

MAGNA1

Model C

Installation and operating instructions



MAGNA1

English (GB)

Installation and operating instructions	4
Dimensions.	39

English (GB) Installation and operating instructions

Original installation and operating instructions

Table of contents

1. General Information	4
1.1 Hazard statements	4
1.2 Notes	4
1.3 Safety symbols on the pump	5
1.4 Target group	5
2. Product introduction	5
2.1 Product description	5
2.2 Intended use	5
2.3 Pumped liquids	5
2.4 Identification	6
3. Receiving the product	7
3.1 Inspecting the product	7
3.2 Scope of delivery	7
3.3 Lifting the product	8
4. Installation requirements	9
4.1 Location	9
4.2 Tools	9
4.3 Insulating shells	10
5. Mechanical installation	11
5.1 Positioning the pump	12
5.2 Venting of twin-head pump housing	12
5.3 Control box positions	12
5.4 Pump head position	13
5.5 Changing the control box position	13
6. Electrical connection	15
6.1 Supply voltage	15
6.2 Wiring diagrams	16
6.3 Connection to the power supply, plug-connected versions	17
6.4 Connection to the power supply, terminal-connected version	18
6.5 Connecting the digital input	19
6.6 Connecting the fault relay output	19
7. Communication	20
7.1 Radio communication	20
7.2 Grundfos GO	20
8. Starting up the product	21
8.1 Non-return valve	21
8.2 Closed valve operation	21
8.3 Twin-head pump startup	21
8.4 Pairing and unpairing twin-head pumps	22
9. Control functions	23
9.1 Operating panel	23
9.2 Connecting the pump to Grundfos GO	23
9.3 Communication, control and monitoring	25
9.4 Proportional-pressure curve (PP1, PP2 or PP3)	27
9.5 Constant-pressure curve (CP1, CP2 or CP3)	27
9.6 Constant curve (I, II or III)	27
9.7 Overview of the control functions	28
9.8 Selecting control function	29
10. Setting the product	30
10.1 Setting the control function	30
11. Service	31
12. Taking the product out of operation	31
13. Storing the product	31
14. Fault finding	32
14.1 Grundfos Eye operating status	33
14.2 Resetting a fault indication	34
14.3 Reading out alarm and warning codes in Grundfos GO	34
14.4 Warning 77, twin-head pump	35

15. Technical data	36
15.1 Tightening torques for bolts	37
15.2 Accessories	38
16. Disposing of the product	38
16.1 Recycling of materials	38
17. Document quality feedback	38

1. General Information

This appliance shall not be used by children.

Children shall not play with the appliance.

Cleaning and user maintenance shall not be carried out by children.



Appliances can be used by persons with reduced physical, sensory, or mental capabilities, as well as persons with a lack of experience and knowledge. This requires that they are given supervision or instruction concerning the use of the appliance in a safe way and that they understand the hazards involved.



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 Safety symbols on the pump



Check the position of the clamp before you tighten it. Incorrect position of the clamp will cause leakage from the pump and damage the hydraulic parts in the pump head.



Fit and tighten the screw that holds the clamp to $8 \text{ Nm} \pm 1 \text{ Nm}$. Do not apply more torque than specified even though water is dripping from the clamp. The condensed water is most likely coming from the drain hole under the clamp.

1.4 Target group

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

We recommend that installation is carried out by skilled persons with technical qualifications required by the specific legislation in force.

2. Product introduction

These instructions are valid for MAGNA1 Model C single-head and MAGNA1 D Model C twin-head pumps. Model C indicates the pump version. The pump version is stated on the nameplate.

2.1 Product description



TM079309

Grundfos MAGNA1 is a circulator pump with integrated controller enabling adjustment of pump performance to the actual system requirements. In many systems, this reduces the power consumption considerably, reduces noise from thermostatic radiator valves and similar fittings and improves the control of the system. You can set the desired head on the operating panel.

2.2 Intended use

The pump is designed for circulating liquids in the following systems:

- heating systems
- domestic hot-water systems
- air-conditioning and cooling systems.

You can also use the pump in the following systems:

- ground-source heat-pump systems
- solar-heating systems.

2.3 Pumped liquids

The product is suitable for pumping thin, clean, non-aggressive and non-explosive liquids, not containing solid particles or fibers or mineral oils that may attack the pump mechanically or chemically.



Do not pump aggressive liquids.



Do not pump flammable, combustible or explosive liquids.

Liquid requirements for heating and cooling systems

In heating and cooling systems, the water must meet the requirements of accepted standards, codes, and any authority having jurisdiction (AHJ) requirements.

In heating systems, the water must meet the requirements of accepted standards on water quality in heating systems. For example the German standard VDI 2035.

You can pump water-glycol mixtures with up to 50 % glycol.

Liquid requirements for pool applications

Stainless steel variants of the MAGNA pump can be used to pump pool water with one of the following properties:

- Chloride (Cl^-) $\leq 150 \text{ mg/l}$ and free chlorine $\leq 1.5 \text{ mg/l}$ at temperatures $\leq 30^\circ\text{C}$
- Chloride (Cl^-) $\leq 100 \text{ mg/l}$ and free chlorine $\leq 1.5 \text{ mg/l}$ at temperatures from 30 to 40°C .

Liquid requirements for domestic hot-water applications



Observe local legislation regarding pump housing material.

In domestic hot-water applications, Grundfos strongly recommends the following:

- stainless-steel pumps to avoid corrosion
- water hardness degree below 14°dH and liquid temperature below 65°C to eliminate the risk of lime precipitation.

Related information

4.1 Location

2.3.1 Pumping glycol mixtures

The product is designed for pumping water-glycol mixtures with up to 50 % glycol.

Example of a water-ethylene-glycol 50/50 mixture:

- Maximum viscosity: 10 cSt ~ 50 % water and 50 % ethylene-glycol at -10°C .

Depending on the water-glycol mixture and the liquid temperature, the density and kinematic viscosity of the mixture will affect the maximum curve and reduce the hydraulic performance of the pump. The pump is protected against overload by an integrated power-limiting function.

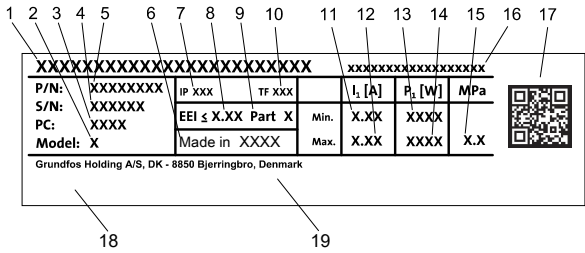
1. Clean and flush the system before you add the water-glycol mixture.
2. Maintain the water-glycol mixture regularly to prevent corrosion or lime precipitation.
3. If further dilution of the supplied glycol is required, follow the glycol supplier's instructions.



To prevent the water-glycol mixture from degrading, minimize the operating time at high temperatures and avoid exceeding the rated liquid temperature.

2.4 Identification

2.4.1 Nameplate



Example of a nameplate

Pos.	Description
1	Product name
2	Model
3	Production code, year and week ¹⁾
4	Serial number
5	Product number
6	Country of origin
7	Enclosure class
8	Energy Efficiency Index, EEI
9	Part, according to EEI
10	Temperature class
11	Minimum current [A]
12	Maximum current [A]
13	Minimum power [W]
14	Maximum power [W]
15	Maximum system pressure
16	Voltage [V] and frequency [Hz]
17	QR code
18	Approvals and markings
19	Manufacturer's name and address

1) Example of production code: 1326. The pump was produced in week 26, 2013.



Production code on the packaging

Related information

- 3.1 Inspecting the product
- 15. Technical data

2.4.2 Type key

Example: **MAGNA1 32-80 N 180**

Example: **MAGNA1 D 32-80 F 220**

Code	Explanation
MAGNA1	Type range
	Single-head pump
D	Twin-head pump
32-	Nominal diameter (DN) of inlet and outlet ports [mm]
80	Maximum head [dm]
	Threaded (pipe connection type)
F	Flanged (pipe connection type)
	Cast iron (pump housing material)
N	Stainless steel (pump housing material)
180	Port-to-port length [mm]
220	

3. Receiving the product

3.1 Inspecting the product

Check that the product received is in accordance with the order.
Check that the voltage and frequency stated on the product nameplate match the voltage and frequency of the installation site.



Pumps tested with water containing anticorrosive additives are taped on the inlet and outlet ports to prevent residual test water from leaking into the packaging. Remove the tape before installing the pump.

Related information

[2.4.1 Nameplate](#)

3.2 Scope of delivery

3.2.1 Plug-connected single-head pump



Plug-connected single-head pump

The box contains the following items:

- MAGNA1 pump
- insulating shells
- gaskets
- quick guide
- safety instructions
- one ALPHA plug.

3.2.2 Plug-connected twin-head pump



Plug-connected twin-head pump

The box contains the following items:

- MAGNA1 D twin-head pump
- gaskets
- quick guide
- safety instructions
- two ALPHA plugs.

3.2.3 Terminal-connected single-head pump



Terminal-connected single-head pump

The box contains the following items:

- MAGNA1 pump
- insulating shells
- quick guide
- safety instructions
- box with terminal and cable glands.

3.2.4 Terminal-connected twin-head pump



Terminal-connected twin-head pump

The box contains the following items:

- MAGNA1 D twin-head pump
- quick guide
- safety instructions
- two boxes with terminal and cable glands.

TM067223

TM055508

TM066741

TM067222

3.3 Lifting the product

WARNING

Falling objects

Death or serious personal injury



- Wear personal protective equipment.
- Always lift directly on the pump head or the cooling fins.
- Make sure that the lifting straps are correctly and securely positioned, when using lifting equipment.



Observe local regulations concerning limits for manual lifting or handling.



Do not lift the pump head by the control box. The control box is the red area of the pump.

Always lift directly on the pump head or the cooling fins when handling the pump.

For large pumps, it may be necessary to use lifting equipment. Position the lifting straps on the cooling fins and the pump head.



TM055819

Correct use of lifting straps on the pump head and the cooling fins



TM067219

Incorrect lifting of the pump by the control box

Related information

[5. Mechanical installation](#)

[12. Taking the product out of operation](#)

4. Installation requirements

4.1 Location

The product is designed for indoor installation.

To ensure sufficient cooling of motor and electronics, observe the following requirements:

- Position the product in such a way that sufficient cooling is ensured.
- The ambient temperature must not exceed 40 °C.

Always install the product in a dry environment where it will not be exposed to drops or splashes of liquid from surrounding equipment or structures, for example condensed water.

The product contains parts of stainless steel. Therefore it is important to avoid direct installation in aggressive environments such as:

- Indoor swimming pools, where the product is exposed to the ambient environment of the pool
- locations with direct and continuous exposure to a marine atmosphere
- locations where hydrochloric acid (HCl) can form acidic aerosols, for example when acid escapes from open tanks or from frequently opened or vented containers.

The above applications do not disqualify for installation of the product. However, it is important that the product is not installed directly in these environments.

Stainless-steel variants of MAGNA can be used to pump pool water. See the section on pumped liquids.

Related information

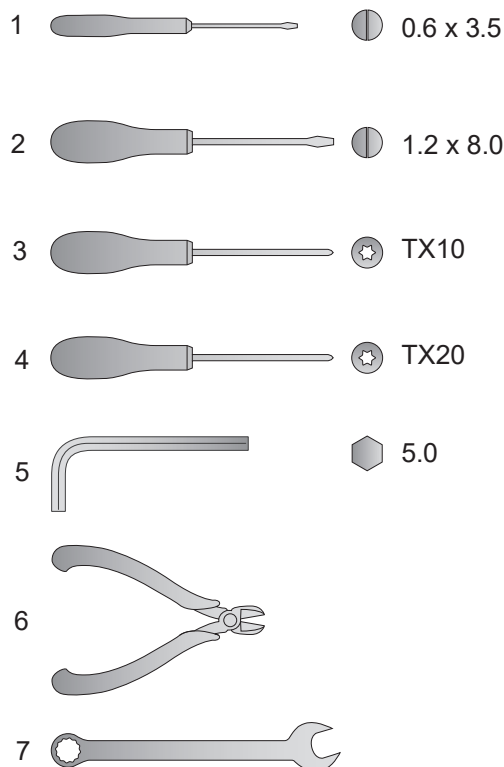
[2.3 Pumped liquids](#)

4.1.1 Drip tray in cooling applications

In cooling applications condensation may occur on the surface of the pump. In certain cases, it is necessary to mount a drip tray.

We also recommend to always keep the pump switched on to protect the electronics.

4.2 Tools



Recommended tools

Pos.	Tool	Size
1	Screwdriver, straight slot	0.6 x 3.5 mm
2	Screwdriver, straight slot	1.2 x 8.0 mm
3	Screwdriver, torx bit	TX10
4	Screwdriver, torx bit	TX20
5	Hexagon key	5.0 mm
6	Side cutter	
7	Open-end spanner	Depending on DN size

TM079324

4.3 Insulating shells

Insulating shells limit the heat loss from the pump housing and pipes in heating systems or limit condensation and ice buildup in cooling systems.



Insulating shells increase the pump dimensions.

4.3.1 Insulating shells for heating systems

Insulating shells for heating systems are factory-fitted and available for single-head pumps only. Remove the insulating shells before you install the pump.



TM055512

Removing insulating shells from the pump

4.3.2 Insulating shells for cooling systems

Insulating shells for pumps in air-conditioning and cooling systems are available as accessories and must be ordered separately. See the section on accessories and look for insulating shells for applications with ice buildup.

Related information

[15.2 Accessories](#)

4.3.3 Insulating the pump

As an alternative to insulating shells, you can insulate the pump housing and pipes.



Do not insulate the control box or cover the operating panel and cooling fins.



