UPM4

Installation and operating instructions

GRUNDFOS

UPM4

English (GB)

Original installation and operating instructions

Table of contents

1. General information

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

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.

2. Product introduction

2.1 Product description

The pump can be used as stand-alone or integrated circulator pump in existing systems as a replacement or in new systems with either variable or constant flow rate. The product can be used in a large range of system applications.

The speed can be controlled by a low-voltage PWM (Pulse Width Modulation) signal or by Local Interconnect Network (LIN) bus communication protocol.

2.2 Pumped liquids

WARNING
Biological hazard
Death or serious personal injury

- In domestic hot-water systems, the temperature of the pumped liquid must always be according to local legislation.

CAUTION
Flammable material
Minor or moderate personal injury

- Do not use the pump for flammable liquids, such as diesel oil and petrol.

CAUTION
Corrosive substance
Minor or moderate personal injury

- Do not use the pump for aggressive liquids, such as acids and seawater.

Frost protection fluids may contain substances that can harm the terminal box material. Grundfos recommends shielding the terminal box from exposure to the frost protection fluids.

The product is suitable for pumping clean, thin, non-aggressive and non-explosive liquids, not containing solid particles or fibres.

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.

The pH must be between 8.2 and 9.5. The minimum value depends on the water hardness and must not be below 7.4 at 4 °dH (0.712 mmol/l).

The electrical conductivity at 25 °C must be equal to or larger than 10 microS/cm.

Mixtures of water with antifreeze media, such as glycol, with a kinematic viscosity lower than 10 mm^2/s (10 cSt).When selecting a pump, the viscosity of the pumped liquid must be taken into consideration.If the pump is used for a liquid with a higher viscosity, the hydraulic performance of the pump is reduced.

Solar media used in typical solar thermal systems containing up to 50 volume % of antifreeze media.

For drinking water use, approved housings must be used, such as CIL3 PPS or stainless steel N. These pumps are WRAS (UK) and ACS (FR) approved, and the materials in contact with drinking water comply with the applicable evaluation criteria issued by UBA (DE).

In domestic hot-water systems, the pump must be used only for water with a degree of temporary hardness of less than 3 mmol/l CaCO3 (16.8 °dH). To avoid lime problems in hard water, the liquid temperature must not exceed 65 °C.

The water quality of test beds for the final production tests of complete heating appliances including pump must be observed to avoid calcification or biofilm formation during a longer storage period.

2.3 Identification

2.3.1 Type key, UPM4

Example: UPM4 LIN 25-75 180 9 XXX

Code	Explanation	Designation
UPM4	Standard	Pump type
UPM4S	Small version with IMM rotor	
UPM4L	Large version with extended performance	
UPM4XL	Extra large version with extended performance	

Code	Explanation	Designation
K	Version	For condensing environments

Code	Explanation	Designation
	PWM	Control variant
LIN	LIN bus	

Code	Explanation	Designation
15	R 1/2" / G 1"	Nominal diameter
20	R 3/4" G1 1/4"	
25	R 1" / G 1 1/2"	
32	R 1 1/4" / G 2"	

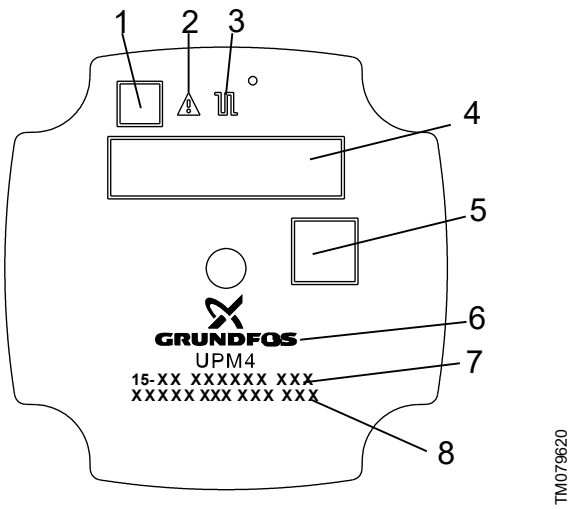
Code	Explanation	Designation
20	2 m	Maximum head
30	3 m	
40	4 m	
45	4.5 m	
50	5 m	
55	5.5 m	
60	6 m	
65	6.5 m	
70	7 m	
75	7.5 m	
90	9 m	

Code	Explanation	Designation
130	Cast iron CED, 130 mm	Pump housing
180	Cast iron CED, 180 mm	
N 130	Stainless steel, 130 mm	
N 150	Stainless steel, 150 mm	
N 180	Stainless steel, 180 mm	
GGES2	Cast iron CED, end suction	
GGAOS3	Cast iron CED, AOS3	
GGMBP3	Cast iron CED, GGMBP3	
GGBP3	Cast iron CED, GGBP3	
CIL3PA	Composite CIL3, PA6.6	
CIL3PP	Composite CIL3, PPS	
CIAO2A	Composite CIAO2 AC	
CIAO2	Composite CIAO2	
CESAO1	Composite CESAO1	
CESAO2	Composite CESAO2	
CESAO3	Composite CESAO3	
CESAO4	Composite CESAO4	
CACAO	Composite CACAO	
CAOD	Composite CAOD	
CAOD3	Composite CAOD3	

