SMART Digital S DDA-C

Installation and operating instructions

SMART Digital S DDA-C
Installation and operating instructions
(all available languages)
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GRUNDFOS

SMART Digital S DDA-C

English (GB)

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Original installation and operating instructions

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1. General information

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

1.1 Hazard statements

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

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

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

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

The hazard statements are structured in the following way:

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

1.2 Notes

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

Observe these instructions for explosion-proof products.

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

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

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

Tips and advice that make the work easier.

1.3 Target group

These installation and operating instructions are intended for professional installers and for the operators of the product.

Qualification and training

The persons 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 persons must be precisely defined by the operator. If necessary, the persons must be trained appropriately.

Risks of not observing the safety instructions

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

The following hazards may arise:

- personal injury from exposure to electrical, mechanical or chemical influences
- damage to the environment or personal injury from leakage of harmful substances.

1.4 Safety instructions for the operator and user

WARNING
Electric shock
Death or serious personal injury
- Keep liquids away from the power supply and electrical components.

Before starting work on the pump, make sure the pump is in operating state "Stop" or is disconnected from the power supply.

The system must be depressurised.

Use the power plug to separate the pump from the power supply.

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

Information attached to the pump must be observed.

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

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

Only original accessories and original spare parts should be used.

1.5 Radiation safety information

CAUTION
Radiation
Minor or moderate personal injury
- Locate the product at a minimum distance of 20 cm (0.66 feet) from any body parts. Human tissue may be heated by RF energy.

1.5.1 RF safety

Installers and end users must be provided with these installation and operating instructions and operating conditions for satisfying RF exposure compliance.

1.5.2 Bluetooth information

Frequency of operation	2400 - 2483.5 MHz (ISM band)
Modulation type	GFSK
Data rate	2 Mbps
Transmit power	5 dBm EIRP with internal antenna

1.5.3 Radio frequency radiation exposure information (for Canada and USA)

CAUTION
Radiation
Minor or moderate personal injury
- This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated with a minimum distance of 20 cm (0.66 feet) between the radiator and your body.

This device complies with part 15 of the FCC Rules and with license exempt RSSs of Innovation, Science & Economic Development Canada.

Changes or modifications made to this equipment not expressly approved by Grundfos may void the FCC authorization to operate this equipment.

Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

1.5.4 EMC statements for USA

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

1.5.5 Radio approvals

The product uses an electronic label (e-label) that displays the conformity marking and the corresponding warnings.

The full list can be found in the pump menu under **Info** > **Regulations**.

See section **Regulations** for more information.

Related information

7.7.2.1 Regulations

1.6 Cyber security

The product must be installed in a location with access control to prevent unauthorized access to the product.

The product must only be connected to protected network subnets with strict access control.

The SMART Digital S DDA-C acts as fieldbus slave for the GENIbus and Modbus RTU or Modbus TCP protocols. These protocols use the underlying network communication. As this does not have any built-in security, it is highly recommended to allow physical access to the installation to authorised persons only, and adhere to the initiatives suggested in the local safety risk assessment.

1.6.1 Network interfaces and services

In the factory default state, the product exposes the following network interfaces:

Interface	Description
RJ45	Wired Ethernet connectivity

In the factory default state, the product exposes the following services over its network interfaces:

Interface	Network service	Description
RJ45	Modbus TCP	TCP/IP-based fieldbus

Related information

7.19.5 Ethernet RJ45

1.7 Safety of the system in the event of a failure in the dosing pump

WARNING
Chemical hazard
Death or serious personal injury

- Make sure that no chemicals released from the pump or no damaged lines impair system parts and buildings.
- We recommend the installation of leak monitoring solutions and drip trays.

The dosing pump has been 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.

According to EN ISO 13850, the system must be connected to an external emergency stop device or emergency shutdown device.

1.8 Dosing chemicals

WARNING
Chemical hazard
Death or serious personal injury

- Observe the safety data sheets and safety instructions of the chemical manufacturer when handling chemicals.
- Wear personal protective equipment when working with chemicals.

When dosing chemicals, observe the following:

- Before switching on the power supply, the dosing lines must be connected in such a way that no chemical in the dosing head can spray out and put people at risk.
- The dosing medium is pressurised and can be harmful to health or the environment.
- When working with chemicals, the accident prevention regulations applicable at the installation site must be applied.
- A de-aeration hose routed into a container, such as a drip tray, must be connected to the de-aeration valve.
- The dosing medium must be in its liquid aggregate state.
- The freezing and boiling points of the dosing medium must be observed.
- The resistance of the parts that come into contact with the dosing medium, such as dosing head, valve ball, gaskets and lines, depends on the medium, media temperature and operating pressure.
- Parts in contact with the dosing media must be resistant to the dosing medium under operating conditions.

For more information, see the list of pumped liquids in the data booklet. See also *Liquids | Grundfos*.

1.9 Diaphragm leakage safety measures

WARNING
Danger of explosion if dosing liquid has entered the pump housing
Death or serious personal injury
If the diaphragm is damaged, dosing liquid can enter the pump housing.

- In case of diaphragm leakage, immediately separate the pump from the power supply.
- Make sure the pump cannot be started unintentionally.
- Disassemble the dosing head without connecting the pump to the power supply and check if dosing liquid has entered the pump housing.

WARNING
Chemical hazard
Death or serious personal injury

- Do not operate the pump with blocked or soiled drain opening.
- Do not attach a hose to the drain opening.
- Do not operate the pump with damaged or loose dosing head screws.

If the diaphragm is leaking or broken, dosing liquid leaks from the drain opening on the flange of the dosing head. See sections Product overview and Dosing head overview.

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

- Perform regular maintenance.
- The drain opening may be blocked by crystallizing media.
- Do not operate the pump with blocked or soiled drain opening.
  - If the drain opening is blocked or soiled, proceed as described in the section about disassembling in case of diaphragm leakage.
- Do not attach a hose to the drain opening.
  - If a hose is attached to the drain opening, it is not possible to see whether dosing liquid is leaking out.
- Take suitable precautions to prevent leaking dosing liquid from causing harm to health or damage to property.
- Do not operate the pump with damaged or loose dosing head screws.

Related information

3.6 Product overview
8.1 Maintenance schedule
8.4 Dosing head overview
8.5 Diaphragm leakage
8.5.1 Disassembling the diaphragm in case of diaphragm leakage

1.10 Battery statements

WARNING
Ingestion hazard
Death or serious personal injury

- Keep new and used batteries out of reach of children.
- Seek immediate medical attention if a battery is suspected to be swallowed or inserted inside any part of the body.
- A swallowed button cell battery can cause internal chemical burns in as little as 2 hours.

The product contains a button cell battery.

- Type CR2032,
- nominal voltage 3 V,
- non-rechargeable,
- removable,
- CE compliant.

To avoid risks of ingestion, observe the following:

- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information.
- Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children. Do not dispose of batteries in household trash or incinerate.
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations.
- Do not force discharge, recharge, disassemble, heat above 80°C/176°F or incinerate. Doing so may result in injury due to venting, leakage or explosion resulting in chemical burns.
- Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.
- Ensure the batteries are installed correctly according to polarity (+ and -).

See section Replacing the battery in the cube front.

Related information

8.6 Replacing the battery in the cube front

2. Handling and storing the product

2.1 Storage

When storing the product, make sure you comply with the following:

- Observe the permissible ambient conditions. See section Technical data.
- The storage location must be protected from rain, humidity, condensation, direct sunlight and dust.
- The product must be drained completely.
- The product must be cleaned.

Related information

4. Technical data
4.1 Technical data for CIP (Clean-In-Place) applications

2.2 Unpacking

The stickers on the pump must not be damaged.
If the stickers are damaged, this may invalidate the warranty.

When unpacking the product, make sure you comply with the following:

- Install the product as soon as possible after unpacking.
- Observe the permissible ambient conditions.

2.3 Transport

When transporting the product, make sure you comply with the following:

- The product must only be transported by trained persons.
- Wear personal protective equipment.
- Observe the permissible ambient conditions. See section Technical data.
- The product must be drained completely.
- The product must be cleaned.
- Use the original packaging or equivalent to protect the product during transport.
- Secure the product during transport to prevent it from tilting or moving.
- Avoid strong impact loads.
- If the pump is installed in a system during transport, make sure it is secured on the mounting plate with the 6 vertical safety screws.

Related information

4. Technical data

3. Product introduction

SMART Digital dosing pumps are self-priming diaphragm pumps.
SMART S DDA pump models consist of a housing with stepper motor and electronics, a dosing head with diaphragm and valves, and a control cube.
Dosing features:

- There is optimal intake even with degassing media, as the pump always works at full suction stroke volume.
- There is continuous dosing, as the dosing medium is sucked up with a short suction stroke, regardless of the current dosing flow, and dosed with the longest possible dosing stroke.

3.1 Intended use

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

The dosing medium must be in its liquid aggregate state.
Observe the freezing and boiling points of the dosing medium.
Sun protection is required for outdoor installation.

The areas of application are the following:

- drinking water treatment,
- wastewater treatment,
- swimming pool water treatment,
- boiler water treatment,
- CIP (Clean-In-Place),
- cooling water treatment,
- process water treatment,
- wash plants,
- chemical industry,
- ultrafiltration processes and reverse osmosis,
- irrigation,
- paper and pulp industry,
- food and beverage industries.

Statement for drinking water treatment in the US and Canada:

The dosing pump is approved according to NSF 61/372 if this is indicated on the nameplate.

Certification is based upon a dose rate that yields a sodium hydroxide (NaOH) concentration in potable water that does not exceed 100 mg/l, a sodium hypochlorite (NaOCl) concentration in potable water that does not exceed 80 mg/l, and a chlorine dioxide (ClO2) concentration in potable water that does not exceed 0.8 mg/l.

Approved chemicals:

- HCl
- NaClO2
- ClO2
- NaOH
- NaOCl

Related information

4. Technical data

4.1 Technical data for CIP (Clean-In-Place) applications

3.2 Improper operating methods

WARNING
Chemical hazard
Death or serious personal injury

- Do not dose flammable liquids.
- Do not use improper hoses and pipes.
- Do not use improper hydraulic connections.

The pump is not approved for operation in potentially explosive areas.

Do not use a wrong supply voltage.
Do not use a wrong electrical connection.
Do not manipulate or cut the power plug or cable.

Frequent disengagement from the power supply, for example with a relay, can result in damage to the pump electronics or in breakdown of the pump. The dosing accuracy is also reduced as a result of internal start procedures.
Do not control the pump via the power supply for dosing purposes.
Only use the **External stop** function to start or stop the pump.

Only use the de-aeration valve for de-aerating the pump. Make sure the de-aeration valve is closed during normal operation.

The operational safety of the pump is only guaranteed if it is used in accordance with section Intended use.

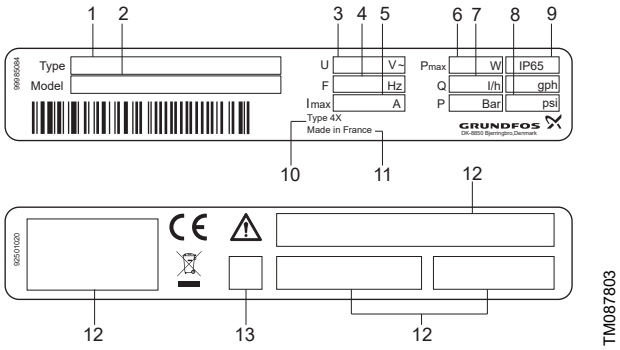
Related information

3.1 Intended use

3.3 Symbols on the pump

Symbol	Description
	This is an indication of a universally dangerous spot.
	In case of emergency and prior to all maintenance work and repairs, disconnect the product from the power supply.
	The device complies with electrical safety class II.
	It indicates connection for de-aeration hose at dosing head. If the de-aeration hose is not connected correctly, there is a risk of dosing liquid leaking out.

3.4 Nameplate



Example of a nameplate

Pos.	Description
1	Type designation
2	Model number
3	Voltage
4	Frequency
5	Max. current consumption
6	Power consumption
7	Max. dosing flow
8	Max. operating pressure
9	IP class
10	Enclosure type
11	Country of origin
12	Approvals
13	Electrical safety marking

3.5 Type key

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

Type
DDA 7.5-16 AR-C-PP/V/C-F-3 1 U2U2 F G

Nominal dosing capacity [l/h]
DDA **7.5** -16 AR-C-PP/V/C-F-3 1 U2U2 F G

Max. pressure [bar]
DDA 7.5- **16** AR-C-PP/V/C-F-3 1 U2U2 F G

Control variant	
DDA 7.5-16 **AR-C** -PP/V/C-F-3 1 U2U2 F G	
AR-C	Standard with embedded connectivity
FCM-C	AR-C with FlowControl measurement

Dosing head variant	
DDA 7.5-16 AR-C- **PP** /V/C-F-3 1 U2U2 F G	
PP	Polypropylene
PV	Polyvinylidene fluoride (PVDF)
SS	Stainless steel 1.4435
PVC	PVC (polyvinyl chloride, only up to 10 bar)

Gasket material	
DDA 7.5-16 AR-C-PP/ **V** /C-F-3 1 U2U2 F G	
E	EPDM
V	FKM
T	PTFE

Valve ball material	
DDA 7.5-16 AR-C-PP/V/ **C** -F-3 1 U2U2 F G	
SS	Stainless steel 1.4401
C	Ceramic

Control Cube	
DDA 7.5-16 AR-C-PP/V/C- **F** -3 1 U2U2 F G	
F	Front-mounted (change to left or right is possible)

Supply voltage	
DDA 7.5-16 AR-C-PP/V/C-F- **3** 1 U2U2 F G	
3	1 × 100-240 V, 50/60 Hz

Valve type	
DDA 7.5-16 AR-C-PP/V/C-F-3 **1** U2U2 F G	
1	Standard (not spring-loaded)
2	Spring-loaded (HV version)

Connection, suction/discharge	
DDA 7.5-16 AR-C-PP/V/C-F-3 1 **U2U2** F G	
U2U2	Hose, 4/6 mm, 6/9 mm, 6/12 mm, 9/12 mm
U7U7	Hose 0.17" × 1/4"; 1/4" × 3/8"; 3/8" × 1/2"
AA	Threaded Rp 1/4, female (stainless steel)
VV	Threaded 1/4 NPT, female (stainless steel)
XX	No connection

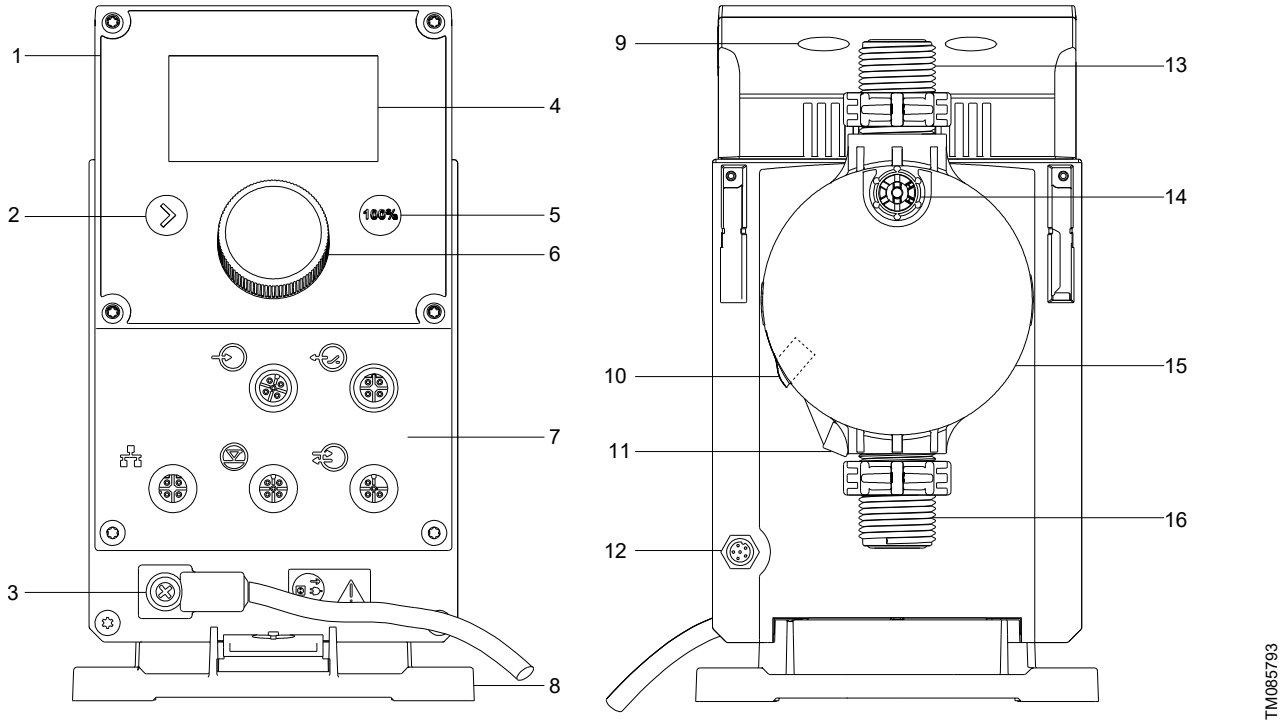
Connection, suction/discharge	
Installation set [1]	
I001	Hose, 4/6 mm (up to 7.5 l/h, 13 bar)
I002	Hose, 9/12 mm (up to 60 l/h, 9 bar)
I003	Hose, 0.17" × 1/4" (up to 7.5 l/h, 13 bar)
I004	Hose, 3/8" × 1/2" (up to 60 l/h, 10 bar)

[1] Including: 2 pump connections, foot valve, injection unit, 6 m PE discharge hose, 2 m PVC suction hose, 2 m PVC de-aeration hose (4/6 mm).

