A PIN code must be entered to change from "OFF" to "ON". When "ON" is selected for the first time, "0000" will appear in the display. If a code has already been entered, it will appear when an attempt to change to "ON" is made. This code can either be re-entered or changed.

If no code has been entered, a code must be set in the same way as the "NX" and "IN" values described in section 6.13 *Timer*.

If a code has already been entered, active digits are flashing.

If attempts are made to operate the pump in locked condition, "LOCKED" will appear in the display for 2 seconds, followed by "0000". A code must be entered. If the entering of a code has not been started within 10 seconds, the operating display without changes will appear.

If a wrong code is entered, "LOCKED" will appear in the display for 2 seconds, followed by "0000". A new code must be entered. If the entering of a code has not been started within 10 seconds, the operating display without changes will appear. This display will also appear if the entering of the correct code exceeds 2 minutes.

If the locking function has been activated but the control panel is unlocked, the control panel will be locked automatically if it is not operated for 2 minutes.

The locking function can also be reactivated by selecting "ON" in the "LOCK" menu. The previously entered code will then appear and must be re-entered by pressing the  button four times. The code can also be changed.

The control panel can be unlocked either by means of the selected code or the factory code 2583.

The following buttons and inputs are still active when the panel is locked:

- Priming (-button).
- On/off button.
- All external inputs.

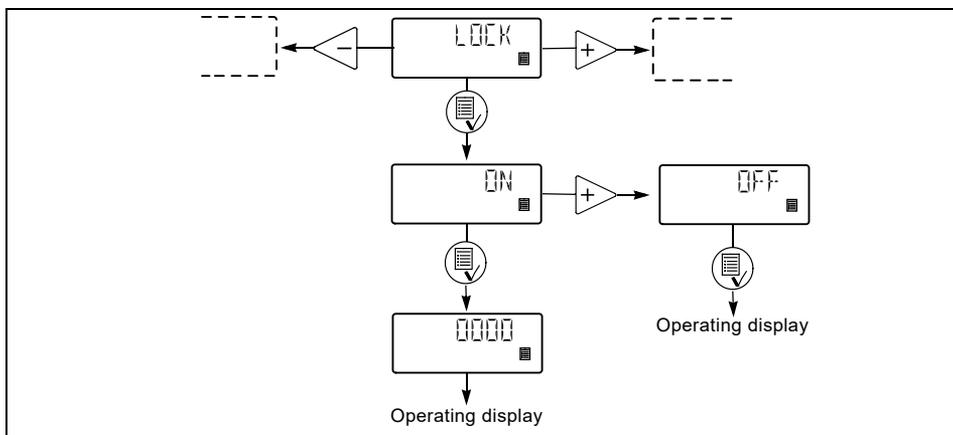


Fig. 26

### Activating the locking function and locking the control panel:

1. Select "LOCK" in the menu.
2. Select "ON" by means of the buttons  and  and confirm with .
3. Enter or re-enter a code by means of the buttons ,  and .

The locking function has now been activated and the control panel is locked.

### Unlocking the control panel (without deactivating the locking function):

1. Press  once. "LOCKED" appears in the display for 2 seconds, followed by "0000".
2. Enter the code by means of the buttons ,  and .

The control panel has now been unlocked and will automatically be locked again if the control panel is not operated for 2 minutes.

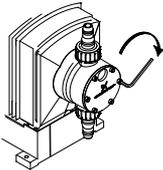
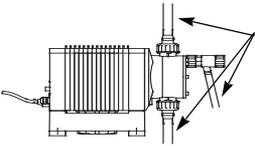
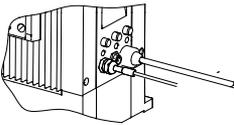
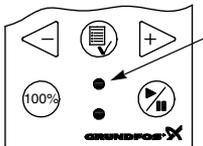
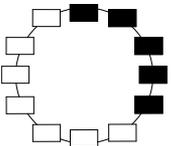
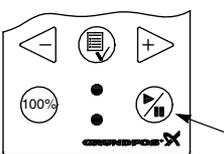
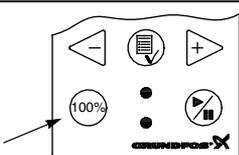
### Deactivating the locking function:

1. Unlock the control panel as described above.
2. Select "LOCK" in the menu.
3. Select "OFF" by means of the buttons  and  and confirm with .

