

DME, Variant B (60-940 l/h)

Installation and operating instructions



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English (GB) Installation and operating instructions

Original 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. 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.

1.1 Symbols used in this document



Warning

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



Caution

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



Note

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

1.2 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.

1.3 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 power supply. 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.

1.4 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.

1.5 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 pressurised 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 not be used with crystallising 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!

Caution

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.

Ensure that parts in contact with 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.

1.6 Diaphragm breakage

If the diaphragm leaks or is broken, dosing liquid escapes from the drain opening (fig. 1) on the dosing head. Observe section [8.4 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 [8.3.2 Dismantling the diaphragm and valves](#).



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

- Perform regular maintenance. See section [8.1 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 [8.3.2 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 recognise 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.

1.7 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 [8.3.2 Dismantling the diaphragm and valves](#).



2. 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 end 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.

2.1 Applications

The pump is suitable for liquid, non-abrasive, non-flammable, non-crystallising 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.

2.2 Improper operating methods

The operational safety of the pump is only guaranteed if it is used in accordance with section [2.1 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 not be used with crystallising media.



Warning

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



Warning

A sunscreen is required for outdoor installation!

2.3 Type key

(Cannot be used for pump configuration.)

| Code | Example | DME | 60 - | 10 | B - | PP/ | E/ | C - | F - | 3 | 1 | 1 | F |
|---------------------------------|---|-----|------|----|-----|-----|----|-----|-----|---|---|---|---|
| | Pump range | | | | | | | | | | | | |
| | Maximum capacity [l/h]: 60 150 375 940 | | | | | | | | | | | | |
| | Maximum pressure [bar]: 4 10 | | | | | | | | | | | | |
| B | Control variant: Basic | | | | | | | | | | | | |
| PP PV SS | Dosing head material: Polypropylene PVDF Stainless steel 1.4401 | | | | | | | | | | | | |
| E T V | Gasket material: EPDM PTFE FKM | | | | | | | | | | | | |
| C G SS T | Valve ball material: Ceramics Glass Stainless steel 1.4401 PTFE | | | | | | | | | | | | |
| F S | Control panel: Front-fitted Side-fitted | | | | | | | | | | | | |
| 3 | Voltage: 1 x 100-240 V, 50/60 Hz | | | | | | | | | | | | |
| 1 2 | Valves: Standard valve Spring-loaded valve | | | | | | | | | | | | |
| A1 A2 Q | Connection, suction/discharge: Threaded Rp 3/4 Threaded Rp 1 1/4 Tubing 19/27 mm + 25/34 mm | | | | | | | | | | | | |
| F G I B J E L | Mains plug: EU (Schuko) UK AU USA JP CH Argentina | | | | | | | | | | | | |

3. Technical data

3.1 Mechanical data

| | DME 60 | DME 150 | DME 375 | DME 940 |
|---|----------------------------|---------|---------|---------|
| Maximum capacity* ¹ [l/h] | 60 | 150 | 376 | 940 |
| Maximum capacity with anti-cavitation 75 %* ¹ [l/h] | 45 | 112 | 282 | 705 |
| Maximum capacity with anti-cavitation 50 %* ¹ [l/h] | 33.4 | 83.5 | 210 | 525 |
| Maximum capacity with anti-cavitation 25 %* ¹ [l/h] | 16.1 | 40.4 | 101 | 252 |
| Maximum pressure [bar] | 10 | 4 | 10 | 4 |
| Maximum stroke rate per minute [strokes/min.] | 160 | | | |
| Maximum suction lift during operation [m] | 6 | | | |
| Maximum suction lift when priming with wet valves [m] | 1.5 | | | |
| Maximum viscosity with spring-loaded valves* ² [mPas] | 3000 mPas at 50 % capacity | | | |
| Maximum viscosity without spring-loaded valves* ² [mPas] | 200 | | | |
| Diaphragm diameter [mm] | 79 | 106 | 124 | 173 |
| Liquid temperature [°C] | 0 to 50 | | | |
| Ambient temperature [°C] | 0 to 45 | | | |
| Accuracy of repeatability | ± 1 % | | | |
| Sound pressure level [dB(A)] | < 70 | | | |

*¹ Irrespective of counter pressure

*² Maximum suction lift 1 metre

3.2 Electrical data

| | DME 60 | DME 150 | DME 375 | DME 940 |
|--|-------------------------|---------|---------|---------|
| Supply voltage [VAC] | 1 x 100-240 | | | |
| Maximum current consumption [A] | at 100 V | 1.20 | 2.4 | |
| | at 230 V | 0.60 | 1.0 | |
| Maximum power consumption P ₁ [W] | 61.33 | 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 | | | |

3.3 Dimensions

See dimensions at the end of these instructions.
All dimensions are in mm.