Insulation of the pump housing and pipe

TM055549

5. Mechanical installation

WARNING

Electric shock

Death or serious personal injury



- A damaged product must be repaired or replaced by Grundfos or a service workshop authorized by Grundfos.

WARNING

Falling objects

Death or serious personal injury



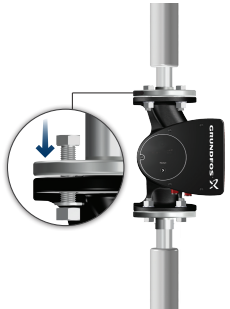
- Wear personal protective equipment.
- Follow the lifting instructions.

We recommend that installation is carried out by skilled persons with technical qualifications required by the specific legislation in force.

Install the pump so that it is not stressed by the pipes. For maximum permissible forces from the pipe connections acting on the pump flanges, see the section on forces and torques.

You can suspend the pump directly in the pipes, provided that the pipes support the pump.

Twin-head pumps are prepared for installation on a mounting bracket or base plate.

Step	Action	Illustration
1	Arrows on the pump housing indicate the liquid flow direction through the pump. The liquid flow direction can be horizontal or vertical, depending on the control-box position.	 TM055513
2	Close the isolating valves and make sure that the system is not pressurised during installation of the pump.	 TM068048  TM068048
3	Mount the pump with gaskets in the pipes.	 TM055515
4	Flanged version: Fit the bolts, washers and nuts. Use the correct size of bolts according to the system pressure. For further information about torques, see the section on tightening torques for bolts.	 TM055516  TM055517

Related information

[3.3 Lifting the product](#)

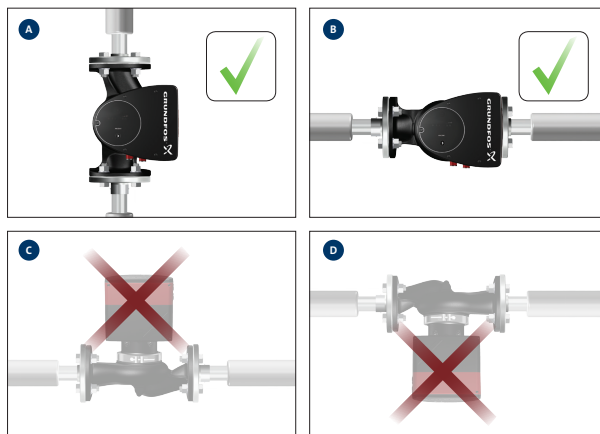
[15.1.1 Forces and torques](#)

[15.1 Tightening torques for bolts](#)

5.1 Positioning the pump

Always install the pump with horizontal motor shaft.

- Pump installed correctly in a vertical pipe. See the figure (A).
- Pump installed correctly in a horizontal pipe. See the figure (B).
- Do not install the pump with vertical motor shaft. See the figure (C and D).



TM055518

Pump installed with horizontal motor shaft

Related information

15.1 Tightening torques for bolts

5.2 Venting of twin-head pump housing

When you install twin-head pumps in horizontal pipes, always make sure to install an automatic vent, Rp 1/4" thread, in the upper part of the pump housing. This is to avoid air being trapped in the pump housing.



TM056062

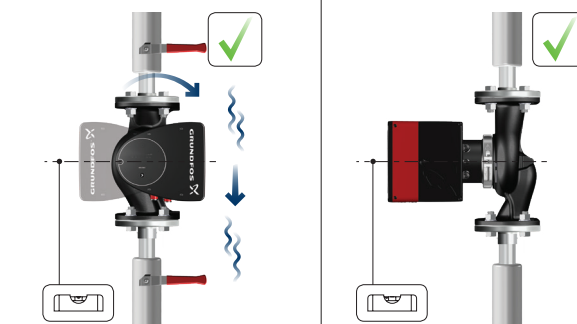
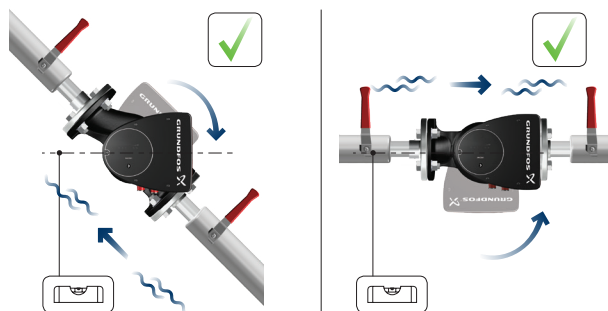
Automatic vent on the upper part of the pump housing

5.3 Control box positions

To ensure adequate cooling, make sure that the control box is in horizontal position with the Grundfos logo in vertical position.



Make sure that the isolating valves are closed before rotating the control box.



Pump with the control box in horizontal position

TM055522

5.4 Pump head position

If you remove the pump head before installing the pump in the pipes, pay special attention when fitting the pump head to the pump housing:

1. Visually check that the floating ring in the sealing system is centred. See the two figures below .
2. Gently lower the pump head with the rotor shaft and impeller into the pump housing.
3. Make sure that the contact face of the pump housing and that of the pump head are in contact before you tighten the clamp. See the figure on fitting the pump head to the pump housing.



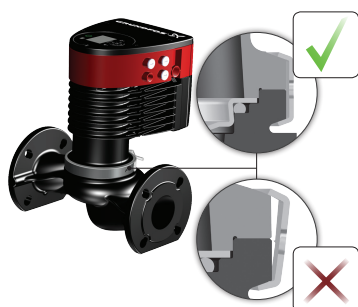
Correctly centred sealing system



Incorrectly centred sealing system



Check the position of the clamp before you tighten it. Incorrect position of the clamp will cause leakage from the pump and damage the hydraulic parts in the pump head. See the figure below.



Fitting the pump head to the pump housing

5.5 Changing the control box position

WARNING

Pressurised system

Death or serious personal injury

- Wear personal protective equipment.
- Drain the system or relieve the pressure inside the pump housing by loosening the thread or flange.
- Close the isolating valves on both sides of the pump.
- Pay attention to any escaping vapour when loosening the clamp. The pumped liquid may be scalding hot and under high pressure.



CAUTION

Falling objects

Minor or moderate personal injury

- Wear personal protective equipment.
- Pay attention not to loosen the screw too much on the clamp that holds the pump head and pump housing together.



Check the position of the clamp before you tighten it. Incorrect position of the clamp will cause leakage from the pump and damage the hydraulic parts in the pump head.



Fit and tighten the screw that holds the clamp to $8 \text{ Nm} \pm 1 \text{ Nm}$. Do not apply more torque than specified even though water is dripping from the clamp. The condensed water is most likely coming from the drain hole under the clamp.



Make sure that the isolating valves are closed before rotating the control box.

The pump must be pressureless before the control box is rotated. Drain the system or relieve the pressure inside the pump housing by loosening the thread or flange.

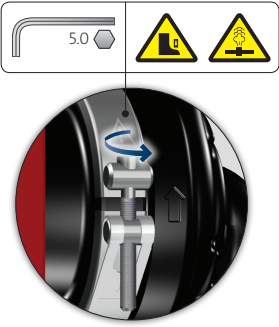
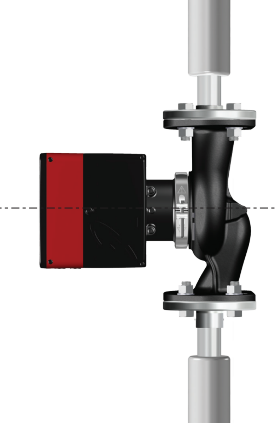
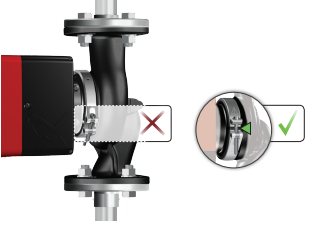
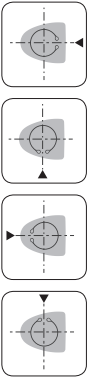


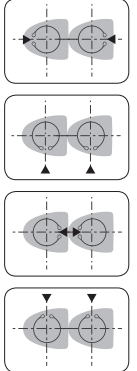
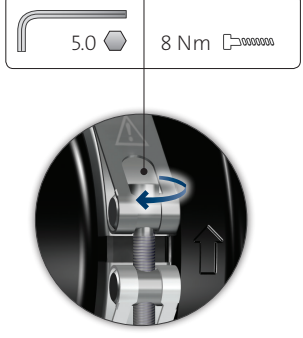
The warning symbol on the clamp holding the pump head and pump housing together indicates that there is a risk of personal injury.

TM056650

TM056651

TM055837

Step	Action	Illustration	
1	Loosen the screw in the clamp that holds the pump head and pump housing together. If you loosen the screw too much, the pump head will be completely disconnected from the pump housing.		TM052867
2	Carefully, turn the pump head to the desired position. If the pump head is stuck, loosen it with a light blow of a rubber mallet.		TM055526
3	Place the control box in horizontal position so that the Grundfos logo is in vertical position. The motor shaft must be in horizontal position.		TM055527
4	Due to the drain hole in the stator housing, position the gap of the clamp as shown in step 4a or 4b.		TM052870
4a	Single-head pump: Position the clamp so that the gap points towards the arrow. It can be in position 3, 6, 9 or 12 o'clock.		TM052918

Step	Action	Illustration	
4b	Twin-head pump: Position the clamps so that the gaps point towards the arrows. They can be in position 3, 6, 9 or 12 o'clock.		TM052917
5	Fit and tighten the screw holding the clamp to 8 Nm $\pm$ 1 Nm. Do not retighten the screw if condensed water is dripping from the clamp.		TM052872
6	Fit the insulating shells. Insulating shells for pumps in air-conditioning and cooling systems must be ordered separately.		TM055529

6. Electrical connection

WARNING

Electric shock

Death or serious personal injury



- Switch off the power supply for at least 3 minutes before you start any work on the product. Make sure that the power supply cannot be switched on accidentally.
- Connect the product to an external supply disconnecting device incorporated in the fixed wiring according to the local wiring rules.

WARNING

Electric shock

Death or serious personal injury



- Connect the pump to an external main switch with a minimum contact gap of 3 mm in all poles.
- Connect the product to protective earth and provide protection against indirect contact in accordance with local regulations.
- When connecting wires to supply terminals, outputs NC, C and start-stop input, make sure to separate the wires from each other and from the supply by reinforced insulation.
- **For plug-connected versions:** In case of an insulation fault, the fault current may be a pulsating DC. Observe national legislation about requirements for and selection of Residual Current Device (RCD) when installing the pump.
- **For terminal-connected versions:** In case of an insulation fault, the fault current may be a DC or pulsating DC. Observe national legislation about requirements for and selection of Residual Current Device (RCD) when installing the pump.



Make sure that the fuse is dimensioned according to the nameplate and local legislation.



Connect all cables in accordance with local regulations.



Make sure that all cables are heat-resistant up to 70 °C. Install all cables in accordance with EN 60204-1 and EN 50174-2.

The pump requires no external motor protection. The motor incorporates thermal protection against slow overloading and blocking (TP 211 according to IEC 60034-11).

- Make sure that the supply voltage and frequency correspond to the values stated on the product nameplate.
- Make sure that the pump is connected to an external main switch.
- When switched on via the power supply, the pump starts after approximately 5 seconds.

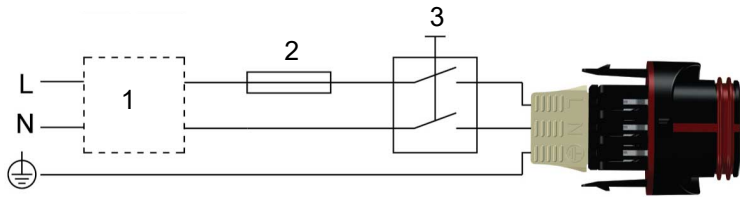
6.1 Supply voltage

1 × 230 V ± 10 %, 50/60 Hz, PE.

The voltage tolerances are intended for mains-voltage variations. Do not use the voltage tolerances for running pumps at other voltages than those stated on the nameplate.