The locking function has now been deactivated and the control panel is unlocked.

\* The panel can always be unlocked with code 2583.

## 7. Start-up

Step	Action
<p>1</p> 	<p><b>Prior to start-up, retighten the dosing head screws:</b></p> <ul style="list-style-type: none"> <li>• Cross-tighten the dosing head screws with a torque wrench once before commissioning and again after 2-5 operating hours at torque 4.06 ft-lb (+ 0.37/- 0 ft-lb) (5.5 Nm. (+ 0.5/- 0 Nm)).</li> </ul>
<p>2</p> 	<p><b>Connect the hoses/pipes:</b></p> <ul style="list-style-type: none"> <li>• Connect the suction and dosing tubes/pipes to the pump.</li> <li>• Connect a tube to the vent valve, if required, and lead the hose to the tank.</li> <li>• Never attach a hose to the drain opening.</li> </ul>
<p>3</p> 	<p><b>Connect the cables:</b></p> <ul style="list-style-type: none"> <li>• Connect the control/level cables, if any, to the pump, see section <a href="#">5.6 Connection overview</a>.</li> </ul>
<p>4</p> 	<p><b>Switch on the electricity supply:</b></p> <ul style="list-style-type: none"> <li>• The display is on.</li> <li>• The green indicator light is flashing (the pump has stopped).</li> <li>• Select language, if required, see section <a href="#">6.20 Language</a>.</li> </ul>
<p>5</p> 	<p><b>Select the operating mode (see section <a href="#">6.9 Operating modes</a>):</b></p> <ul style="list-style-type: none"> <li>• Manual.</li> <li>• Pulse.</li> <li>• Analog.</li> <li>• Timer.</li> <li>• Batch.</li> </ul>
<p>6</p> 	<p><b>Start the pump:</b></p> <ul style="list-style-type: none"> <li>• Start the pump by pressing the on/off button.</li> <li>• The green indicator light is permanently on.</li> </ul>
<p>7</p> 	<p><b>Priming/venting:</b></p> <ul style="list-style-type: none"> <li>• Press the  button on the pump control panel and let the pump run without a counter pressure. Open the vent valve, if required. When the buttons  and  are pressed simultaneously during priming, the pump can be set to run for a specific number of seconds at maximum capacity.</li> </ul>
<p>8</p> 	<p><b>Calibration:</b></p> <ul style="list-style-type: none"> <li>• When the pump has been primed and is running at the right counter pressure, calibrate the pump, see section <a href="#">8. Calibration</a></li> </ul>

If the pump is not operating satisfactorily, see section [10. Fault finding chart](#).

## 8. Calibration

It is important that the pump is calibrated after installation to ensure that the correct value (ml/h or l/h) appears in the display.

The calibration can be carried out in two different ways:

- **Direct calibration.**  
The dosed quantity of 100 strokes is measured directly. See section [8.1 Direct calibration](#).
- **Check calibration.** See section [8.2 Check calibration](#).