4. Installation

4.1 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.

4.2 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 weathers.

4.3 Installation of pump

- See also the installation example in section [4.4 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 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. 1.

Caution

Never attach a hose to the drain opening.

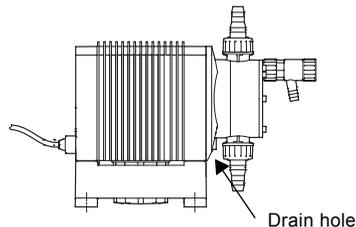


Fig. 1

4.4 Installation example

The drawing in fig. 2 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.

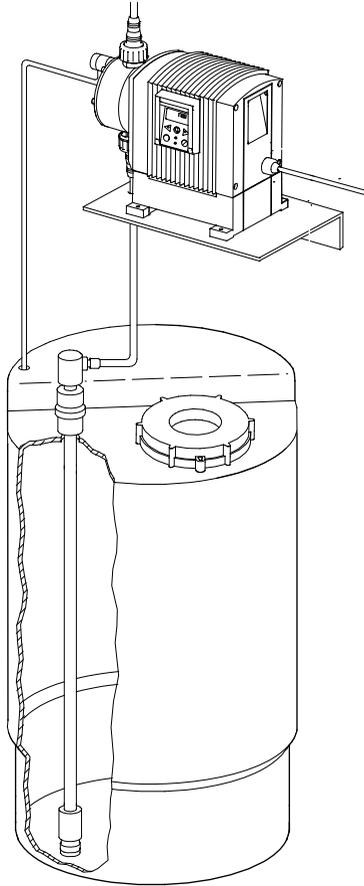


Fig. 2

4.5 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 [3.2 Electrical data](#).

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 earth fault currents with DC content (pulsating DC) and smooth DC earth fault currents occur. This means that a RCD type B, sensitive to universal current, must be used.



5. Functions

5.1 Control panel

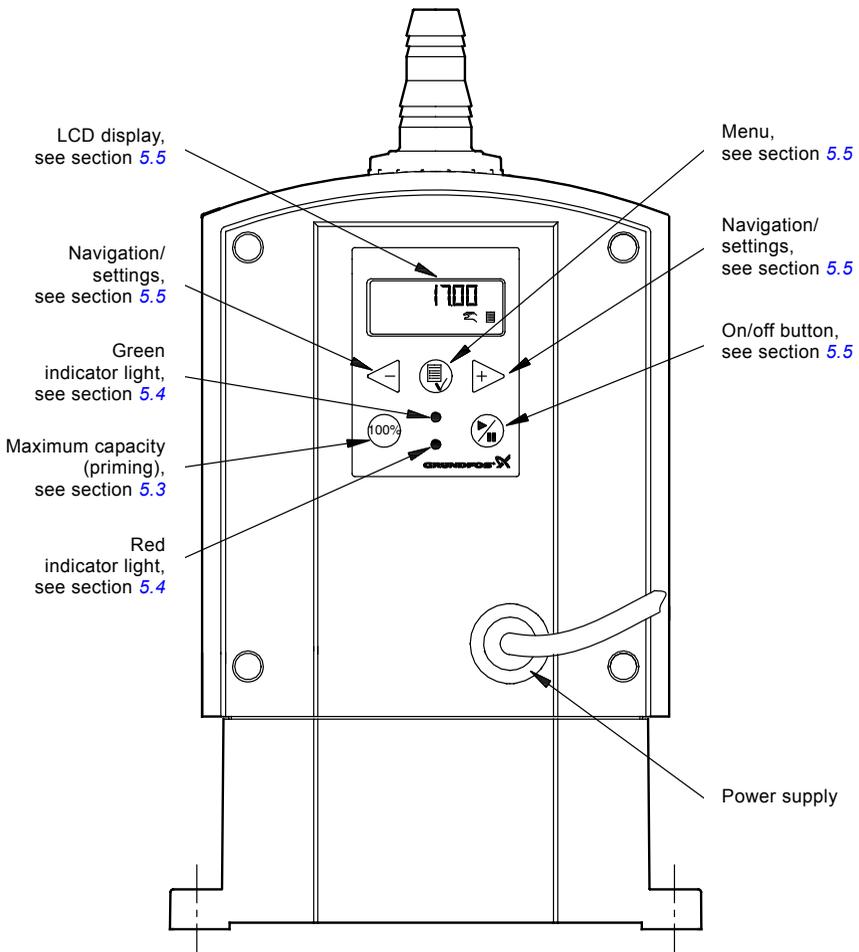


Fig. 3

TM02 8601 0604

5.2 Start/stop of pump

The pump can be started/stopped locally on the pump control panel.

5.3 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.