Code	Explanation	Designation
3	3 o'clock (right)	Control box orientation
6	6 o'clock (below)	
9	9 o'clock (left)	
0	12 o'clock (top)	

Code	Explanation	Designation
	XXX	Customer code

2.3.2 Nameplate, UPM4



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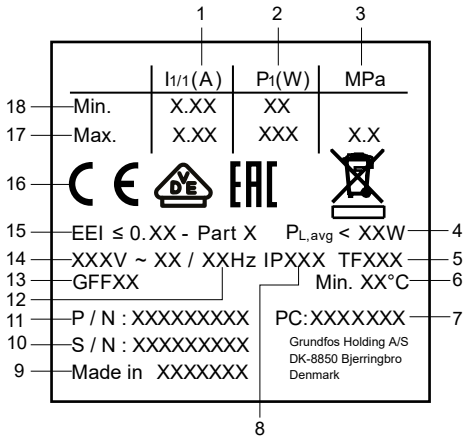
Pos.	Description
1	QR code for quick guide
2	Error indicator
3	External communicator indicator
4	Area for customer specific logo
5	Grundfos data matrix
6	Grundfos logo
7	Grundfos pump type
8	Customer product number or barcode

Related information

3.2 Inspecting the product

2.3.2.1 Terminal box side



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Terminal box side

Pos.	Terminal box side
1	Rated current at minimum and maximum performance
2	Input power at minimum and maximum performance
3	Maximum operating pressure
4	Average power input $P_{L,avg}$ (Ecodesign regulation)
5	Temperature class
6	Minimum liquid temperature (only condensing pumps)
7	Production code (year and week) and customer ID
8	Enclosure class
9	Production site
10	Serial number
11	Product number
12	Frequency[Hz]
13	Product mark (legal product code)
14	Voltage[V]
15	Energy index with indication of measurement standard
16	CE mark and approvals
17	Maximum
18	Minimum

3. Receiving the product

3.1 Transporting the product

- Use appropriate lifting and transporting devices.
- Observe the maximum stacking height of pallets printed on the side of the pallet.

3.2 Inspecting the product

When you have received the product, make sure that:

- The product is in accordance with the order.
- The voltage and frequency of the product match the voltage and frequency of the installation site.

Related information

2.3.2 Nameplate, UPM4

4. Mechanical installation

Mechanical installation must be carried out by trained persons in accordance with local regulations.

The pump must always be installed with horizontal motor shaft within ± 5 °.

Arrows on the pump housing indicate the liquid flow direction through the pump. The pump is designed to be installed with horizontal shaft pumping upwards, downwards or horizontally.

- The pump must be installed in the system in such a way that no major amount of air flowing through or gathering in the pump housing affects the pump when it is out of operation.
- If an additional non-return valve is installed in the flow pipe, there is a high risk of dry running as the air cannot pass the valve.
- It must be possible to vent the system at the highest part of each system segment.
- Permanent venting is recommended.

1. Check the arrows on the pump housing for flow direction through the pump. The flow direction can be horizontal or vertical, depending on the control box position.

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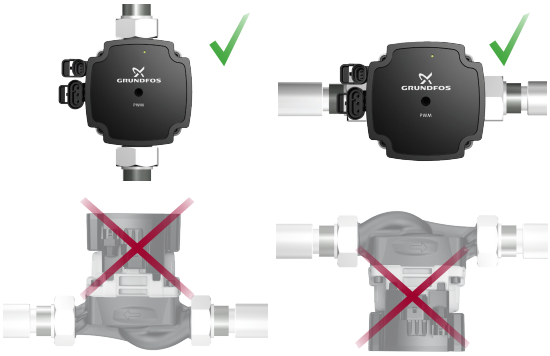
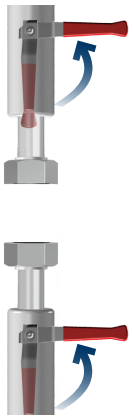


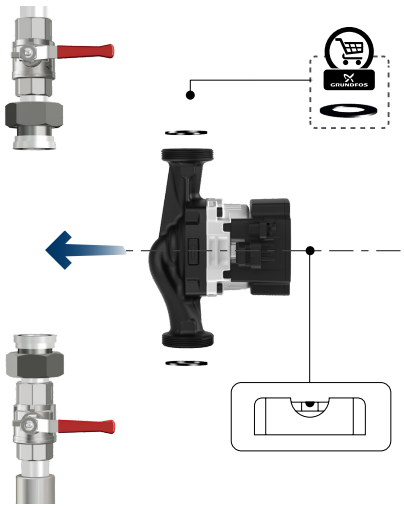
TM080999

2. Close the isolating valves and make sure that the system is not pressurised during the installation of the pump.



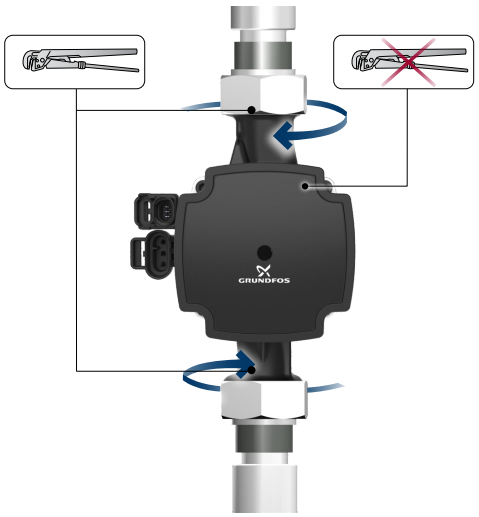
TM078759

3. Mount the pump with gaskets in the pipes.



TM078760

4. Tighten the union nuts (maximum 30 Nm).



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In heating systems, do not insulate the control box or cover the operating panel.