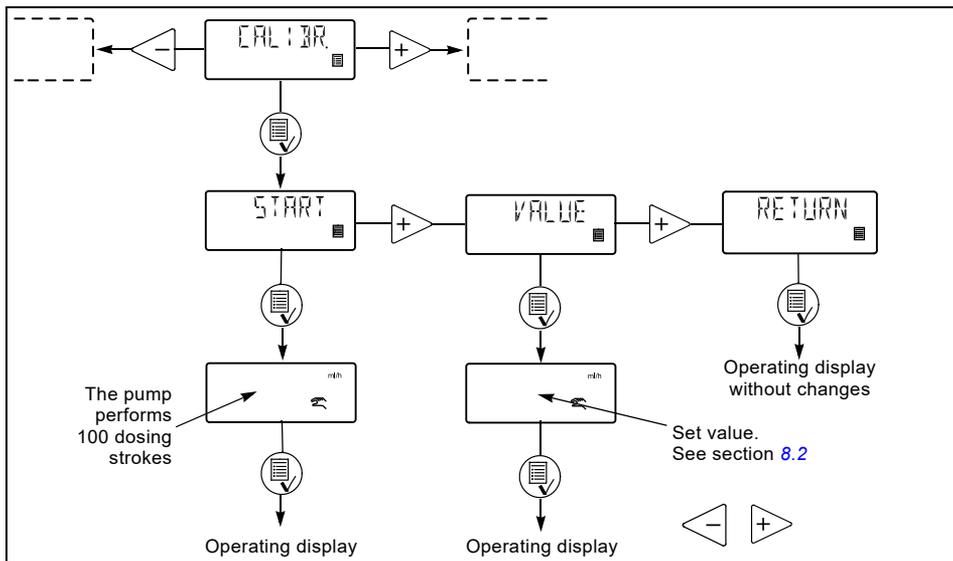


Fig. 27

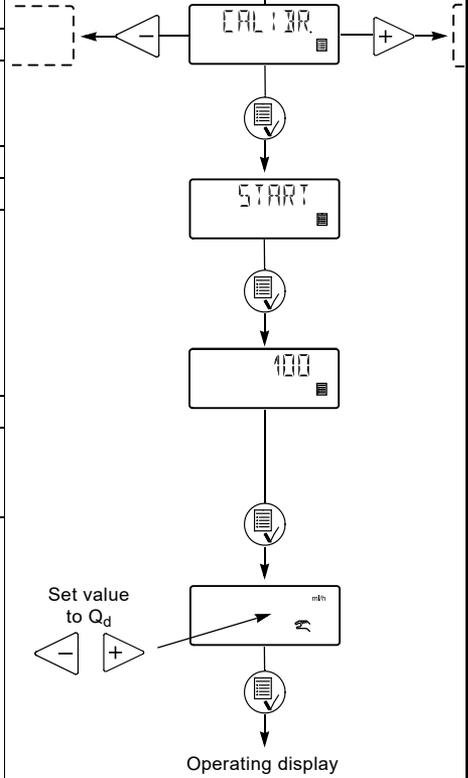
### 8.1 Direct calibration

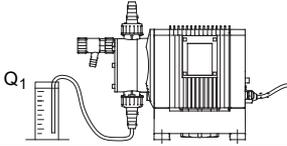
Before calibration, make sure:

- that the pump is installed with foot valve, injection valve, etc. in the existing system.

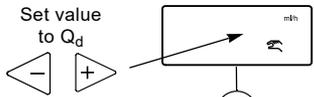
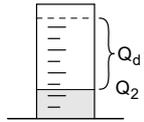
- that the pump is running at the counter pressure it is supposed to operate at (adjust the counter pressure valve, if required).
- that the pump is operating with the correct suction lift.

To carry out a direct calibration, proceed as follows:

Action	Pump display
1. Prime the dosing head and the suction tubing.	
2. Stop the pump. The green LED is flashing.	
3. Fill a graduated glass with dosing liquid, $Q_1$ . DME 60: approx. 1.5 l DME 150: approx. 2.5 l DME 375: approx. 6 l DME 940: approx. 14 l	
4. Read and note the quantity $Q_1$ .	
5. Place the suction tubing in the graduated glass.	
6. Go to the calibration menu, see section 6.8 Menu.	
7. Press the  button twice.	
8. The pump is performing 100 dosing strokes.	
9. The factory-calibration value appears in the display.	
10. Remove the suction tubing from the graduated glass and read $Q_2$ .	
11. Set the display value to $Q_d = Q_1 - Q_2$ .	
12. Confirm with the  button.	
13. The pump is now calibrated and returns to the operating display.	



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## 8.2 Check calibration

In check calibration, the calibration value is calculated by reading the consumption of chemical in a specific period and comparing this with the number of dosing strokes performed in the same period.

This calibration method is very accurate and especially suitable for check calibration after long periods of operation or if direct calibration is impossible. The calibration can for instance be carried out when the chemical tank is replaced or filled.