5.4 Indicator lights

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

The functions of the indicator lights appear from the table below:

| Condition | Green LED | Red LED | Display |
|--|-------------------|---------|-------------------|
| Pump running | On | Off | Normal indication |
| Set to stop | Flashing | Off | Normal indication |
| Pump fault | Off | On | EEPROM |
| Supply failure | Off | Off | OFF |
| Overheating | Off | On | MAX. TEMP. |
| Internal communication fault | Off | On | INT. COM. |
| Internal Hall fault* ¹ | Off | On | HALL |
| Maximum pressure exceeded* ² | Off* ³ | On | OVERLOAD |
| No motor rotation detected* ¹ | Off | On | ORIGO |

*¹ Please contact a Grundfos service centre.

*² Alarms can be reset  when the faults have been corrected.

*³ The pump will make 10 attempts to restart before going into permanent OFF mode.

5.5 Menu

The pump features a user-friendly menu which is activated by pressing the  button. During start-up, all texts will appear in English language. To select language, see section [5.12 Language](#).

All menu items are described in the following sections. When  appears at a menu item, it means that this item is activated. By selecting "RETURN" anywhere in the menu structure, you will return to the operating display without changes.

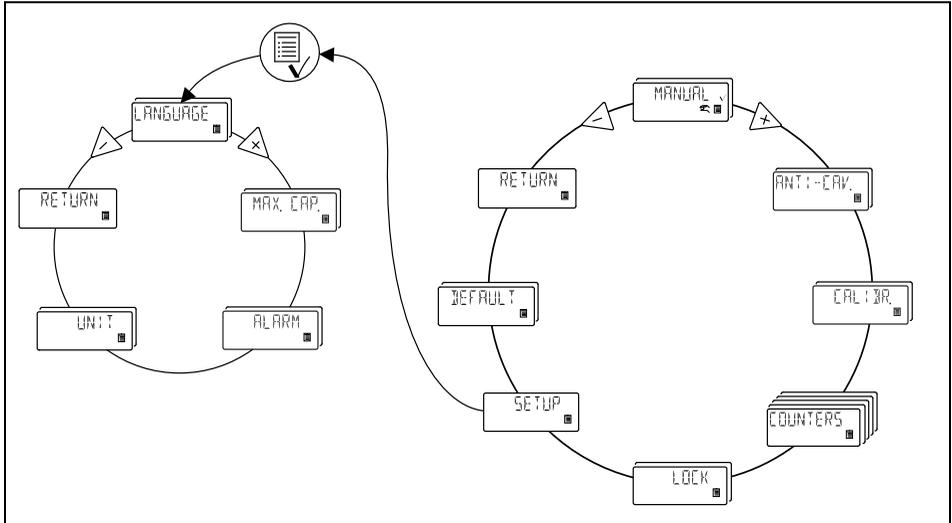


Fig. 4



See section [5.6](#)
 See section [5.7](#)
 See section [7](#).
 See section [5.9](#)
 See section [5.15](#)
 See section [5.10](#)



See section [5.11](#)
 See section [5.12](#)
 See section [5.8](#)
 See section [5.13](#)
 See section [5.14](#)

5.6 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: 75 ml/h - 60 l/h
 DME 150: 200 ml/h - 150 l/h
 DME 375: 500 ml/h - 375 l/h
 DME 940: 1200 ml/h - 940 l/h

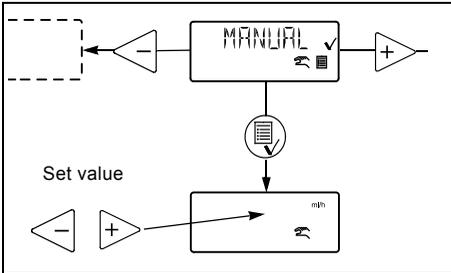


Fig. 5

5.7 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 and
- 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 [3.1 Mechanical data](#).

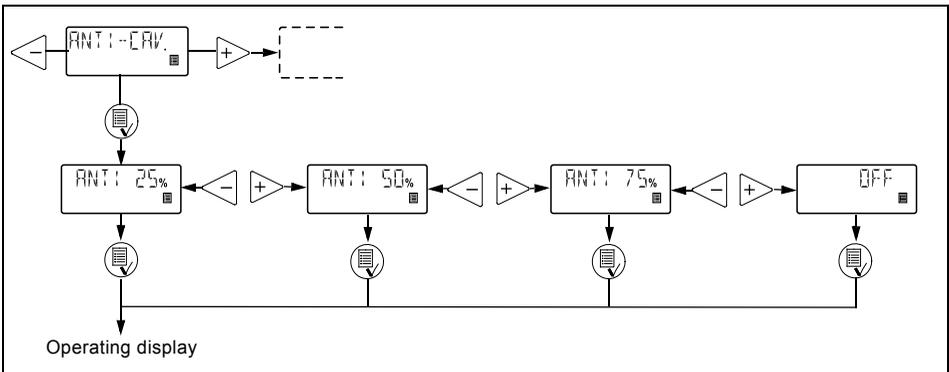


Fig. 6

5.8 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 (100%), see section [5.3 Priming/venting of pump](#).