4.1 Control box positions

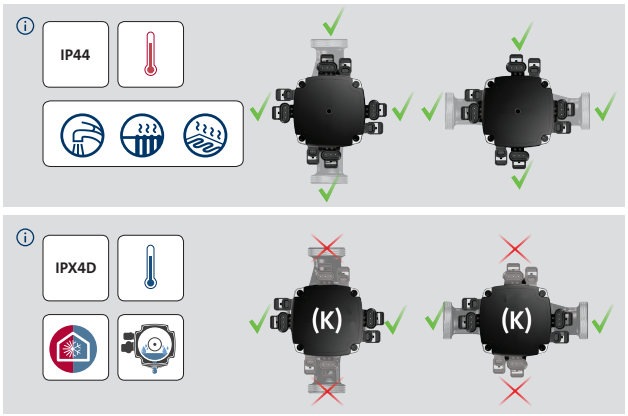
The control box gives access to the terminals from the front. If necessary, you can turn the control box in steps of 90 degrees:

- 3 o'clock
- 6 o'clock
- 9 o'clock
- 12 o'clock.

As standard, the operating panel is in the top position (12 o'clock) when the terminals are in 9 o'clock position. The front foil can be placed in four different positions. This allows you to place it in a horizontal position regardless of the orientation of the control box.

Observe the following:

- IP44 versions without drain holes: All positions are allowed.
- IPX4D versions with drain holes: The drain hole must point downwards after installation. Only connector positions to the side are possible.



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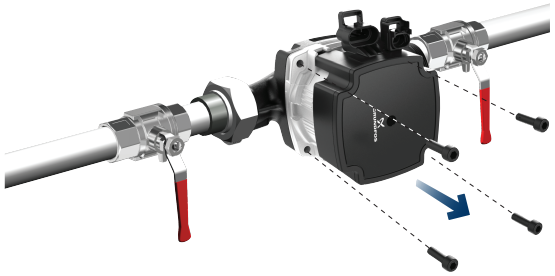
4.1.1 Changing the control box position

1. Close the isolating valves.

TM078766

2. Remove the screws that keep the pump head in place.



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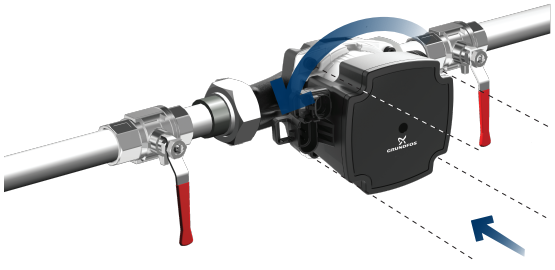
3. Turn the control box into the desired position, and fit the screws.



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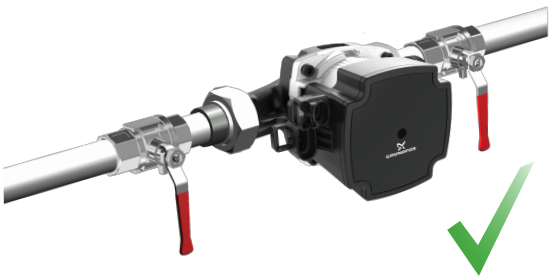
4. Tighten the new screws securely.



TM078769

5. Open the isolating valves, and check the tightness.

The nameplate position cannot be changed.

Before dismantling the pump, drain the system or close the isolating valves on either side of the pump.

4.2 Preventing the pump from blocking

To prevent the pump from blocking, do the following:

1. Once installation is complete, the pump must run for two hours to vent the system.
2. Make sure that the pump runs for a period of time every day.

4.3 Insulation

When insulating the pump, the front plate of the control box must not be covered in order to allow for cooling by the surrounding air.

If the pump is installed inside a cabinet, a boiler or a heating kit encapsulated with insulating shells, the inside air temperature has to be measured, and it must not exceed 70 °C during operation.

TM064411

Insulation of a pump

5. Electrical connection

WARNING
Electric shock
Death or serious personal injury
- 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 product.

WARNING
Electric shock
Death or serious personal injury
- The pump shall be connected to a supply disconnecting device incorporated in the fixed wiring according to the local wiring rules.

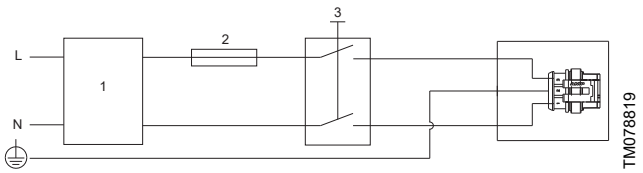
WARNING
Electric shock
Death or serious personal injury
- Switch off the power supply before you start any work on the product.Make sure that the power supply cannot be switched on accidentally.