Power plug	
DDA 7.5-16 AR-C-PP/V/C-F-3 1 U2U2 **F** G	
F	EU (Schuko)
B	USA, Canada
G	UK
I	Australia, New Zealand, Taiwan
E	Switzerland
J	Japan
L	Argentina
N	Brazil

Pump design	
G	Grundfos

3.6 Product overview



Pos.	Description
1	Control cube
2	Start/Stop key
3	Power supply
4	Graphical LC display
5	100% key
6	Click wheel
7	Signal inputs and outputs
8	Mounting plate
9	Control cube assembly screws
10	Connection for deaeration hose
11	Drain opening
12	FlowControl connection (only FCM)
13	Valve, discharge side
14	Deaeration valve
15	Dosing head
16	Valve, suction side

Related information

5.4.1 Signal connections

4. Technical data

Mechanical data		7.5-16	12-10	17-7	30-4
Turn-down ratio (setting range)	[1:X]	3000	1000	1000	1000
Max. dosing capacity	[l/h]	7.5	12.0	17.0	30.0
	[gph]	2.0	3.1	4.5	8.0
Max. dosing capacity with SlowMode 50 %	[l/h]	3.75	6.00	8.50	15.00
	[gph]	1.00	1.55	2.25	4.00
Max. dosing capacity with SlowMode 25 %	[l/h]	1.88	3.00	4.25	7.50
	[gph]	0.50	0.78	1.13	2.00
Min. dosing capacity	[l/h]	0.0025	0.0120	0.0170	0.0300
	[gph]	0.0007	0.0031	0.0045	0.0080
Max. operating pressure [2]	[bar]	16	10	7	4
	[psi]	230	150	100	60
Max. stroke frequency [3]	[strokes/min]	190	155	205	180
Stroke volume	[ml]	0.74	1.45	1.55	3.10
Accuracy of repeatability	[%]	± 1 (of setpoint)			
Max. suction lift during operation [4]	[m]	6			
Max. suction lift when priming with wet valves [4]	[m]	2	3	3	2
Min. pressure differential between suction and discharge side	[bar]	1 (FCM-C: 2)			
Max. inlet pressure, suction side	[bar]	2			
Max. viscosity in SlowMode 25 % with spring-loaded valves [5]	[mPas] (= cP)	2500	2500	2000	1500
Max. viscosity in SlowMode 50 % with spring-loaded valves [5]	[mPas] (= cP)	1800	1300	1300	600
Max. viscosity without SlowMode with spring-loaded valves [5]	[mPas]] (= cP)	600	500	500	200
Max. viscosity without spring-loaded valves [5]	[mPas] (= cP)	50	300	300	150
Min. internal hose/pipe diameter suction/discharge side [4] [6]	[mm]	4	6	6	9
Min. internal hose/pipe diameter suction/discharge side (high viscosity) [6]	[mm]	9			
Min./Max. liquid temperature	[°C]	-10/45			
Min./max. ambient temperature	[°C]	0/45			
Min./max. storage temperature	[°C]	-20/70			
Max. relative humidity (non-condensing)	[%]	96			
Max. altitude above sea level	[m]	2000			

2) PVC: up to 10 bar.

3) The maximum stroke frequency varies depending on calibration.

4) Data is based on measurements with water.

5) Maximum suction lift: 1 m, dosing capacity reduced (approx. 30 %).

6) Length of suction line: 1.5 m, length of discharge line: 10 m (at max. viscosity).

Electrical data		7.5-16	12-10	17-7	30-4
Voltage	[V]	100-240 V (- 10 %/+ 10 %), 50/60 Hz			
Length of power cable	[m]	1.5			
Max. inrush current for 2 ms (100 V)	[A]	8			
Max. inrush current for 2 ms (230 V)	[A]	25			
Max. power consumption P_1	[W]	24			
Enclosure class		IP65, enclosure type 4X			
Electrical safety class		II			
Pollution degree		2			

Signal input		7.5-16	12-10	17-7	30-4
Max. load for level input		12 V, 5 mA			
Max. load for external stop input		12 V, 5 mA			
Max. load for pulse input		12 V, 5 mA			
Min. pulse length	[ms]	0.5			

Signal input		7.5-16	12-10	17-7	30-4
Max. pulse frequency	[Hz]	1000			
Impedance at 0/4-20 mA analog input	[Ω]	15			
Accuracy of analog input (full-scale value)	[%]	± 0.5			
Min. resolution of analog input	[mA]	0.007			
Max. resistance in level/pulse circuit	[Ω]	1000			

The **Debounce** function is activated by default and must be deactivated to achieve the maximum pulse frequency.

Signal output		7.5-16	12-10	17-7	30-4
Max. current on relay output (ohmic load)	[A]	0.5			
Max. frequency on relay output	[Hz]	100			
Max. voltage on relay output	[V]	30 VDC / 30 VAC			
Max. voltage on analog output	[V]	24 VDC			
Impedance at 0/4-20 mA analog output	[Ω]	500			
Accuracy of analog output (full-scale value)	[%]	± 0.5			
Min. resolution of analog output	[mA]	0.006			

Weight and size		7.5-16	12-10	17-7	30-4
Weight (PVC, PP, PVDF dosing head)	[kg]	2.5	2.5	2.5	2.7
Weight (stainless-steel dosing head)	[kg]	3.3	3.3	3.3	4.1
Diaphragm diameter	[mm]	44	50	50	74

Sound pressure		7.5-16	12-10	17-7	30-4
Max. sound pressure level	[dB(A)]	60			

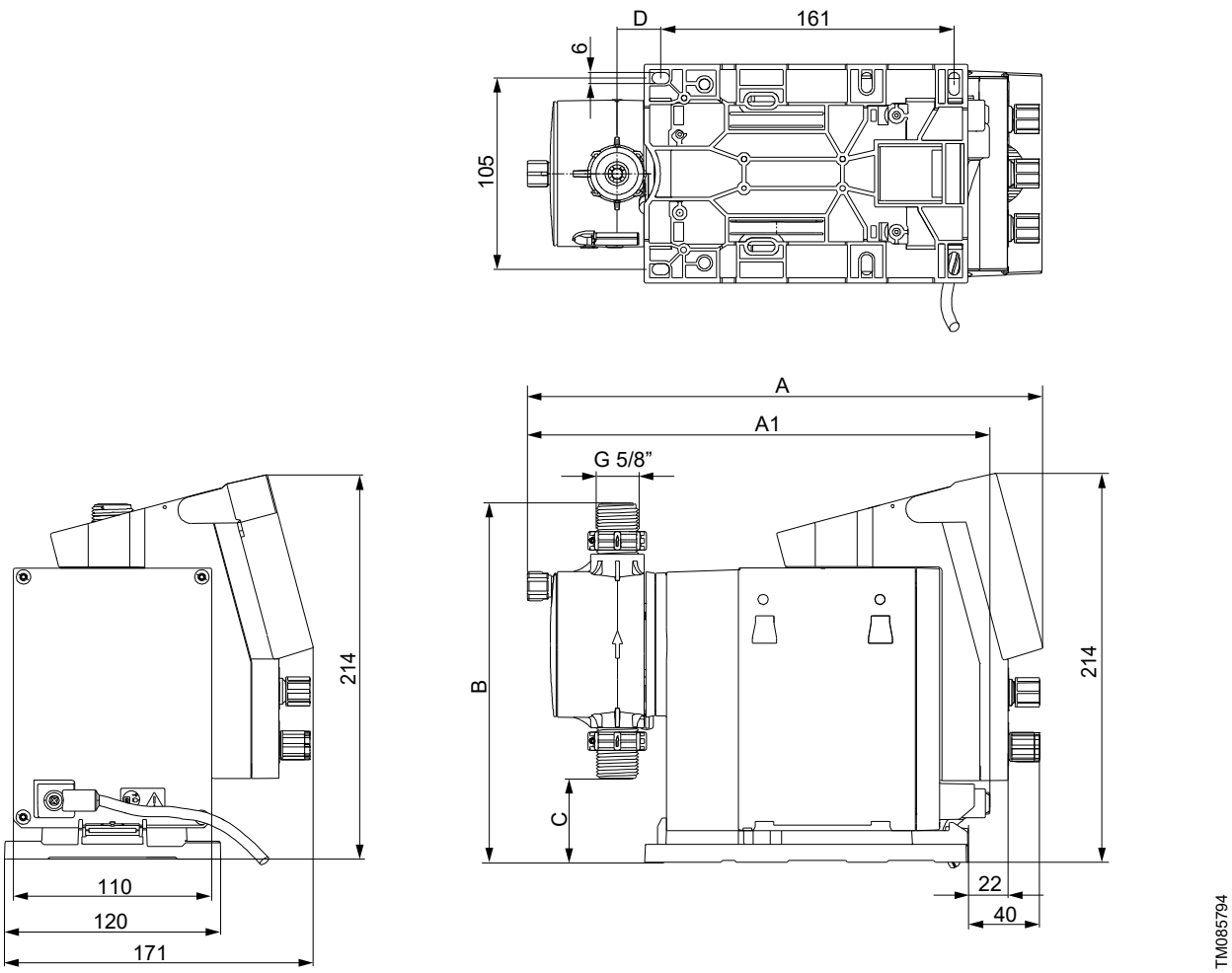
4.1 Technical data for CIP (Clean-In-Place) applications

Short-term temperature limits for maximum 40 minutes at maximum 2 bar operating pressure:

Max. liquid temperature for dosing head material PVDF	[°C]	85
Max. liquid temperature for dosing head material stainless steel	[°C]	120

The dosing head materials polyvinyl chloride (PVC) and polypropylene (PP) must not be used in CIP applications.

4.2 Dimensions



Dimensions are provided in mm.

Pump type	A [mm]	A1 [mm]	B [mm]	C [mm]	D [mm]
DDA 7.5-16	285	255	196	46.5	24
DDA 12-10 / 17-7	285	255	200.5	39.5	24
DDA 30-4	300	270	204.5	35.5	38.5

5. Assembly and installation

5.1 Installation requirements

WARNING
Chemical hazard
Death or serious personal injury

- Observe the safety data sheets and safety instructions of the chemical manufacturer when handling chemicals.
- Wear personal protective equipment when working on the dosing head, connections or lines.

WARNING
Electric shock
Death or serious personal injury

- All electrical connections must be carried out by a qualified electrician in accordance with local regulations.
- The supply voltage must correspond to the values indicated on the nameplate.
- Do not manipulate or cut the power plug or cable.

CAUTION
Radiation
Minor or moderate personal injury

- Locate the product at a minimum distance of 20 cm (0.66 feet) from any body parts. Human tissue may be heated by RF energy.

The product must be installed in a location with access control to prevent unauthorized access to the product.

The stickers on the pump must not be damaged.
If the stickers are damaged, this may invalidate the warranty.

When installing the product, make sure the following requirements are met:

- The installation location must be protected from rain, humidity, condensation, direct sunlight and dust.
- The installation location must have sufficient lighting to ensure safe operation.
- The installation location must have sufficient ventilation to prevent corrosion of the devices, especially if the pump is installed in a closed cabinet.
- Observe the permissible ambient conditions. See section Technical data.
- The mounting surface must be stable and must not vibrate.
- Dosing must flow upwards.
- According to EN ISO 13850, the system must be connected to an external emergency stop device or emergency shutdown device.

Related information

4. Technical data

5.2 Pump assembly

Install the pump in such a way that the plug can easily be reached by the operator during operation.
This enables the operator to separate the pump from the power supply quickly in case of emergency.

The pump is delivered with a mounting plate.
It only takes a few steps to firmly secure the pump to the mounting plate by a slot mechanism.
The mounting plate must be mounted horizontally, for example, on a tank or vertically, for example, on a wall.
The pump can easily be released from the mounting plate for maintenance.

5.2.1 Aligning and installing the mounting plate

Vertical installation: the mounting plate slot mechanism must be above.
Horizontal installation: the mounting plate slot mechanism must be opposite the dosing head.
The mounting plate can be used as a drill template.
See also the Quick Guide (PN 92881337).

1. Mark the drill holes.
   Make sure not to damage any cables or lines during installation.
2. Drill the holes.
3. Secure the mounting plate to the wall, on the bracket or the tank, using four screws, diameter 5 mm.

Related information

4.2 Dimensions

5.2.2 Engaging the pump in the mounting plate

See also the Quick Guide (PN 92881337).

1. Attach the pump to the mounting plate support clamps.
2. Slide the pump with slight pressure until it engages (there is a click).

5.2.3 Adjusting the control cube position

WARNING
Electric shock
Death or serious personal injury

- Install the control cube correctly to ensure the enclosure class (IP65/enclosure type 4X) and shock protection.

The control cube is fitted to the front of the pump on delivery. It can be turned by 90° so that the user can choose to operate the pump from the right or left side.
See also the Quick Guide (PN 92881337).

1. Disconnect the pump from the power supply.
2. Carefully remove both protective caps on the control cube using a thin screwdriver.
3. Loosen the screws.
   Wrench size: TORX PLUS 15 IP
4. Carefully lift the control cube so far from the pump housing that no tensile stress is produced on the flat band cable.
   Make sure no liquid enters the housing.
5. Turn the control cube by 90° and re-attach it.
   Make sure the O-ring is placed correctly.
6. Push down the control cube and tighten the screws hand-tight using a torque wrench.
   Torque [Nm]: 1.7 (± 0.2)

7. Attach the protective caps observing the correct orientation.

Example:

5.3 Hydraulic connection

WARNING
Chemical hazard
Death or serious personal injury

- Observe the safety data sheets and safety instructions of the chemical manufacturer when handling chemicals.
- Wear personal protective equipment when working on the dosing head, connections or lines.

The pressure differential between the suction and discharge side must be at least 1 bar (14.5 psi).

For control variant FCM and for pumps with diaphragm leakage detection, the pressure differential between the suction and discharge side must be at least 2 bar (29 psi).

Tighten the dosing head screws with a torque wrench once before startup and every time the dosing head has been opened.

After 2-5 operating hours, retighten the dosing head screws using a torque wrench.

Torque [Nm]: 4

The dosing head may contain water from the factory check. If you want to dose media that should not come into contact with water, dose another medium beforehand.

Faultless function can only be guaranteed in conjunction with lines supplied by Grundfos.

The lines used must comply with the pressure limits. See section Technical data.

Make sure you comply with the following points:

- Observe the suction lift and the line diameter. See section Technical data.
- Cut hoses and pipes at right angles.
- Make sure there are no loops or kinks in the hoses.
- Keep the suction line as short as possible.
- Route the suction line up towards the suction valve.
- Install a filter in the suction line to protect the entire installation against dirt and reduce the risk of leakage.
- Install a pressure relief valve in the discharge line to provide protection against high pressure.
- Check the condition of the foot valve regularly.
- Only control variant FCM: For discharge quantities below 1 l/h, we recommend the use of an additional spring-loaded valve (approx. 3 bar) on the discharge side for the safe generation of the necessary differential pressure.

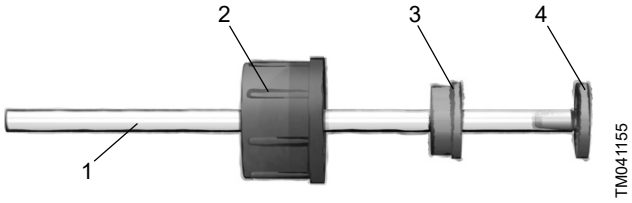
Related information

4. Technical data

5.3.1 Connecting the hose

1. Push the union nut and the tensioning ring across the hose.
2. Push the cone part fully into the hose.
3. Attach the cone part with the hose to the corresponding pump valve.
4. Tighten the union nut manually. Do not use tools.
   If using PTFE gaskets, retighten the union nuts after 2-5 operating hours.
5. Attach a de-aeration hose to the corresponding connection and run it into a suitable container or collecting tray.
   See also section Product overview.

Example:



Pos.	Description
1	Hose
2	Union nut
3	Tensioning ring
4	Cone part

Related information

3.6 Product overview

5.3.2 Installation example

The pump offers various installation options. In the picture below, the pump is installed in conjunction with a suction line with level switch and a multifunction valve on a Grundfos tank.

Pos.	Description
1	Multifunction valve
2	De-aeration hose
3	Tank
4	Suction line with level switch

5.4 Electrical connection

WARNING
Electric shock
Death or serious personal injury

- All electrical connections must be carried out by a qualified electrician in accordance with local regulations.
- The supply voltage must correspond to the values indicated on the nameplate.
- Electric circuits of external devices connected to the pump inputs must be separated from dangerous voltage by double or reinforced insulation.
- Switch off the power supply before starting any work on the pump.
- Make sure the power supply cannot be switched on unintentionally.
- Do not manipulate or cut the power plug or cable.

CAUTION
Chemical hazard
Minor or moderate personal injury

- Make sure the pump has been correctly installed and is ready to be started before you switch on the power supply.
- The pump can start automatically when the power supply is switched on.

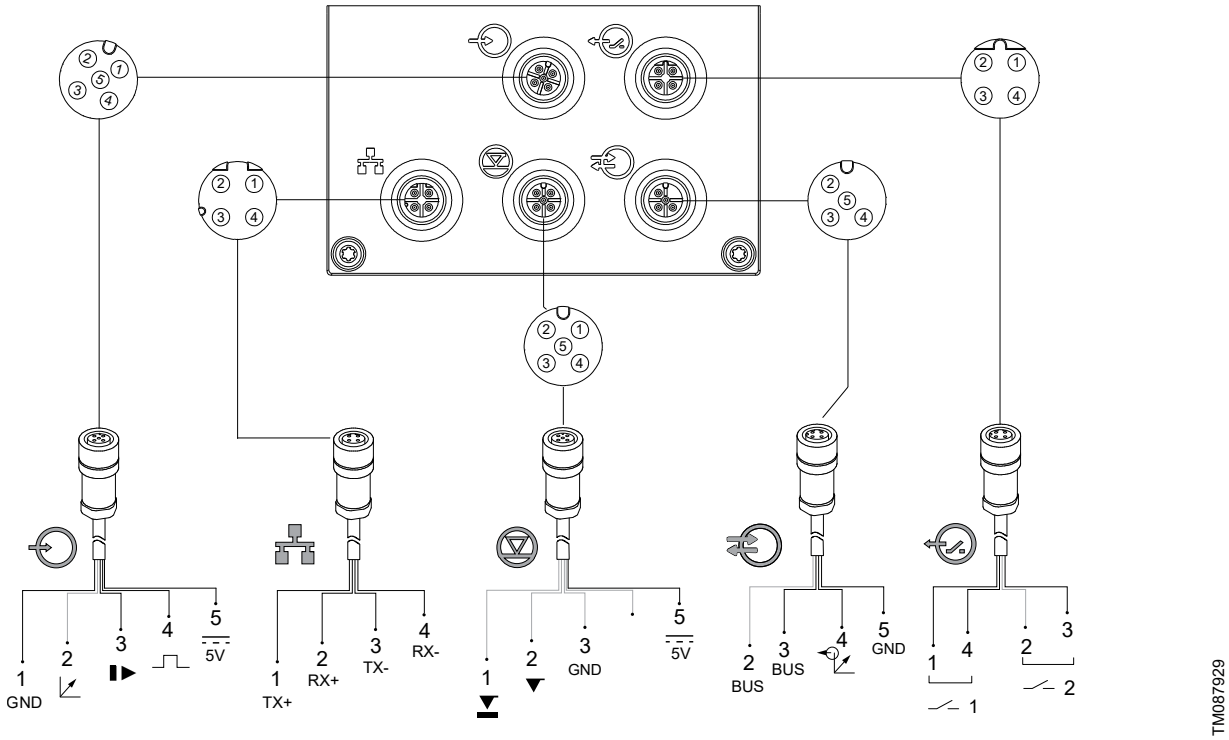
The enclosure class (IP65/enclosure type 4X) is only guaranteed if plugs or protective caps are correctly installed.

The power plug is for separating the pump from the power supply.