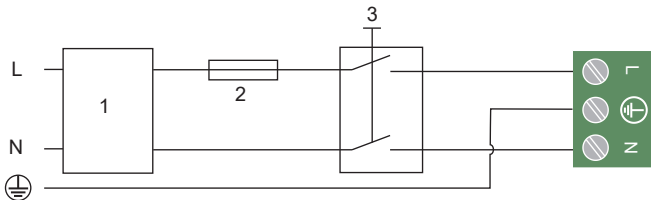
6.2 Wiring diagrams

Plug-connected motor with a main switch, backup fuse and additional protection



TM055277

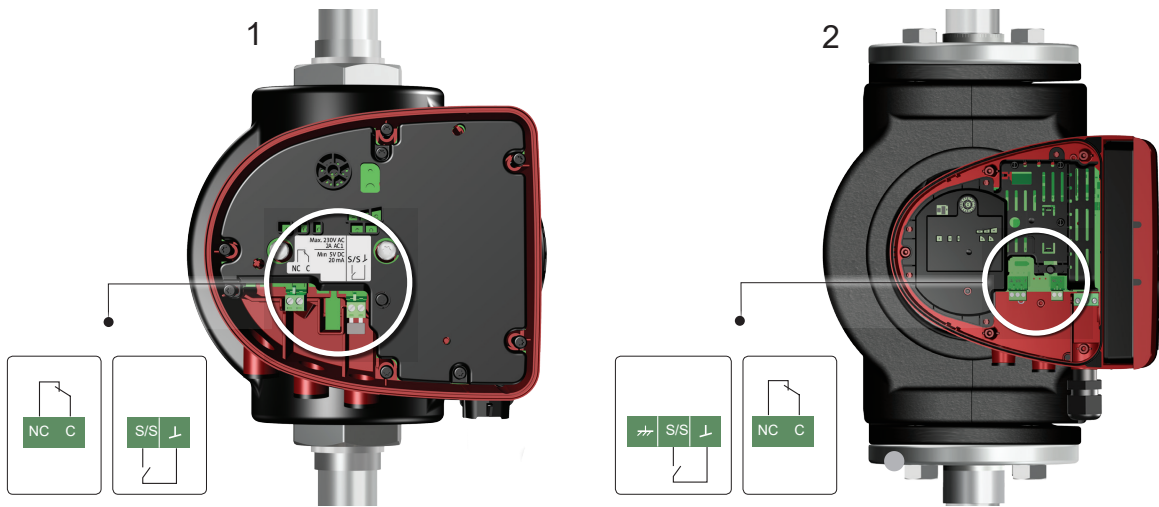
Mains-connected motor with a main switch, backup fuse and additional protection



TM079325

Pos.	Description
1	RCD
2	Fuse
3	External switch

Connection to external control



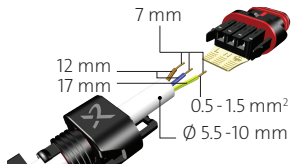
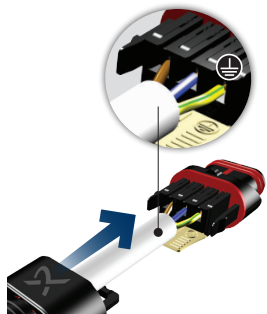
TM070888

Pos.	Description
1	Plug-connected versions
2	Terminal-connected versions

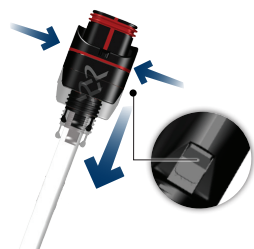
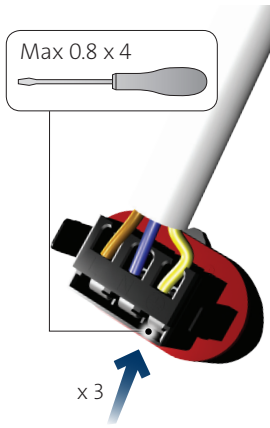
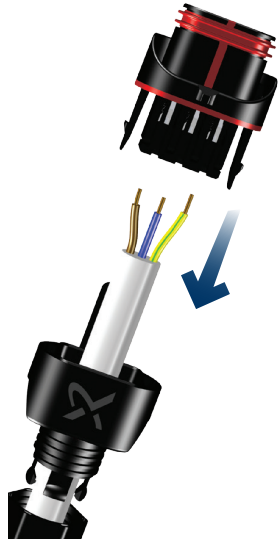
Related information

- [6.5 Connecting the digital input](#)
- [9.3.2 Fault relay output](#)

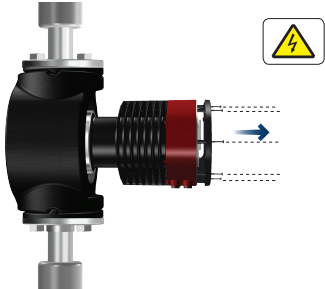
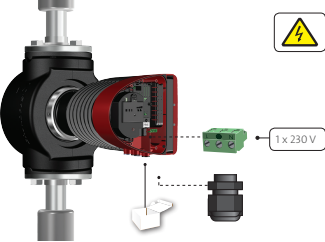
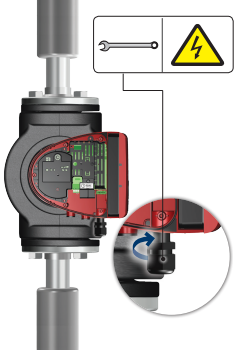
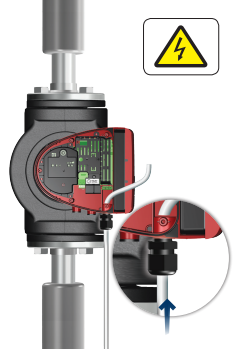
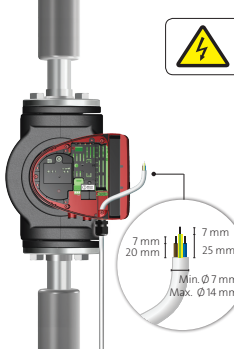
6.3 Connection to the power supply, plug-connected versions

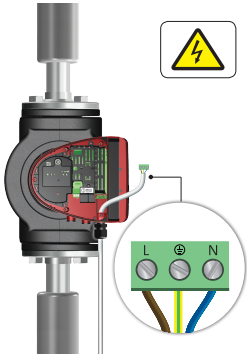
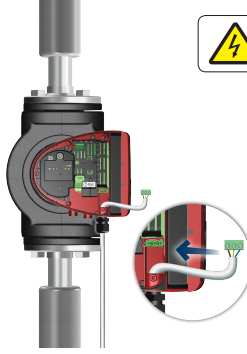
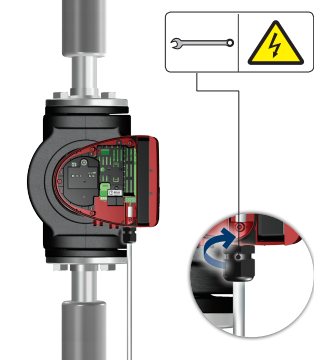
Step	Action	Illustration
1	Fit the cable gland and plug cover to the cable. Strip the cable conductors as illustrated.	 7 mm 12 mm 17 mm 0.5-1.5 mm² Ø 5.5-10 mm TM055538
2	Connect the cable conductors to the power supply plug.	 TM055539
3	Bend the cable with the cable conductors pointing upwards.	 TM055540
4	Pull out the conductor guide plate and throw it away.	 TM055541
5	Click the plug cover onto the power supply plug.	 TM055542
6	Screw the cable gland onto the power supply plug.	 TM055543
7	Insert the power supply plug into the male plug in the pump control box.	 TM071417

Disassembling the plug

Step	Action	Illustration
1	Loosen the cable gland and remove it from the plug.	 TM055545
2	Pull off the plug cover while pressing on both sides.	 TM055546
3	Loosen the cable conductors one by one by pressing a screwdriver gently into the terminal clip.	 Max 0.8 x 4 x 3 TM055547
4	The plug has now been removed from the power supply plug.	 TM055548

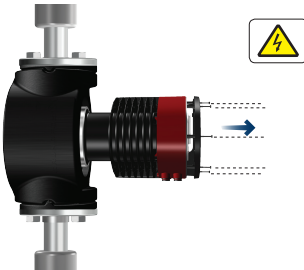
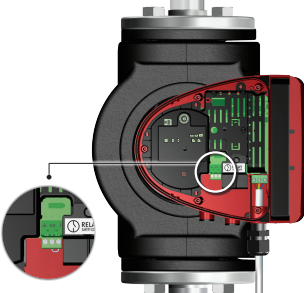
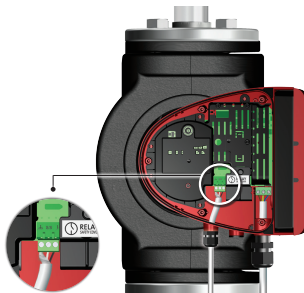
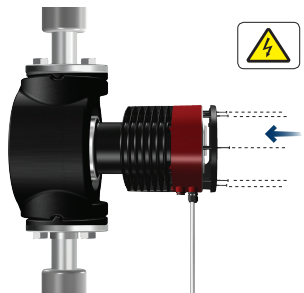
6.4 Connection to the power supply, terminal-connected version

Step	Action	Illustration
1	Remove the front cover from the control box. Do not remove the screws from the cover.	 TM055530
2	Locate the power supply plug and cable gland in the small cardboard box supplied with the pump.	 TM068049
3	Connect the cable gland to the control box.	 TM068050
4	Pull the power cable through the cable gland.	 TM068051
5	Strip the cable conductors as illustrated.	 TM068052

Step	Action	Illustration
6	Connect the cable conductors to the power supply plug.	 TM068053
7	Insert the power supply plug into the male plug in the control box.	 TM068054
8	Tighten the cable gland. Refit the front cover.	 TM068051

6.5 Connecting the digital input

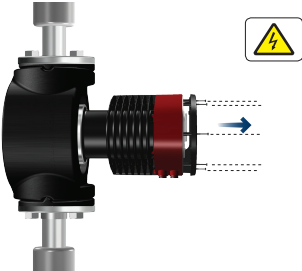
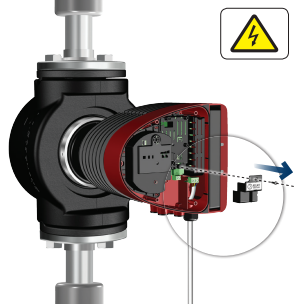
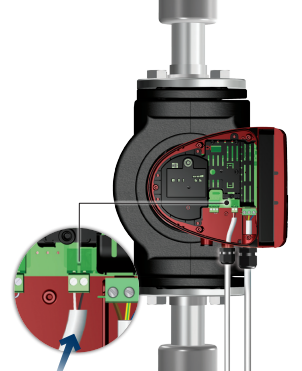
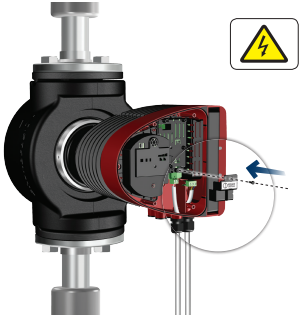
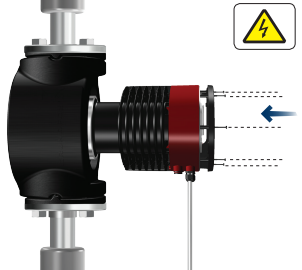
The example is based on a MAGNA1 terminal-connected version. The connection terminals of plug-connected versions differ from those of terminal-connected versions, but they have the same function and connection options. See the sections on wiring diagrams and on communication, control and monitoring.

Step	Action	Illustration
1	Remove the front cover from the control box. Do not remove the screws from the cover.	 TM055530
2	Locate the digital input terminal connector.	 TM068017
3	Pull the cable through a cable gland, M16, and connect the cable conductors to the digital input terminal connector. See the section on digital input (Start/Stop) for instructions on how to connect the cable to the terminal.	 TM068516
4	Refit the front cover to the control box.	 TM068059

Related information

- 6.2 Wiring diagrams
- 9.3 Communication, control and monitoring
- 9.3.1 Digital input (Start/Stop)

6.6 Connecting the fault relay output

Step	Action	Illustration
1	Remove the front cover from the control box. Do not remove the screws from the cover.	 TM055530
2	Locate the fault relay output cover and remove it.	 TM068056
3	Pull the cable through a cable gland, M16, and connect the cable conductors to the fault relay output terminal connector. See the section on fault relay output for instructions on how to connect the cable to the terminal.	 TM068057
4	Refit the fault relay output cover.	 TM068058
5	Refit the front cover to the control box.	 TM068059

Related information

- 8.3 Twin-head pump startup
- 9.3.2 Fault relay output

7. Communication

7.1 Radio communication

MAGNA1 single-head pumps are designed for infrared communication (IR) only, intended for connection to Grundfos GO.

MAGNA1 D twin-head pumps have built-in radio and use a GLoWPAN signal for wireless communication with compatible MAGNA1 D pumps and with Grundfos GO.

MAGNA1 D twin-head pumps incorporate a class 1 radio module intended for remote control. You can use the module anywhere in the EU member states without restrictions.



The radio communication between the pump and Grundfos GO is encrypted to protect against misuse.



Grundfos offers variants without any form of external wireless connection or radio module. Contact your local Grundfos representative.

7.2 Grundfos GO

Grundfos GO is intended for wireless connection to and remote control of Grundfos products. Download the Grundfos GO or GO Remote app from the Apple App Store and Google Play Store.

MAGNA1 is designed to communicate with Grundfos GO, which allows you to:

- adjust the setpoint of the proportional pressure curve
- manage the fault-relay trigger setting in twin-head pumps
- read warning and alarm indications.

MAGNA1 pumps require the add-on MI 301 module for infrared (IR) communication with Grundfos GO or GO Remote.

Grundfos GO MI 301 module

The MI 301 module has built-in infrared (IR) and radio communication and connects to Android and iOS-based smart devices via Bluetooth. MI 301 has a rechargeable Li-ion battery and is charged separately via its own charger.



TM053890

Grundfos GO MI 301 module, product number 98046408.



The radio communication between the pump and Grundfos GO is encrypted to protect against misuse.

The radio part of MI 301 can be operated in the EU member states without restrictions. Observe local regulations for use in other countries.

Related information

[9.2 Connecting the pump to Grundfos GO](#)

8. Starting up the product

CAUTION

Contamination

Minor or moderate personal injury



- Before the pump is used for supplying drinking water, flush the pump thoroughly with clean water.
- Do not use the pump for drinking water if the internal parts have been in contact with particles or substances unsuitable for human consumption.

CAUTION

Hot liquid and surface

Minor or moderate personal injury



- Wear personal protective equipment.
- To avoid burns, only touch the operating panel.



Do not start the pump until the system has been filled with liquid and vented.

The pump is self-venting through the system, and the system must be vented at the highest point.



Limit the number of starts and stops to four times per hour to protect the electronics.



In cooling applications where cold water is forced through the pump, do not power off the pump once it is installed. This is to protect the electronics against condensation and the risk of ice building up.



If the pump is not used during periods of frost, add antifreeze or let the pump run at regular intervals to prevent frost bursts.

The required minimum inlet pressure must be available at the pump inlet. See the section on technical data.