WARNING
Electric shock
Death or serious personal injury
- Always make sure that the safety earth (PE Protective Earth) on the pump is connected to the PE in the installation

All electrical connections must be carried out by a qualified electrician in accordance with local regulations.

- The pump requires no external motor protection.
- Check that the supply voltage and frequency correspond to the values stated on the nameplate.
- The pump must not be used with an external speed control that varies the supply voltage.
- If an RCD is used, check which type it is.
- If an external relay is used, check if it can stand the inrush current.

5.1 Wiring diagram



Pos.	Description
1	Residual Current Device (RCD)
2	Fuse
3	External switch

5.2 Supply voltage

1 × 230 V +10 % / -15 %, 50/60 Hz.

The pump is externally controlled via PWM signal or LIN bus signal, or internally speed-controlled by a frequency converter. The pump must therefore not be used with an external speed control that varies the supply voltage, for example phase-cut or pulse-cascade control.

5.2.1 Reduced supply voltage

Pump operation is ensured down to 150 VAC. If the supply voltage falls below 150 VAC, the pump stops and starts again when the supply voltage is above 160 VAC.

Pumps with PWM and LIN bus control

If the voltage falls below 190 VAC, a low-voltage warning is sent via the PWM or LIN bus signal.

If the voltage falls below 150 VAC, the pump stops and a low-voltage alarm is sent via the PWM or LIN bus signal.

Pumps in internal control mode

If the voltage falls below 150 VAC, the pump stops and gives an alarm.

Related information

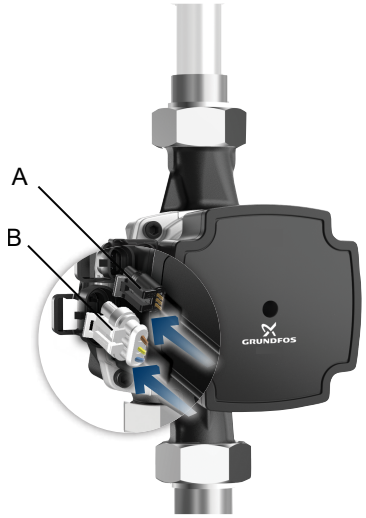
12.7 Fault indication on the operating panel

5.3 Control box connections

All control boxes have two electrical connections on one side:

- power supply connection
- signal connection.

If the signal connection is not needed, it can be covered by a blind plug.



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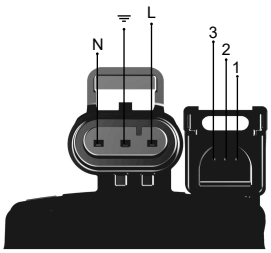
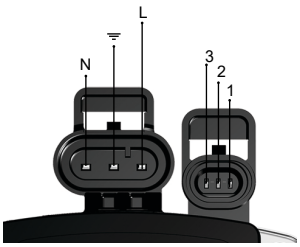
Signal connection and power connection

Pos.	Description
A	Signal connection
B	Power connection



TM068062

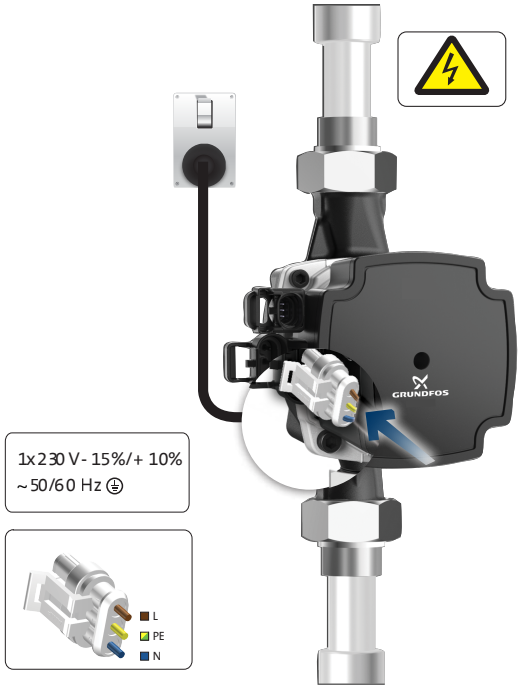
Connections FCI



TM064416

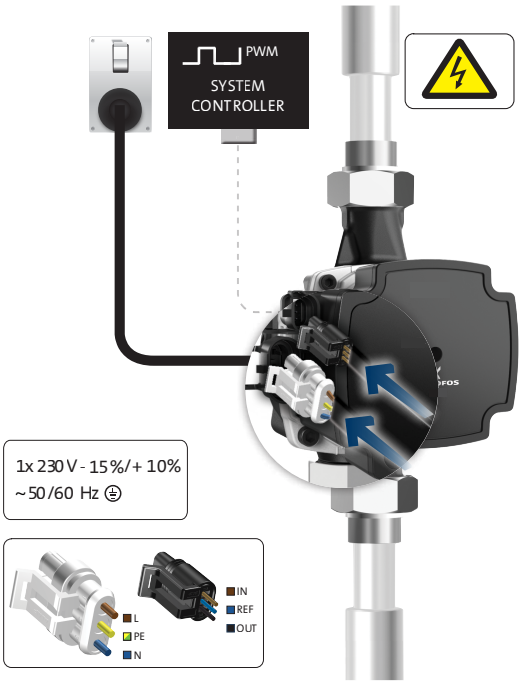
Connections Mini SS

Contact	PWM	LIN	Cable
1	PWM input	VBAT	Brown
2	Signal reference	Signal reference	Blue
3	PWM output	LIN bus signal	Black



TM079641

Control box without signal connection



TM079642

Control box with Mini Superseal connection

5.3.1 Power supply connection

The pump must be connected to the power supply with the TE Superseal connector.