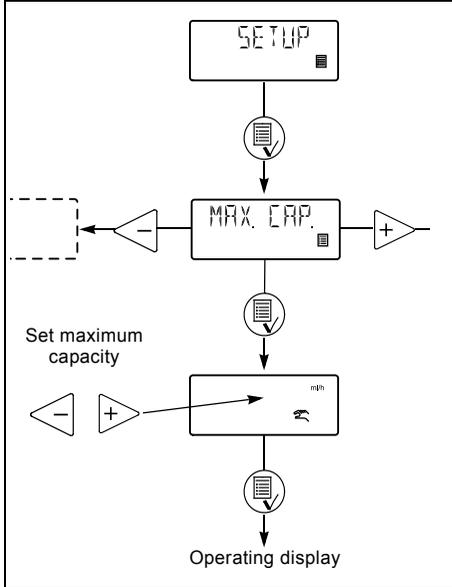


Fig. 7

5.9 Counters

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

- **"QUANTITY"**
Accumulated value of dosed quantity in litres 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.

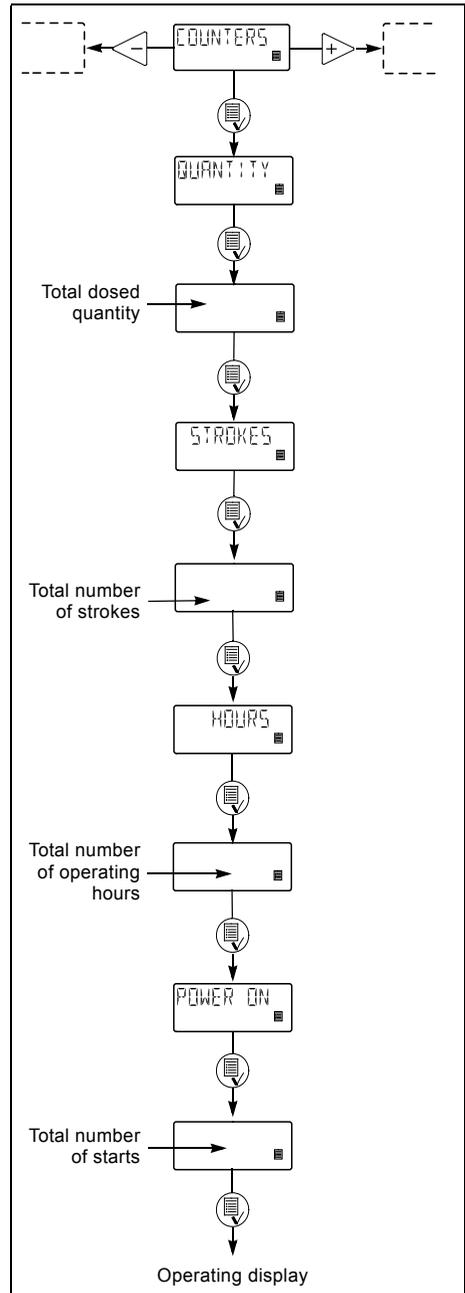


Fig. 8

5.10 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 |
| Capacity limitation: | Maximum capacity |
| Alarm reset required to restart the pump | |
| Language: | English |
| Units: | Metric |

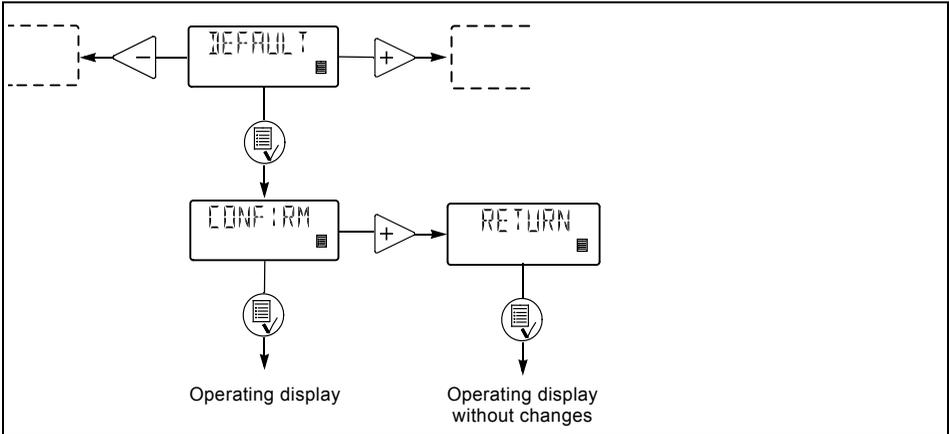


Fig. 9

5.11 Return



Fig. 10

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.