To carry out a check calibration, proceed as follows:

1. Stop the pump by pressing the  button.
2. Read the counter and note the number of dosing strokes, see section [6.17 Counters](#).
3. Read and note the quantity in the chemical tank.
4. Start the pump by pressing the  button and let it run for at least 1 hour. The longer the pump is operating, the more accurate the calibration will be.
5. Stop the pump by pressing the  button.
6. Read the counter and note the number of dosing strokes, see section [6.17 Counters](#).
7. Read and note the quantity in the chemical tank.
8. Calculate the dosed quantity in ml and the number of dosing strokes performed during the operating period.
9. Calculate the calibration value as follows:  
(dosed quantity in ml/dosing strokes) x 100.
10. Set the calculated value in the calibration menu.

## 9. Service

In order to ensure a long service life and dosing accuracy, wearing parts such as diaphragms and valves must be regularly checked for signs of wear. Where necessary, replace worn parts with original spare parts made from suitable materials.

Should you have any questions, please contact your service partner.

### 9.1 Regular maintenance

Interval	Task
	<p>Check, if liquid leaks from the drain opening (fig. 2) and if the drain opening is blocked or soiled. If so, follow the instructions given in section <a href="#">9.4 Diaphragm breakage</a>.</p> <p>Check, if liquid leaks from the dosing head or valves.</p>
Daily	<p>If the pump was operated with damaged or loose dosing head screws, immediately separate the pump from the power supply! Follow the instructions given in section <a href="#">9.5 Operation with loose dosing head screws</a>. If necessary, tighten valves and cap nuts, or perform service (see <a href="#">9.3 Perform service</a>).</p>
Weekly	<p>Clean all pump surfaces with a dry and clean cloth.</p>
Every 3 months	<p>Check dosing head screws. If necessary, cross-tighten dosing head screws with a torque wrench at torque 4.06 ft-lb (+ 0.37/- 0 ft-lb) (5.5 Nm (+ 0.5/- 0 Nm)). Replace damaged screws immediately.</p>
Every 2 years or 8000 operating hours*	<p>Replace diaphragm and valves (see <a href="#">9.3 Perform service</a>)</p>

\* For media which result in increased wear, the service interval must be shortened.

### 9.2 Cleaning

If necessary, clean all pump surfaces with a dry and clean cloth.

### 9.3 Perform service

Only spare parts and accessories from Grundfos should be used for maintenance. The usage of non-original spare parts and accessories renders any liability for resulting damages null and void.

Further information about carrying out maintenance can be found in the service kit catalog on our homepage ([www.grundfos.com](http://www.grundfos.com)).

#### Warning

Risk of chemical burns!

When dosing dangerous media, observe the corresponding precautions in the safety data sheets!

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

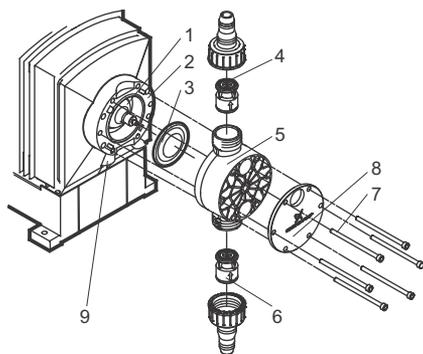
Do not allow any chemicals to leak from the pump. Collect and dispose of all chemicals correctly!



#### Caution

Before any work to the pump, the pump must be disconnected from the power supply. The system must be pressureless!

#### 9.3.1 Dosing head overview



**Fig. 28** Dosing head, exploded view (without deaeration valve)

1	Safety diaphragm
2	Flange
3	Diaphragm
4	Valve on discharge side
5	Dosing head
6	Valve on suction side
7	Screws
8	Dosing head front plate (only PP, PVDF)
9	Drain opening

#### 9.3.2 Dismantling the diaphragm and valves

Before dismantling, read section [9.4 Diaphragm breakage](#) and section [9.5 Operation with loose dosing head screws](#) thoroughly.

#### Warning

Danger of explosion, if dosing liquid has entered the pump housing!



If the diaphragm is possibly damaged or if the pump was operated with damaged or loose dosing head screws, don't connect the pump to the power supply!

This section refers to fig. [28](#).