Related information

3.4 Nameplate

5.4.1 Signal connections



Input: Analog, External stop, Pulse

Function	Pins				
	1/brown	2/white	3/blue	4/black	5/yellow/green
Analog	GND / (-) mA	(+) mA			
External stop	GND		X		
Pulse	GND			X	

Relay outputs

Function	Pins			
	1/brown	2/white	3/blue	4/black
Relay 1	X			X
Relay 2		X	X	

Ethernet RJ45

Function	Pins			
	1/green/white	2/orange/white	3/green	4/orange
TX+ / TX-	X		X	
RX+ / RX-		X		X

Level signals: Empty signal, Low-level signal

Function	Pins				
	1	2	3	4	5
Low-level signal	X		GND		
Empty signal		X	GND		

GENIbus, Analog output, Modbus RTU

Function	Pins			
	2/white	3/blue	4/black	5/yellow/green
GENIbus / Modbus RTU	RS-485 A	RS-485 B		RS-485 Y
Analog output			(+) mA	GND / (-) mA

6. Startup

6.1 Preparing the pump for startup

CAUTION
Chemical hazard
Minor or moderate personal injury

- Observe the safety data sheets and safety instructions of the chemical manufacturer when handling chemicals.
- Wear personal protective equipment when working on the dosing head, connections or lines.
- Make sure the pump has been correctly installed and is ready to be started before you switch on the power supply.
- The pump can start automatically when the power supply is switched on.
- Collect and dispose of all chemicals in a way that is not harmful to humans, animals or the environment.

Tighten the dosing head screws with a torque wrench before startup and every time the dosing head is opened.
After 2-5 operating hours, retighten the dosing head screws using a torque wrench.
Torque [Nm]: 4

When preparing the pump for startup, observe the following:

- Make sure the pump has been connected electrically by a qualified person.
- Make sure the power supply specified on the nameplate matches the local conditions.
- Make sure all pipe or hose connections have been tightened properly and tighten them, if necessary. See section Hydraulic connection.
- Make sure the latest software version is installed on your pump. Check in the **Grundfos GO** app whether software updates are available.

Related information

5.3 Hydraulic connection

6.2 Starting up the pump

Before starting up the pump, check in the **Grundfos GO** app whether software updates are available.

1. Read section Preparing the pump for startup.
2. Switch on the power supply.
3. Proceed according to the following sections:
   a. Setting the menu language
   b. De-aerating the pump
   c. Calibrating the pump.

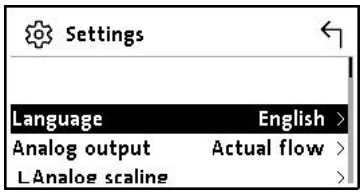
Related information

6.1 Preparing the pump for startup
6.3 Setting the menu language
6.4 De-aerating the pump
6.5 Calibrating the pump

6.3 Setting the menu language

On delivery, the menu language is set to English. Set your desired language as follows:

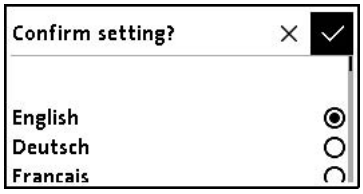
1. Turn the click wheel to show the top menu bar and select the cog symbol.
2. Press the click wheel to open the **Settings** menu.
3. Turn the click wheel to highlight the **Language** menu.



4. Press the click wheel to open the **Language** menu.

5. Turn the click wheel to highlight the desired language.

6. Press the click wheel to select the highlighted language.
7. Press the click wheel again to confirm the **Confirm setting?** dialog and apply the setting.



6.4 De-aerating the pump

WARNING
Chemical hazard
Death or serious personal injury

- The de-aeration hose must be connected correctly and inserted into a suitable tank.
- Do not open the de-aeration valve by more than one full turn.

Read section Preparing the pump for startup.

The duration of the procedure can be extended to up to 300 seconds by pressing the 100% key and turning the click wheel clockwise.

1. Open the de-aeration valve by approximately half a turn.
2. Press the 100% key and hold it down until liquid flows out of the de-aeration hose continuously without any bubbles.
3. Close the de-aeration valve finger tight.
   Do not use tools.

The pump is de-aerated.

Related information

6.1 Preparing the pump for startup

6.5 Calibrating the pump

- The pump must be connected hydraulically and electrically.
- The pump must be integrated into the dosing process under operating conditions.
- The dosing head and the suction line must be filled with dosing medium.
- The pump must be de-aerated.

Read section Calibration.

1. Stop the pump.
2. Fill a measuring beaker with dosing medium.
   Recommended filling volumes V_1:
   - DDA 7.5-16: 0.3 l
   - DDA 12-10: 0.5 l
   - DDA 17-7: 1.0 l
   - DDA 30-4: 1.5 l
3. Read off and note down the filling volume V_1.
   For example: 300 ml
4. Place the suction line in the measuring beaker.
5. Select **Settings** > **Calibration**. Press **START** to start the calibration process.
6. The pump executes 200 dosing strokes and displays the factory calibration value.
   For example: 125 ml
7. Remove the suction line from the measuring beaker and check the remaining volume V_2.
   For example: 170 ml
8. Calculate the actual dosed volume: $V_d = V_1 - V_2$
   For example: 300 ml - 170 ml = 130 ml
9. Set and confirm V_d with the click wheel.

The pump is calibrated.

Related information

7.14.2 AutoFlowAdapt
7.16 Calibration

7. Operation

7.1 Operating elements

The user interface of the pump includes a display and operating elements.

If the pump is operated via the **Grundfos GO** app, the operating elements are locked.

Pos.	Description
1	**Graphical LC display**
2	**Click wheel**
3	**Start/Stop key**
4	**100% key**

Click wheel

The click wheel is used for navigating through the menus, and selecting and confirming settings.

Turning the click wheel clockwise moves the cursor clockwise on the display. Turning the click wheel counter-clockwise moves the cursor counter-clockwise.

If the pump is operated via the **Grundfos GO** app, the click wheel cannot be used for navigating through the menus. To be able to navigate through the menus again, turn the click wheel and disconnect from GO.

Start/Stop key

The **Start/Stop key** is used for starting and stopping the pump. It can still be used while the pump is operated via the **Grundfos GO** app.

100% key

If the 100% key is pressed for less than 1 second, the display returns to the **Idle screen**.

If the 100% key is pressed for longer than 1 second, the pump doses at maximum flow, regardless of the operation mode. The pump continues dosing for 5 seconds while the click wheel can be operated. This is useful for one-handed operation during processes such as start-up or de-aeration.

The 100% key is locked when the pump is operated via the **Grundfos GO** app.

7.2 Navigation

If the click wheel is turned, a black menu bar with white icons appears at the top of the display. The icons represent the main menus **Info**, **Events log** and **Settings**. Turn the click wheel to select an icon. Press the click wheel to open the respective main menu.

The main menu icon and name are shown in the top bar, the options and submenus are listed below. Turn the click wheel to navigate through the options and submenus. The scroll bar at the right edge of the display indicates that there are more menu items. If a menu is selected from the list, a chevron with the respective submenu appears below. The submenu can now be selected with the click wheel.

The position of the cursor is highlighted in black. Press the click wheel to confirm your selection and open the next menu level. Use the **Back** icon to return to the higher menu level.

If **Settings** > **Display** > **Mult. display** is selected, an additional icon appears in the top bar on the right. You can switch between **Dashboard screen** and **Legacy screen** by selecting the respective additional icon in the top menu bar.

7.3 Operating states

The operating state of the pump is indicated by a symbol and the display colour.

If the pump is connected to the Grundfos GO app, the display colour is blue, independent from the operating state.

Display colour	Fault	Operating state		
		Stop	Ready	Running
White	-	■	❚❚	-
Green	-	-	-	▶
Yellow	Warning	■	❚❚	▶
Red	Alarm	■	❚❚	-

7.4 Sleep mode (energy-saving mode)

If the pump is not operated for 2 minutes, the display goes to sleep mode to save energy.

- The display returns to the **Idle screen**, the display brightness is reduced to 50 %.
- If you adjust the display brightness to a value under 50 %, the brightness does not change.

The sleep mode is cancelled when the pump is operated or a fault occurs.

The sleep mode is disabled during manual de-aeration, stroke volume calibration, pressure sensor calibration, and **ConditionCheck**.

7.5 Overview of display icons

Icon	Top menu bar
	Info
	Events log
	Settings
	Dashboard screen
	Legacy screen

Icon	Operating state
	Running
	Ready
	STOP
	Diaphragm position "out"
	Diaphragm position "in"

Icon	Operation mode
	Manual
	Pulse
	Analog 0-20 mA / **Analog 4-20 mA**
	Batch
	Batch > **Timer cycle**
	Batch > **Timer week**

Icon	Activated function
	FlowControl
	Stop after power failure
	Auto deaeration
	Bus control
	SlowMode
	Key lock
	Temporary unlock
	Bluetooth Off

Icon	Idle screen
Q	**Actual flow / Target flow**
	Analog input current
	Remaining duration until next batch
	Remaining batch duration

Icon	Signal or error display
	External stop
	Empty signal
	Low-level signal
	Pressure sensor / Sensor signal
	CIU
	Service
M	**Motor blocked**
	Overheating
I	**Overcurrent**
	RTC battery low

Icon	Additional icons
	Home
	Back
	Confirm
	Close
	Chevron
L	**Submenu**

7.6 Grundfos GO

With the **Grundfos GO** app on the smartphone, the pump can be configured and the pump settings can be monitored and changed. In addition, the following settings can be changed:

- pump name,
- service kit,
- analog border,
- analog calibration.

Software updates can be made via the **Grundfos GO** app.

The pump settings can be saved in the **Grundfos GO** app on the smartphone. The settings can be recalled there and then loaded into another pump. For example, a developer can configure the pump and an operator can load the settings into the pump.

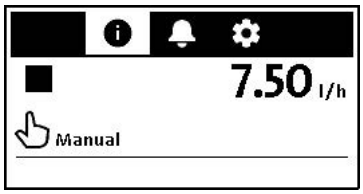
Save your settings in the **Grundfos GO** app.

7.7 Main menus

If the click wheel is turned, a black bar with white icons appears at the top of the display. The icons represent the main menus **Info**, **Events log** and **Settings**. Select an icon and press the click wheel to open the respective main menu. The active main menu icon turns black and is highlighted with a white square.

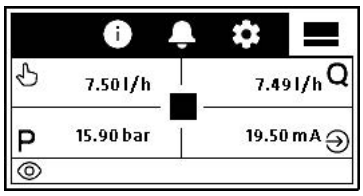
7.7.1 Legacy screen and Dashboard screen

Status information, such as dosing flow, selected operation mode and operating state, is displayed on the **Idle screen**.

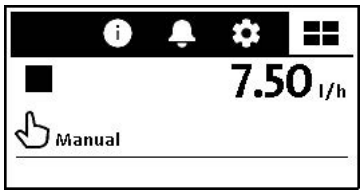


The **Idle screen** can be switched to the **Legacy screen** or the **Dashboard screen**.

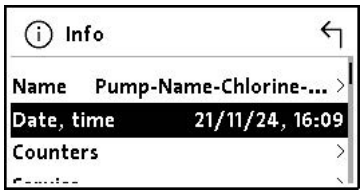
In the **Settings** > **Display** > **Mult. display** menu, select 1 to 3 values. If **Dashboard screen** is selected, the screen is split and the **Legacy screen** icon appears in the top bar.



When selecting the **Legacy screen** icon in the top bar, the display switches to the **Legacy screen**. As long as the **Dashboard screen** is active, the **Dashboard screen** icon is visible in the top bar.



7.7.2 Info



In the **Info** menu, the following information is shown about the product, the active dosing process and the service system status:

- **Name**
  - The pump name can be changed via **Grundfos GO**.
- **Date, time**
- **Indicator diagram** (FCM)
  - The **Indicator diagram** is only shown when **FlowControl active** is set.
- **Backpressure** (FCM)
- **Counters**
  - See the table below.
- **Service**: **Service due date**, **Motor runtime left**
- **Service reset**
  - The dialog **Reset service?** can be rejected or confirmed.
- **Service kit**
  - All service kits available for the pump are listed with their product numbers and contents.
- **Statistics**
  - FCM faults are listed with counters: **Air bubbles**, **Cavitation**, **Low diff. pressure**, **Overpressure**, **Pressure sensor**, **Disch valve leak**, **Flow deviation**, **Suct valve leak**.
- **Statistics reset**
  - All counters in **Statistics** can be set to 0.
- **Software version**: **Application**, **Bluetooth**
- **Hardware version**: **Main board**, **Driver board**
- **Serial number**
- **Product number**
- **QR code**
  - The **Info QR code** is generated when the menu is opened for the first time. It is unique for every pump. Information such as **Product number**and **Serial number** are stored.
  - The **Setting QR code** stores the settings and configurations of the pump as well as the **Software version** for service.
- **Type key**
- **MAC address**
- **Regulations**
  - Certificates and regulations are listed by country.

The information can be accessed during operation.

Counters

The **Info** > **Counters** menu contains the following counters:

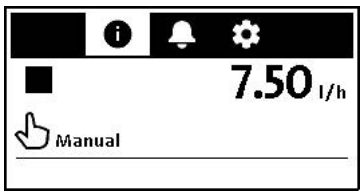
Counters	Resettable
Trip volume Volume dosed from a container in litres or US gallons	Yes
Total volume Total dosed volume in litres or US gallons	No
Operating hours Accumulated operating hours (pump switched on)	No
Motor runtime Accumulated motor runtime in hours	No
Strokes Accumulated number of dosing strokes	No
Power on/off Accumulated frequency of switching power supply on	No

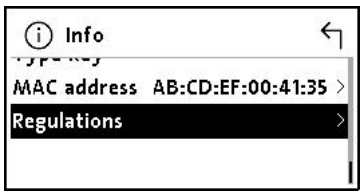
7.7.2.1 Regulations

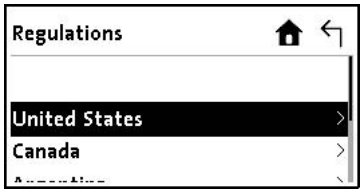
The **Regulations** menu contains a list of conformity marks (e-label) and the corresponding warnings

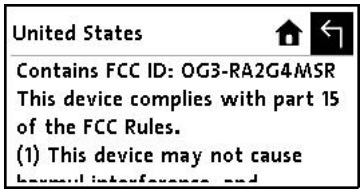
The full list can be found in the pump menu under **Info** > **Regulations**.

For example the United States:





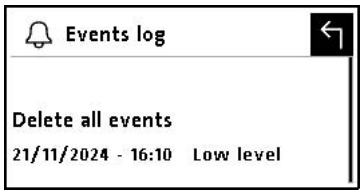




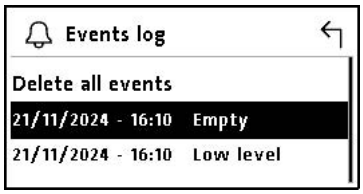
7.7.3 Events log

CAUTION
Chemical hazard
Minor or moderate personal injury
- The pump can start automatically.
- Before entering the **Events log** menu, make sure the pump is in operating state "Stop".

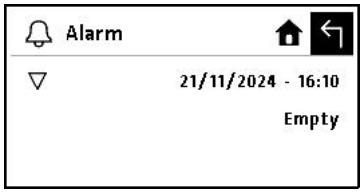
In the **Events log** menu, up to 10 alarms and warnings are displayed.



The events are listed in chronological order together with their date, time and cause.



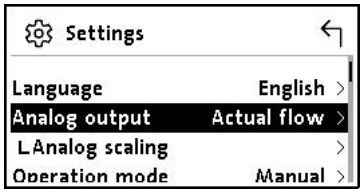
If you click on an event in the list, more detailed information is shown.



All events can be deleted. If the list is full, the oldest entry is overwritten.

7.7.4 Settings

The **Settings** menu contains menus for pump configuration.



Check all the pump settings after any change in the **Settings** menu:

- **Language**
- **Analog output**
  - **Analog scaling**
- **Operation mode**
  - **Target flow**
  - **Pulse volume**
  - **Pulse memory**
  - **Analog scaling**
  - **Priority value**
  - **Trigger**
  - **Batch volume**
  - **Batch duration**
  - **Cycle time**
  - **Weekly procedures**
  - **Start delay**
  - **Continue after interrupt**
- **Max. capacity**
- **SlowMode**
- **Stop after power failure**
- **FlowControl active**
  - **FlowControl**
  - **AutoFlowAdapt**
  - **Pressure monitoring**
  - **Sensor calibration**
  - **ConditionCheck**
- **Auto deaeration**
- **Calibration**
- **Key lock**
- **Display**
- **Communication**
- **Time**
- **Date**
- **Inputs/Outputs**
- **Basic settings**
- **Advanced settings**.

The submenus are only displayed for specific default settings and control variants. Clicking on a submenu takes you directly into the submenu.

The contents of the **Settings** menu may vary depending on the operation mode.

Related information

7.8 Language
7.9 Analog output
7.10 Operation mode
7.11 Max. capacity
7.12 SlowMode
7.13 Stop after power failure
7.14 FlowControl active
7.14.2 AutoFlowAdapt
7.14.3 Pressure monitoring
7.14.4 Sensor calibration
7.14.5 ConditionCheck
7.15 Auto deaeration
7.16 Calibration
7.17 Key lock
7.18 Display
7.19 Communication
7.20 Time
7.21 Date
7.22 Inputs/Outputs
7.23 Basic settings
7.24 Advanced settings

7.8 Language

On delivery, the menu language is set to English. In the **Settings** > **Language** menu, you can set the desired language.

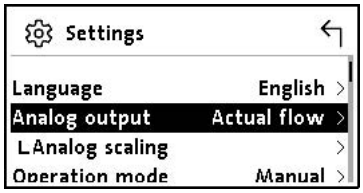
See section Setting the menu language.

Related information

6.3 Setting the menu language

7.9 Analog output

The analog output of the pump is parameterised in the **Settings** > **Analog output** menu.



The following settings are possible:

Setting	Description of output signal	Variant	
		FCM	AR
Output = Input	Analog feedback signal (not for master-slave application) The analog input signal is mapped 1:1 to the analog output.	X	X
Actual flow [7]	Current actual flow: 0/4 mA = 0 % 20 mA = 100 % See section **Analog 0-20 mA**, **Analog 4-20 mA**.	X	X [8]
Backpressure	Back pressure measured in the dosing head: 4 mA = 0 bar 20 mA = Max. operating pressure See section Pressure monitoring.	X	
Bus control	It is enabled by a command in Bus control. See section **Communication**.	X	X

7) The signal has the same analog scaling as the current analog input signal.

8) For the AR variant, the output signal is based on motor speed and pump status (target flow).

In all operation modes except in **Analog 0-20 mA** mode, the analog output has a range of 4-20 mA.

The back pressure value shown on the display or the measured at the analog output is always the value of the last discharge stroke.

For the wiring diagram, see section Signal connections.

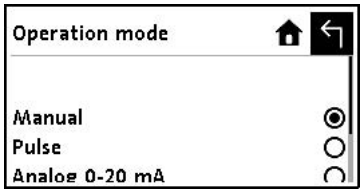
Related information

5.4.1 Signal connections
7.10.3 Analog 0-20 mA, Analog 4-20 mA
7.14.3 Pressure monitoring
7.19 Communication

7.10 Operation mode

CAUTION
Automatic startup
Minor or moderate personal injury

- When changing the operation mode, the pump can start automatically.
- Before changing operation mode, set the pump to operating state "Stop".