5.12 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

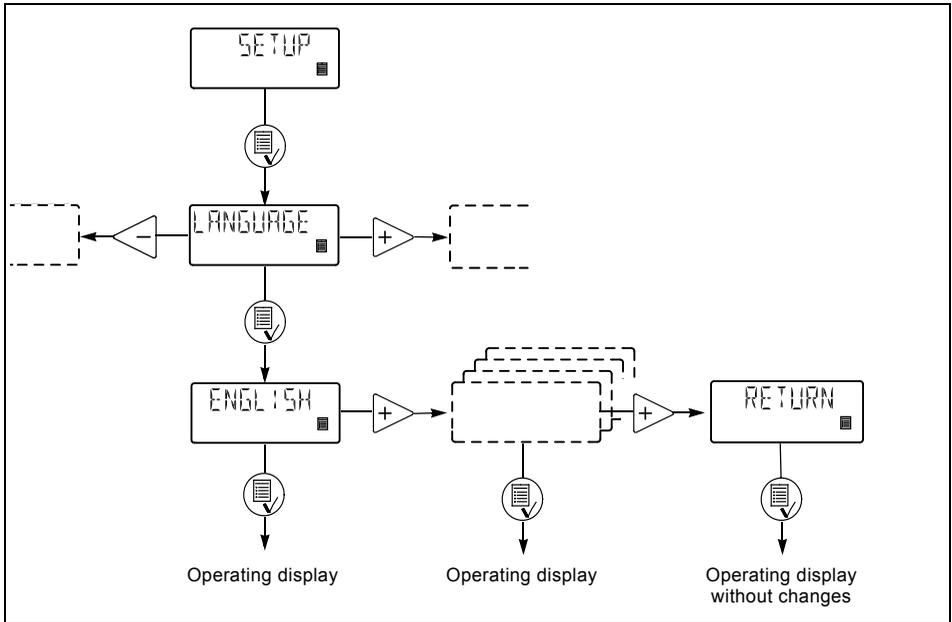


Fig. 11

5.13 Alarm

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

5.14 Measuring units

It is possible to select metric units (litre/millilitre) or US units (gallons/millilitre).

Metric measuring units:

- Set the quantity to be dosed in litres per hour (l/h) or millilitres per hour (ml/h).
- For calibration**, set the quantity to be dosed in ml per 100 strokes.
- Under the "QUANTITY" menu item in the "COUNTERS" menu, the dosed quantity is indicated in litres.

US measuring units:

- Set the quantity to be dosed in gallons per hour (gph).
- For calibration**, set the quantity to be dosed in ml per 100 strokes.
- Under the "QUANTITY" menu item in the "COUNTERS" menu, the dosed quantity is indicated in US gallons (gal).

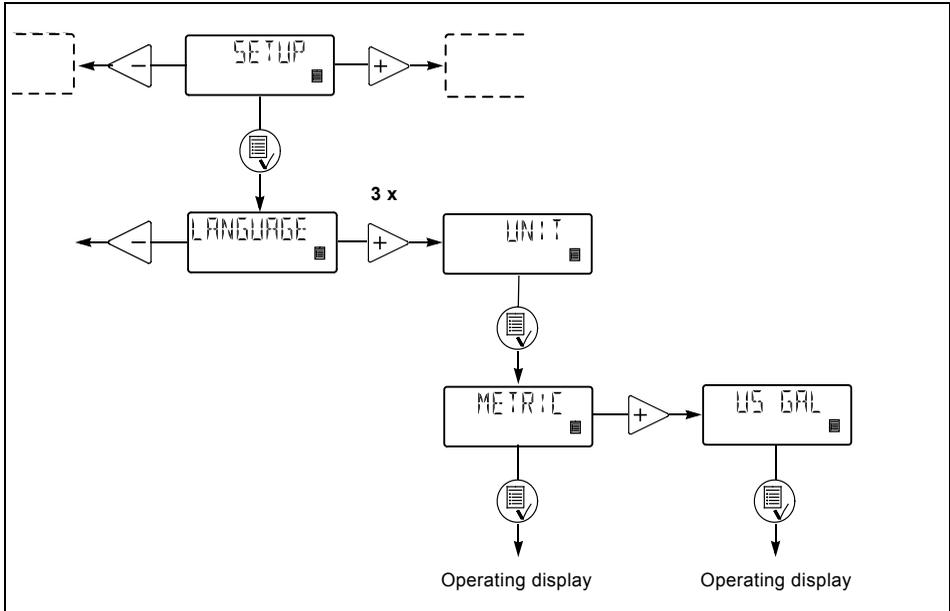


Fig. 12

5.15 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, "_____" 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 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 "_____" . 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 "_____" . 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.