Step	Action	Illustration
1	Switch on the power supply to the pump. The pump starts after approximately 5 seconds.	 I: On O: Off TM070033
2	Operating panel at first startup.	 TM055551
3	The pump has been factory-set to the intermediate proportional-pressure curve. Select the control mode according to the system application by pressing the button  . See the sections on control functions and on setting the product.	 TM055551

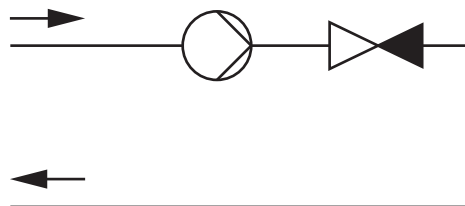
Related information

[9. Control functions](#)

[15. Technical data](#)

8.1 Non-return valve

If a non-return valve is fitted in the pipe system, ensure that the set minimum outlet pressure of the pump is always higher than the closing pressure of the valve. This is especially important in proportional-pressure control mode with reduced head at a low flow rate.



Non-return valve

8.2 Closed valve operation

MAGNA1 pumps can operate at any speed against a closed valve for several days without damage to the pump. However, Grundfos recommends to operate at the lowest possible speed curve to minimise energy losses. There are no minimum flow requirements.



Do not close inlet and outlet valves simultaneously, always keep one valve open when the pump is running to avoid pressure buildup.

8.3 Twin-head pump startup



Follow the general instructions and precautions for starting up a MAGNA pump.



Make sure that both pump heads are powered on.

The pumps are paired from factory. When switching on the power supply, the heads will establish connection, which is indicated by a green light in the centre of Grundfos Eye. Please allow approximately 5 seconds for this to happen.

Flush the system with clean water to remove all impurities before you start the pump.

If one of the pump heads is turned off, the pump with power will show a yellow indicator light, warning 77, see the section on warning 77, twin-head pump. In that case, power up the switched off pump. Once both pumps are on, the pumps will establish connection and the warning deactivates.

For additional twin-head pump setup options, see the sections on digital input (Start/Stop), fault relay output and twin-head pump function.

Related information

[6.6 Connecting the fault relay output](#)

[9.3.1 Digital input \(Start/Stop\)](#)

[9.3.3 Twin-head pump function](#)

[14.4 Warning 77, twin-head pump](#)

TM053055

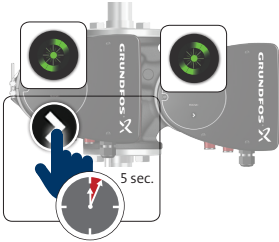
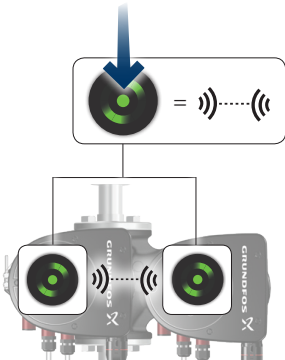
8.4 Pairing and unpairing twin-head pumps

The pumps are paired from factory, however, it can be useful to know how to pair the system e.g. for service purposes. The pumps can also be unpaired.

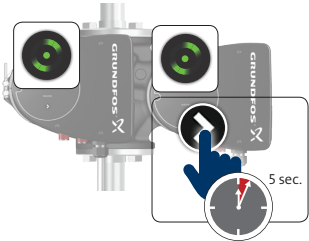
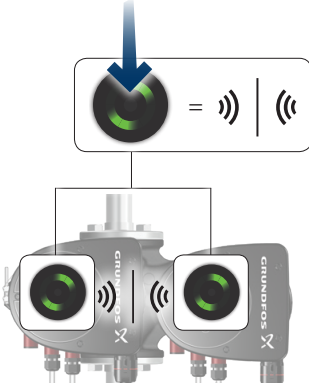
! When you have paired the pumps, you must wait 10 seconds before unpairing.

8.4.1 Pairing a twin-head MAGNA pump

💡 The master pump head is the one from which you initiate the pairing.

Step	Action	Illustration
1	Push and hold the button on the pump you wish to assign as the master pump for 5 seconds. The centre of Grundfos Eye on both pumps will begin to flash.	 TM068524
2	Push the button on the other pump to assign this as the slave pump.	 TM068525
3	The centre of both Grundfos Eye indicator lights are alight and constant. The two pumps are now paired.	 TM068527

8.4.2 Unpairing a twin-head MAGNA pump

Step	Action	Illustration
1	Push and hold the button on any of the two pump heads for 5 seconds.	 TM068521
2	The light in the centre of Grundfos Eye will disappear. The system has been deactivated.	 TM068522

9. Control functions



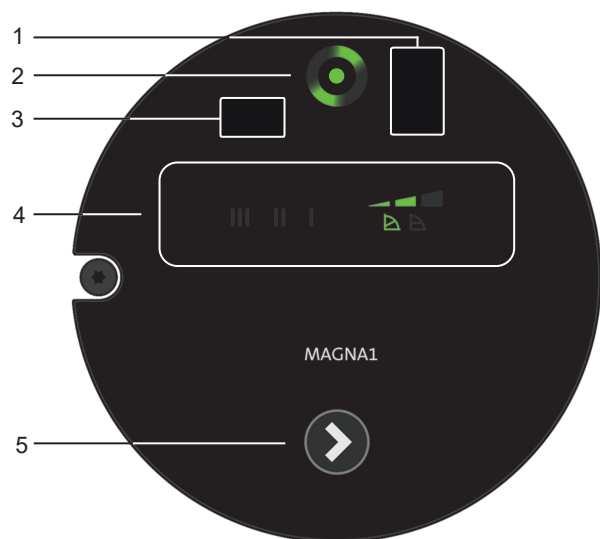
Factory setting: Intermediate proportional-pressure curve, referred to as PP2.

Related information

[8. Starting up the product](#)

[10.1 Setting the control function](#)

9.1 Operating panel



TM069078

Operating panel

The operating panel on the pump comprises the following:

Pos.	Description
1	Infrared receiver for Grundfos GO. Plug-connected versions.
2	Grundfos Eye.
3	Infrared receiver for Grundfos GO. Terminal-connected versions.
4	LEDs indicate the control function.
5	Push-button for selection of a control function.

Related information

[10.1 Setting the control function](#)

[14.1 Grundfos Eye operating status](#)

9.2 Connecting the pump to Grundfos GO

MAGNA1 single-head pumps are designed for infrared communication (IR) with Grundfos GO or GO Remote, while MAGNA1 twin-head pumps can also communicate via radio.

Before connecting to Grundfos GO

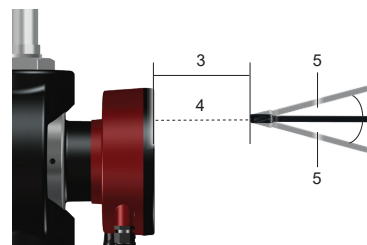
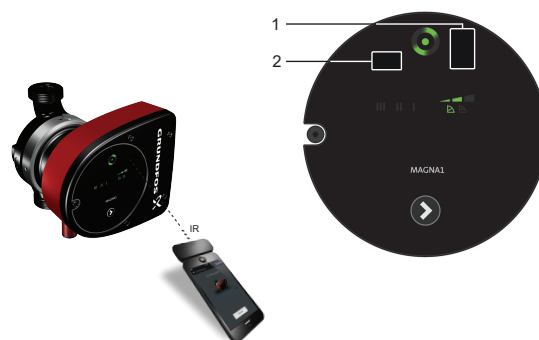
To use Grundfos GO together with MAGNA1 make sure to have the following ready:

- For IR communication: A Grundfos GO add-on module, which is available as an accessory. See the section on Grundfos GO.
- Download the Grundfos GO or GO Remote app to your smart device from the Apple App Store or Google Play Store.

Connecting to Grundfos GO

To connect to Grundfos GO, do as follows:

- For IR communication: Establish a connection between the Grundfos GO add-on module and your smart device. See the separate installation and operating instructions.
- Open the Grundfos GO app and select either IR or radio communication depending on the pump type and chosen communication method. Make sure to point Grundfos GO at the receiver placed left or right to Grundfos Eye depending on your pump model.



TM079336

Establishing a connection between Grundfos GO and MAGNA1 via infrared communication

Pos.	Description
1	Plug-connected versions
2	Terminal-connected versions
3	Min. 30 cm
4	IR
5	Max. 15°
6	Max. 15°

Related information

[7.2 Grundfos GO](#)

[10.1.1 Adjusting the proportional pressure using Grundfos GO](#)

[14.3 Reading out alarm and warning codes in Grundfos GO](#)

[14.4.1 Activating and deactivating the fault relay](#)

9.2.1 Using Grundfos GO

Grundfos GO or GO Remote enable wireless communication with the pump for easy access to status information, settings and control.

You can use the Grundfos GO or GO Remote as follows:

- Check the current operating status of the pump.
- Request accumulated operating data, such as energy consumption, operating hours and number of pump restarts.
- Receive alarm and warning indications. View the log of previous alarms and warnings.
- Set the control mode.
- Adjust the setpoint.
- Adjust the proportional pressure setpoint.
- Multipump setup.
- Configure the twin-head pump warning 77 and activate or deactivate the fault relay.
- Generate reports in PDF.
- Find relevant product information and technical documentation.

Related information

[*10.1.1 Adjusting the proportional pressure using Grundfos GO*](#)

[*14.1.1 Operating indications related to a multipump system*](#)

[*14.3 Reading out alarm and warning codes in Grundfos GO*](#)

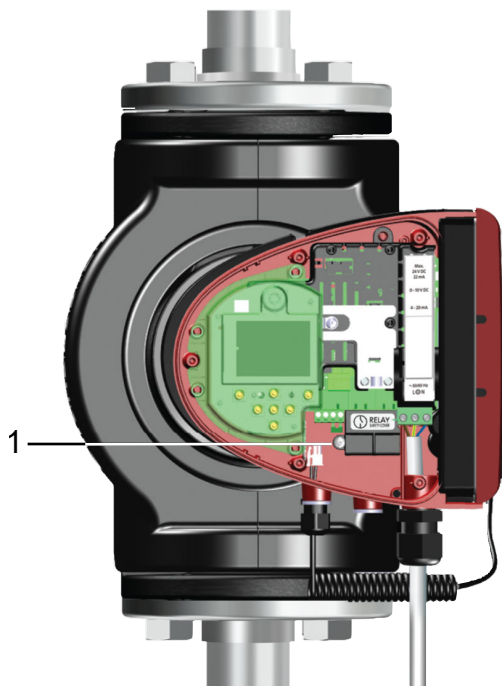
[*14.4 Warning 77, twin-head pump*](#)

[*14.4.1 Activating and deactivating the fault relay*](#)

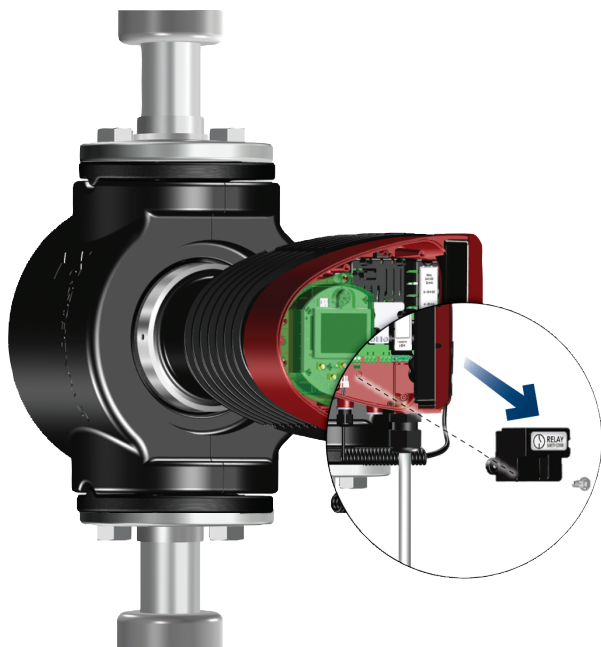
9.3 Communication, control and monitoring

MAGNA1 enables external control and monitoring via the Start/Stop input and the fault relay output on both single and twin-head pumps. See the sections on digital input (Start/Stop) and fault relay output. In addition, the wireless communication feature in twin-head pumps lets you use the pump without an external controller. See the section on twin-head pump function.

The two signal relays are protected by a relay cover. To access the relays, you must remove the cover by unscrewing the screw located at the top of the cover. See the figure on removing the relay cover.



Location of the relay cover (1)



Removing the relay cover

Related information

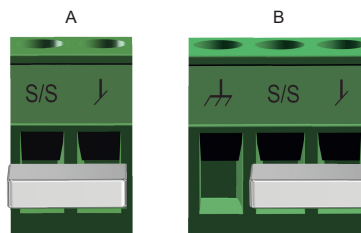
- [6.5 Connecting the digital input](#)
- [9.3.1 Digital input \(Start/Stop\)](#)
- [9.3.2 Fault relay output](#)
- [9.3.3 Twin-head pump function](#)

9.3.1 Digital input (Start/Stop)

To use the digital input, connect the control wires to terminals Start/Stop (S/S) and frame ($\perp$).



If no external on and off switch is connected, maintain the jumper between terminals Start/Stop (S/S) and frame ($\perp$). This connection is the factory setting.



TM079339

Digital input in the control box. A: Plug-connected versions. B: Terminal-connected versions

Contact symbol	Function
S/S	Start/Stop
$\perp$	Frame connection
$\perp$	Cable shield



Plug-connected versions, position A in the figure above:
When using a shielded cable, connect the shield in the frame terminal ($\perp$) together with the frame connection cord.

Start/Stop		
		Normal duty
		Stop

For instructions on how to connect to the Start/Stop input, see the section on connecting the digital input.