Adapters are available for cables with Molex or Volex connectors.

6. Starting up the product

Before you start the pump:

1. Mount the pump in the right way.
2. Check that the unions are tightened.
3. Check that the valves are opened.
4. Fill the system and vent it above the pump.
5. Check if the required minimum inlet pressure is available at the pump inlet.
6. Switch on the power supply.
7. Check if the external controller sends a signal to the pump.

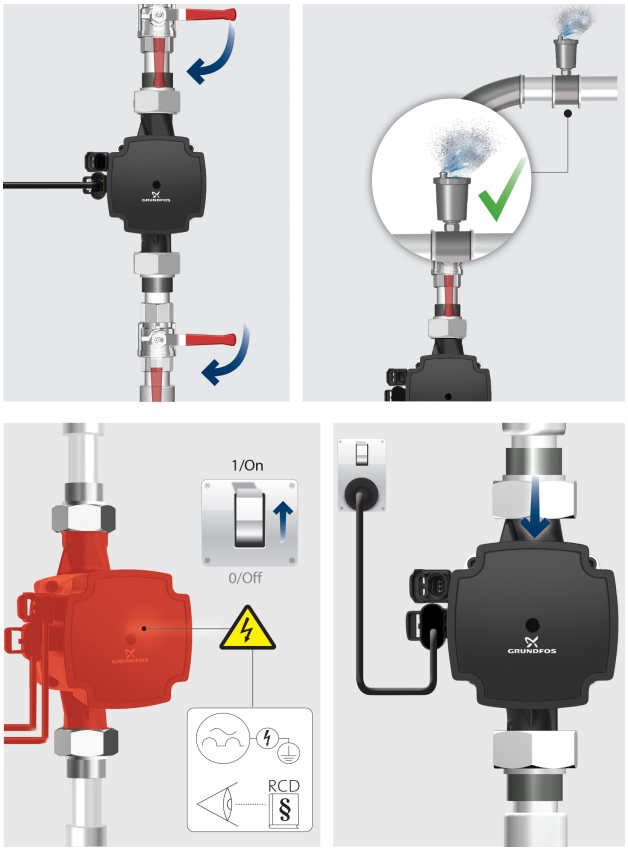
Do not start the pump until the system has been filled with liquid and vented.

To prevent the pump from blocking, ensure after installation that the pump runs for two hours to vent the system. Make sure that the pump runs for a period of time every day.

Heating systems must be flushed according to local standards, such as DIN EN 14336 or VOB ATV C DIN 18380, before startup. After filling the system for the first time, the pump must run for approximately 1 hour before a long-term stop.

Inhibitors and additives increase the risk of malfunction of the pump.

If filters are installed, they must be monitored and maintained thoroughly.



7. Operating panel and settings

7.1 UPM4 control modes

UPM4 is externally controlled via a PWM or LIN bus signal.

7.1.1 UPM4 operating panel

The operating panel is designed with three indicators.

UPM4 operating panel

Pos.	Description
A	LED (used for Grundfos GO Balance)
B	Signal established with the product. For LIN and PWM communication, the LED flashes when communication is established.
C	Fault indicator

The LED shows whether or not the pump is controlled externally or if the pump experiences an error.

7.1.2 Alarm status

If the pump detects an alarm, the LED switches from green to red. This means that the rotor is blocked or there is an electrical error.

The warnings can be read out via the PWM or LIN bus return signal.

Related information

12.7 Fault indication on the operating panel

8. External control mode and signals

8.1 Control principles

The pumps are controlled via a digital low-voltage pulse-width modulation (PWM) signal, which means that the speed of rotation depends on the input signal. The speed changes as a function of the input profile.

The PWM communication signals are standardized in the VDMA Einheitsblatt 24224 "Wet runner circulating pumps - Specification of PWM control signals".

9. Control signals

9.1 Digital low-voltage PWM signal

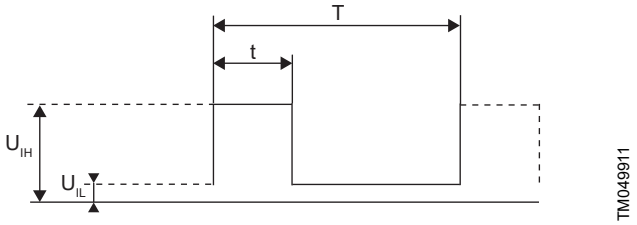
The PWM output provides feedback to the controller.