Different operation modes can be set in the **Settings** > **Operation mode** menu:

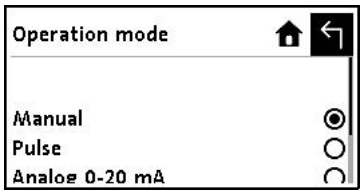
- **Manual**
- **Pulse**
- **Analog 0-20 mA**
- **Analog 4-20 mA**
- **Batch**.

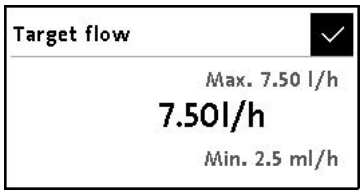
Related information

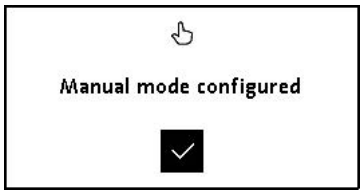
7.10.1 Manual
7.10.2 Pulse
7.10.3 Analog 0-20 mA, Analog 4-20 mA
7.10.4 Batch

7.10.1 Manual

In this operation mode, the pump constantly doses the target flow set with the click wheel. The target flow is set in l/h or ml/h in the **Settings** > **Operation mode** > **Manual** menu.







After completing the settings, the target flow can also be set directly from the **Legacy screen** or **Dashboard screen** using the click wheel.

The pump automatically switches between the units. Alternatively, the display can be set to US units (gph). See section Display.

The setting range depends on the pump type.

Type	Setting range	
	[l/h]	[gph]
DDA 7.5-16	0.0025 - 7.5	0.0007 - 2.0
DDA 12-10	0.012 - 12	0.0031 - 3.1
DDA 17-7	0.017 - 17	0.0045 - 4.5
DDA 30-4	0.03 - 30	0.0080 - 8.0

When **SlowMode** or **Max. capacity** is set, the maximum dosing flow is reduced automatically.

Related information

4. Technical data

7.18 Display

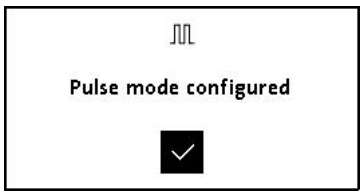
7.10.2 Pulse

In this operation mode, the pump doses the set dosing volume for each incoming (potential-free) pulse, for example, from a water meter. The pump automatically calculates the optimum stroke frequency for dosing the set volume per pulse.

The calculation is based on the following:

- the frequency of external pulses,
- the set dosing volume per pulse.

The **Pulse volume** can be set in the **Settings** > **Operation mode** > **Pulse** menu.



After completing the settings, the **Pulse volume** can also be set directly from the **Legacy screen** or **Dashboard screen** using the click wheel.

The setting range for the dosing volume depends on the pump type.

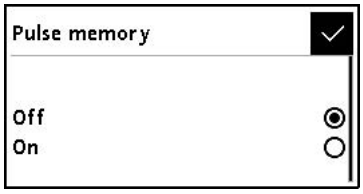
Type	Setting range [ml/pulse]
DDA 7.5-16	0.0015 - 14.9
DDA 12-10	0.0029 - 29.0
DDA 17-7	0.0031 - 31.0
DDA 30-4	0.0062 - 62.0

The frequency of incoming pulses is multiplied by the set dosing volume. If the pump receives more pulses than it can process at the maximum dosing flow, it runs at the maximum stroke frequency in continuous operation. Excess pulses are ignored if the memory function is not enabled.

Memory function

! The subsequent processing of pulses can lead to a local increase in the concentration of dosed chemicals.

The **Pulse memory** can be enabled in **Settings** > **Operation mode** > **Pulse**. Up to 65,000 unprocessed pulses can be saved for subsequent processing.

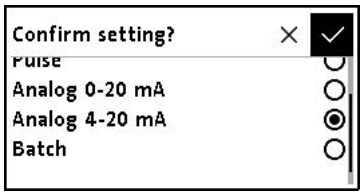


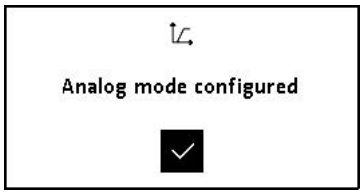
The contents of the memory are deleted by the following:

- switching off the power supply,
- changing the operation mode,
- interruption (for example alarm, external stop).

7.10.3 Analog 0-20 mA, Analog 4-20 mA

In these operation modes, the pump doses according to the external analog input signal. **Analog 0-20 mA** or **Analog 4-20 mA** can be set in the **Settings** > **Operation mode** menu.





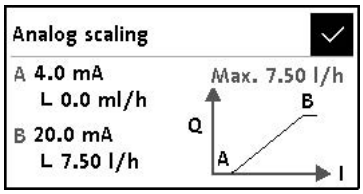
The dosing volume is proportional to the signal input value in mA.

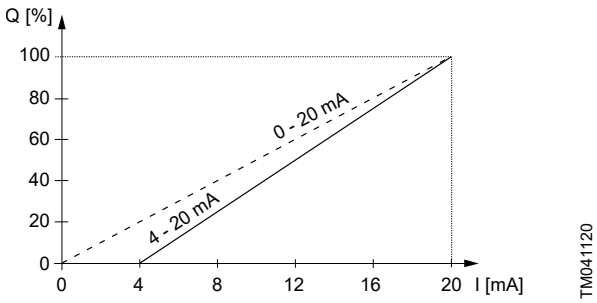
Operation mode	Analog input value [mA]	Dosing flow [%]
4-20mA	≤ 4.1	0
	≥ 19.8	100
0-20mA	≤ 0.1	0
	≥ 19.8	100

The relation of the analog input value and the dosing flow, as shown in the table, can be set in the **Grundfos GO** app in **Advanced settings** > **Analog input border**.

If the analog input value in operation mode **4-20mA** falls below 2 mA, an alarm is displayed and the pump stops. A cable break or signal transmitter error may have occurred. The respective icon is displayed.

Set Analog scaling





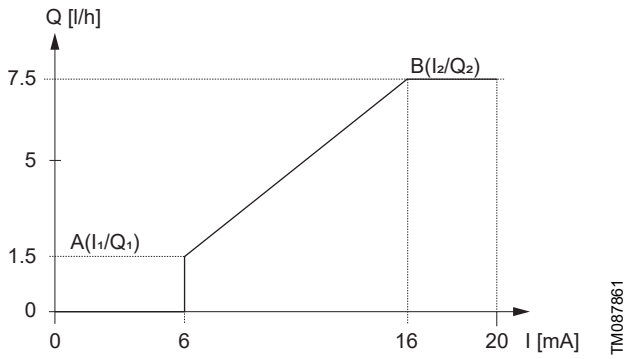
Analog scaling refers to the assignment of the current input value to the dosing flow.

Changes of **Analog scaling** also affect the analog output signal. See section Analog output.

Analog scaling passes through the two reference points A (I_1/Q_1) and B (I_2/Q_2), which are set in the operation mode settings. The operation mode settings can be changed in the **Analog scaling** function in the **Settings** > **Operation mode** > **0-20mA** or **4-20mA** menu. The dosing flow is controlled according to this setting.

Example 1 (DDA 7.5-16)

Analog scaling with positive gradient:

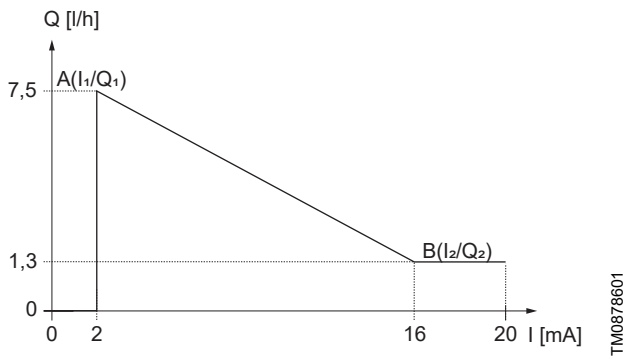


In example 1, reference points I_1 = 6 mA, Q_1 = 1.5 l/h and I_2 = 16 mA, Q_2 = 7.5 l/h have been set.

From 0 to 6 mA, **Analog scaling** is described by a line that passes through Q = 0 l/h, between 6 mA and 16 mA, it rises proportionally from 1.5 l/h to 7.5 l/h, and from 16 mA onwards, it passes through Q = 7.5 l/h.

Example 2 (DDA 7.5-16)

Analog scaling with negative gradient (**Operation mode 0-20mA**):



In example 2, reference points I_1 = 2 mA, Q_1 = 7.5 l/h and I_2 = 16 mA, Q_2 = 1.3 l/h have been set.

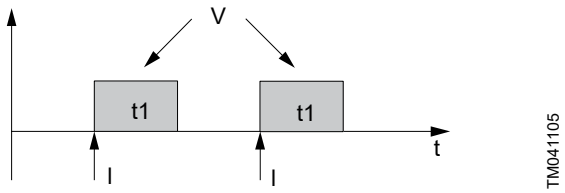
From 0 to 2 mA, **Analog scaling** is described by a line that passes through Q = 0 l/h, between 2 mA and 16 mA, it drops proportionally from 7.5 l/h to 1.3 l/h, and from 16 mA onwards, it passes through Q_2 = 1.3 l/h.

Related information

7.9 Analog output

7.10.4 Batch

In the **Batch** mode, the pump doses the set **Batch volume** in the set **Batch duration**.



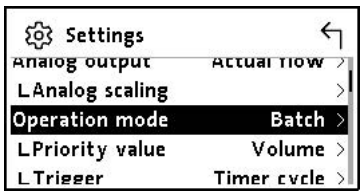
Pos.	Description
V	**Batch volume**
I	**Pulse**
t	**Time**
t1	**Batch duration**

The setting range depends on the pump type. If the **SlowMode** is active, the setting range is reduced.

Type	Setting range per Batch		
	from [ml]	to [l]	Resolution [9] [ml]
DDA 7.5-16	0.74	180	0.0925
DDA 12-10	1.45	288	0.1813
DDA 17-7	1.55	408	0.1938
DDA 30-4	3.10	720	0.3875

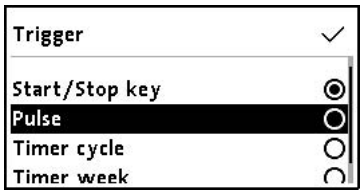
9) Dosing quantities with a resolution of up to 1/8 of the dosing stroke volume can be dosed due to digital motor control.

Open the **Settings** > **Operation mode** > **Batch** menu.



Select the **Priority value**: **Batch volume** or **Batch duration**.

Set the **Trigger**.



The **Trigger** can be set to **Start/Stop key**, **Pulse**, **Timer cycle** or **Timer week**.

Trigger	Description
Start/Stop key	A batch is dosed every time the **Start/Stop key** is pressed.
Pulse	A batch is dosed with each incoming pulse.
Timer cycle	The pump doses the set batch volume in regular cycles. See section **Timer cycle**.
Timer week	Up to 16 dosing procedures can be defined for a week. See section **Timer week**.

Set the **Batch volume** and **Batch duration** by turning and pushing the click wheel.

If the **Trigger** is set to **Start/Stop key** or **Pulse**, **Continue after interrupt** can be activated or deactivated.

- If **Continue after interrupt** is activated, the pump stops dosing and goes to operating state "Ready" in the event of an interruption (**Alarm**, **External stop**). The remaining **Batch volume** and **Batch duration** are displayed. Once the interruption is resolved, the pump automatically continues dosing the remaining **Batch volume** in the remaining **Batch duration**.
- If **Continue after interrupt** is deactivated, the pump stops dosing and the batch is reset in the event of an interruption. The remaining **Batch volume** is displayed. Once the interruption is resolved, the pump waits for the next trigger to restart with a new batch.

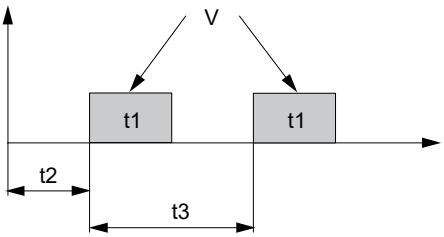
Related information

7.10.5 Timer cycle

7.10.6 Timer week

7.10.5 Timer cycle

In the **Timer cycle** mode, the pump doses the set **Batch volume** in regular cycles. A cycle starts after a **Start delay**. For the **Batch volume** setting range, see section **Batch**.



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Pos.	Description
V	**Batch volume**
t1	**Batch duration**
t2	**Start delay**
t3	**Cycle time**

In the event of an interruption due to **Alarm** or **External stop**, the pump stops dosing and goes to operating state "Ready" while the **Timer cycle** continues to run. The remaining **Batch volume** and **Batch duration** are displayed. Once the interruption is resolved, the pump automatically continues dosing according to the actual timeline position.

In the event of a power interruption, the pump automatically starts a completely new **Timer cycle**, which begins with a **Start delay** as soon as the power is restored. If the pump is stopped, the **Timer cycle** is lost. A new **Timer cycle** is started when the pump is started.

The following settings are required in the **Settings** > **Operation mode** > **Batch** > **Timer cycle** menu:

- **Batch volume**: the quantity dosed in a batch.
- **Batch duration**: the time in which a batch is dosed.
- **Cycle time**: the time in which a batch is dosed plus the pause time.
- **Start delay**: the time before a batch cycle starts.

Set the **Batch volume**, **Batch duration**, **Cycle time** and **Start delay** by turning and pushing the click wheel.

Related information

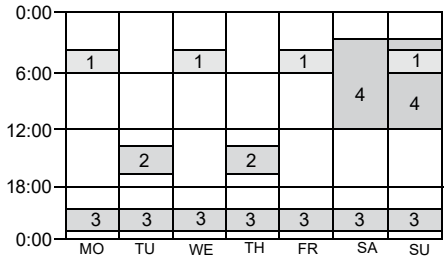
7.10.4 Batch

7.10.6 Timer week

WARNING
Chemical hazard
Death or serious personal injury

- Changing the time or date can lead to over- or underdosing and thus to an increase or decrease in concentration.
- Replace the battery immediately when the **RTC battery low** warning appears on the display. If the battery is not replaced, this can lead to under- or overdosing.

In this operation mode, up to 16 dosing procedures can be defined for a week. These dosing procedures may take place regularly on one or several week days. For the **Batch volume** setting range, see section **Batch**.



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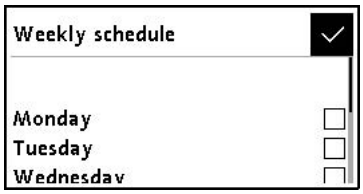
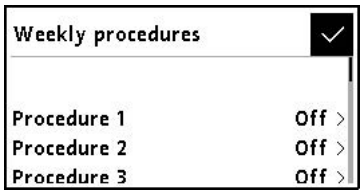
*Example of a **Weekly schedule***

The following settings are required in the **Settings** > **Operation mode** > **Batch** > **Timer week** menu for each dosing procedure:

- **Weekly schedule**
- **Start time**
- **Batch volume**
- **Batch duration**
- **Active**: **On**/**Off**.

Create your **Weekly schedule** by setting your **Weekly procedures**.





Set the **Start time**, **Batch volume**, and **Batch duration** by turning and pushing the click wheel. Activate a procedure by selecting **On** or **Off**.

If several procedures overlap, the process with the higher dosing flow has priority.

In the event of an interruption due to **Alarm** or **External stop** or a power interruption, the pump stops dosing and goes to operating state "Ready" while the **Timer week** continues to run. The remaining **Batch volume** and **Batch duration** are displayed. Once the interruption is resolved, the pump automatically continues dosing according to the actual timeline position.

Daylight saving time

WARNING
Chemical hazard
Death or serious personal injury

- During the switchover to summer time or winter time, batch dosing could be affected. It could happen that batches are skipped or that batches are dosed more than once. It could also happen that a batch is dosed longer than scheduled.
- To avoid this, deactivate **Set automatically** in the Grundfos GO app.

By default, the pump time is set to Central European Time (CET), that is, Coordinated Universal Time with an offset of 1 hour (UTC+1). The pump time can be adjusted to the local time by activating **Set automatically** in the **Grundfos GO** app. If **Set automatically** is activated in the **Grundfos GO** app, the daylight saving time is adjusted automatically.

Daylight saving time is active by default.

Related information

7.10.4 Batch

8.6 Replacing the battery in the cube front

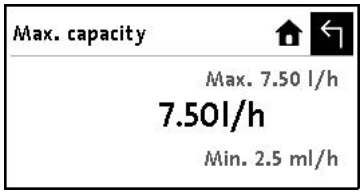
9.2.17 RTC battery low warning

7.11 Max. capacity

Max. capacity impacts your settings. Save your settings before you set **Max. capacity**.

This function offers the possibility of reducing the maximum pump capacity for all operation modes and functions. If **Max. capacity** is set, the pump cannot operate at a higher capacity than the set maximum capacity. **Max. capacity** does not affect the function of the 100% button.

The maximum capacity of the pump can be set in the **Settings** > **Max. capacity** menu with the click wheel.

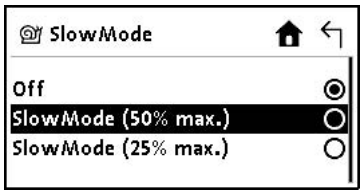


The default maximum capacity is the nominal flow of the pump.

7.12 SlowMode

The **SlowMode** function reduces the maximum dosing flow of the pump to the set percentage.

The function is enabled in the **Settings** > **SlowMode** menu.

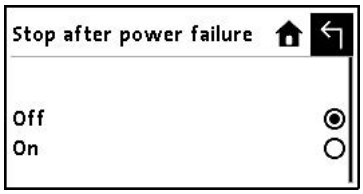


When the **SlowMode** function is enabled, the pump slows down the suction stroke. The speed of the suction stroke can be reduced to 50 % or 25 %. This is used for preventing cavitation in the following cases:

- when dosing liquids with a high viscosity
- when dosing degassing liquids
- if the installation has long suction lines
- if the suction lift is high.

7.13 Stop after power failure

Each time the power supply is switched on, a reference movement is performed. With the reference movement, the pump identifies the exact diaphragm position to ensure accurate dosing. Depending on the initial diaphragm position, the reference movement can dose a small amount of dosing medium into the process. To avoid this, the **Stop after power failure** function can be activated in the **Settings** menu.



The function is deactivated by default.

If **Stop after power failure** is activated, the pump stops and displays an alarm when the power supply is switched on. When the alarm has been acknowledged, the pump performs the reference movement.

The following functions that require the reference movement are deactivated until the reference movement is performed:

- **Auto deaeration**
- **FlowControl**
- moving the diaphragm into service position
- volume counter.

To avoid dosing during the reference movement, carry out the following steps after switching on the power supply:

1. The pump is in operating state "Standby" and displays an alarm. Push the **Start/Stop key** to set the pump to operating state "Stop".
2. Make sure a de-aeration hose is connected to the de-aeration valve and routed into a container or a drip tray.
3. Open the de-aeration valve by about half a turn.
4. Acknowledge the alarm on the display.
   - The pump performs the reference movement.
   - The dosing medium flows through the de-aeration hose and not into the process.
5. Close the de-aeration valve finger tight.
   - Do not use tools.
6. Push the **Start/Stop key** to start the pump.