Digital input on twin-head pumps

The Start/Stop input operates on system level, meaning that if the master pump head receives a stop signal, the system stops.

As a main rule the digital input is only effective on the master, which is why it is important to know which pump is assigned as the master.



Identifying the master pump head on the nameplate

TM068063

For redundancy purposes, the digital input can be used concurrent on the slave pump head. However, as long as the master is powered up, the input on the slave will be ignored. In the event of power loss on the master, the digital input of the slave will take over. When the master pump head is back on, the master takes over and controls the slave.

Related information

- 6.5 Connecting the digital input
- 8.3 Twin-head pump startup
- 9.3 Communication, control and monitoring

9.3.2 Fault relay output

The fault relay has a potential-free changeover contact for external fault indication. See the section on wiring diagrams.

It is possible to use the relay output as part of a control strategy or for monitoring. For example, if the pump experiences a fault, the fault relay sends a signal to the controller, which will subsequently trigger further events depending on your chosen strategy. In order to use the fault relay output, follow the instructions in the fault relay output table.

The relay can be used for outputs up to 250 V and 2 A.
Factory settings of the relay:



TM079340

Contact symbol	Function
NC	Normally closed
C	Common

The functions of the fault relay are as shown in the table:

Fault relay output table

Fault relay	Alarm signal
	Not activated: The power supply has been switched off. The pump has not registered a fault.
	Activated: The pump has registered a fault or there is a wirebreak.

For instructions on how to connect to the fault relay output, see the section on connecting the fault relay output.

Fault relay output in twin-head pumps

The fault relay output on each pump head operates independently, meaning that if a fault occurs in one of the pumps its respective relay is triggered.

Related information

- 6.2 Wiring diagrams
- 6.6 Connecting the fault relay output
- 9.3 Communication, control and monitoring

9.3.3 Twin-head pump function

The twin-head pump function allows you to use twin-head pumps without an external controller, as the two pump heads communicate via wireless connection.

Operating mode

The pumps are operating in alternating mode, meaning that only one pump is running at a time. The two pumps change from one pump to the other every 24 hours with a tolerance of ± 0.5 % per day.

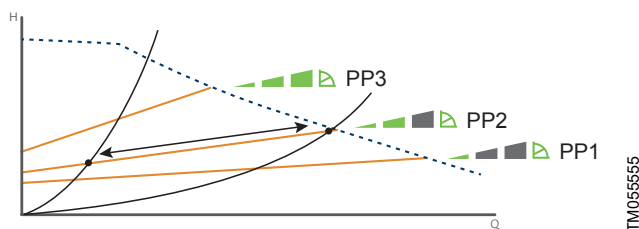
To control the twin-head pump via the digital Start/Stop input, see the section on digital input (Start/Stop).
To monitor the twin-head pump via the fault relay output, see the section on connecting the fault relay output.

Related information

- 8.3 Twin-head pump startup
- 9.3 Communication, control and monitoring

9.4 Proportional-pressure curve (PP1, PP2 or PP3)

Proportional-pressure control adjusts the pump performance to the actual flow rate demand in the system, but the pump performance follows the selected performance curve, PP1, PP2 or PP3. See the figure below where PP2 has been selected.



Three proportional-pressure curves and settings

The selection of the right proportional-pressure setting depends on the characteristics of the system in question and the actual flow rate demand.

For further information, see the sections on overview of the control functions and selecting a control function.

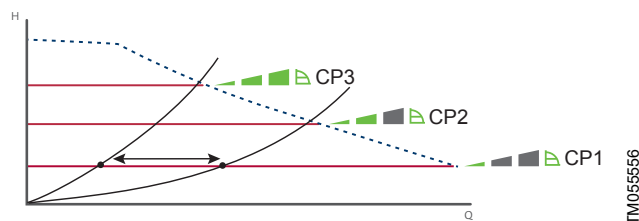
Related information

[9.7 Overview of the control functions](#)

[9.8 Selecting control function](#)

9.5 Constant-pressure curve (CP1, CP2 or CP3)

Constant-pressure control adjusts the pump performance to the actual flow rate demand in the system, but the pump performance follows the selected performance curve, CP1, CP2 or CP3. See the figure below where CP1 has been selected.



Three constant-pressure curves and settings

The selection of the right constant-pressure setting depends on the characteristics of the system in question and the actual flow rate demand.

For further information, see the sections on overview of the control functions and selecting a control function.

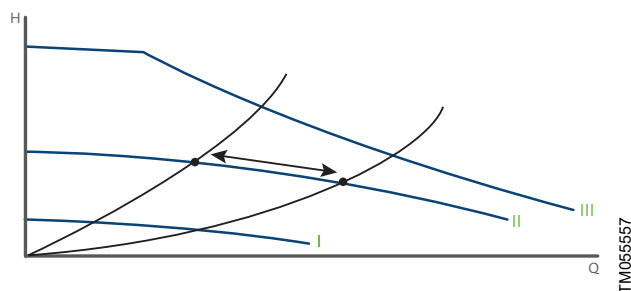
Related information

[9.7 Overview of the control functions](#)

[9.8 Selecting control function](#)

9.6 Constant curve (I, II or III)

At constant-curve operation, the pump runs at a constant speed, independently of the actual flow rate demand in the system. The pump performance follows the selected performance curve, I, II or III. See the figure below where II has been selected.



Three constant-curve settings

The selection of the right constant-curve setting depends on the characteristics of the system in question.

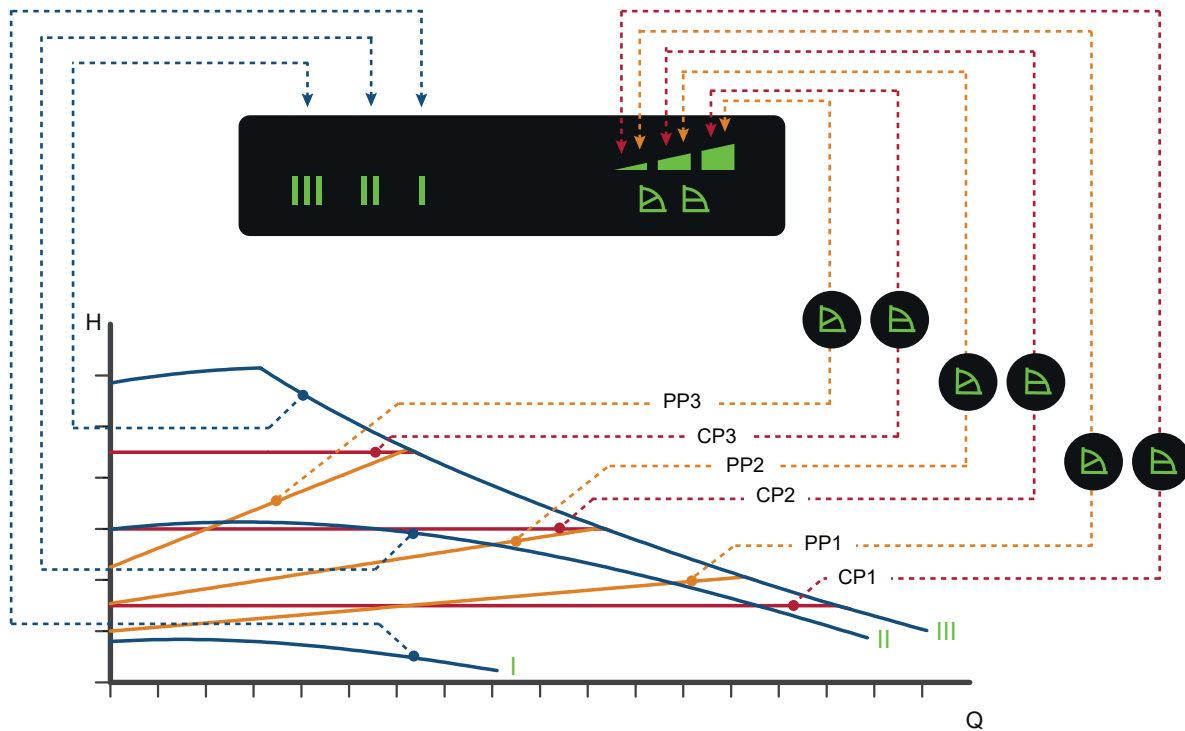
For further information, see the sections on overview of the control functions and selecting a control functions.

Related information

[9.7 Overview of the control functions](#)

[9.8 Selecting control function](#)

9.7 Overview of the control functions



TM079326

Control function in relation to system requirements

Setting	Pump curve	Function
PP1	Lowest proportional-pressure curve	The duty point of the pump will move up or down on the lowest proportional-pressure curve, depending on the flow rate demand. The head is reduced at falling flow rate demand and increased at rising flow rate demand.
PP2	Intermediate proportional-pressure curve	The duty point of the pump will move up or down on the intermediate proportional-pressure curve, depending on the flow rate demand. The head is reduced at falling flow rate demand and increased at rising flow rate demand.
PP3	Highest proportional-pressure curve	The duty point of the pump will move up or down on the highest proportional-pressure curve, depending on the flow rate demand. The head is reduced at falling flow rate demand and increased at rising flow rate demand.
CP1	Lowest constant-pressure curve	The duty point of the pump will move out or in on the lowest constant-pressure curve, depending on the flow rate demand in the system. The head is kept constant, irrespective of the flow rate demand.
CP2	Intermediate constant-pressure curve	The duty point of the pump will move out or in on the intermediate constant-pressure curve, depending on the flow rate demand in the system. The head is kept constant, irrespective of the flow rate demand.
CP3	Highest constant-pressure curve	The duty point of the pump will move out or in on the highest constant-pressure curve, depending on the flow rate demand in the system. The head is kept constant, irrespective of the flow rate demand.
III	Speed III	The pump runs on a constant curve which means that it runs at a constant speed. At speed III, the pump is set to run on the maximum curve under all operating conditions. You obtain quick venting of the pump by setting the pump to speed III for a short period.
II	Speed II	The pump runs on a constant curve which means that it runs at a constant speed. At speed II, the pump is set to run on the intermediate curve under all operating conditions.
I	Speed I	The pump runs on a constant curve which means that it runs at a constant speed. At speed I, the pump is set to run on the minimum curve under all operating conditions.

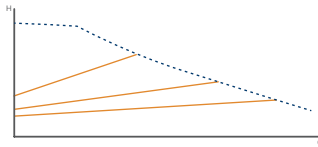
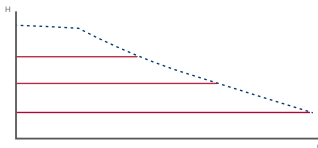
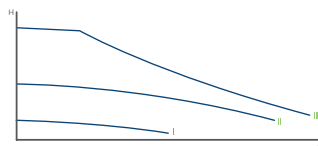
Related information

[9.4 Proportional-pressure curve \(PP1, PP2 or PP3\)](#)

[9.5 Constant-pressure curve \(CP1, CP2 or CP3\)](#)

[9.6 Constant curve \(I, II or III\)](#)

9.8 Selecting control function

System application	Select this control mode
Systems with relatively large pressure losses in the distribution pipes and in air-conditioning and cooling systems. - Two-pipe heating systems with thermostatic valves and the following: - very long distribution pipes - strongly throttled pipe-balancing valves - differential-pressure regulators - large pressure losses in those parts of the system through which the total quantity of water flows, for example a boiler, a heat exchanger and a distribution pipe up to the first branching. - Primary circuit pumps in systems with large pressure losses in the primary circuit. - Air-conditioning systems with the following: - heat exchangers, fan coils - cooling ceilings - cooling surfaces.	Proportional pressure 
Systems with relatively small pressure losses in the distribution pipes. - Two-pipe heating systems with thermostatic valves and the following: - dimensioning for natural circulation - small pressure losses in those parts of the system through which the total quantity of water flows, for example a boiler, a heat exchanger and a distribution pipe up to the first branching or modified to a high differential temperature between the flow pipe and the return pipe, for example district heating. - Underfloor heating systems with thermostatic valves. - One-pipe heating systems with thermostatic valves or pipe-balancing valves. - Primary circuit pumps in systems with small pressure losses in the primary circuit.	Constant pressure 
Operation according to the maximum or minimum curve, like an uncontrolled pump: - Use the maximum-curve mode in periods in which a maximum flow rate is required. This operating mode is for instance suitable for hot-water priority in domestic hot-water systems. - Use the minimum-curve mode in periods in which a minimum flow rate is required.	Constant curve 

Related information

[9.4 Proportional-pressure curve \(PP1, PP2 or PP3\)](#)

[9.5 Constant-pressure curve \(CP1, CP2 or CP3\)](#)

[9.6 Constant curve \(I, II or III\)](#)

10. Setting the product

10.1 Setting the control function

The pump has nine control functions. Select the control function by pressing the push-button on the operating panel. The control function is indicated by eight different light fields in the display.

Button presses	Active light fields	Description
0		Intermediate proportional-pressure curve, referred to as PP2, factory setting
1		Highest proportional-pressure curve, referred to as PP3
2		Lowest constant-pressure curve, referred to as CP1
3		Intermediate constant-pressure curve, referred to as CP2
4		Highest constant-pressure curve, referred to as CP3
5		Constant curve III
6		Constant curve II
7		Constant curve I
8		Lowest proportional-pressure curve, referred to as PP1

Related information

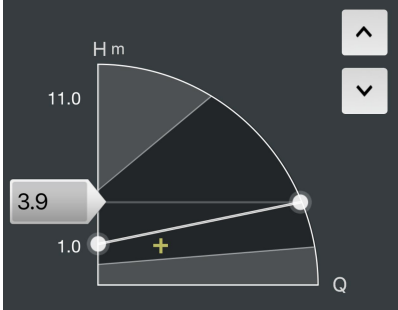
- 9. Control functions
- 9.1 Operating panel

10.1.1 Adjusting the proportional pressure using Grundfos GO

The setpoint of the proportional-pressure curve can be adjusted using Grundfos GO or GO Remote. Set the pump control mode to **Proportional pressure** and navigate to **Setpoint**.