1. Make system pressureless.
2. Empty the dosing head before maintenance and flush it, if necessary.
3. Take suitable steps to ensure that the returning liquid is safely collected.
4. Dismantle suction, pressure and deaeration hoses.
5. Unscrew deaeration valve.
6. Dismantle valves on suction and discharge side (4, 6).
7. Loosen screws (7) on the dosing head (5).
8. Remove the screws, in case of PP or PVDF dosing head together with the front plate (8).
9. Remove the dosing head (5).
10. Unscrew diaphragm (3) counter-clockwise and remove it.
11. Make sure the drain opening (9) is not blocked or soiled. Clean if necessary.
12. Check the safety diaphragm (1) for wear and damage.

If nothing indicates that dosing liquid has entered the pump housing, and if the safety diaphragm is not worn or damaged, go on as described in section [9.3.3 Reassembling the diaphragm and valves](#). Otherwise proceed as described in section [9.4.1 Dosing liquid in the pump housing](#).

### 9.3.3 Reassembling the diaphragm and valves

**Caution**

Please observe as well section [5. Installation](#), [6.3 Priming/venting of pump](#) and [7. Start-up!](#)

The pump must only be reassembled, if nothing indicates that dosing liquid has entered the pump housing. Otherwise proceed as described in section [9.4.1 Dosing liquid in the pump housing](#).

This section refers to fig. 28.

1. Screw on new diaphragm (3) clockwise.
2. Attach the dosing head (5).
3. Install screws (7), in case of PP or PVDF dosing head together with the front plate (8), and cross-tighten with a torque wrench.
  - Torque: 4.06 ft-lb (+ 0.37/- 0 ft-lb) (5.5 Nm (+ 0.5/- 0 Nm)).
4. Install new valves (4, 6).
  - Observe the flow direction (indicated by an arrow on the valve)!
5. Install the deaeration valve.
6. Connect suction, pressure and deaeration hoses.

Cross-tighten the dosing head screws with a torque wrench once before commissioning and again after 2-5 operating hours at torque 4.06 ft-lb (+ 0.37/- 0 ft-lb) (5.5 Nm (+ 0.5/- 0 Nm)).

**Caution**

7. Deaerate dosing pump (see section [6.3 Priming/venting of pump](#)).

### 9.4 Diaphragm breakage

If the diaphragm leaks or is broken, dosing liquid escapes from the drain opening (fig. 28, pos. 9) on the dosing head flange.

In case of diaphragm breakage, the safety diaphragm (fig. 28, pos. 1) protects the pump housing against ingress of dosing liquid.

When dosing crystallizing liquids the drain opening can be blocked by crystallization. If the pump is not taken out of operation immediately, a pressure can build up between the diaphragm (fig. 28, pos. 3) and the safety diaphragm in the flange (fig. 28, pos. 1). The pressure can press dosing liquid through the safety diaphragm into the pump housing.

Most dosing liquids don't cause any danger when entering the pump housing. However a view liquids can cause a chemical reaction with inner parts of the pump. In the worst case, this reaction can produce explosive gases in the pump housing.

**Warning**

Danger of explosion, if dosing liquid has entered the pump housing!

Operation with damaged diaphragm can lead to dosing liquid entering the pump housing.

In case of diaphragm breakage, immediately separate the pump from the power supply!



Make sure the pump cannot be put back into operation by accident!

Dismantle the dosing head without connecting the pump to the power supply and make sure no dosing liquid has entered the pump housing. Proceed as described in section [9.3.2 Dismantling the diaphragm and valves](#).

To avoid any danger resulting from diaphragm breakage, observe the following:

- Perform regular maintenance. See section [9.1 Regular maintenance](#).
- Never operate the pump with blocked or soiled drain opening.
  - If the drain opening is blocked or soiled, proceed as described in section [9.3.2 Dismantling the diaphragm and valves](#).
- Never attach a hose to the drain opening. If a hose is attached to the drain opening, it is impossible to recognize escaping dosing liquid.
- Take suitable precautions to prevent harm to health and damage to property from escaping dosing liquid.
- Never operate the pump with damaged or loose dosing head screws.

### 9.4.1 Dosing liquid in the pump housing

#### Warning

Danger of explosion!

Immediately separate the pump from the power supply!

Make sure the pump cannot be put back into operation by accident!



If dosing liquid has entered the pump housing, or if the safety diaphragm is damaged or worn:

- Send the pump to Grundfos for repair, following the instructions given in section [9.6 Repairs](#).
- If a repair isn't economically reasonable, dispose of the pump observing the information in section [11. Disposal](#).