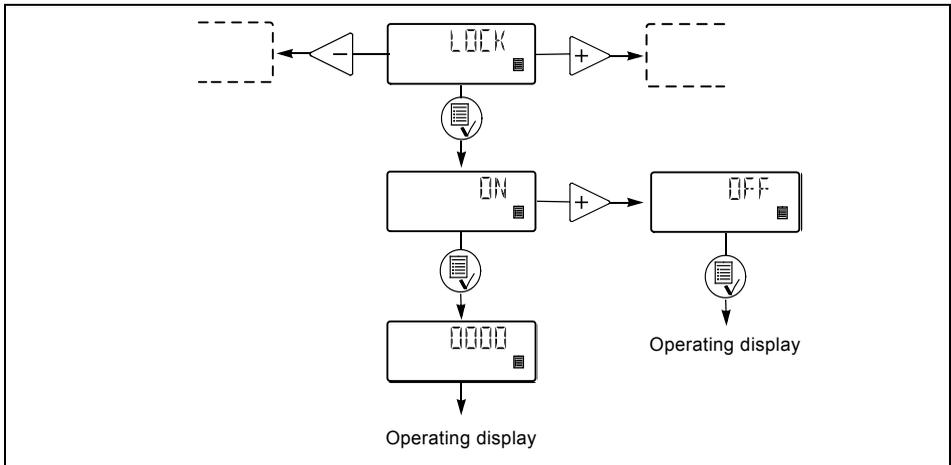


Fig. 13

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 "_____" .

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.

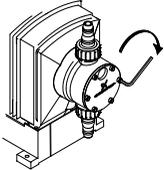
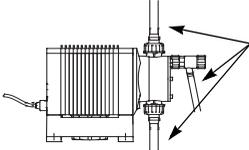
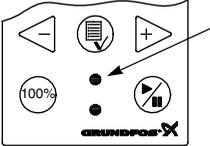
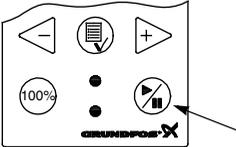
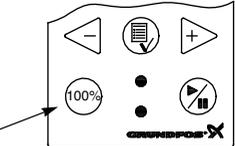
Deactivating the locking function:

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.

6. Start-up

| Step | Action |
|--|--|
| <p>1</p>  | <p>Prior to start-up, retighten the dosing head screws:</p> <ul style="list-style-type: none"> • Cross-tighten the dosing head screws with a torque wrench once before commissioning and again after 2-5 operating hours at 5.5 Nm (+ 0.5/- 0 Nm). |
| <p>2</p>  | <p>Connect the hoses/pipes:</p> <ul style="list-style-type: none"> • Connect the suction and dosing tubes/pipes to the pump. • Connect a tube to the vent valve, if required, and lead the hose to the tank. • Never attach a hose to the drain opening. |
| <p>3</p>  | <p>Switch on the electricity supply:</p> <ul style="list-style-type: none"> • The display is on. • The green indicator light is flashing (the pump has stopped). • Select language, if required, see section 5.12 Language. |
| <p>4</p>  | <p>Start the pump:</p> <ul style="list-style-type: none"> • Start the pump by pressing the on/off button. • The green indicator light is permanently on. |
| <p>5</p>  | <p>Priming/venting:</p> <ul style="list-style-type: none"> • Press the 100% button on the pump control panel and let the pump run without a counter pressure. Open the vent valve, if required. When the buttons 100% and > are pressed simultaneously during priming, the pump can be set to run for a specific number of seconds at maximum capacity. |
| <p>6</p>  | <p>Calibration:</p> <ul style="list-style-type: none"> • When the pump has been primed and is running at the right counter pressure, calibrate the pump, see section 7. Calibration |

If the pump is not operating satisfactorily, see section [9. Fault finding chart](#).

7. 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 [7.1 Direct calibration](#).
- **Check calibration.** See section [7.2 Check calibration](#).