Duty cycle

d % = 100 × t/T

Example	Rating
T = 2 ms (500 Hz)	
t = 0.6 ms	
d % = 100 × 0.6 / 2 = 30 %	
U_{IH} = 5 V	U_{IH} = 4 - 24 V
U_{IL} = 0.5 V	U_{IL} ≤ 1 V

Example

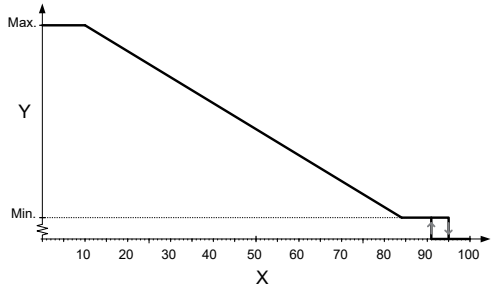


PWM signal

Abbreviation	Description
T	Period of time [s]
d	Duty cycle [t/T]
U_{IH}	High-level input voltage
U_{IL}	Low-level input voltage

9.2 PWM input signal profile A (heating)

At high PWM signal duty cycles, a hysteresis prevents the pump from starting and stopping if the input signal fluctuates around the shifting point. At low PWM signal duty cycles, the pump speed is high for safety reasons. In case a cable breaks when mounted in a system, the pump starts to run at maximum speed. This is suitable for both boilers and heat pumps to ensure that the pump transfers heat even if a cable breaks.



TM049985

PWM input profile A (heating)

Axis	Value
X	Input duty cycle
Y	Speed

PWM input duty cycle	Pump status
PWM signal ≤ 10 %	Max. speed
10 % < PWM signal ≤ 84 %	Variable speed from min. to max. speed
84 % < PWM signal ≤ 91 %	Min. speed
91 % < PWM signal ≤ 95 %	Hysteresis area: on/off
95 % < PWM signal ≤ 100 %	Standby mode: off

9.2.1 PWM A profile (heating)

The pump runs on constant speed curves depending on the current PWM value.

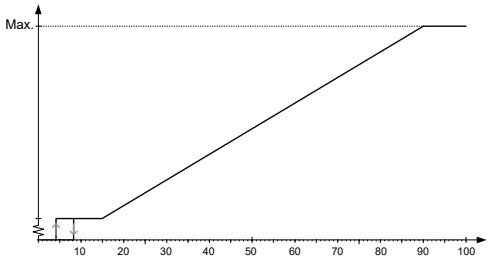
The speed decreases when the PWM value increases. If PWM equals zero, the pump runs at maximum speed.

TM060706

	Head [m]			
PWM profile	**UPM4 XX-20**	**UPM4 XX-50**	**UPM4 XX-70**	**UPM4 XX-75**
A1	1.0	3	5	5
A2	1.5	4	6	6
A3 (max.)	2.0	5	7	7.5
MAX	UPM4 XX-20	UPM4 XX-50	UPM4 XX-70	UPM4 XX-75
A1	1.0	3	5	5
A2	1.5	4	6	6
A3	2.0	5	7	7.5

9.3 PWM input signal profile C (solar)

At low PWM signal duty cycles, a hysteresis prevents the pump from starting and stopping if the input signal fluctuates around the shifting point. Without PWM signal, the pump stops for safety reasons. If a signal is missing, for example if a cable breaks, the pump stops to avoid overheating of the solar thermal system.



TM051575

PWM input profile C (solar)

Axis	Value
X	Input duty cycle
Y	Speed

PWM input duty cycle	Pump status
PWM signal ≤ 5 %	Standby mode: off
5 % < PWM signal ≤ 8 %	Hysteresis area: on/off
8 % < PWM signal ≤ 15 %	Minimum speed
15 % < PWM signal ≤ 90 %	Variable speed from minimum to maximum speed
90 % < PWM signal ≤ 100 %	Maximum speed

9.3.1 PWM C profile (solar)

The pump runs on constant speed curves depending on the current PWM value.

Speed will increase with increasing PWM value. If PWM equals zero, the pump stops.

TM060707

	Head [m]				
PWM profile	**UPM4 XX-50**	**UPM4 XX-70**	**UPM4 XX-75**	**UPM4 XX-105**	**UPM4 XX-145**
C1	3	5	5	6.5	8.5
C2	4	6	6	8.5	10.5
C3 (max.)	5	7	7.5	10.5	14.5

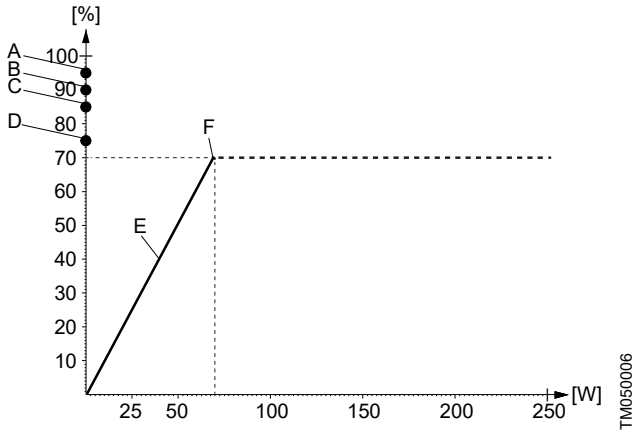
9.4 PWM feedback signal (standard)