### 9.5 Operation with loose dosing head screws

#### Warning

Danger of explosion, if dosing liquid has entered the pump housing!

Operation with damaged or loose dosing head screws can lead to dosing liquid entering the pump housing.

If the pump was operated with damaged or loose dosing head screws, immediately separate the pump from the power supply!

Make sure the pump cannot be put back into operation by accident!

Dismantle the dosing head without connecting the pump to the power supply and make sure no dosing liquid has entered the pump housing. Proceed as described in section [9.4.1 Dosing liquid in the pump housing](#).



### 9.6 Repairs

#### Warning

The pump housing must only be opened by personnel authorized by Grundfos!

Repairs must only be carried out by authorized and qualified personnel!

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



#### Note

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

After consulting Grundfos, please send the pump, together with the safety declaration completed by a specialist, to Grundfos. The safety declaration can be found at the end of these instructions. It must be copied, completed and attached to the pump.

The pump must be cleaned prior to dispatch!

#### Caution

If dosing liquid has possibly entered the pump housing, state that explicitly in the safety declaration! Observe section [9.4 Diaphragm breakage](#).

If the above requirements are not met, Grundfos may refuse to accept delivery of the pump. The shipping costs will be charged to the sender.

## 10. Fault finding chart

Fault	Cause	Remedy
1. The dosing has stopped or the output is too low.	a) Valves leaking or blocked.	Check and clean valves.
	b) Valves incorrectly installed.	Remove and fit valves. Check that the arrow on the valve casing is pointing in the liquid flow direction. Check that all O-rings have been fitted correctly.
	c) Suction valve or suction pipe/hose leaking or blocked.	Clean and seal the suction pipe/hose.
	d) Suction lift too high.	Install the pump in a lower position. Install a priming tank.
	e) Viscosity too high.	Select the anti-cavitation function, see section <a href="#">6.15 Anti-cavitation</a> . Install a pipe/hose with larger cross-section. Fit spring-loaded valves.
	f) Pump out of calibration.	Calibrate the pump, see section <a href="#">8. Calibration</a> .
2. Pump dosing too little or too much.	a) Pump out of calibration.	Calibrate the pump, see section <a href="#">8. Calibration</a> .
3. Pump dosing irregularly.	a) Valves leaking or blocked.	Check and clean the valves.
4. Leakage from drain hole.	a) Diaphragm defective.	Install a new diaphragm.
5. Frequent diaphragm failures.	a) Diaphragm not fastened properly.	Install a new diaphragm and ensure that the diaphragm is fastened properly.
	b) Counter-pressure too high (measured at the pump discharge port).	Check the system. Check the injection valve.
	c) Sediment in dosing head.	Clean/flush the dosing head.

## 11. Disposal

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.

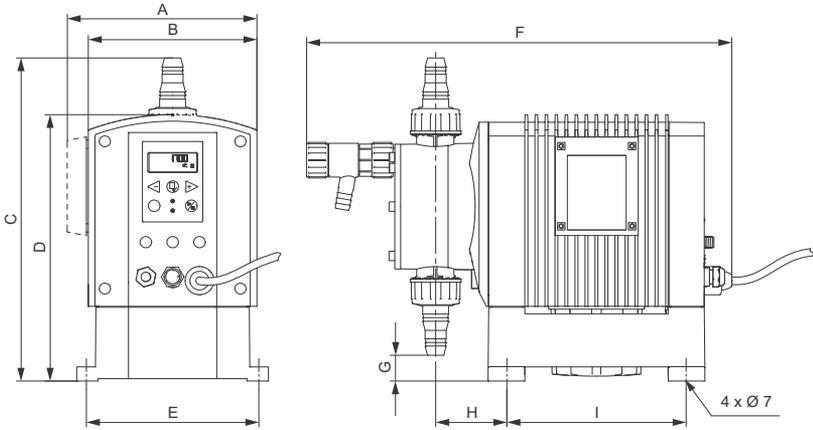


The crossed-out wheellie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local

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](http://www.grundfos.com/product-recycling).