Adjusting the proportional pressure is only possible in proportional pressure mode.

Description	Illustration
Use the arrows on the top right of the screen, or slide the setpoint indicator up and down to adjust the setpoint.	

Example from Grundfos GO Remote

The proportional pressure symbol on the pump lights up when the pump receives the setpoint from Grundfos GO. None of the level indicators light up.



For instructions on how to connect the pump to Grundfos GO or GO Remote, see the section on connecting the pump to Grundfos GO.

Related information

- 9.2 Connecting the pump to Grundfos GO
- 9.2.1 Using Grundfos GO

11. Service



Only qualified persons are allowed to service the pump. Observe the safety precautions for taking the product out of operation.



If the power cable is damaged, it must be replaced by the manufacturer, the manufacturer's service partner or a similarly qualified person.

Spare parts

Always use original spare parts from Grundfos and suitable for drinking water.

Always use accessories which are compatible with the specifications for the pump and the pumped liquid.

Service instructions

Illustrated service instructions and service kit instructions are available in Grundfos Product Center (<http://product-selection.grundfos.com>).

Service instructions	Number	Link
MAGNA1 plug-connected versions	98361211	http://net.grundfos.com/qr/i/98361211
MAGNA1 terminal-connected versions	98162680	http://net.grundfos.com/qr/i/98162680

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

Related information

[12. Taking the product out of operation](#)

12. Taking the product out of operation

WARNING

Electric shock

Death or serious personal injury



- Switch off the power supply for at least 3 minutes before you start any work on the product. Make sure that the power supply cannot be switched on accidentally.
- Make sure that other pumps or sources do not force flow through the pump even if the pump is stopped. This will cause the motor to act like a generator, resulting in voltage on the pump.

WARNING

Magnetic field

Death or serious personal injury



- Do not handle the motor or rotor if you have a pacemaker.

WARNING

Pressurised system

Death or serious personal injury



- Wear personal protective equipment.
- Drain the system or relieve the pressure inside the pump housing by loosening the thread or flange.
- Close the isolating valves on both sides of the pump.
- Pay attention to any escaping vapour when loosening the clamp. The pumped liquid may be scalding hot and under high pressure.

WARNING

Falling objects

Death or serious personal injury



- Wear personal protective equipment.
- Follow the lifting instructions.
- Follow the instructions on how to loosen and tighten the clamp that holds the pump head and pump housing together.

CAUTION

Hot liquid and surface

Minor or moderate personal injury



- Wear personal protective equipment.
- Let the liquid and surface adjust to the ambient temperature before you start any work on the product.



Only qualified and trained persons are allowed to dismantle and disassemble the product.

Related information

[3.3 Lifting the product](#)

[11. Service](#)

[14. Fault finding](#)

13. Storing the product

During long-term storage, switch on the power and let the pump run for 30 minutes at least once every two years. We recommend regular intervals of once a year.

Newly delivered pumps can be stored for two years without opening the original packaging.

Related information

[15. Technical data](#)

14. Fault finding

WARNING

Electric shock

Death or serious personal injury



- Switch off the power supply for at least 3 minutes before you start any work on the product. Make sure that the power supply cannot be switched on accidentally.
- Make sure that other pumps or sources do not force flow through the pump even if the pump is stopped. This will cause the motor to act like a generator, resulting in voltage on the pump.

WARNING

Pressurised system

Death or serious personal injury



- Wear personal protective equipment.
- Drain the system or relieve the pressure inside the pump housing by loosening the thread or flange.
- Close the isolating valves on both sides of the pump.
- Pay attention to any escaping vapour when loosening the clamp. The pumped liquid may be scalding hot and under high pressure.



If the power cable is damaged, it must be replaced by the manufacturer, the manufacturer's service partner or a similarly qualified person.



If you dismantle the pump, follow the instructions in the section on taking the product out of operation.

Alarm and warning codes	Fault	Automatic reset and restart?	Corrective actions
"Pump communication fault" (10) Alarm	Communication fault between different parts of the electronics.	Yes	Replace the pump, or contact Grundfos Service. Check if the pump is running in turbine operation. See code (29) " Forced pumping ".
"Forced pumping" (29) Alarm	Other pumps or sources force flow through the pump even if the pump is stopped and switched off.	Yes	Switch off the pump on the main switch. If the light in Grundfos Eye is on, the pump is running in forced-pumping mode. Check the system for defective non-return valves and replace the valves, if necessary. Check the system for correct position of non-return valves.
"Undervoltage" (40, 75) Alarm	The supply voltage to the pump is too low.	Yes	Make sure that the power supply is within the specified range.
"Blocked pump" (51) Alarm	The pump is blocked.	Yes	Dismantle the pump, and remove any foreign matter or impurities preventing the pump from rotating. Check the water quality to eliminate the risk of lime precipitation.
High motor temperature (64) Alarm	The temperature in the stator windings is too high.	No	Contact Grundfos Service, or replace the pump.
Internal fault (72 and 155) Alarm	Internal fault in the pump electronics. Irregularities in the voltage supply can cause alarm 72.	Yes	There might be turbine flow in the application that forces a flow through the pump. Contact Grundfos Service, or replace the pump.
"Overvoltage" (74) Alarm	The supply voltage to the pump is too high.	Yes	Make sure that the power supply is within the specified range.
Comm. fault, twin-head pump (77) Warning	The communication between pump heads was disturbed or broken.	-	Make sure that the second pump head is powered on or connected to the power supply.
Internal fault (84 and 85) Warning	Fault in the pump electronics.	-	Contact Grundfos Service, or replace the pump.

Related information

[12. Taking the product out of operation](#)

[14.2 Resetting a fault indication](#)

[14.3 Reading out alarm and warning codes in Grundfos GO](#)

14.1 Grundfos Eye operating status

Grundfos Eye is on when you switch on the power supply.

Grundfos Eye is an indicator light providing information about the actual pump status. A fault is indicated by a yellow or red indicator light in Grundfos Eye on the operating panel and in the Grundfos GO Remote app.

The indicator light flashes in different sequences and provides information about the following:

Grundfos Eye	Indication	Cause
	No lights are on.	The power is off. The pump is not running.
	Two opposite green indicator lights running in the direction of rotation of the pump.	The power is on. The pump is running.
	Two opposite green indicator lights are permanently on.	The power is on. The pump is not running.
	One yellow indicator light running in the direction of rotation of the pump.	Warning. The pump is running.
	One yellow indicator light is permanently on.	Warning. The pump has stopped.
	Two opposite red indicator lights flashing simultaneously.	Alarm. The pump has stopped.



If the pump impeller is rotated, for example when filling the pump with water, sufficient energy may be generated to light up the operating panel even if the power supply has been switched off.

Related information

[9.1 Operating panel](#)

14.1.1 Operating indications related to a multipump system

When connecting Grundfos GO Remote to a multipump setup and choosing 'system view', GO Remote will indicate the system's operating status and not the status of the pump itself. Therefore, the indicator light on the GO Remote dashboard might differ from the indicator light shown on the pump's operating panel. See the table below.

Grundfos Eye, master pump	Grundfos Eye, slave pump	Grundfos Eye, Grundfos GO Remote
Green	Green	Green
Green/yellow	Yellow/red	Yellow
Yellow/red	Green/yellow	Yellow
Red	Red	Red

Related information

[9.2.1 Using Grundfos GO](#)

14.2 Resetting a fault indication

You can reset a fault indication, when the fault cause has been eliminated.

Press the reset button on the pump.

If the pump does not revert to normal duty, the fault cause is not eliminated. See the section on the fault finding.

If the fault disappears by itself, the fault indication is automatically reset.

A fault can also be reset by using Grundfos GO or GO Remote. See the section on reading out warning and alarm codes in Grundfos GO.

Related information

- 14. Fault finding
- 14.3 Reading out alarm and warning codes in Grundfos GO

14.3 Reading out alarm and warning codes in Grundfos GO

To read out alarm codes and get fault descriptions, connect the pump to Grundfos GO or GO Remote and navigate to the **Alarms and warnings** menu.

Alarm and warning codes are indicated on the dashboard. A log of previous alarms and warnings is also available. See the overview of alarm and warning codes in the section on fault finding.

When the fault is corrected, you can reset the alarm in Grundfos GO or GO Remote.

Example of Grundfos GO Remote dashboard

Description	Illustration
Pos A: Alarms and warnings Pos B: Grundfos Eye indicates Communication fault, pump (10). You can also reach the menu by tapping Grundfos Eye.	



For twin-head pumps, connect Grundfos GO or GO Remote to one of the pumps at a time and read out alarm codes and log history for that pump. Then switch the connection to the other pump.

For instructions on how to connect the pump to Grundfos GO, see the section on connecting the pump to Grundfos GO.

Related information

- 9.2 Connecting the pump to Grundfos GO
- 9.2.1 Using Grundfos GO
- 14. Fault finding
- 14.2 Resetting a fault indication

14.4 Warning 77, twin-head pump

A yellow Grundfos Eye in a twin-head pump system often means that the two heads have lost connection to each other. This is often intermittent and caused by external disturbance, or because one of the heads has lost power.

The warning is shown immediately and triggers the fault relay after one hour. If communication is re-established, the warning is automatically reset.

Related information

[8.3 Twin-head pump startup](#)

[9.2.1 Using Grundfos GO](#)

14.4.1 Activating and deactivating the fault relay

It is possible to choose whether "Warning 77, twin-head pump" should trigger the fault relay or not. This is done in Grundfos GO or GO Remote.

Example from Grundfos GO Remote:

1. To activate or deactivate the fault relay, navigate to the **Settings** menu
2. Select **Warning 77 relay settings**.
The fault relay setting is activated by default. To disable the setting, choose "Do not activate relay".

For instructions on how to connect the pump to Grundfos GO or GO Remote, see the section on connecting the pump to Grundfos GO.

Related information

[9.2 Connecting the pump to Grundfos GO](#)

[9.2.1 Using Grundfos GO](#)

15. Technical data

Operating conditions

Ambient conditions	
Ambient temperature during operation	-20 to +40 °C
Ambient temperature during storage and transport	-40 to +70 °C
Relative humidity	Max. 95 %



Observe the requirements for operation at ambient temperatures below 0 °C to reduce condensation and avoid ice buildup.

Requirements for operation at ambient temperatures below 0 °C	Media type	
	Glycol mix	Water
Media temperature at min. 5 °C	-	•
Power switched on permanently	•	•
Continuous operation	-	•
Twin-head pumps: cascade operation every 24 hours	•	•

Liquid temperature

Continuous operation	-10 to +110 °C
Recommended for stainless steel pumps in domestic hot-water systems to avoid lime precipitation	Max. 65 °C

System pressure



The actual inlet pressure and the pump pressure against a closed valve must be lower than the maximum permissible system pressure.

The maximum permissible system pressure is stated on the pump nameplate:

PN 6: 6 bar or 0.6 MPa

PN 10: 10 bar or 1.0 MPa

PN 16: 16 bar or 1.6 MPa.

Test pressure

The pumps can withstand test pressures as indicated in EN 60335-2-51.

- PN 6: 7.2 bar
- PN 10: 12 bar
- PN 6/10: 12 bar
- PN 16: 19.2 bar.

During normal operation, do not use the pump at higher pressures than those stated on the nameplate. Refer to the section on the nameplate.

The pressure test has been made with water containing anti-corrosive additives at a temperature of 20 °C.

Minimum inlet pressure

The following relative minimum inlet pressure must be available at the pump inlet during operation to avoid cavitation noise and damage to the pump bearings.



The values in the table below apply to single-head pumps and twin-head pumps in single-head operation.

Single-head operation DN	Liquid temperature		
	75 °C	95 °C	110 °C
	Inlet pressure [bar] / [MPa]		
25-40/60/80/100/120	0.10 / 0.01	0.35 / 0.035	1.0 / 0.10
32-40/60/80/100/120	0.10 / 0.01	0.35 / 0.035	1.0 / 0.10
32-40/60/80/100/120 F	0.10 / 0.01	0.35 / 0.035	1.0 / 0.10
32-120 F	0.10 / 0.01	0.20 / 0.020	0.7 / 0.07
40-40/60 F	0.10 / 0.01	0.35 / 0.035	1.0 / 0.10
40-80/100/120/150/180 F	0.10 / 0.01	0.50 / 0.05	1.0 / 0.10
50-60/80 F	0.10 / 0.01	0.40 / 0.04	1.0 / 0.10
50-100/120 F	0.10 / 0.01	0.50 / 0.05	1.0 / 0.10
50-150/180 F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17
65-40/60/80/100/120/150 F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17
80-60/80/100/120 F	0.50 / 0.05	1.00 / 0.10	1.5 / 0.15
100-40/60/80/100/120 F	0.70 / 0.07	1.20 / 0.12	1.7 / 0.17

Inlet pressure in cascade operation: In the case of cascade operation, the required relative inlet pressure must be increased by 0.1 bar / 0.01 MPa compared to the stated values for single-head pumps or for twin-head pumps in single-head operation.

Inlet pressure at altitudes above 300 metres: The relative minimum inlet pressures apply to pumps installed up to 300 metres above sea level. For altitudes above 300 metres, increase the required relative inlet pressure by 0.01 bar or 0.001 MPa per 100 metres altitude. The pump is only approved for an altitude of maximum 2000 metres above sea level.