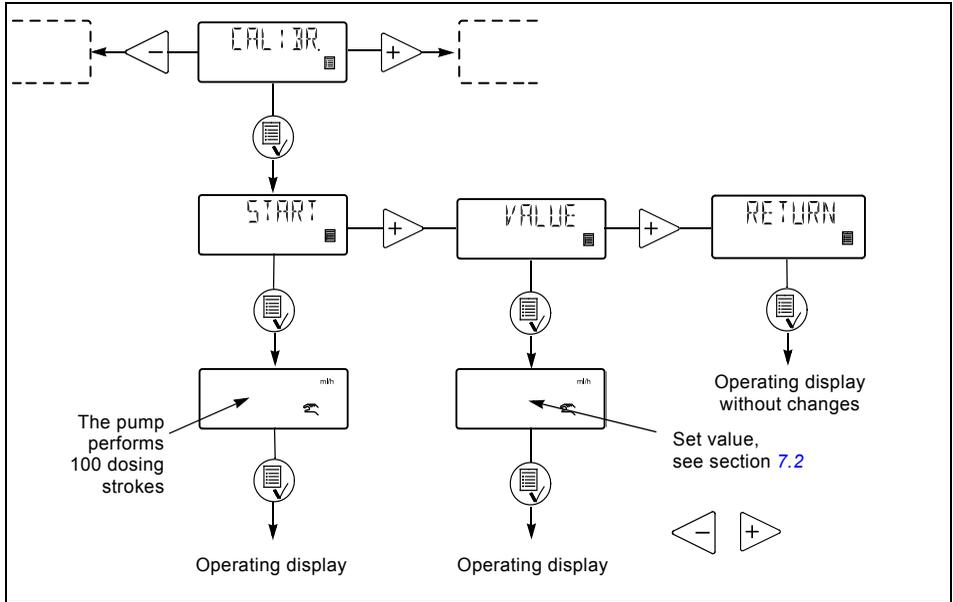


Fig. 14

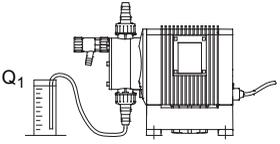
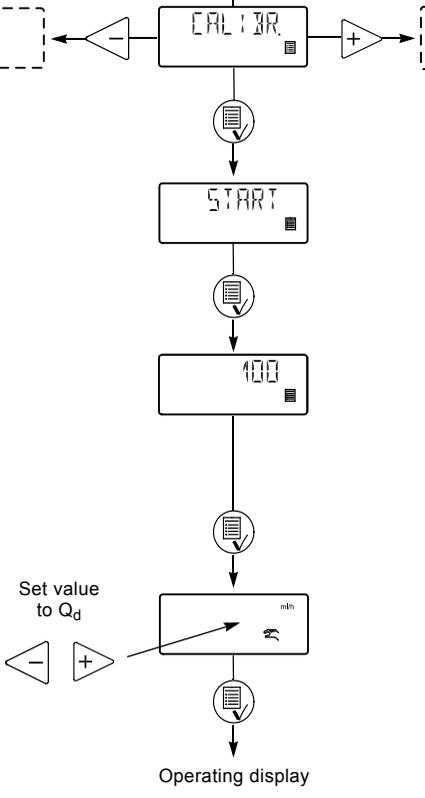
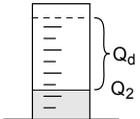
7.1 Direct calibration

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 5.5 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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7.2 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 [5.9 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 [5.9 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.

8. 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.

8.1 Regular maintenance

| Interval | Task |
|--|---|
| | Check, if liquid leaks from the drain opening (fig. 1) and if the drain opening is blocked or soiled. If so, follow the instructions given in section 8.4 Diaphragm breakage . |
| Daily | Check, if liquid leaks from the dosing head or valves. 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 8.5 Operation with loose dosing head screws . If necessary, tighten valves and cap nuts, or perform service (see 8.3 Perform service). |
| Weekly | Clean all pump surfaces with a dry and clean cloth. |
| Every 3 months | Check dosing head screws. If necessary, cross-tighten dosing head screws with a torque wrench at 5.5 Nm (+ 0.5/- 0 Nm). Replace damaged screws immediately. |
| Every 2 years or 8000 operating hours* | Replace diaphragm and valves (see 8.3 Perform service) |

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

8.2 Cleaning

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

8.3 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).

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!

8.3.1 Dosing head overview

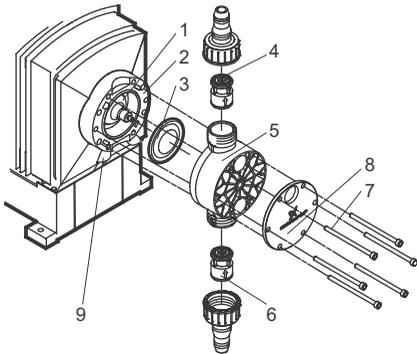


Fig. 15 Dosing head, exploded view (without deaeration valve)

| | |
|---|---|
| 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 |

8.3.2 Dismantling the diaphragm and valves

Before dismantling, read section [8.4 Diaphragm breakage](#) and section [8.5 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. 15.

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 [8.3.3 Reassembling the diaphragm and valves](#). Otherwise proceed as described in section [8.4.1 Dosing liquid in the pump housing](#).

8.3.3 Reassembling the diaphragm and valves

Please observe as well section

- Caution** [4. Installation](#), [5.3 Priming/venting of pump](#) and [6. 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 [8.4.1 Dosing liquid in the pump housing](#).