## Dimensions



Dimensions are in inches (mm)

	DME 60		DME 150		DME 375		DME 940	
<b>A</b>	6.93	(176)	6.93	(176)	9.37	(238)	9.37	(238)
<b>B</b>	7.8	(198)	7.8	(198)	8.58	(218)	8.58	(218)
<b>C</b>	13.03	(331)	13.58	(345)	18.54	(471)	19.53	(496)
<b>D</b>	11.18	(284)	11.18	(284)	14.33	(364)	14.33	(364)
<b>E</b>	7.09	(180)	7.09	(180)	9.06	(230)	9.06	(230)
<b>F</b>	17.48	(444)	17.48	(444)	21.26	(540)	21.22	(539)
<b>G</b>	1.61	(41)	1.10	(28)	1.22	(31)	0.24	(6)
<b>H</b>	2.91	(74)	2.91	(74)	3.74	(95)	3.74	(95)
<b>I</b>	7.36	(187)	7.36	(187)	9.69	(246)	9.69	(246)

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## Appendix

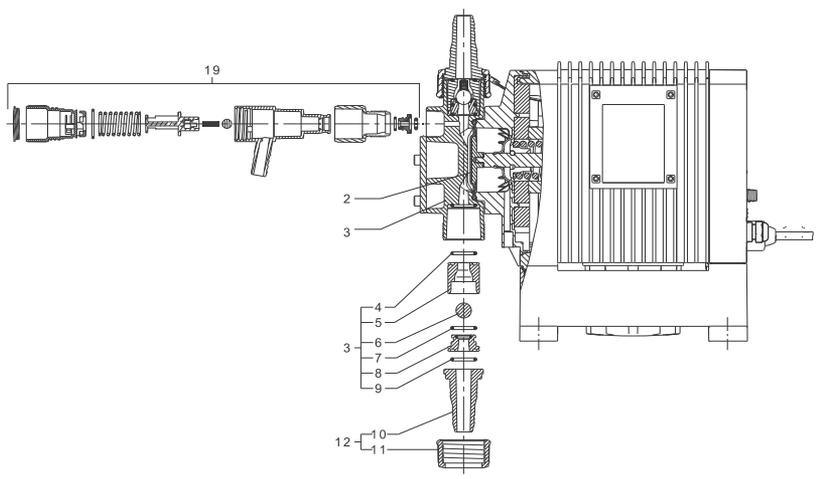
## Service kits, DME

Pump size	Valves	Connectors	Materials Dosing head/ Gaskets/ Valves	Complete dosing head with NPT connectors (no hose clamp connectors incl.)
DME 60	Standard	PVC 3/4" NPT	PP/EPDM/Ceramics	96549401
			PP/FKM/Ceramics	96549402
			PVDF/FKM/Ceramics	96549403
			Stainless steel/FKM/Stainless steel	96549404
	Spring loaded		PP/EPDM/Ceramics	96549405
			PP/FKM/Ceramics	96549406
			PVDF/FKM/Ceramics	96549407
			Stainless steel/FKM/Stainless steel	96549408
DME 150	Standard		PP/EPDM/Ceramics	96549409
			PP/FKM/Ceramics	96549431
			PVDF/FKM/Ceramics	96549432
			Stainless steel/FKM/Stainless steel	96549433
	Spring loaded		PP/EPDM/Ceramics	96549434
			PP/FKM/Ceramics	96549435
			PVDF/FKM/Ceramics	96549436
			Stainless steel/FKM/Stainless steel	96549437
DME 375	Standard	PVC 1 1/4" NPT	PP/EPDM/Glass	96561182
			PP/FKM/Glass	96561183
			PVDF/FKM/Glass	96561184
			Stainless steel/FKM/Stainless steel	96561185
	Spring loaded		PP/EPDM/Glass	96561186
			PP/FKM/Glass	96561187
			PVDF/FKM/Glass	96561188
			Stainless steel/FKM/Stainless steel	96561189
DME 940	Standard		PP/EPDM/Glass	96561200
			PP/FKM/Glass	96561201
			PVDF/FKM/Glass	96561202
			Stainless steel/FKM/Stainless steel	96561203
	Spring loaded		PP/EPDM/Glass	96561204
			PP/FKM/Glass	96561205
			PVDF/FKM/Glass	96561206
			Stainless steel/FKM/Stainless steel	96561207

<b>Front cover</b>	96520502
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<b>Vent valve pos. 1</b>	PP/EPDM/Ceramics	96520488
	PP/FKM/Ceramics	96520489
	PVDF/KFM/Ceramics	96520500
	SS/KFM/SS	96520501

<b>Power cord</b>	Schuko	96440333
	US	96440334
	Schweiz	96460537
	Japan	96460769
	Australia	96460770
	U.K.	96460772



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## Safety declaration

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

**Note**

Fill in this document using english or german language.