The PWM feedback signal offers the same pump information as in bus systems:

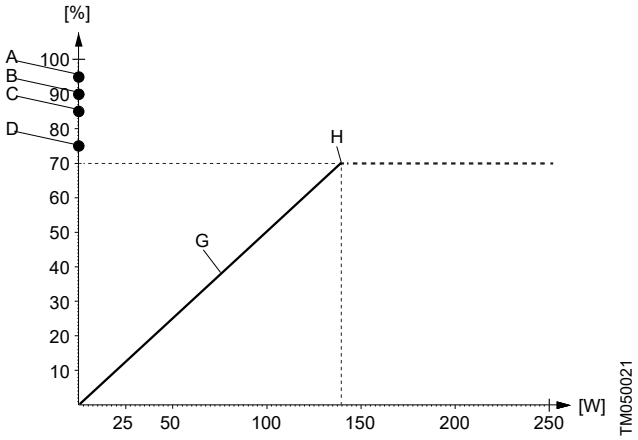
- current power consumption (accuracy ± 2 % of PWM signal)
- warning
- alarm
- operating status.

Alarms

Alarm output signals are available because some PWM output signals are dedicated to alarm information. If a supply voltage is measured below the specified supply voltage range, the output signal is set to 75 %. If the rotor is locked due to deposits in the hydraulics, the output signal is set to 90 % as this alarm has a higher priority.



PWM feedback signal, UPM4 power consumption



PWM feedback signal, UPM4L power consumption

Pos.	Description
X-axis	Output power consumption [W]
Y-axis	Output duty cycle in percentage [%]
A	Standby (stop)
B	Alarm stop: fault, blocked pump
C	Alarm stop: electrical fault
D	Warning
E	Slope: 1 W / % PWM signal
F	Saturation at 70 W
G	Slope: 2 W/ % PWM signal
H	Saturation at 140 W

PWM output duty cycle	QT [s]	Pump information	DT [s]	Priority
95	0	Standby (stop) by PWM duty cycle	0	1
90	30	Alarm, stop, blocked error	12	2
85	0-30	Alarm, stop, electrical error	1-12	3
75	0	Warning	0	5
0-70		0-70 W (slope 1 W / % PWM)		6
Output frequency: 75 Hz ± 5 %				

QT = qualification time, DT = disqualification time

9.5 Control signal data levels

PWM input duty cycle	Symbol	Value
PWM input frequency with high-speed optocoupler	F_i	100-1500 Hz [1]
Rated input voltage - high level	U_{iH}	4-24 V
Rated input voltage - low level	U_{iL}	< 1 V
High-level input current	I_{iH}	< 10 mA
Input duty cycle	PWM	0-100 %

1) Only for standard profiles.

PWM output duty cycle	Symbol	Value
PWM frequency output, open collector	f	75 Hz ± 5 %
Accuracy of output signal regarding power consumption	-	± 2 % (of PWM signal)
Output duty cycle	D_o	0-100
Output impedance	Z_o	< 500 Ω

10. Servicing the product

10.1 Service

DANGER
Electric shock
Death or serious personal injury

- Before dismantling the complete pump installation, switch off the power supply at least 5 minutes before beginning work.
- Make sure that the power supply cannot be switched on accidentally.

DANGER
Electric shock
Death or serious personal injury

- The pump is running in turbine mode and acts as a generator. It creates hazardous induction voltage at the motor terminals.
- Prevent the fluid from flowing through the pump by closing the shut-off valves.

WARNING
Pressurised system
Death or serious personal injury

- Before dismantling the pump, drain the system or close the isolating valve on either side of the pump. The pumped liquid may be scalding hot and under high pressure.

WARNING
Biological hazard
Death or serious personal injury

- Always use original spare parts.

WARNING
Electric shock
Death or serious personal injury

- Connect the product to protective earth and provide protection against indirect contact in accordance with local regulations.

WARNING
Hot surface
Death or serious personal injury

- The pump housing may be hot due to the pumped liquid being scalding hot.
- Close the isolating valves on both sides of the pump and wait for the pump housing to cool down.

WARNING
Electric shock
Death or serious personal injury

- 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 product.

WARNING
Magnetic field
Death or serious personal injury

- If you have a pacemaker, keep a safety distance of at least 0.3 m when dismantling the pump.

WARNING
Toxic material
Death or serious personal injury

- Decontaminate pumps that handle fluids pose a health hazard.

WARNING
General hazard
Death or serious personal injury

- All service work must be carried out by an instructed service technician.

CAUTION
Crushing of feet
Minor or moderate personal injury

- Wear personal protective equipment.

10.2 Maintaining the product

The pumps are maintenance-free. However, it might be necessary to deblock or to open the pump, for example, if it is blocked by impurities.

Deblocking is possible by opening the deblocking screw at the front.

1. Unscrew the deblocking screw at the front of the pump head.

CAUTION
Pressurised system
Minor or moderate personal injury

- Be aware of splashing hot water.

2. Deblock the pump with a screwdriver.

10.3 Cleaning the product

If the impeller or pump housing has to be cleaned from impurities, proceed as follows:

1. Drain the system or close the isolating valves.

CAUTION
Pressurised system
Minor or moderate personal injury

- Be aware of splashing hot water.