This section refers to fig. 15.

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: 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 5.5 Nm (+ 0.5/- 0 Nm).

Caution

7. Deaerate dosing pump (see section [5.3 Priming/venting of pump](#)).

8.4 Diaphragm breakage

If the diaphragm leaks or is broken, dosing liquid escapes from the drain opening (fig. 15, pos. 9) on the dosing head flange.

In case of diaphragm breakage, the safety diaphragm (fig. 15, pos. 1) protects the pump housing against ingress of dosing liquid.

When dosing crystallising liquids the drain opening can be blocked by crystallisation. If the pump is not taken out of operation immediately, a pressure can build up between the diaphragm (fig. 15, pos. 3) and the safety diaphragm in the flange (fig. 15, 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 [8.3.2 Dismantling the diaphragm and valves](#).

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

- Perform regular maintenance. See section [8.1 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 [8.3.2 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 recognise 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.

8.4.1 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 [8.6 Repairs](#).
- If a repair isn't economically reasonable, dispose of the pump observing the information in section [10. Disposal](#).

8.5 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 [8.3.2 Dismantling the diaphragm and valves](#).

8.6 Repairs

Warning

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

Repairs must only be carried out by authorised 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 authorised 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 [8.4 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.

9. Fault finding chart

| Fault | Cause | Remedy |
|--|--|---|
| The dosing has stopped or the output is too low. | Valves leaking or blocked. | Check and clean valves. |
| | 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. |
| | Suction valve or suction pipe/hose leaking or blocked. | Clean and seal the suction pipe/hose. |
| | Suction lift too high. | Install the pump in a lower position. Install a priming tank. |
| | Viscosity too high. | Select the anti-cavitation function, see section 5.7 Anti-cavitation . Install a pipe/hose with larger cross-section. Fit spring-loaded valves. |
| Pump out of calibration. | Pump out of calibration. | Calibrate the pump, see section 7. Calibration |
| Pump dosing too little or too much. | Pump out of calibration. | Calibrate the pump, see section 7. Calibration |
| Pump dosing irregularly. | Valves leaking or blocked. | Check and clean the valves. |
| Leakage from drain hole. | Diaphragm defective. | Install a new diaphragm. |
| Frequent diaphragm failures. | Diaphragm not fastened properly. | Install a new diaphragm and ensure that the diaphragm is fastened properly. |
| | Counter-pressure too high (measured at the pump discharge port). | Check the system. Check the injection valve. |
| | Sediment in dosing head. | Clean/flush the dosing head. |

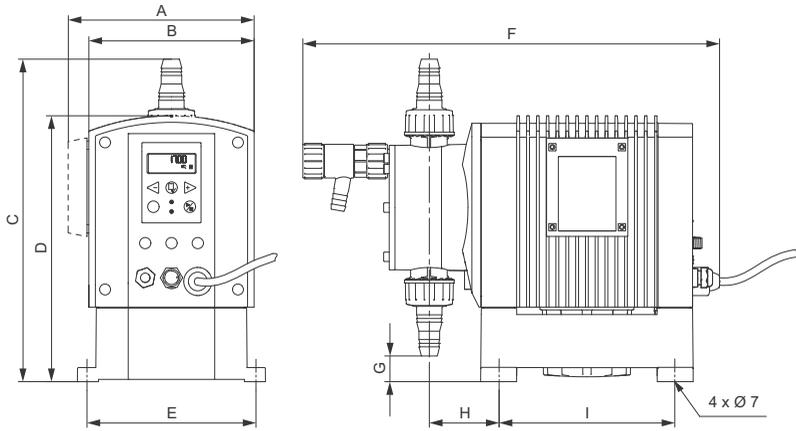
Subject to alterations.

10. Disposal

This product and all its associated parts must be disposed of in an environmentally friendly manner. Use appropriate waste collection services. If there is no such facility or the facility refuses to accept the materials used in the product, the product can be sent to the nearest Grundfos company or Grundfos service centre.

Appendix

Dimensions



TM02 7062 03.15

| | DME 60 | DME 150 | DME 375 | DME 940 |
|----------|--------|---------|---------|---------|
| A = [mm] | 176 | 176 | 238 | 238 |
| B = [mm] | 198 | 198 | 218 | 218 |
| C = [mm] | 331 | 345 | 471 | 496 |
| D = [mm] | 284 | 284 | 364 | 364 |
| E = [mm] | 180 | 180 | 230 | 230 |
| F = [mm] | 444 | 444 | 540 | 539 |
| G = [mm] | 41 | 28 | 31 | 6 |
| H = [mm] | 74 | 74 | 95 | 95 |
| I = [mm] | 187 | 187 | 246 | 246 |

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