Electrical data

Supply voltage	1 x 230 V ± 10 %, 50/60 Hz, PE
Enclosure class	IPX4D (EN 60529)
Insulation class	F
Temperature class	TF110 (EN 60335-2-51)

Motor protection

The pump requires no external motor protection.

Leakage current

The mains filter will cause a leakage current to earth during operation. The leakage current is less than 3.5 mA.

Power factor

The terminal-connected versions have a built-in active power-factor correction which gives a $\cos \phi$ from 0.98 to 0.99.

The plug-connected versions have a built-in passive power-factor correction with coil and resistors which ensure that the current drawn from the grid is in phase with the voltage and that the current is approximately sinusoidal which gives a $\cos \phi$ from 0.55 to 0.98.

Input and output communication

Digital input	External potential-free contact.
	Contact load: 5 V, 10 mA.
	Screened cable. Loop resistance: Maximum 130 Ω.
Relay output	Internal potential-free changeover contact.
	Maximum load: 250 V, 2 A, AC1.
	Minimum load: 5 VCD, 20 mA. Screened cable, depending on signal level.

Dimensions

See the appendix for MAGNA1 single-head pump dimensions and MAGNA D twin-head pump dimensions.

- Threaded versions
- Plug-connected versions, flanged
- Terminal-connected versions, flanged

Sound pressure level

The sound pressure level of the pump is dependent on the power consumption. Levels are determined in accordance with ISO 3745 and ISO 11203, method Q2.

Pump size	Max. dB(A)
25-40/60/80/100/120	39
32-40/60/80/100/120	
40-40/60	
50-40	
32-120 F	45
40-80/100	
50-60/80	
65-40/60	
80-40	
40-120/150/180	50
50-100/120/150/180	
65-80/100/120	
80-60/80	
100-40/60	
65-150	55
80-100/120	
100-80/100/120	

Related information

[2.4.1 Nameplate](#)

[8. Starting up the product](#)

[13. Storing the product](#)

15.1 Tightening torques for bolts

Recommended tightening torques for bolts used in flanged connections:

Bolt dimension	Torque
M12	27 Nm
M16	66 Nm

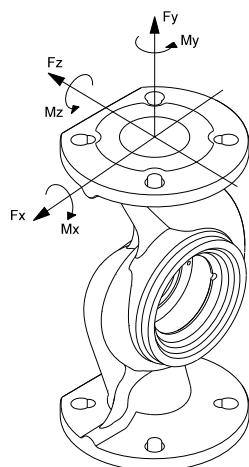
Related information

[5. Mechanical installation](#)

[5.1 Positioning the pump](#)

15.1.1 Forces and torques

Maximum permissible forces and torques from the pipe connections acting on the pump flanges are indicated in the figure below.



TM055639

Forces and torques from the pipe connections acting on the pump flanges

Diameter	Force [N]			
	Fy	Fz	Fx	ΣFb
25 ²⁾	350	425	375	650
32 ²⁾	425	525	450	825
40	500	625	550	975
50	675	825	750	1300
65	850	1050	925	1650
80	1025	1250	1125	1975
100	1350	1675	1500	2625

²⁾ The values also apply to pumps with threaded connection.

Diameter	Torque [Nm]			
	My	Mz	Mx	ΣMb
25 ³⁾	300	350	450	650
32 ³⁾	375	425	550	800
40	450	525	650	950
50	500	575	700	1025
65	550	600	750	1100
80	575	650	800	1175
100	625	725	875	1300

³⁾ The values also apply to pumps with threaded connection.

Forces are static.

The above values apply to cast-iron versions. For stainless-steel versions, the values can be multiplied by two according to the ISO 5199 standard.

Related information

[5. Mechanical installation](#)

15.2 Accessories

You can find the lists of available accessories and product numbers in the MAGNA1 Model C data booklet.

We can recommend the following accessories:

- Insulating shells for applications with ice buildup.
- Condensation jacket for cooling applications.
- Blanking flange for twin-heads pumps. Used when one pump head is removed for service.
- ALPHA plug accessories.
- Pipe connections.

Accessories are described in our data booklets available in Grundfos Product Center (<http://product-selection.grundfos.com>).

Data booklet	Number	Link
MAGNA1 Model C	99234565	http://net.grundfos.com/qr/i/99234565

If you have any questions, please contact your local Grundfos company.

Related information

[4.3.2 Insulating shells for cooling systems](#)

16. Disposing of the product

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

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



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

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

16.1 Recycling of materials

This product has been designed with focus on the recycling and disposal of materials. The following average disposal values apply to all variants of MAGNA pumps:

- 85 % recycling
- 10 % incineration
- 5 % depositing.

17. Document quality feedback

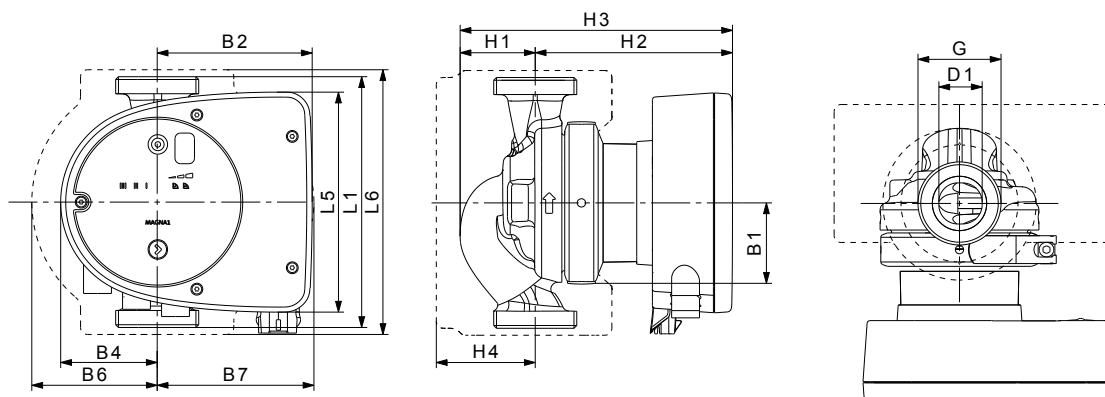
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Dimensions

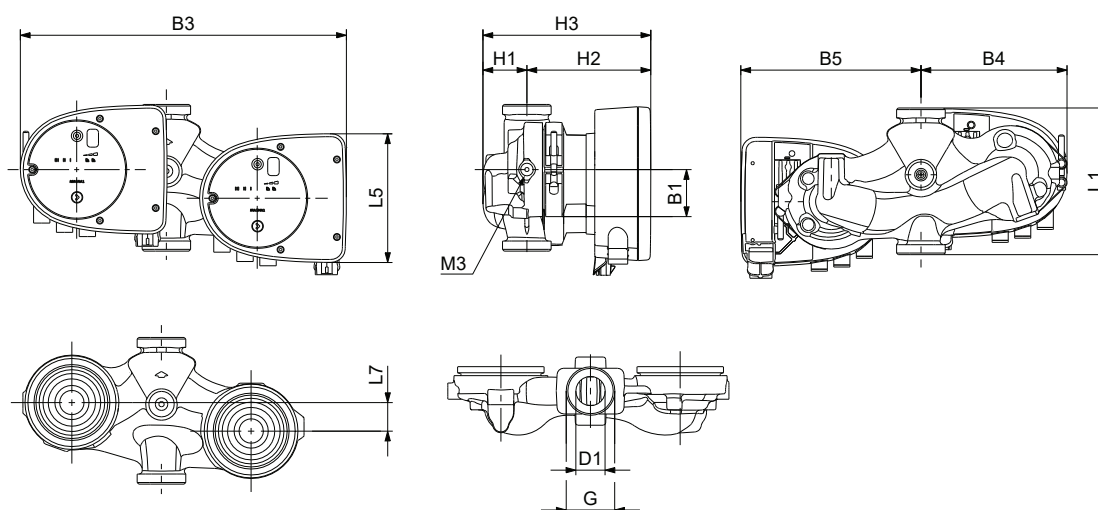
1. Dimensions, threaded versions



TM069948

Single-head pump dimensions, threaded version

Pump type	Dimensions [mm]													[inch]
	L1	L5	L6	B1	B2	B4	B6	B7	H1	H2	H3	H4	D1	G
MAGNA1 25-40 (N)	180	158	190	58	111	69	90	113	54	142	196	71	25	1 1/2
MAGNA1 25-60 (N)	180	158	190	58	111	69	90	113	54	142	196	71	25	1 1/2
MAGNA1 25-80 (N)	180	158	190	58	111	69	90	113	54	142	196	71	25	1 1/2
MAGNA1 25-100 (N)	180	158	190	58	111	69	90	113	54	142	196	71	25	1 1/2
MAGNA1 25-120 (N)	180	158	190	58	111	69	90	113	54	142	196	71	25	1 1/2
MAGNA1 32-40 (N)	180	158	190	58	111	69	90	113	54	142	196	71	32	2
MAGNA1 32-60 (N)	180	158	190	58	111	69	90	113	54	142	196	71	32	2
MAGNA1 32-80 (N)	180	158	190	58	111	69	90	113	54	142	196	71	32	2
MAGNA1 32-100 (N)	180	158	190	58	111	69	90	113	54	142	196	71	32	2
MAGNA1 32-120 (N)	180	158	190	58	111	69	90	113	54	142	196	71	32	2

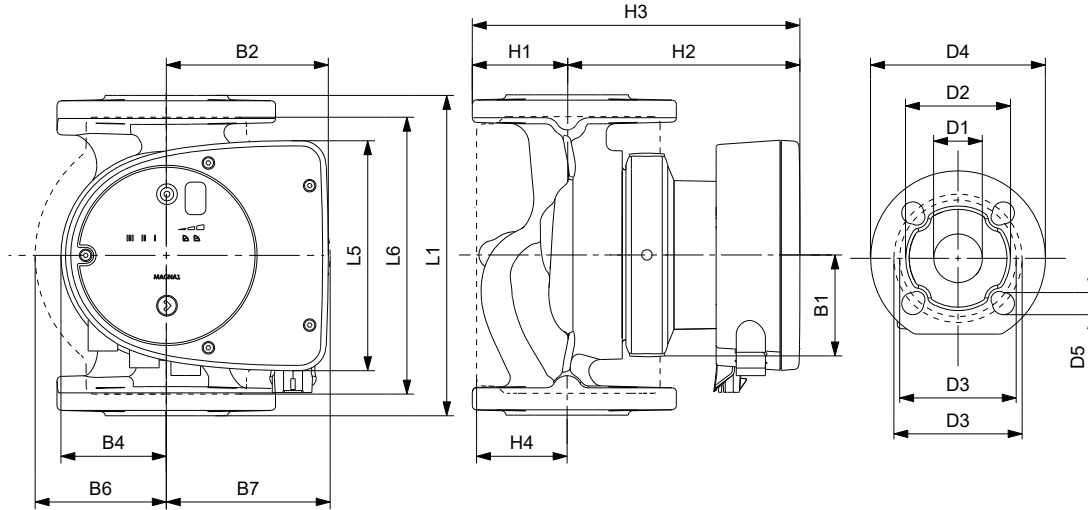


TM070068

Twin-head pump dimensions, threaded version

2. Dimensions, flanged versions

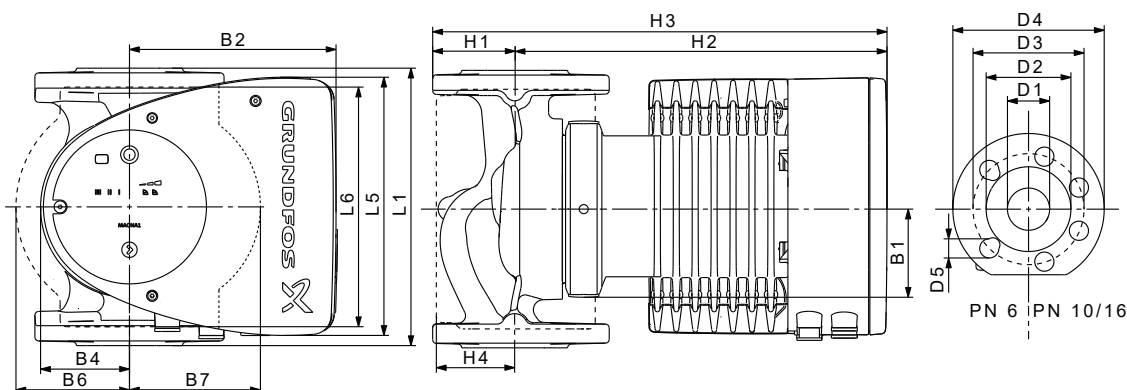
Pump type	Dimensions [mm]										[inch]		
	L1	L5	L7	B1	B3	B4	B5	H1	H2	H3	D1	G	M3
MAGNA1 D 32-40	180	158	35	58	400	179	221	54	142	196	32	2	1/4
MAGNA1 D 32-60	180	158	35	58	400	179	221	54	142	196	32	2	1/4
MAGNA1 D 32-80	180	158	35	58	400	179	221	54	142	196	32	2	1/4
MAGNA1 D 32-100	180	158	35	58	400	179	221	54	142	196	32	2	1/4