7.14 FlowControl active

This section applies to the FCM control variant.

The dosing process can be monitored by the **FlowControl active** function. Influences such as air bubbles can cause a reduction in flow or even stop the dosing process, although the pump is running. To ensure optimum process reliability, the following errors and deviations can be detected and displayed:

- overpressure
- damaged discharge line
- air in the dosing chamber
- cavitation
- suction valve leakage > 70 %
- discharge valve leakage > 70 %.

Faults are indicated by a flashing eye icon. All faults are listed in the **Events log** menu.

The submenus **FlowControl**, **AutoFlowAdapt**, **Pressure monitoring**, **Sensor calibration** and **ConditionCheck** are visible, when **FlowControl active** is set to **On**. **FlowControl active** is set to **On** by default.

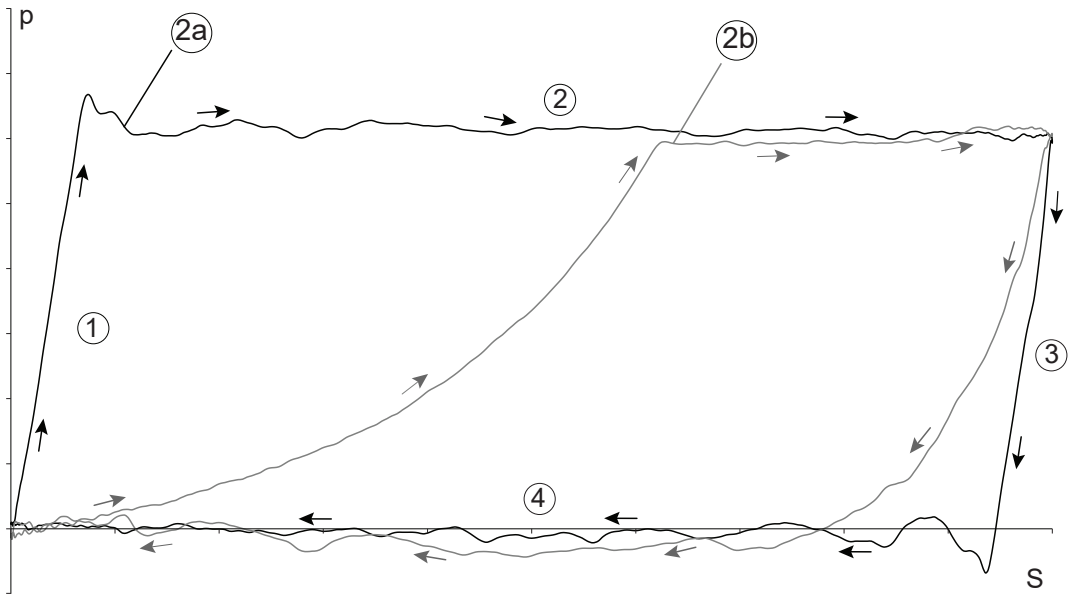
FlowControl active works with a maintenance-free sensor in the dosing head. During the dosing process, the sensor measures the current pressure and continuously sends the measured value to the microcontroller in the pump. An **Indicator diagram** is created from the current measured values and the current diaphragm position (stroke length). Causes for deviations can be identified immediately by aligning the current indicator diagram with a calculated optimum indicator diagram. **Air bubbles** in the dosing head reduce the discharge phase and consequently the stroke volume.

Requirements for a correct indicator diagram:

- The **FlowControl active** function is activated.
- The pressure difference between suction and discharge side is more than 2 bar.
- There is no interruption or pause in the discharge stroke.
- The pressure sensor and the cable are intact.
- There is no leakage of more than 50 % in the suction valve or the discharge valve.

If one of these requirements is not met, the **Indicator diagram** cannot be evaluated.

Indicator diagram



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Pos.	Description
p	Pressure
S	Stroke length
1	Compression phase
2	Discharge phase
2a	Trouble-free dosing stroke
2b	Air bubbles disturbing the dosing stroke
3	Expansion phase
4	Suction phase

Related information

9.2.5 Air bubbles warning

7.14.1 FlowControl

This section applies to the FCM control variant.

The **FlowControl** function is set in the **Settings** > **FlowControl active** > **FlowControl** menu with the parameters **Sensitivity** and **Delay**. **FlowControl** is set to **On** by default.

Sensitivity

In **Sensitivity**, the deviation in stroke volume is set in percentage. The deviation leads to an error message.

Sensitivity	Deviation
Low	approx. 70 %
Medium(default value)	approx. 50 %
High	approx. 30 %

Delay

Delay defines the time period until an error message is generated: **Short**, **Medium** or **Long**. The delay depends on the set dosing flow and therefore cannot be measured in strokes or time. **Medium** is the default value.

Air bubbles

The **FlowControl** function detects if more than 60 % of the stroke volume are air bubbles. The pump switches to the **Air bubbles** warning status, adapts the stroke frequency to approximately 30-40 % of the maximum stroke frequency, and starts a special motor drive strategy. The adapted stroke frequency makes the air bubbles rise from the suction valve to the discharge valve. The special motor drive strategy displaces the air bubbles from the dosing head into the discharge line.

If the air bubbles are not eliminated after 60 strokes, the pump returns to the normal motor drive strategy.

Related information

9.2.5 Air bubbles warning
9.2.9 Flow deviation warning

7.14.2 AutoFlowAdapt

This section applies to the FCM control variant.

The **AutoFlowAdapt** function is activated in the **Settings** > **FlowControl active** menu. It detects changes in various parameters and responds accordingly in order to keep the set target flow constant.

Dosing accuracy is increased when **AutoFlowAdapt** is activated.

This function processes information from the pressure sensor in the dosing head. The pump responds immediately, regardless of the operation mode, by adjusting the stroke frequency.

If the target flow cannot be achieved by the adjustments, a warning is issued.

AutoFlowAdapt operates on the basis of the following functions:

- **FlowControl**: Malfunctions are identified.
- **Pressure monitoring**: Pressure fluctuations are identified.
- **Flow measurement**: Deviations from the target flow are identified.

AutoFlowAdapt is set to **On** by default.

Example of AutoFlowAdapt

Pressure fluctuations

The dosing volume decreases as back pressure increases, and conversely the dosing volume increases, as the back pressure decreases.

AutoFlowAdapt compensates for pressure fluctuations by adjusting the stroke frequency. The actual flow is thus maintained at a constant level.

Related information

7.14.1 FlowControl
7.14 FlowControl active
7.14.3 Pressure monitoring

7.14.3 Pressure monitoring

This section applies to the FCM control variant.

A pressure sensor monitors the pressure in the dosing head. If the pressure falls below the set **Min. pressure** during the discharge phase, a warning is generated and the pump continues to run. If the **Min. pressure alarm** function is activated in the **Settings** > **FlowControl active** > **Pressure monitoring** menu, an alarm is generated and the pump is stopped.

If the pressure exceeds the **Max. pressure** set in the **Settings** > **FlowControl active** > **Pressure monitoring** menu, the pump stops dosing, goes to operating state "Ready" and indicates an alarm.

The pump restarts automatically once the back pressure falls below the set **Max. pressure**.

The back pressure value shown on the display or the measured at the analog output is always the value of the last discharge stroke.

7.14.3.1 Pressure setting ranges

WARNING
Pressurised system
Death or serious personal injury
- Install a pressure relief valve in the discharge line to provide protection against high pressure.

The pressure measured in the dosing head is slightly higher than the actual system pressure.

The **Max. pressure** should be set at least 0.5 bar higher than the system pressure.

The **Min. pressure** should be set at least 1 bar less than the **Max. pressure**.

Type	Min. pressure [bar]	Max. pressure [bar]
DDA 7.5-16	2-16	3-17
DDA 7.5-16 (PVC)	2-10	3-11
DDA 12-10	2-10	3-11
DDA 17-7	2-7	3-8
DDA 30-4	2-4	3-5

Both the **Min. pressure** and the **Max. pressure** are adjustable.

By default, the **Max. pressure** is set to the nominal pressure + 1 bar, the **Min. pressure** is set to 2 bar.

7.14.4 Sensor calibration

This section applies to the FCM control variant.

The pressure sensor is calibrated in the factory. As a rule, it does not need to be recalibrated.

CAUTION
Chemical hazard
Minor or moderate personal injury
- Remove the suction valve before calibrating the pressure sensor.

Calibrate the pressure sensor only if it is technically required.

Calibrating the pressure sensor while the suction valve is installed results in incorrect calibration.

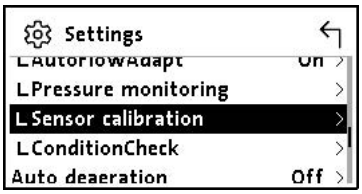
7.14.4.1 Calibrating the pressure sensor

This section applies to the FCM control variant.

If specific circumstances, such as pressure sensor exchange or extreme air pressure values at the location of the pump, require calibration, the pressure sensor can be calibrated as follows:

1. Put on the stipulated personal protective equipment.
2. Set the pump to operating state "Stop".
3. Depressurise the system.
4. Flush the dosing head, if necessary.

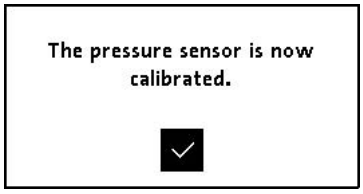
5. Remove the suction line and the suction valve.
   Make sure the returning liquid is safely collected.
   Calibrating the pressure sensor while the suction valve is installed results in incorrect calibration which can cause personal injuries and damage to property.
6. Open **Settings** > **FlowControl active** > **Sensor calibration**.



   Make sure the pressure sensor is connected to the pump.
7. Confirm the dialog.

   Calibration is started.

If the calibration was successful, the display shows the dialog **The pressure sensor is now calibrated.**.



Confirm the dialog.

If the calibration failed, a corresponding dialog appears. Confirm the dialog to start the calibration again.

If the calibration failed, check the connections, the cable and the pressure sensor. Replace all defective parts.

Check whether the suction valve and the drain opening show signs of crystallized dosing liquid.

7.14.5 ConditionCheck

This section applies to the FCM control variant.

CAUTION
Chemical hazard
Minor or moderate personal injury
- The pump starts dosing during the **ConditionCheck**.

The pump must be installed in a system and in operating state "Stop" before carrying out a **ConditionCheck**.

Each **ConditionCheck** analyses one fault. To find out if there are more faults, you must perform a new **ConditionCheck** after the first fault is remedied.

When **Settings** > **FlowControl active** > **ConditionCheck** is selected, an analysis of the pump and the system where the pump is installed is performed. During the analysis, a progress bar is shown.

After the analysis, the message **Analysis complete:** is displayed with an information about the fault and a recommendation. The display colour may change.

If there is a **Motor blocked** alarm, the **ConditionCheck** does not start. Eliminate the reason for the alarm and restart the **ConditionCheck**.

Related information

9.2.11 Motor blocked alarm

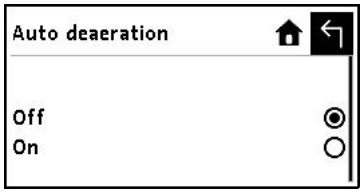
7.15 Auto deaeration

If degassing media are dosed, air pockets can form in the dosing head during breaks in dosing. As a result, it is possible that no medium is dosed when the pump is restarted. The **Auto deaeration** function performs pump de-aeration automatically at regular intervals. Software-controlled diaphragm movements make the air bubbles rise and collect at the discharge valve so that they can be removed on the next dosing stroke.

The **Auto deaeration** function operates under the following conditions:

- if the pump is not in operating state "Stop"
- if no alarm is active
- during breaks in dosing, for example, **External stop** or no incoming pulses.

The **Auto deaeration** function can be activated or deactivated in the **Settings** menu.



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The diaphragm movements can displace small volumes of dosing liquid into the discharge line. This is virtually impossible when dosing highly degassing media.

7.16 Calibration

The pump is calibrated in the factory for media with a viscosity similar to water at maximum pump back pressure.

If the pump is operated with fluctuating back pressure or a liquid with a different viscosity is dosed, the pump must be calibrated.

See section Calibrating the pump.

Pumps with FCM control variant do not have to be calibrated, as long as the **AutoFlowAdapt** function is enabled.

During calibration, the pump performs 120 strokes/minute as a standard. If the **SlowMode** function is activated, the number of strokes/minute is 60 at 50 % and 30 at 25 %.

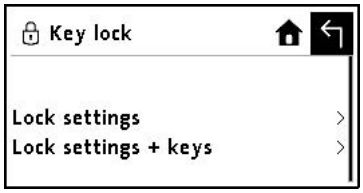
If there is a **Motor blocked** or an **Overpressure** alarm, the **Calibration** does not start. Eliminate the reason for the alarm and restart the **Calibration**.

Related information

6.5 Calibrating the pump

7.17 Key lock

The **Key lock** function protects the pump by preventing changes to the settings. The function can be activated in the **Settings** > **Key lock** menu by entering a four-digit custom lock code. Two levels are available.



Level	Description
Lock settings	All settings can only be changed by entering the lock code. The **Start/Stop key** and the **100% key** are not locked.
Lock settings + keys	All settings can only be changed by entering the lock code. The **Start/Stop key** and the **100% key** are locked.

It is still possible to navigate in the **Info** menu, acknowledge alarms in the **Events log** menu, and check the settings in the **Settings** menu.

Temporary unlock

If the **Key lock** function is activated but settings must be modified, the keys can be unlocked temporarily by entering the custom lock code. If the lock code is not entered within two minutes, the display automatically switches to the **Idle screen**. The **Key lock** function remains active.

The lock code can be set and changed by the click wheel or in the **Grundfos GO** app.

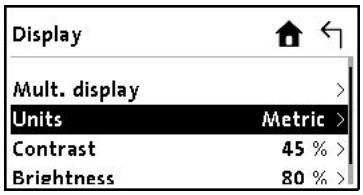
Unlock settings

The **Key lock** function can be deactivated in the **Settings** > **Key lock** menu by selecting **Disable lock**. Enter your four-digit custom lock code or the general code (2583) and confirm the **Disable lock?** dialog.

The general code is for the service specialist and cannot be changed.

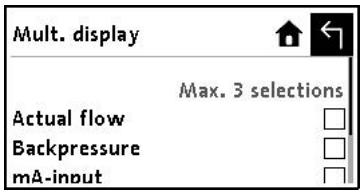
7.18 Display

The display properties can be set in **Settings** > **Display**.

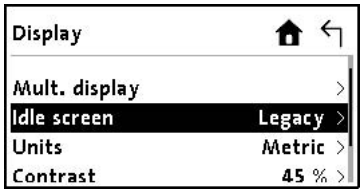


Mult. display

In **Mult. display**, select 1 to 3 values from the list.



The list may vary according to the operation mode. In the **Idle screen** submenu, **Legacy screen** or **Dashboard screen** can be selected.



If **Dashboard screen** is selected, the screen is split and shows the previously selected values. An additional icon appears in the top bar of the **Idle screen**. You can switch between **Dashboard screen** and **Legacy screen** by selecting the respective additional icon.

See also section **Legacy screen** and **Dashboard screen**.

Units

Metric units (litres/millilitres/bar) or US units (US gallons/psi) can be displayed. According to the operation mode and function, the units are shown as follows:

Operation mode or function	Metric Units	US Units
Manual	ml/h, l/h	gph
Pulse	ml/**Pulse**	ml/**Pulse**
Analog 0-20 mA, **Analog 4-20 mA**	ml/h, l/h	gph
Batch	ml, l	gal
Calibration	ml	ml
Volume Counters	l	gal
Pressure monitoring	bar	psi

Contrast

The **Contrast** can be set from 0 to 100 in percentage with the click wheel.

Brightness

The **Brightness** can be set from 0 to 100 in percentage with the click wheel.

Related information

7.7.1 Legacy screen and Dashboard screen

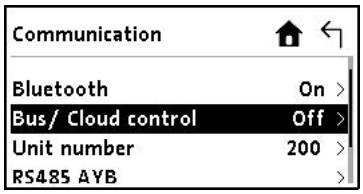
7.19 Communication

The product must only be connected to protected network subnets with strict access control.

The pump can be integrated into various bus systems and configured via Bluetooth with the Grundfos GO app.

The **Settings** > **Communication** menu offers several options of remote configuration:

- **Bluetooth** (**Grundfos GO**)
- **Bus/ Cloud control**
- **Unit number**
- **RS485 AYB** (**GENIbus**, **Modbus RTU**)
- **Ethernet RJ45** (**Modbus TCP protocol**).



Further manuals, functional profiles and support files, such as GSD-files, are available on Grundfos Product Center at www.grundfos.com.

7.19.1 Bluetooth communication

Bluetooth can be activated or deactivated in the **Settings** > **Bus/ Cloud control** menu.

The pump can be connected to **Grundfos GO** via **Bluetooth**. See section Connecting to Grundfos GO.

With **Grundfos GO**, the pump can be configured and the SMART Digital CHEMPAIRING Suite (SDCS) can be commissioned.

Related information

7.19.1.1 Connecting to Grundfos GO

7.19.1.1 Connecting to Grundfos GO

Before connecting the pump, the **Grundfos GO** app must be downloaded to your smartphone or tablet. The app is free of charge and available for iOS and Android devices.

1. Open the **Grundfos GO** app on your device. Make sure that Bluetooth is enabled.

   Your device must be within reach of the product to establish Bluetooth connection.

2. Tap the Bluetooth connect button in the **Grundfos GO** app.
   - When pairing, the displays of all pumps within reach start flashing blue. To identify your pump, tap the product icon. The display of your pump lights up.
   - When connecting to your pump, the name of your pump is shown in the app. The pump display flashes blue.

3. Select your pump and tap **CONNECT**.

   The display of the pump turns blue and shows the Bluetooth icon.

4. When pairing, press the click wheel on the pump to confirm the connection.

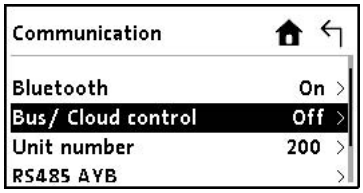
The connection is established. **Grundfos GO** is loading the pump data.

7.19.2 Bus/ Cloud control

CAUTION
Automatic startup
Minor or moderate personal injury
- After deactivating the **Bus/ Cloud control** function, the pump can start automatically.
- Before deactivating the **Bus/ Cloud control** function, set the pump to operating state "Stop".

To change any settings manually, the **Bus/ Cloud control** function must be deactivated temporarily.

The **Bus/ Cloud control** function can be activated or deactivated in the **Settings** > **Communication** menu.



To start and stop the pump via bus, it must be in operating state "Running". When the pump is remotely stopped via bus, the **External stop** icon is displayed and the pump switches to operating state "Ready".

All operation modes can still be used when **Bus/ Cloud control** is activated. **Bus/ Cloud control** can be used only for monitoring and configuring the pump.