Product type (nameplate) \_\_\_\_\_

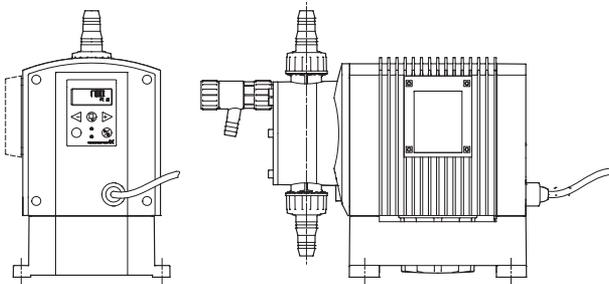
Model number (nameplate) \_\_\_\_\_

Dosing medium \_\_\_\_\_

### Fault description

Please make a circle around the damaged parts.

In the case of an electrical or functional fault, please mark the cabinet.



Please describe the error/cause of the error in brief.

Dosing liquid has possibly entered the pump housing.  
The pump must not be connected to the power supply! Danger of explosion!

We hereby declare that the pump has been cleaned and is completely free from chemical, biological and radioactive substances.

\_\_\_\_\_  
Date and signature

\_\_\_\_\_  
Company stamp

# CERTIFICATE OF CLEANLINESS

## HEALTH AND SAFETY CLEARANCE FORM

Please copy, fill in, sign this form and attach it to the pump returned for service along with a return material authorization number.

Product Description \_\_\_\_\_  
 Product Number \_\_\_\_\_ RMA # \_\_\_\_\_ Quantity \_\_\_\_\_

**APPLICATION:** The referenced product has been exposed to toxic or hazardous materials:  
 YES  NO If yes, complete SECTION A. If no, continue to SECTION B.

### SECTION A: TOXIC CLEARANCE

*(To be completed if applied substances ARE hazardous)*

Please specify all hazardous materials/substances used with the referenced product(s).

\_\_\_\_\_  
 \_\_\_\_\_

Provide the Material Safety Data Sheet for all materials referenced or list precautions to be taken when handling these substances. Also, provide any actions to be taken in the event of human contact with any liquid within the product (even after cleaning and/or flushing).

\_\_\_\_\_  
 \_\_\_\_\_

The product returned has been decontaminated, drained of liquid and is safe to handle. Provide decontamination method used.

\_\_\_\_\_ Initial/Date \_\_\_\_\_

### SECTION B: NON-TOXIC CLEARANCE

*(To be completed if applied substances ARE NOT hazardous)*

The product returned has not handled or been in contact with any toxic or hazardous substances. The product has been drained of liquid and is safe to handle.

\_\_\_\_\_ Initial/Date \_\_\_\_\_

I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport, by all modes, according to applicable international and national governmental regulations. Health and safety issues are clearly understood and will be given consideration during shipment. (A repair or inspection of product will only be undertaken when this certificate has been completed and authorized by a qualified member of staff employed by the returning company.)

COMPANY NAME \_\_\_\_\_

NAME \_\_\_\_\_ POSITION \_\_\_\_\_

SIGNATURE \_\_\_\_\_ PHONE \_\_\_\_\_

A return material authorization number from Grundfos, along with a completed and signed copy of this form **must** accompany the returned product. It is the senders responsibility to package, transport and complete the shipping documents regarding the nature of the product shipped. Irrespective of this, Grundfos reserves the right to reject the service order for other reasons. Grundfos will rely on this representation and will look to the customer for reimbursement of any and all costs, claims or damages incurred, including attorney's fees, if any representation is not correct. **Radioactive products will not be accepted for repair.**



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