TM070067

Single-head pump dimensions, plug-connected versions, flanged version

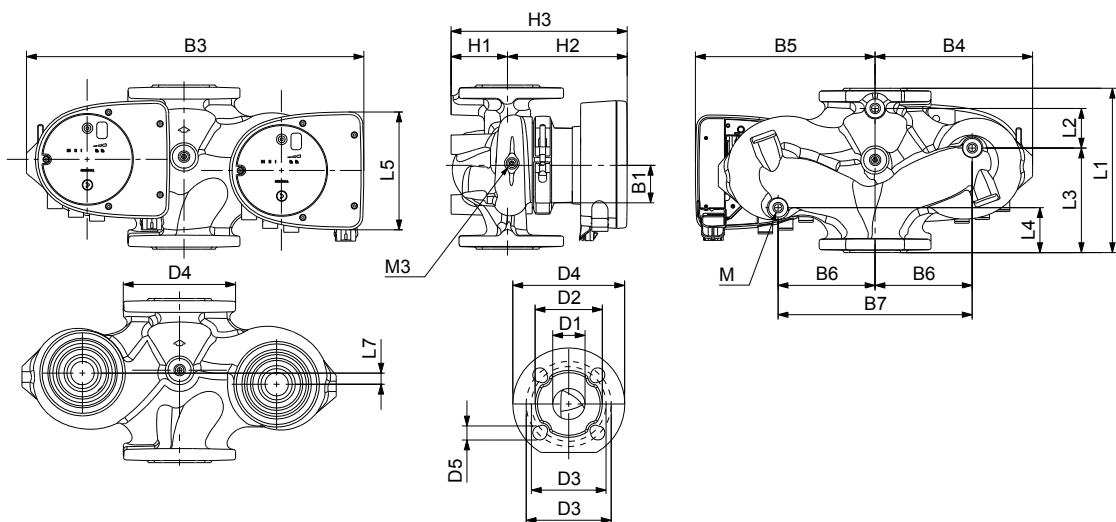
Pump type	Dimensions [mm]																
	L1	L5	L6	B1	B2	B4	B6	B7	H1	H2	H3	H4	D1	D2	D3	D4	D5
MAGNA1 32-40 F (N)	220	158	220	58	111	69	100	110	65	142	207	82	32	76	90/100	140	14/19
MAGNA1 32-60 F (N)	220	158	220	58	111	69	100	110	65	142	207	82	32	76	90/100	140	14/19
MAGNA1 32-80 F (N)	220	158	220	58	111	69	100	110	65	142	207	82	32	76	90/100	140	14/19
MAGNA1 32-100 F (N)	220	158	220	58	111	69	100	110	65	142	207	82	32	76	90/100	140	14/19
MAGNA1 40-40 F (N)	220	158	220	58	111	69	105	105	65	156	221	83	40	84	100/110	150	14/19
MAGNA1 40-60 F (N)	220	158	220	58	111	69	105	105	65	156	221	83	40	84	100/110	150	14/19



TM055276

Single-head pump dimensions, terminal-connected versions, flanged version

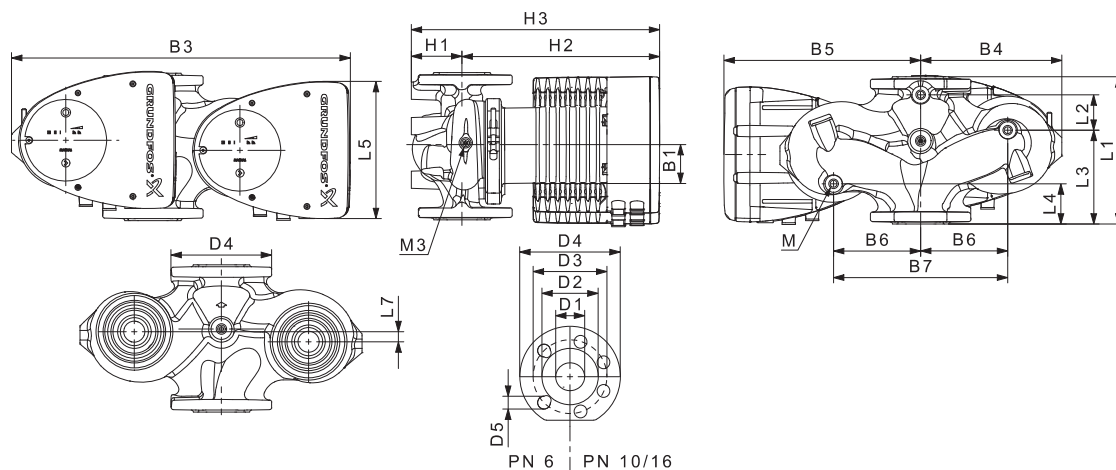
Pump type	Dimensions [mm]																
	L1	L5	L6	B1	B2	B4	B6	B7	H1	H2	H3	H4	D1	D2	D3	D4	D5
MAGNA1 32-120 F (N)	220	204	216	84	164	73	106	116	65	301	366	86	32	76	90/100	140	14/19
MAGNA1 40-80 F (N)	220	204	220	84	164	73	106	128	65	304	369	83	40	84	100/110	150	14/19
MAGNA1 40-100 F (N)	220	204	220	84	164	73	106	128	65	304	369	83	40	84	100/110	150	14/19
MAGNA1 40-120 F (N)	250	204	220	84	164	73	106	128	65	304	369	83	40	84	100/110	150	14/19
MAGNA1 40-150 F (N)	250	204	220	84	164	73	106	128	65	304	369	83	40	84	100/110	150	14/19
MAGNA1 40-180 F (N)	250	204	220	84	164	73	106	128	65	304	369	83	40	84	100/110	150	14/19
MAGNA1 50-60 F (N)	240	204	240	84	164	73	127	127	71	304	374	97	50	102	110/125	165	14/19
MAGNA1 50-80 F (N)	240	204	240	84	164	73	127	127	71	304	374	97	50	102	110/125	165	14/19
MAGNA1 50-100 F (N)	280	204	240	84	164	73	127	127	72	304	376	97	50	102	110/125	165	14/19
MAGNA1 50-120 F (N)	280	204	240	84	164	73	127	127	72	304	376	97	50	102	110/125	165	14/19
MAGNA1 50-150 F (N)	280	204	240	84	164	73	127	127	72	304	376	97	50	102	110/125	165	14/19
MAGNA1 50-180 F (N)	280	204	240	84	164	73	127	127	72	304	376	97	50	102	110/125	165	14/19
MAGNA1 65-40 F (N)	340	204	296	84	164	73	133	133	74	312	386	94	65	119	130/145	185	14/19
MAGNA1 65-60 F (N)	340	204	296	84	164	73	133	133	74	312	386	94	65	119	130/145	185	14/19
MAGNA1 65-80 F (N)	340	204	296	84	164	73	133	133	74	312	386	94	65	119	130/145	185	14/19
MAGNA1 65-100 F (N)	340	204	296	84	164	73	133	133	74	312	386	94	65	119	130/145	185	14/19
MAGNA1 65-120 F (N)	340	204	296	84	164	73	133	133	74	312	386	94	65	119	130/145	185	14/19
MAGNA1 65-150 F (N)	340	204	296	84	164	73	133	133	74	312	386	94	65	119	130/145	185	14/19
MAGNA1 80-60 F	360	204	310	84	164	73	163	163	96	318	413	115	80	128	150/160	200	19
MAGNA1 80-80 F	360	204	310	84	164	73	163	163	96	318	413	115	80	128	150/160	200	19
MAGNA1 80-100 F	360	204	310	84	164	73	163	163	96	318	413	115	80	128	150/160	200	19
MAGNA1 80-120 F	360	204	310	84	164	73	163	163	96	318	413	115	80	128	150/160	200	19
MAGNA1 100-40 F	450	204	396	84	164	73	178	178	103	330	433	120	100	160	170	220	19
MAGNA1 100-60 F	450	204	396	84	164	73	178	178	103	330	433	120	100	160	170	220	19
MAGNA1 100-80 F	450	204	396	84	164	73	178	178	103	330	433	120	100	160	170	220	19
MAGNA1 100-100 F	450	204	396	84	164	73	178	178	103	330	433	120	100	160	170	220	19
MAGNA1 100-120 F	450	204	396	84	164	73	178	178	103	330	433	120	100	160	170	220	19



TM070069

Twin-head pump dimensions, plug-connected versions, flanged version

Pump type	Dimensions [mm]																				
	L1	L2	L3	L4	L5	L7	B1	B3	B4	B5	B6	B7	H1	H2	H3	D1	D2	D3	D4	D5	M
MAGNA1 D 32-40 F	220	73	120	85	158	35	58	400	179	221	130	260	69	142	211	32	76	90/100	140	14/19	12
MAGNA1 D 32-60 F	220	73	120	85	158	35	58	400	179	221	130	260	69	142	211	32	76	90/100	140	14/19	12
MAGNA1 D 32-80 F	220	73	120	85	158	35	58	400	179	221	130	260	69	142	211	32	76	90/100	140	14/19	12
MAGNA1 D 40-40 F	220	53	140	60	158	15	58	452	211	241	130	260	76	156	232	40	84	100/110	150	14/19	12
MAGNA1 D 40-60 F	220	53	140	60	158	15	58	452	211	241	130	260	76	156	232	40	84	100/110	150	14/19	12
MAGNA1 D 40-80 F	220	53	140	60	204	15	84	502	210	294	130	260	76	303	379	40	84	100/110	150	14/19	12



Twin-head pump dimensions, terminal-connected versions, flanged version

Pump type	Dimensions [mm]																				
	L1	L2	L3	L4	L5	L7	B1	B3	B4	B5	B6	B7	H1	H2	H3	D1	D2	D3	D4	D5	M
MAGNA1 D 32-120 F	220	97	90	50	204	50	84	502	210	294	130	260	68	300	368	32	76	90/100	140	14/19	12
MAGNA1 D 40-80 F	220	53	140	60	204	15	84	502	210	294	130	260	76	303	379	40	84	100/110	150	14/19	12
MAGNA1 D 40-100 F	220	53	140	60	204	15	84	502	210	294	130	260	76	303	379	40	84	100/110	150	14/19	12
MAGNA1 D 40-120 F	250	58	155	75	204	0	84	512	220	294	130	260	69	303	372	40	84	100/110	150	14/19	12
MAGNA1 D 40-150 F	250	58	155	75	204	0	84	512	220	294	130	260	69	303	372	40	84	100/110	150	14/19	12
MAGNA1 D 40-180 F	250	58	155	75	204	0	84	512	220	294	130	260	69	303	372	40	84	100/110	150	14/19	12
MAGNA1 D 50-40 F	240	48	160	45	204	45	84	515	221	294	130	260	75	304	379	50	102	110/125	165	14/19	12
MAGNA1 D 50-60 F	240	48	160	45	204	45	84	515	221	294	130	260	75	304	379	50	102	110/125	165	14/19	12
MAGNA1 D 50-80 F	240	48	160	45	204	45	84	515	221	294	130	260	75	304	379	50	102	110/125	165	14/19	12
MAGNA1 D 50-100 F	280	175	75	75	204	0	84	517	223	294	130	260	75	304	379	50	102	110/125	165	14/19	12
MAGNA1 D 50-120 F	280	175	75	75	204	0	84	517	223	294	130	260	75	304	379	50	102	110/125	165	14/19	12
MAGNA1 D 50-150 F	280	175	75	75	204	0	84	517	223	294	130	260	75	304	379	50	102	110/125	165	14/19	12
MAGNA1 D 50-180 F	280	175	75	75	204	0	84	517	223	294	130	260	75	304	379	50	102	110/125	165	14/19	12
MAGNA1 D 65-40 F	340	218	92	92	204	0	84	522	228	294	130	260	77	312	389	65	119	130/145	185	14/19	12
MAGNA1 D 65-60 F	340	218	92	92	204	0	84	522	228	294	130	260	77	312	389	65	119	130/145	185	14/19	12
MAGNA1 D 65-80 F	340	218	92	92	204	0	84	522	228	294	130	260	77	312	389	65	119	130/145	185	14/19	12
MAGNA1 D 65-100 F	340	218	92	92	204	0	84	522	228	294	130	260	77	312	389	65	119	130/145	185	14/19	12
MAGNA1 D 65-120 F	340	218	92	92	204	0	84	522	228	294	130	260	77	312	389	65	119	130/145	185	14/19	12
MAGNA1 D 65-150 F	340	218	92	92	204	0	84	522	228	294	130	260	77	312	389	65	119	130/145	185	14/19	12
MAGNA1 D 80-40 F	360	218	102	102	204	0	84	538	244	294	130	260	97	318	415	80	128	150/160	200	19	12
MAGNA1 D 80-60 F	360	218	102	102	204	0	84	538	244	294	130	260	97	318	415	80	128	150/160	200	19	12

TM055275

Pump type	Dimensions [mm]																				
	L1	L2	L3	L4	L5	L7	B1	B3	B4	B5	B6	B7	H1	H2	H3	D1	D2	D3	D4	D5	M
MAGNA1 D 80-80 F	360	218	102	102	204	0	84	538	244	294	130	260	97	318	415	80	128	150/160	200	19	12
MAGNA1 D 80-100 F	360	218	102	102	204	0	84	538	244	294	130	260	97	318	415	80	128	150/160	200	19	12
MAGNA1 D 80-120 F	360	218	102	102	204	0	84	538	244	294	130	260	97	318	415	80	128	150/160	200	19	12
MAGNA1 D 100-40 F	450	243	147	147	204	0	84	551	252	299	135	270	103	330	434	100	160	170	220	19	12
MAGNA1 D 100-60 F	450	243	147	147	204	0	84	551	252	299	135	270	103	330	434	100	160	170	220	19	12
MAGNA1 D 100-80 F	450	243	147	147	204	0	84	551	252	299	135	270	103	330	434	100	160	170	220	19	12
MAGNA1 D 100-100 F	450	243	147	147	204	0	84	551	252	299	135	270	103	330	434	100	160	170	220	19	12
MAGNA1 D 100-120 F	450	243	147	147	204	0	84	551	252	299	135	270	103	330	434	100	160	170	220	19	12



M3: Rp 1/4 for a vent valve is available on all twin-head pumps.

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