2. Remove the screws that hold the pump head.
3. Check the impeller and pump housing and remove the impurities.
4. Place the pump head in the desired position, fit the screws and tighten them securely.

11. Storing the product

- Observe the permissible ambient conditions.
- Observe the permissible storage temperature: -40 to +75 °C.
- Protect the storage location from rain, humidity, condensation, direct sunlight and dust.
- Maximum storage time (without power supply): 2 years from delivery.

Related information

13.1.1 Ambient and liquid temperature

12. Fault finding the product

12.1 Noise in the pump

Cause	Remedy
There is air in the pump.	• Let the pump run. The pump vents itself over time.
The inlet pressure is too low.	• Increase the system pressure or check the air volume in the expansion tank, if installed.

12.2 Noise in the system

Cause	Remedy
There is air in the system.	• Vent the system.
The differential pressure is too high.	• Reduce the pump performance at the pump or the external controller.

12.3 Pump is not running, no power supply

Cause	Remedy
The system is switched off.	• Check the system controller.
A fuse in the installation is blown.	• Replace the fuse.
There is a power supply failure.	• Check the power supply.

12.4 Pump is not running, normal power supply

Cause	Remedy
The controller is switched off.	• Check the controller and its settings.
The pump is blocked by impurities.	• Remove impurities. Deblock the pump from the front of the control box with a screwdriver.
The pump is defective.	• Replace the pump.

12.5 Insufficient flow

Cause	Remedy
The pump performance is too low.	• Check the external controller and the pump settings.
The hydraulic system is closed or the system pressure is insufficient.	• Check the non-return valve and the filter. • Increase the system pressure.

12.6 Pump runs at maximum speed and cannot be controlled

Cause	Remedy
There is no signal from the signal cable.	• Check if the cable is connected to the controller. If it is connected, replace the cable.

12.7 Fault indication on the operating panel

When an alarm is active, the pump alarm LED is turned on.

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The priority of the fault finding is defined by the sequence of the table below:

Alarm LED lights red	Indication	Pump operation	Remedy
•	The rotor is blocked.	The pump tries to start again every 1.33 seconds.	Wait or deblock the shaft.
•	Electrical error.	The pump is stopped because of low supply voltage or serious failure.	Control the supply voltage. Replace the pump.

Related information

5.2.1 Reduced supply voltage

7.1.2 Alarm status

13. Technical data

13.1 Operating conditions

13.1.1 Ambient and liquid temperature

The ambient and liquid temperature of the specific pump is indicated in the table below. The ambient temperature is measured in a distance of no more than 5 cm in front of the front foil at its lower edge.

Product mark	Product name	70 °C ambient at 110 °C liquid temperature	55 °C ambient at 95 °C liquid temperature
GFFHC	UPM4S	•	
GFFKD	UPM4	•	
GFFKF	UPM4L	•	
GFFLH	UPM4XL		• [2]

2) Operation at 70 °C ambient temperature at 95 °C media temperature possible for a short duration.

The above-mentioned temperature ranges do not take temperature limitations of the drinking water approvals into account.

- UPM4, IP44 above dew point of ambient air: minimum 2 °C
- UPM4, IP4XD as K version with drain hole: minimum -20 °C.

Related information

11. Storing the product

13.1.2 Relative humidity

IP44: The relative humidity must not exceed 95 % in a non-condensing environment.

The dew point of the air at ambient temperature must always be lower than the liquid temperature, otherwise condensation may form in the stator housing.

K-Version/IPX4D: Condensation is acceptable.

13.1.3 Minimum inlet pressure

To avoid cavitation and damage to the pump bearings, the following minimum pressures are required at the pump inlet port.

Liquid temperature	75 °C	95 °C	110 °C
Pressure	0.005 MPa	0.05 MPa	0.108 MPa
	0.05 bar	0.5 bar	1.08 bar

13.1.4 System pressure

The materials in the pump housing can withstand the following pressure:

Cast-iron: 1 Mpa (10 bar).

Stainless steel: 1 MPa (10 bar).

Composite: For composite housings, we recommend that the system pressure does not exceed 3 bar (0.3 MPa). For shorter periods of time, for example, in fault scenarios, the composite housing can withstand 6 bar (0.6 MPa).

13.2 Mechanical data

13.2.1 Speed range

563 to 6300 rpm.

13.2.2 Temperature class

UPM4S, UPM4, UPM4L: TF110 at 70 °C ambient temperature.

UPM4XL: TF95 at 70 °C ambient temperature.

13.2.3 Enclosure class

IP44 (standard without drain holes).

K-version: IPX4D (with drain holes).

13.2.4 Insulation class

F (EN 60335-1)

13.3 Electrical data

13.3.1 Supply voltage

Nominal supply voltage: 1 x 230 V +10% / -15%, 50/60 Hz.

Minimum supply voltage down to 160 VAC but with reduced speed.

13.3.2 Motor protection

The motor is protected by the electronics in the control box and requires no external motor protection.

13.3.3 High voltage protection

EN 60335-1 1000 VAC.

13.3.4 Leakage current

The pump mains filter causes a leakage current to earth during operation.

Leakage current: < 3.5 mA.

14. Disposing of the product

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

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

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

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

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92508446 **11.2023**
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