The BusWatchDog is activated by default. If it is not deactivated, faults in communication can potentially stop the pump. See the functional profile of the respective CIM or CIU.

Communication faults

CAUTION
Automatic startup
Minor or moderate personal injury
- The pump can start automatically.
- Before repairing any fault, set the pump to operating state "Stop".

Faults are only detected if the respective BusWatchDog is activated. See the functional profile of the respective CIM or CIU.

In case of a bus communication fault, for example, communication cable break, the pump stops dosing and switches to operating state "Ready" after the fault is detected. An alarm is triggered, detailing the cause of the fault.

7.19.3 Unit number

The **Unit number** is used for addressing the pump from the **GENIbus**. A unique number can be allocated to the pump. This makes it possible to distinguish between pumps in connection with **GENIbus** communication.

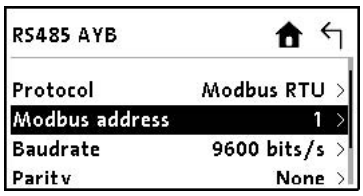
In the **Settings** > **Communication** menu, the **Unit number** can be set with the click wheel.

7.19.4 RS485 AYB

WARNING
Chemical hazard
Death or serious personal injury
- Do not control the pump with two masters via Ethernet and RS485 at the same time.

Read the documentation delivered with the CIU and CIM prior to installation and startup.

In **Settings** > **Communication** > **RS485 AYB** > **Protocol**, **Modbus RTU** or **GENIbus** can be selected.



GENIbus is used for internal communication with a Grundfos Communication Interface Module (CIM) integrated in a Grundfos Communication Interface Unit (CIU). **GENIbus** does not have to be configured.

Modbus RTU must be configured for the system where the pump is used. The following values must be set:

- **Modbus address**
- **Baudrate**
- **Parity**
- **Stop bits**.

Set the values according to your bus system.

If **Modbus RTU** is enabled, **Modbus TCP protocol** is disabled.

Further manuals, functional profiles and support files, such as GSD-files, are available on Grundfos Product Center at www.grundfos.com.

7.19.5 Ethernet RJ45

WARNING
Chemical hazard
Death or serious personal injury
- Do not control the pump with two masters via Ethernet and RS485 at the same time.

The product must only be connected to protected network subnets with strict access control.

Only shielded cables are allowed for Ethernet connection.

Ethernet RJ45 is deactivated by default and must be activated in the **Settings** > **Communication** > **Ethernet RJ45** menu, if required. If **Ethernet RJ45** is deactivated, **Modbus TCP protocol** is also deactivated.

Modbus TCP protocol is deactivated by default.

If **Modbus TCP protocol** is selected, the **TCP port number** must be entered using the click wheel.

If **Modbus TCP protocol** is enabled, **Modbus RTU** is disabled.

If **DHCP** is selected, the values for **IP address**, **Subnet mask** and **Gateway** are filled in by the **DHCP** server. If **DHCP** is not selected, these values must be entered manually.

Primary and Secondary DNS Server can be set via **Grundfos GO**, if necessary.

7.19.6 CIM modules

WARNING
Chemical hazard
Death or serious personal injury
- Do not control the pump with two masters via Ethernet and RS485 at the same time.

Read the documentation delivered with the CIU and CIM prior to installation and startup.

The pump can be integrated into different networks with a Grundfos Communication Interface Unit (CIU) equipped with one of the following Communication Interface Modules (CIM):

- **CIM 150**
- **CIM 200**
- **CIM 280**
- **CIM 290**
- **CIM 500**
- **CIM 550**.

The CIM modules communicate with the pump via **GENIbus**.

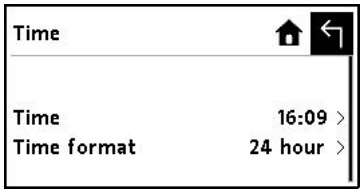
Installing a communication interface module not listed above might affect the compliance level of the product.

Further manuals, functional profiles and support files, such as GSD-files, are available on Grundfos Product Center at www.grundfos.com.

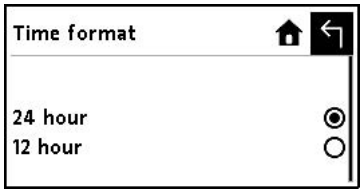
7.20 Time

WARNING
Chemical hazard
Death or serious personal injury
- Changing the time can affect time-sensitive functions.
- Changing the time can lead to over- or underdosing and thus to an increase or decrease in concentration.
- If **Set automatically** is selected in the **Grundfos GO** app, the time is synchronised between the app and the pump. This applies also to the daylight saving time.

The time can be set in the **Settings** > **Time** menu.



Optional formats are **24 hour** or **12 hour**. In the **12 hour** format, AM or PM can be set.



By default, the pump time is set to Central European Time (CET), that is, Coordinated Universal Time with an offset of 1 hour (UTC+1).

The pump time can be adjusted to the local time on the smartphone by activating **Set automatically** in the **Settings** > **Time and date** menu in the **Grundfos GO** app.

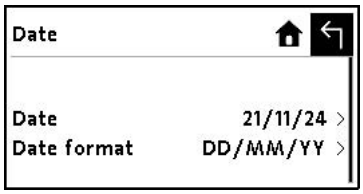
- If **Set automatically** is activated, the daylight saving time is activated and adjusted automatically.
- If **Set automatically** is deactivated, the daylight saving time is disabled.

Daylight saving time is active by default.

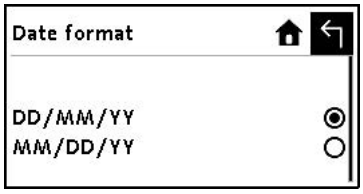
7.21 Date

WARNING
Chemical hazard
Death or serious personal injury
- Changing the date can affect time-sensitive functions.
- Changing the date can lead to over- or underdosing and thus to an increase or decrease in concentration.

The date can be set in the **Settings** > **Date**menu.



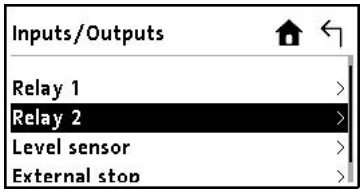
Optional formats are **DD/MM/YY** or **MM/DD/YY**.



7.22 Inputs/Outputs

In the **Settings** > **Inputs/Outputs** menu, the following can be configured:

- the outputs **Relay 1** and **Relay 2**
- the level signal inputs **Level sensor** (**Empty signal**, **Low-level signal**)
- the signal input **External stop**.



7.22.1 Relay outputs

The pump can switch two external signals using installed relays. The relay outputs are potential-free. For the connection diagram of the relays, see section Signal connections.

Both relays can be allocated with the following signals:

Relay 1 signal Trigger	Relay 2 signal Trigger	Description
Alarms	**Alarms**	The display is red, the pump stops (for example **Empty signal**).
Warnings	**Warnings**	The display is yellow, the pump is running (for example **Low-level signal**).
Alarms + Warnings [10]	**Alarms + Warnings**	See the descriptions above.
Stroke signal	**Stroke signal**	It signals each full stroke.
Pump dosing	**Pump dosing** [10]	The pump is running and dosing.
Pulse input [11]	**Pulse input** [11]	It signals each incoming pulse from pulse input.
Bus control	**Bus control**	It is activated by a command in the bus communication.
	Timer cycle	See the following sections.
	Timer week	See the following sections.
Contact type		
NO [10]	**NO** [10]	**Normally open (NO)** contact
NC	**NC**	**Normally closed (NC)** contact

[10] This is the factory setting.

[11] The correct transmission of incoming pulses can only be guaranteed up to a pulse frequency of 100 Hz.

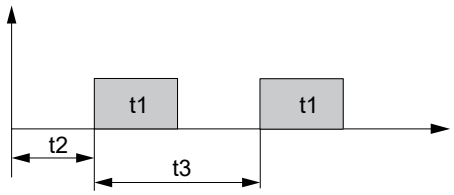
If **Relay 2** is selected as pulse output, **Pulse input** is limited, because **Debounce** is active.

It is recommended to include an appropriate series resistor to achieve maximum frequency.

Timer cycle (Relay 2)

For the **Relay 2** > **Timer cycle** function, the following parameters must be set:

- **Start timer cycle**
- **Continue after power on** (**On**/**Off**)
- **On time** (t1)
- **Cycle time** (t3)
- **Start delay** (t2).



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See also section Timer cycle.

Timer week (Relay 2)

WARNING
Chemical hazard
Death or serious personal injury
- Replace the battery immediately when the **RTC battery low** warning appears on the display. If the battery is not replaced, this can lead to under- or overdosing.

During the switchover to summer time or winter time, **Timer week** could be affected. It could happen that a **Procedure** is skipped or performed more than once. It could also happen that a **Procedure** is longer than scheduled. To avoid this, deactivate **Set automatically** in the **Grundfos GO** app.

This function saves up to 16 relay on-times (dosing procedures) for a week. The following settings can be made for each relay switching operation in the **Relay 2** > **Procedure** > **Timer week** menu:

- **Active** (**On**/**Off**)
- **Weekly schedule**
- **Start time**
- **On time** (duration).

See also section Timer Week.

Related information

5.4.1 Signal connections
7.10.5 Timer cycle
7.10.6 Timer week
8.6 Replacing the battery in the cube front
9.2.17 RTC battery low warning

7.22.2 Level sensor

CAUTION
Chemical hazard
Minor or moderate personal injury
- When the container is filled up again, the pump restarts automatically.

In order to monitor the filling level in the container, a dual-level sensor can be connected to the pump. The pump responds to the level signals as follows:

Sensor signal	Pump status
Low-level signal	Display yellow Low-level icon flashing Pump running
Empty signal	Display red Empty icon flashing Pump stopping

Both signal inputs are allocated to the **Normally open (NO)** contact in the factory. They can be re-allocated in the **Settings** > **Inputs/Outputs** > **Level sensor** menu to **Normally closed (NC)** contact.

7.22.3 External stop

The pump can be stopped via an external contact, for example, from a control room. When activating the **External stop** signal, the pump changes from operating state "Run" to "Ready". The corresponding symbol is displayed.

Frequent disengagement from the power supply, for example, via a relay, can result in damage to the pump electronics and in the breakdown of the pump. The dosing accuracy is also reduced as a result of internal start procedures.

Do not control the pump via the power supply for dosing purposes.

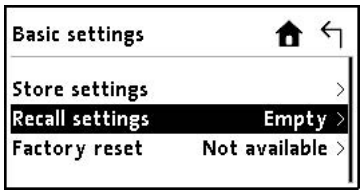
Only use the **External stop** function to start and stop the pump.

The contact type is factory-set to **Normally open (NO)**. In the **Settings** > **Inputs/Outputs** > **External stop** menu, the setting can be changed to **Normally closed (NC)**.

7.23 Basic settings

In the **Settings** > **Basic settings** menu, the following options are available:

- **Store settings**: The current pump configuration is saved to the memory of the pump.
- **Recall settings**: All settings are reset to the stored settings.
- **Factory reset**: All settings are reset to the factory settings.



Stop the pump before running the process.

The memory of the pump always contains the previously saved configuration. Older memory data is overwritten.

Multiple settings can be stored in the **Grundfos GO** app and then transferred to several pumps.

In the **Grundfos GO** app, the following options are available:

- **Store settings in GO**: The current pump configuration is saved to the memory in Grundfos GO.
- **Store settings on pump**: The current pump configuration is saved to the memory of the pump.
- **Restore settings**: All settings are reset to the stored settings.
- **Factory reset**: All settings are reset to the factory settings.

7.24 Advanced settings

In the **Settings** > **Advanced settings** menu, a four-digit code (2583) must be entered. The following options are available:

- **Debounce**: Contact bouncing can be eliminated by setting the frequency for the contact input.
  - **On** or **Off** can be selected. The default setting is **On**.
  - If the relay is set to **Pulse input**, **Debounce** must be set to **On**.
- **Settings from Cloud**: The settings for the SMART Digital CHEMPAIRING Suite (SDCS) are stored.
  - This is not suitable for standard fieldbus networks.
  - Do not store standard fieldbus settings with **Settings from Cloud**. Otherwise the pump memory gets damaged.

In the **Grundfos GO** app, the following options are available:

- **Analog input calibration**: The analog input can be exactly matched with a measured value from a current transmitter. The analog input is calibrated in the factory. As a rule, it does not need to be recalibrated.
- **Analog input border**: The relation of the analog input value and the dosing flow can be set. See section **Analog 0-20 mA**, **Analog 4-20 mA**.
- **Analog output calibration**: The analog output can be exactly matched with a value measured by a multimeter. The analog output is calibrated in the factory. As a rule, it does not need to be recalibrated.
- **Analog output border**: Tolerances in the current loop can be compensated. In case of tolerance issues with the measuring equipment you can jump beyond the limits of your current loop.
- **Debounce**: Contact bouncing can be eliminated by setting the frequency for the contact input.
  - **On** or **Off** can be selected. The default setting is **On**.
  - If the relay is set to **Pulse input**, **Debounce** must be set to **On**.

Related information

7.10.3 Analog 0-20 mA, Analog 4-20 mA

8. Service

WARNING
Chemical hazard
Death or serious personal injury

- Maintenance work must only be carried out by qualified persons.
- The pump housing must only be opened by persons authorised by Grundfos.
- Do not connect the pump to the power supply.
- If the pump must remain connected to the power supply for maintenance, deactivate Bluetooth.
- The maintenance schedule must be observed. If the daily checks are not carried out, diaphragm leakage might not be recognized, which may lead to a chemical hazard.

To ensure a long service life and high dosing accuracy, wearing parts, such as diaphragms and valves, must be regularly checked for signs of wear. Replace worn parts with original spare parts made of suitable materials.

For service kits and spare parts, see the Service Kit Catalogue on the Grundfos Product Center.

Find the Service Instructions manual (93079510) on www.grundfos.com.

Contact your Grundfos service partner if you have any questions.

8.1 Maintenance schedule

Daily

- Check if liquid is leaking from the drain opening and if the drain opening is blocked or soiled.
  - See section Dosing head overview.
  - Follow the instructions in section Diaphragm leakage.
- Check if liquid is leaking from the dosing head or valves.
  - Tighten the dosing head screws with a torque wrench at 4 Nm.
  - Tighten the valves and cap nuts, or perform service.
- Check if a service request message is shown on the pump display.
  - Follow the instructions in section Service system.

Weekly

- Clean all pump surfaces with a dry and clean cloth.

Every 3 months

- Check the dosing head screws.
  - Tighten the dosing head screws with a torque wrench at 4 Nm.
  - Replace damaged screws immediately.

Check the condition of your foot valve regularly and with every dosing tank exchange.

Related information

8.3 Service system
8.4 Dosing head overview
8.5 Diaphragm leakage

8.2 Cleaning the product

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

8.3 Service system

After a defined motor runtime or period of operation, service request messages are shown. Service request messages are shown regardless of the current operating state of the pump and do not affect the dosing process.

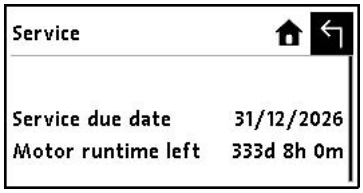
A service request message signals when the replacement of wearing parts is due. Press the click wheel to temporarily hide the message.

When the **Service now** message appears, the pump must be serviced immediately.

Service	Motor runtime [12] [h]	Time interval [12] [months]
Soon	7500	23
Now	8000	24

[12] Since the last service system reset

In the **Info** > **Service** menu, the **Service due date** and the **Motor runtime left** are displayed.



In the **Info** > **Service kit** menu, the following service kits are displayed with their product numbers:

- **Valves + diaphragm**
- **Valves**
- **Diaphragm**
- **Complete Dosing head**

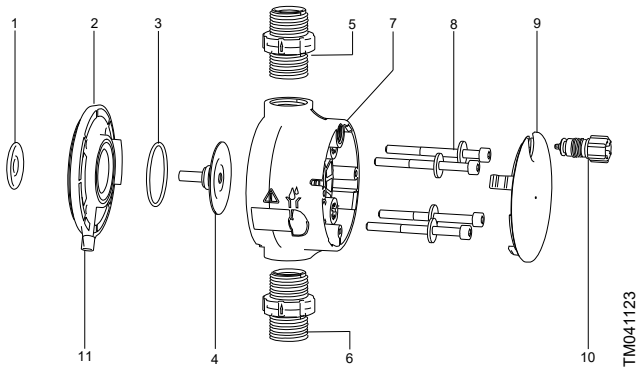
More service kits and spare parts can be found on www.grundfos.com.

Read the Service Instructions manual (93079510) for details on performing service.

For media that cause increased wear, the service interval must be shortened.

After performing service, the service system must be reset using the **Info** > **Service reset** function.

8.4 Dosing head overview



Pos.	Component
1	Safety diaphragm
2	Flange
3	O-ring
4	Diaphragm
5	Valve on discharge side
6	Valve on suction side
7	Dosing head
8	Screws with washers
9	Cover
10	De-aeration valve
11	Drain opening

8.5 Diaphragm leakage

WARNING
Danger of explosion if dosing liquid has entered the pump housing
Death or serious personal injury

- Operation with damaged diaphragm can lead to dosing liquid entering the pump housing.
- In case of diaphragm leakage, immediately separate the pump from the power supply.
- Make sure the pump cannot be started unintentionally.
- Disassemble 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 Disassembling the diaphragm in case of diaphragm leakage.

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

- Perform regular maintenance.
- Do not operate the pump with blocked or soiled drain opening.
  - If the drain opening is blocked or soiled, proceed as described in section Disassembling the diaphragm in case of diaphragm leakage.
- Do not 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 or damage to property from escaping dosing liquid.
- Do not operate the pump with damaged or loose dosing head screws.

If the diaphragm is leaking or broken, dosing liquid leaks from the drain opening on the flange of the dosing head.

In case of diaphragm leakage, the safety diaphragm 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 and the safety diaphragm. The pressure can press dosing liquid through the safety diaphragm into the pump housing.

Most dosing liquids do not cause any danger when entering the pump housing. Few liquids can cause a chemical reaction with internal parts of the pump. In the worst case, this reaction can produce explosive gases in the pump housing.

Related information

1.9 Diaphragm leakage safety measures

8.5.1 Disassembling the diaphragm in case of diaphragm leakage

8.5.1 Disassembling the diaphragm in case of diaphragm leakage

WARNING
Chemical hazard
Death or serious personal injury
- Do not connect the pump to the power supply.
- If the pump must remain connected to the power supply for maintenance, deactivate Bluetooth.

Observe section Diaphragm leakage and section Service.

The numbers in brackets refer to the figure in section Dosing head overview.

1. Put on the stipulated personal protective equipment.
2. If the pump must remain connected to the power supply, press the Start/Stop key to set the pump to operating state "Stop".
3. Depressurise the system.
4. Flush the dosing head, if necessary.
5. Disassemble the suction, discharge and de-aeration lines.
   Make sure that the returning liquid is safely collected.
6. Disconnect the **FlowControl** signal connection, if present.
   See section Product overview.
7. Remove the cover (9).
8. Loosen the screws (8) on the dosing head (7) and remove them together with the washers.
9. Remove the dosing head (7).
10. Grasp the diaphragm (4) with your hands, turn it counter-clockwise and remove it together with the flange (2).
    Do not use tools.
11. Make sure that the drain opening (11) is not blocked or soiled. Clean the drain opening, if necessary.
12. Check the safety diaphragm (1) for wear and damage. Replace the safety diaphragm, if necessary.

If nothing indicates that dosing liquid has entered the pump housing, go on as described in section Reassembling the dosing head, diaphragm and valves.

If dosing liquid has entered the pump housing, proceed as described in section Dosing liquid in the pump housing.

Related information

3.6 Product overview

8. Service

8.4 Dosing head overview

8.5 Diaphragm leakage

8.5.2 Reassembling the dosing head, diaphragm and valves

8.5.3 Dosing liquid in the pump housing

8.5.2 Reassembling the dosing head, diaphragm and valves

Tighten the dosing head screws with a torque wrench before startup and every time the dosing head is opened.

After 2-5 operating hours, retighten the dosing head screws using a torque wrench.

Torque [Nm]: 4

Only start reassembling if nothing indicates that dosing liquid has entered the pump housing. Otherwise proceed as described in section Dosing liquid in the pump housing.

The numbers in brackets refer to the figure in section Dosing head overview.

1. Put on the stipulated personal protective equipment.
2. Attach the flange (2) correctly.
   Observe the drain opening (11).
3. Place a new O-ring (3) in the flange (2).
   Make sure the O-ring is seated correctly.
4. Assemble the new diaphragm (4) by turning it clockwise with your hands until it is firmly seated.
   Do not use tools.
5. Press the Start/Stop key and the 100% key simultaneously to move the diaphragm to its 'in' position.
)- is shown on the display.
6. Attach the dosing head (7).
7. Screw in the screws with washers (8) manually and cross-tighten them with a torque wrench.
   Torque [Nm]: 4
8. Connect the **FlowControl** signal connection, if present.
   See section Signal connections.
9. Attach the cover (9).
10. Install new valves (5, 6).
    - Do not interchange the valves.
    - Observe the direction of the arrow on the valves.
    - Make sure that the O-rings are seated correctly.
11. Connect the suction, discharge and de-aeration lines.
    See section Hydraulic connection.
12. Press the Start/Stop key to leave the service mode.
13. De-aerate the dosing pump.
    See section De-aerating the pump.
14. If you installed a new dosing head with pressure sensor, perform sensor calibration.
    See section Calibrating the pressure sensor.

Related information

5.3 Hydraulic connection

5.4.1 Signal connections

6.4 De-aerating the pump

7.14.4.1 Calibrating the pressure sensor

8.4 Dosing head overview

8.5.3 Dosing liquid in the pump housing

8.5.3 Dosing liquid in the pump housing

WARNING
Danger of explosion if dosing liquid has entered the pump housing
Death or serious personal injury
- Immediately separate the pump from the power supply.
- Make sure the pump cannot be started unintentionally.

If dosing liquid has entered the pump housing:

- Send the pump to Grundfos for repair. Observe section Repairs.
- If a repair is not economically justifiable, dispose of the pump. Observe section Disposing of the product.

Related information

8.8 Repairs

11. Disposing of the product

8.6 Replacing the battery in the cube front

WARNING
Ingestion hazard
Death or serious personal injury

- Keep new and used batteries out of reach of children.
- Seek immediate medical attention if a battery is suspected to be swallowed or inserted inside any part of the body.
- A swallowed button cell battery can cause internal chemical burns in as little as 2 hours.

WARNING
Chemical hazard
Death or serious personal injury

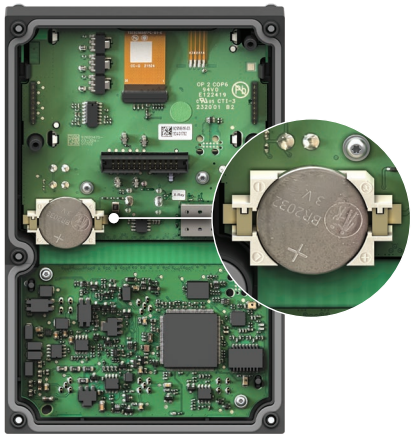
- Replace the battery immediately when the **RTC battery low** warning appears on the display. If the battery is not replaced, this can lead to under- or overdosing.

Only use the correct type of battery: CR2032, 3 V, non-rechargeable, removable, CE compliant.

Do not touch the electronic parts.

See also section Battery statements.

The cube front has a button cell battery for the timer. It must be replaced after a few years.



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If the **RTC battery low** warning is displayed, the battery must be replaced. See also section Faults with error messages.

1. Disconnect the pump from the power supply.
2. Loosen the 6 screws on the front of the control cube.
   Wrench size: TORX PLUS 15 IP
3. Carefully remove the cube front from the control cube.
   Observe the flat band cable.
4. Carefully remove the flat band cable manually.
5. Place the cube front on a table so that the battery is on your left.
6. Insert a small plastic lever or pin into the gap between the battery and the left battery holder.
   The battery pops out.
7. Slide a new button cell battery under the right battery holder.
   Push the left side of the button cell battery down.
   Battery type CR2032 (3 V).
   The positive pole (+) must be at the top.
8. Carefully reattach the flat band cable.
9. Place the cube front on the control cube
   Make sure that the gasket is positioned correctly.
10. Fasten the 6 screws crosswise.
    Wrench size: TORX PLUS 15 IP.
    Torque: 1.3 Nm.

Related information

1.10 Battery statements

9.2.17 RTC battery low warning

9.2 Faults with error messages

8.7 Replacing the power cable

CAUTION
Chemical hazard
Minor or moderate personal injury

- Make sure that the pump has been correctly installed and is ready to be started before you switch on the power supply.
- The enclosure class (IP65 / type 4X) is only guaranteed, if the power cable is correctly installed.
- Do not manipulate or cut the power plug or cable.

1. Disconnect the pump from the power supply.
2. Unscrew the safety screw on the power cable with a crosshead screwdriver.
3. Replace the power cable.
   Observe the orientation.
4. Carefully screw in the safety screw with a torque wrench.
   Torque [Nm]: 0.4 (+ 0.1)

The pump can start automatically when the power supply is switched on.

8.8 Repairs

WARNING
Chemical hazard
Death or serious personal injury

- The pump housing must only be opened by persons authorised by Grundfos.
- Repairs must only be carried out by authorised and qualified persons.
- Switch off the power supply before carrying out maintenance work and repairs.

Consult your Grundfos service partner. If required, send the pump to Grundfos, together with the safety declaration. Find the safety declaration at the end of this manual. Print out the safety declaration, fill it in and attach it to the pump.

The pump must be cleaned prior to dispatch.
If dosing liquid has possibly entered the pump housing, state that explicitly in the safety declaration. Observe section Diaphragm leakage.

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.

Related information

8.5 Diaphragm leakage

9. Fault finding

9.1 General faults

9.1.1 Dosing flow too high

Cause	Remedy
The inlet pressure is higher than the back pressure.	• Install an additional spring-loaded valve on the discharge side. Approx. 3 bar • Increase the pressure differential.
The calibration is incorrect.	• Calibrate the pump. See section Calibrating the pump.

Related information

6.5 Calibrating the pump

9.1.2 Dosing flow too low or no dosing flow

Cause	Remedy
There is air in the dosing head.	• De-aerate the pump.
The dosing diaphragm is damaged.	• Replace the dosing diaphragm. See section Service. See the Service Instructions manual (93079510).
The dosing lines are leaky or broken.	• Check the lines. • Repair the lines, if necessary.
The valves are leaky or blocked.	• Check the valves. • Clean the valves. • Replace the valves, if necessary.
The valves are installed incorrectly.	• Make sure the arrow on the valve housing is pointing in the direction of flow. • Make sure all O-rings are installed correctly.
The suction line is blocked.	• Clean the suction line. • Install a filter on the suction line.
The suction lift is too high.	• Reduce the suction lift. • Enable **SlowMode**. See section **SlowMode**.
The viscosity is too high.	• Enable **SlowMode**. See section **SlowMode**. • Use lines with a larger diameter. • Install spring-loaded valves on the dosing head.
The calibration is incorrect.	• Calibrate the pump. See section Calibrating the pump.
The de-aeration valve is open.	• Close the de-aeration valve.

Related information

6.5 Calibrating the pump

7.12 SlowMode

8. Service

9.1.3 Irregular dosing

Cause	Remedy
The valves on the dosing head are leaky or blocked.	• Tighten up the valves. • Replace the valves, if necessary. See section Service. See the Service Instructions manual (93079510).
There are fluctuations in the back pressure.	• Keep the back pressure constant. • FCM variant: Activate **AutoFlowAdapt**.

Related information

8. Service

9.1.4 Liquid is leaking from the drain opening

Cause	Remedy
The dosing diaphragm is damaged.	• Immediately separate the pump from the power supply. • Observe section Service and section Diaphragm leakage.

Related information

8. Service

8.5 Diaphragm leakage

9.1.5 Liquid leakage

Cause	Remedy
The dosing head screws are not tightened.	• Tighten up the dosing head screws. See section Hydraulic connection.
The valves are not tightened.	• Tighten up the valves and union nuts. See section Hydraulic connection.

Related information

5.3 Hydraulic connection

9.1.6 Pump is not sucking in liquid

Cause	Remedy
The suction lift is too high.	• Reduce the suction lift. • Provide positive inlet pressure.
The back pressure is too high.	• Open the de-aeration valve.
The valves are soiled.	• Flush the system. • Replace the valves, if necessary. See section Service. See the Service Instructions manual (93079510).

Related information

8. Service

9.1.7 CIM or fieldbus does not connect to the pump

Cause	Remedy
The installed fieldbus cannot communicate with the pump.	• Check in the **Settings** > **Communication** menu if a CIM protocol is displayed. - If only a **CIM ID** is displayed, the CIM module is not detected. There might be a cable break or another issue. - If **CIM - Unsupported** is displayed, the CIM module is not supported. Use another CIM module that is supported or check the configuration of your CIM module in the respective Functional Profile.

9.2 Faults with error messages

In the event of faults, a warning or an alarm is triggered. The corresponding fault icon flashes on the **Idle screen**.

CAUTION
Chemical hazard
Minor or moderate personal injury
- Before entering the **Events log** menu, make sure that the pump is in operating state "Stop".
- The pump can start automatically when the power supply is switched on.

Press the click wheel to open the **Events log** menu.

A yellow display indicates a warning, and the pump continues running.

A red display indicates an alarm, and the pump stops dosing. For some alarms, the pump tries to restart periodically. When the cause of the alarm has been remedied, the pump starts automatically and switches back to normal operation.

CAUTION
Chemical hazard
Minor or moderate personal injury
- Before remedying the cause of the fault, make sure that the pump is ready to be started.
- The pump can start automatically when the power supply is switched on.

Before starting work on the pump, make sure that the pump is in operating state "Stop" or disconnected from the power supply.

Make sure that the system is depressurised.

The last 10 faults are stored in the **Events log** menu. When a new fault occurs, the oldest fault is deleted. The time and cause of the fault are displayed.

The list of faults can be deleted at the beginning of the list.

If there is a service request message, this appears when the **Events log** menu is opened. Press the click wheel to temporarily close the message. See section Service system.

Related information

8.3 Service system

9.2.1 Empty alarm

The **Empty** alarm icon is shown on the display:

Cause	Remedy
The dosing tank is empty.	• Fill the dosing tank. • Check the plug connection. See section Signal connections. • Check the contact setting (NO or NC).

Related information

5.4.1 Signal connections

9.2.2 Low level warning

The **Low level** warning icon is shown on the display:

Cause	Remedy
The dosing tank is almost empty.	• Fill the dosing tank. • Check the plug connection. See section Signal connections. • Check the contact setting (NO or NC).

Related information

5.4.1 Signal connections

9.2.3 Overpressure alarm

The **Overpressure** alarm icon is shown on the display:

Cause	Remedy
The discharge valve is blocked.	• Replace the discharge valve if necessary. See section Service. See the Service Instructions manual (93079510).
The isolating valve on the discharge side is closed.	• Check the flow direction. See the arrow on the valves. • Open the isolating valve on the discharge side.
The back pressure exceeds the maximum operating pressure.	• Reduce the back pressure. See section Technical data.
Pressure peaks occur due to the high viscosity of the dosing medium.	• Enlarge the diameter of the discharge line.
The maximum pressure is set too low.	• Change the pressure setting. See sections Pressure monitoring and Pressure setting ranges.

Related information

4. Technical data
5.4.1 Signal connections
7.14.3 Pressure monitoring
7.14.3.1 Pressure setting ranges
8. Service

9.2.4 Low diff. pressure warning or alarm

Depending on the setting, the **Low diff. pressure** warning or alarm icon is shown on the display:

Cause	Remedy
The dosing diaphragm is damaged.	• Separate the pump from the power supply. • Replace the diaphragm. See section Service. See the Service Instructions manual (93079510).
The discharge line is broken.	• Check the discharge line. Repair it, if necessary.
The pressure differential between suction and discharge side is too low.	• Install an additional spring-loaded valve on the discharge side. Approx. 3 bar
There is leakage in the pressure loading valve at Q < 1 l/h.	• Install an additional spring-loaded valve on the discharge side. Approx. 3 bar
The de-aeration valve is open.	• Close the de-aeration valve finger tight. Do not use tools.

Related information

8. Service

9.2.5 Air bubbles warning

The **Air bubbles** warning icon is shown on the display:

Cause	Remedy
The suction line is leaky or broken.	• Check the suction line. Repair it, if necessary. • Provide positive inlet pressure. Place the dosing tank above the pump.
The dosing medium is strongly degassing.	• Enable **SlowMode**. See section Slow Mode.
The dosing tank is empty.	• Fill the dosing tank.

Related information

7.12 SlowMode

9.2.6 Cavitation warning

The **Cavitation** warning icon is shown on the display:

Cause	Remedy
The suction line is blocked or constricted or squeezed.	• Check the suction line. • Open the isolating valve, if necessary.
The suction valve is blocked or constricted.	• Check the suction valve.
The suction lift is too high.	• Reduce the suction lift.
The viscosity of the dosing medium is too high.	• Enable **SlowMode**. See section Slow Mode. • Increase the suction line diameter.

Related information

7.12 SlowMode

9.2.7 Suct valve leak warning

The **Suct valve leak** warning icon is shown on the display:

Cause	Remedy
The suction valve is leaky.	• Check the suction valve. Tighten it up, if necessary. • Check the O-ring. • Replace the valve, if necessary. See section Service. See the Service Instructions manual (93079510).
The suction valve is dirty.	• Flush the system. • Install a filter on the suction line.
The de-aeration valve is open.	• Close the de-aeration valve finger tight. Do not use tools.

Related information

8. Service

9.2.8 Disch valve leak warning

The **Disch valve leak** warning icon is shown on the display:

Cause	Remedy
The discharge valve is leaky.	• Check the discharge valve. Tighten it up, if necessary. • Check the O-ring. • Replace the valve, if necessary.
The discharge valve is dirty.	• Flush the system. • Install a filter in the suction line.
The pressure loading valve is leaky.	• Check the pressure loading valve. Tighten it up, if necessary. • Replace the valve, if necessary. See section Service. See the Service Instructions manual (93079510). • Install a spring-loaded valve on the discharge side.
The de-aeration valve is open.	• Close the de-aeration valve finger tight. Do not use tools.

Related information

8. Service

9.2.9 Flow deviation warning

The **Flow deviation** warning icon is shown on the display:

Cause	Remedy
There is considerable deviation between target flow and actual flow.	• Check the installation.
The dosing pump is not or is incorrectly calibrated.	• Calibrate the dosing pump. See section Calibrating the pump.

Related information

6.5 Calibrating the pump

9.2.10 Pressure sensor warning

The **Pressure sensor** warning icon is shown on the display:

Cause	Remedy
The **FlowControl** cable is broken.	• Check the plug connection. See section Signal connections. • If the **FlowControl** connection at the pump is damaged, send the pump for repair. See section Repairs.
The pressure sensor is defective.	• Replace the pressure sensor.
The pressure sensor is not correctly calibrated.	• Calibrate the pressure sensor correctly. See section Calibrating the pressure sensor.

Related information

5.4.1 Signal connections

7.14.4.1 Calibrating the pressure sensor

8.8 Repairs

9.2.11 Motor blocked alarm

The **Motor blocked** alarm icon is shown on the display:

Cause	Remedy
The back pressure exceeds the nominal pressure.	• Reduce the back pressure.
The diaphragm is installed incorrectly.	• Install the diaphragm correctly. See section Service. See the Service Instructions manual (93079510).
The gear is damaged.	• Arrange for repair of the gear. Contact your Grundfos service partner.
There is a hall sensor failure.	• Contact your Grundfos service partner.
There is a motor failure.	• Contact your Grundfos service partner.

Related information

8. Service

9.2.12 Bus error alarm

The **Bus error** alarm icon is shown on the display:

Cause	Remedy
There is a fieldbus communication error.	• Check the cables for correct specification or damage. • Replace the cables, if necessary. • Check the routing and shielding of the cables. • Correct them, if necessary.

9.2.13 CIU alarm

The **CIU** alarm icon is shown on the display:

Cause	Remedy
There is a CIU connection error.	• Check the plug connection.
The CIU is faulty.	• Replace the CIU.

9.2.14 Sensor signal alarm

The **Sensor signal** alarm icon is shown on the display:

Cause	Remedy
There is a defect in the 4-20 mA analog cable (input current < 2 mA).	• Check the cable and plug connections. • Replace cable and plug, if necessary. • Check the signal transmitter.

9.2.15 Stop after power failure alarm

The **Stop after power failure** alarm icon is shown on the display:

Cause	Remedy
The **Stop after power failure** function is enabled and the power supply was switched on or re-established after power failure.	• Check the power supply and the power cable. See section Stop after power failure.

Related information

7.13 Stop after power failure

9.2.16 Overcurrent warning

The **Overcurrent** warning icon is shown on the display:

A current of 22.5 mA on the analog current input is indicated.

Cause	Remedy
The flow sensor is defective.	• Measure the actual current signal with a multimeter. • If the indicated current is still 22.5 mA, replace the flow sensor.
The pump is defective.	• Remove the sensor cable and check the indicated current. • If the indicated current is still 22.5 mA, contact your Grundfos service partner.

9.2.17 RTC battery low warning

WARNING
Ingestion hazard
Death or serious personal injury

- Keep new and used batteries out of reach of children.
- Seek immediate medical attention if a battery is suspected to be swallowed or inserted inside any part of the body.
- A swallowed button cell battery can cause internal chemical burns in as little as 2 hours.

WARNING
Chemical hazard
Death or serious personal injury

- Replace the battery immediately when the **RTC battery low** warning appears on the display. If the battery is not replaced, this can lead to under- or overdosing.

The **RTC battery low** warning icon is shown on the display:

Cause	Remedy
The battery in the cube front is almost empty.	• Replace the battery in the cube front immediately. See section Replacing the battery in the cube front.

Related information

8.6 Replacing the battery in the cube front

9.2.18 Service now warning

The **Service now** warning icon is shown on the display:

Cause	Remedy
The time interval for service has expired.	• Perform service. See section Service. See the Service Instructions manual (93079510).

Related information

8. Service

10. Decommissioning

Delete all information before decommissioning.

1. Select **Settings** > **Basic settings** > **Factory reset**. Confirm the dialog.
2. Empty the dosing head.

11. Disposing of the product

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

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.
3. Dispose of the waste battery through the national collective schemes. If in doubt, contact your local Grundfos company.

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

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

12. Document quality feedback

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A.1. Limited consumer warranty

This Limited Warranty is provided for Consumer Products sold in the United States only and applies to Consumer Transactions as defined in and applicable under the Magnusson-Moss Warranty Act and any other applicable Federal and/or State laws. In case of non-Consumer Products, please refer to Grundfos' warranty terms defined in clause 10 of Grundfos US Terms and Conditions of Sale of Product and Services available at *https://www.grundfos.com/legal/grundfos-customer-terms/usa-grundfos-general-terms-for-sales-of-products-and-services*

This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

New products manufactured by Grundfos are warranted to the original purchaser only and are to be free from defects in design, material and workmanship under normal use and service for no greater than a period of thirty (30) months from the date of manufacture which is set forth on the product's nameplate and on the product's packaging or the minimum period required by the applicable State law. For New Jersey, the applicable period is one year from the date of purchase.

The warranty period for replacement products, parts and components expires thirty (30) months from the original date of manufacture of the product originally purchased, unless a longer period is required under the applicable State law. For New Jersey, the warranty period for replacement products, parts and components expires one year from the original date of purchase of the product, not the date of replacement.

Products sold by Grundfos that are manufactured by others are not covered by this warranty.

Note that when purchasing a Grundfos product online, it is important to check the date of manufacture and the duration of the warranty with the seller as the product might no longer be covered under this Limited Warranty.

When a product is subject to this Limited Warranty a purchaser should contact the seller from which it purchased the product to make a claim.

If the seller of a product is no longer in business, the purchaser should contact a Grundfos Authorized Service Partner, which can be found at *www.grundfos.com/us* under > Support > Contact Service.

As part of making a claim, a purchaser shall return a defective product at the purchaser's cost, to the extent allowed by applicable law, along with proof of purchase and an explanation of the defect, date the defect occurred and circumstances surrounding the defect. For New Jersey there is no prohibition on returning a defective product at a purchaser's cost. If Grundfos is required by applicable State law to pay for the cost of shipment under applicable State law, then a purchaser should contact a Grundfos Authorized Service Partner to arrange for shipment. A purchaser also needs to promptly respond to Grundfos as to any inquiries regarding a warranty claim.

Grundfos' liability under this Limited Warranty to purchaser is limited to the repair or replacement of a product (at Grundfos' decision) that is the sole and exclusive remedy for purchaser to the extent permissible by applicable law. For New Jersey this limitation is permissible.

This warranty does not cover the following: ordinary wear and tear; use of a product for applications for which it is not intended; use of a product in an unsuitable environment; modifications, alterations or repair undertaken by anyone not acting with Grundfos' written authorization; failure to follow Grundfos' instructions, operations manuals, any other guidelines or good industry practice; use of faulty or inadequate ancillary equipment in combination with a product; application of spare or replacement parts not provided or authorized by Grundfos; accidental or intentional damage or misuse of a product.

The time period for making a claim under the implied warranty of merchantability and implied warranty of fitness are limited to the same time period as provided by this warranty to the extent permissible by applicable law. For residents of New Jersey, this limitation is permissible, but note that some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Grundfos shall not be liable for any incidental and consequential damages in connection with a product to the extent permissible by applicable law. For residents of New Jersey, this limitation is permissible, but note that some states do not allow limitations of incidental or consequential damages, so the above limitation may not apply to you.

A.2. Garantía limitada del consumidor

Esta garantía limitada se proporciona únicamente para los productos de consumo vendidos en los Estados Unidos y es aplicable a las transacciones de consumo tal y como se define en y resulta aplicable en virtud de la ley de Garantías Magnusson-Moss y cualquier otra legislación federal y/o estatal aplicable. Para el caso de productos que no sean de consumo, consulte los términos de la garantía de Grundfos definidos en la cláusula 10 de los términos y condiciones de venta de productos y servicios de Grundfos para los EE. UU., disponibles en *https://www.grundfos.com/legal/grundfos-customer-terms/usa-grundfos-general-terms-for-sales-of-products-and-services*.

Esta garantía limitada le confiere derechos legales específicos. Puede que también tenga otros derechos en virtud de su jurisdicción estatal.

Se garantiza únicamente al comprador original que los productos fabricados por Grundfos estarán libres de defectos de diseño, materiales y mano de obra en condiciones normales de uso y servicio durante un periodo no mayor a treinta (30) meses a partir de la fecha de fabricación que figura en la placa de datos del producto y en el empaque del mismo o el periodo mínimo exigido por la legislación estatal aplicable. Para Nueva Jersey, el periodo aplicable es de un año a partir de la fecha de compra.

El periodo de garantía para los productos, partes y componentes de repuesto vence a los treinta (30) meses contados a partir de la fecha de fabricación original del producto adquirido en primer lugar, a menos que la legislación estatal aplicable exija un periodo más largo. Para Nueva Jersey, el periodo de garantía de los productos, partes y componentes de repuesto vence un año contado a partir de la fecha original de compra del producto, no de la fecha de sustitución.

Los productos vendidos por Grundfos que sean producidos por otros fabricantes no están cubiertos por esta garantía.

Tenga en cuenta que, al comprar un producto Grundfos en línea, es importante revisar la fecha de fabricación y la duración de la garantía con el vendedor, ya que es posible que el producto ya no esté cubierto por esta garantía limitada.

Cuando un producto esté sujeto a esta garantía limitada, el comprador deberá ponerse en contacto con el vendedor al que haya comprado el producto para presentar una reclamación.

Si el vendedor de un producto ya no está en el negocio, el comprador debe ponerse en contacto con socio de servicio autorizado por Grundfos, que puede encontrar en la dirección *www.grundfos.com/us*, en la sección “Support” > “Contact Service”.

Como parte de la presentación de una reclamación, el comprador deberá devolver el producto descompuesto a su costa, en la medida en la que lo permita la legislación aplicable, junto con el comprobante de compra y una explicación del defecto, la fecha en que este se haya producido y las circunstancias en torno al defecto. En Nueva Jersey no existe ninguna prohibición de devolver un producto descompuesto a costa del comprador. Si la legislación estatal aplicable obliga a Grundfos a hacerse cargo de los gastos de envío, el comprador deberá ponerse en contacto con un servicio técnico autorizado por Grundfos para organizar el envío. El comprador también debe responder con prontitud a Grundfos cualquier consulta relacionada con una reclamación de garantía.

La responsabilidad de Grundfos hacia el comprador en virtud de esta garantía limitada se limita a la reparación o sustitución de un producto (a decisión de Grundfos), que es el único y exclusivo remedio para el comprador en la medida permitida por la legislación aplicable. Para Nueva Jersey, esta limitación resulta permisible.

Esta garantía no cubre lo siguiente: el desgaste ordinario; el uso de un producto para aplicaciones para las que no está diseñado; el uso de un producto en un entorno inadecuado; las modificaciones, alteraciones o reparaciones realizadas por cualquier persona que no actúe con la autorización por escrito de Grundfos; el incumplimiento de las instrucciones, manuales de operación, cualquier otro lineamiento o las buenas prácticas industriales de Grundfos; el uso de equipos auxiliares descompuestos o inadecuados en combinación con un producto; el uso de repuestos o partes de sustitución no proporcionados ni autorizados por Grundfos; el daño accidental o deliberado o el uso indebido de un producto.

El periodo para presentar una reclamación en virtud de la garantía implícita de comerciabilidad y la garantía implícita de idoneidad se limita al mismo periodo previsto por esta garantía en la medida permitida por la legislación aplicable. Para los residentes de Nueva Jersey, esta limitación resulta permisible, si bien se debe tener en cuenta que algunos estados no permiten limitaciones en cuanto a la duración de una garantía implícita, por lo que la limitación anterior puede no resultar aplicable en su caso.

Grundfos no será responsable de ningún daño indirecto o consecuente en relación con un producto en la medida en la que lo permita la legislación aplicable. Para los residentes de Nueva Jersey, esta limitación resulta permisible, si bien debe tenerse en cuenta que algunos estados no permiten limitaciones en cuanto a daños indirectos o consecuentes, por lo que la limitación anterior puede no resultar aplicable en su caso.

B.1. Limited manufacturer's warranty

This Limited Manufacturer's Warranty outlines applicable coverage and claims procedures for the pumps manufactured by Grundfos (the "Product").

This Limited Manufacturer's Warranty is provided for consumer products sold and used in Canada only and applies to consumer transactions as defined in the applicable provincial and territorial laws. In case of non-consumer products, please refer to Grundfos' warranty terms defined in clause 10 of Grundfos Canada Terms and Conditions of Sale of Product and Services available at: *https://www.grundfos.com/ca/legal/general-terms-and-conditions-of-sales-and-delivery*

This Limited Manufacturer's Warranty provides specific rights and limitations. Some of the limitations may not apply to you, and you may also have other rights that vary from province to province.

Scope of the Limited Manufacturer's Warranty

Subject to the following warranty terms and conditions, Grundfos Canada Inc. of 2941 Brighton Rd, Oakville, ON L6H 6C9, Canada ("Grundfos"), warrants to the original consumer (the "Purchaser") that the new Product manufactured by Grundfos is free from defects in design, material and workmanship under normal use and service for a period of twenty-four (24) months from the date of retail purchase but no greater than a period of thirty (30) months from the date of manufacture which is set forth on the Product's nameplate and on the Product's packaging (the "Warranty Period").

Note that when purchasing a Grundfos Product online, it is important to check the date of manufacture and the duration of the warranty with the seller as the Product might no longer be covered under this Limited Manufacturer's Warranty.

This Limited Manufacturer's Warranty applies exclusively to a new Grundfos Product sold and used in Canada. This Limited Manufacturer's Warranty does not apply to any Product sold "as is" or "sales final". This Limited Manufacturer's Warranty is not transferrable by the original Purchaser. Products sold by Grundfos that are manufactured by others are not covered by this warranty.

The sole and exclusive remedy under this Limited Manufacturer's Warranty is the repair or, at the discretion of Grundfos, the replacement of the Product, as set out below. Defects or damages are not covered by the Limited Manufacturer's Warranty if they are due to:

- ordinary wear and tear;
- use of the Product for an application for which it is not intended;
- installation of the Product in an environment not suitable for the Product;
- any modification, alteration or repair of the Product undertaken by the Purchaser or a third party (not acting on Grundfos' behalf);
- failure to follow Grundfos' instructions, including in the installation manual, operation manual, maintenance manual or service manual;
- installation, commissioning, operation (including the use of the Product or any Grundfos product outside its specifications) or maintenance of the Product other than in accordance with Grundfos installation manual, operation manual, maintenance manual or service manual or with good industry practice;
- use of faulty or inadequate ancillary equipment in combination with the Product;
- the application of spare parts of poor quality (excluding the application of any Grundfos original spare parts);
- accidental or intentional damage or misuse of the Products or services by the Purchaser or a third party (not acting on Grundfos' behalf); or
- the non-compliance of the Purchaser or of the Purchaser's own products with applicable law and regulation.

How to get service under the Limited Manufacturer's Warranty:

When a Product is subject to this Limited Manufacturer's Warranty, the Purchaser should contact the seller from which it purchased the Product to make a claim within 24 months from the date of retail purchase but no later than thirty (30) months from the date of manufacture which is set forth on the Product's nameplate and on the Product's packaging (the "Warranty Notification Period").

If the seller of a Product is no longer in business, the Purchaser should contact Grundfos Service at *www.grundfos.com/us* under **Support** > **Contact Service**.

To exercise the rights under this Limited Manufacturer's Warranty, the Purchaser shall return a defective Product at the Purchaser's cost, to the extent allowed by applicable law, along with proof of purchase and an explanation of the defect, date the defect occurred and circumstances surrounding the defect.

The Purchaser is responsible for any expenses for dismounting and mounting the Product and for any and costs related to removal, reinstallation, transportation, and insurance. If Grundfos is required by applicable provincial or territorial law to pay for the cost of transportation, then the Purchaser should contact Grundfos Service Partner to arrange for shipment. The Purchaser also needs to promptly respond to Grundfos as to any inquiries regarding a warranty claim.

Unless requested by Grundfos, the Product may not be disassembled prior to remedy. Any failure to comply herewith will render this Limited Manufacturer's Warranty void.

Grundfos will either arrange the repair of the defective Product under this Limited Manufacturer's Warranty or, at Grundfos' option, provide the Purchaser with a replacement of the defective Product. The replacement unit can be new or remanufactured.

To the extent permissible by applicable law, Grundfos shall not be liable for any incidental and consequential damages or losses of any kind whatsoever arising under, relating to or in connection with the Product, use of the Product or the inability to use the Product.

B.2. Garantie limitée du fabricant

Cette garantie limitée du fabricant décrit la couverture applicable et les procédures de réclamation pour les pompes fabriquées par Grundfos (ci-après le « Produit »).

Cette garantie limitée du fabricant est fournie pour les produits de consommation vendus et utilisés au Canada uniquement et s'applique aux transactions de consommateurs telles que définies dans les lois provinciales et territoriales applicables. Dans le cas de produits non destinés aux consommateurs, se référer aux conditions de garantie de Grundfos définies à l'article 10 des Conditions générales de vente des produits et services de Grundfos Canada, qui sont disponibles à l'adresse suivante : *https://www.grundfos.com/ca/fr/legal/general-terms-and-conditions-of-sales-and-delivery*

Cette garantie limitée du fabricant prévoit des droits et des limitations spécifiques. Certaines des limitations peuvent ne pas s'appliquer à vous, et vous pouvez également bénéficier d'autres droits qui varient d'une province à l'autre.

Champ d'application de la garantie limitée du fabricant

Sous réserve des conditions générales de garantie suivantes, Grundfos Canada Inc., dont le siège social est situé au 2941, Brighton Rd, Oakville, ON L6H 6C9, Canada (ci-après « Grundfos »), garantit au consommateur initial (ci-après « l'Acheteur ») que le nouveau Produit fabriqué par Grundfos est exempt de défauts de conception, de matériaux et de fabrication dans des conditions normales d'utilisation et d'entretien pendant une période de vingt-quatre (24) mois à compter de la date d'achat au détail, mais pas plus de trente (30) mois à compter de la date de fabrication indiquée sur la plaque signalétique et sur l'emballage du Produit (« Période de garantie »).

Lors de l'achat d'un Produit Grundfos en ligne, il est important de vérifier la date de fabrication et la durée de la garantie auprès du vendeur, car le Produit pourrait ne plus être couvert par cette garantie limitée du fabricant.

Cette garantie limitée du fabricant s'applique exclusivement à un Produit Grundfos neuf vendu et utilisé au Canada. Cette garantie limitée du fabricant ne s'applique pas aux Produits vendus « en l'état » ou « vente finale ». La présente garantie limitée du fabricant n'est pas transférable par l'Acheteur initial. Les produits vendus par Grundfos qui sont fabriqués par des tiers ne sont pas couverts par cette garantie.

Le seul et unique recours dans le cadre de cette garantie limitée du fabricant est la réparation ou, à la discrétion de Grundfos, le remplacement du Produit, comme indiqué ci-dessous. Les défauts ou dommages ne sont pas couverts par la garantie limitée du fabricant s'ils sont dus à :

- l'usure normale ;
- l'utilisation du Produit pour une application pour laquelle il n'est pas prévu ;
- l'installation du Produit dans un environnement non adapté au Produit ;
- toute modification, altération ou réparation du Produit entreprise par l'Acheteur ou un tiers (n'agissant pas pour le compte de Grundfos) ;
- la non-observation des instructions de Grundfos, y compris dans les notices d'installation, d'utilisation, de maintenance ou d'entretien ;
- l'installation, la mise en service, l'utilisation (y compris l'utilisation du Produit ou de tout produit Grundfos en dehors de ses spécifications) ou l'entretien du Produit autrement que conformément aux notices d'installation, d'utilisation, de maintenance ou d'entretien Grundfos ou aux bonnes pratiques de l'industrie ;
- l'utilisation d'un équipement auxiliaire défectueux ou inadéquat en combinaison avec le Produit ;
- l'utilisation de pièces de rechange de mauvaise qualité (à l'exclusion de l'utilisation de pièces de rechange d'origine Grundfos) ;
- tout dommage accidentel ou intentionnel ou toute mauvaise utilisation des Produits ou des services par l'Acheteur ou un tiers (n'agissant pas pour le compte de Grundfos) ; ou
- la non-conformité de l'Acheteur ou de ses propres produits aux lois et règlements applicables.

Procédure à suivre pour bénéficier d'un service dans le cadre de la garantie limitée du fabricant :

Lorsqu'un Produit est soumis à la présente garantie limitée du fabricant, l'Acheteur doit contacter le vendeur auprès duquel il a acheté le produit pour faire une réclamation dans les 24 mois suivant la date d'achat au détail, mais au plus tard trente (30) mois à compter de la date de fabrication indiquée sur la plaque signalétique du Produit et sur l'emballage du Produit (« Période de notification de garantie »).

Si le vendeur d'un Produit n'est plus en activité, l'Acheteur doit contacter le service Grundfos à l'adresse *www.grundfos.com/us* sous **Support** > **Contact Service**.

Pour exercer les droits prévus par la présente garantie limitée du fabricant, l'Acheteur doit renvoyer le Produit défectueux à ses frais, dans la mesure où la loi applicable le permet, accompagné de la preuve d'achat et d'une explication du défaut, de la date à laquelle le défaut s'est produit et des circonstances entourant le défaut.

L'Acheteur est responsable de tous les frais de démontage et de montage du Produit et de tous les frais liés à l'enlèvement, à la réinstallation, au transport et à l'assurance. Si Grundfos est tenu par la loi provinciale ou territoriale applicable de payer les frais de transport, l'Acheteur doit contacter le partenaire de service Grundfos pour organiser l'expédition. L'Acheteur doit également répondre rapidement à Grundfos pour toute demande concernant une réclamation au titre de la garantie.

Sauf demande de Grundfos, le Produit ne doit pas être démonté avant d'être remis en état. Tout manquement à ces dispositions entraînera l'annulation de la présente garantie limitée du fabricant.

Grundfos procédera à la réparation du Produit défectueux dans le cadre de cette garantie limitée du fabricant ou, à la convenance de Grundfos, fournira à l'Acheteur un produit de remplacement du Produit défectueux. L'unité de remplacement peut être neuve ou refabriquée.

Dans la mesure autorisée par la loi applicable, Grundfos ne sera pas responsable des dommages accessoires et indirects ou des pertes de quelque nature que ce soit découlant de, liés à ou en rapport avec le Produit, l'utilisation du Produit ou l'incapacité d'utiliser le Produit.

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