

UPS3

Installation and operating instructions



English (GB) Installation and operating instructions

Original installation and operating instructions

These installation and operating instructions describe Grundfos UPS3.

Sections 1-4 give the information necessary to be able to unpack, install and start up the product in a safe way.

Sections 5-12 give important information about the product, as well as information on service, fault finding and disposal of the product.

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



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.

1. General information

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 text accompanying the three hazard symbols DANGER, WARNING and CAUTION is structured in the following way:



SIGNAL WORD

Description of hazard

Consequence of ignoring the warning.
- Action to avoid the hazard.

The hazard statements are structured in the following way:

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. Receiving the product

2.1 Inspecting the product



CAUTION

Crushing of feet

Minor or moderate personal injury
- Wear safety shoes when opening the box and handling the product.

Check that the product received is in accordance with the order.

Check that the voltage and frequency of the product match voltage and frequency of the installation site. See section [5.4.1 Nameplate](#).

2.2 Scope of delivery

The box contains the following items:

- UPS3 pump
- installer plug
- two gaskets
- quick guide.

3. Installing the product

DANGER

Electric shock

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



CAUTION

Crushing of feet

Minor or moderate personal injury
- Wear safety shoes when opening the box and handling the product.



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



The pump must always be installed with a horizontal motor shaft within $\pm 5^\circ$.

3.1 Mechanical installation



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

3.1.1 Mounting the product

1. The arrows on the pump housing indicate the flow direction through the pump. See fig. 1.
2. Fit the two gaskets supplied with the pump when you mount the pump in the pipe. Install the pump with a horizontal motor shaft within $\pm 5^\circ$. See fig. 2. See also section [3.3 Control box positions](#).
3. Tighten the fittings. See fig. 3.

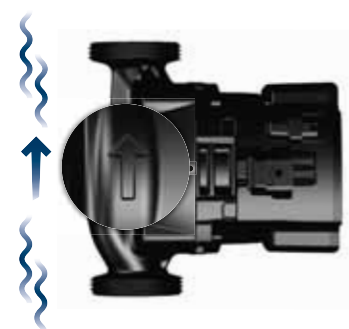


Fig. 1 Flow direction

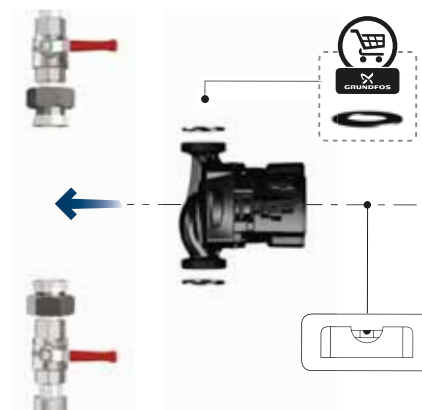
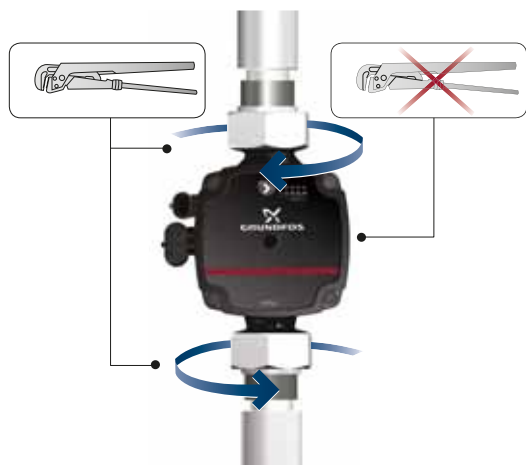


Fig. 2 Pump installation

TM07 0368 1518

TM07 0369 1518



TM07 0370 1518

Fig. 3 Tightening the fittings

3.2 Pump positions

Always install the pump with a horizontal motor shaft within $\pm 5^\circ$. Do not install the pump with a vertical motor shaft. See fig. 4, bottom row.

- Pump installed correctly in a vertical pipe. See fig. 4, top row, left.
- Pump installed correctly in a horizontal pipe. See fig. 4, top row, right.



TM07 0371 1518

Fig. 4 Pump positions

3.3 Control box positions

DANGER

Electric shock



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

CAUTION

Hot surface



Minor or moderate 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.

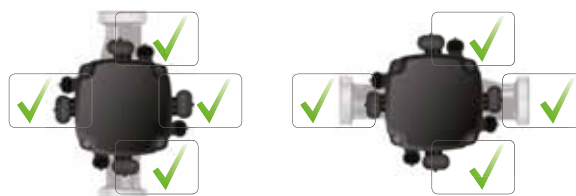
CAUTION

Pressurised system



Minor or moderate personal injury
- Before dismantling the pump, drain the system or close the isolating valves on both sides of the pump. The pumped liquid may be scalding hot and under high pressure.

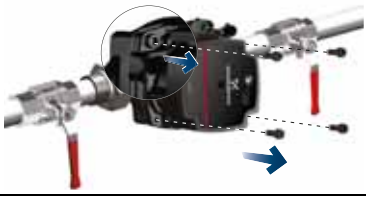
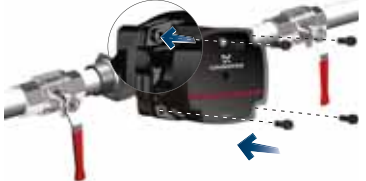
The control box can be mounted in all positions. See fig. 5.



TM06 7297 0918

Fig. 5 Possible control box positions

3.3.1 Changing the control box position

Step	Action	Illustration
1	Make sure that the inlet and outlet valves are closed. Unscrew the screws on the pump head.	 TM07 0372 1518
2	Turn the pump head to the desired position.	 TM07 0373 1518
3	Refit the screws on the pump head.	 TM07 0374 1518

3.4 Electrical connection

DANGER

Electric shock

Death or serious personal injury

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



DANGER

Electric shock

Death or serious personal injury

- Switch off the power supply before starting any work on the product. Make sure that the power supply cannot be accidentally switched on.



DANGER

Electric shock

Death or serious personal injury

- Connect the pump to earth.



DANGER

Electric shock

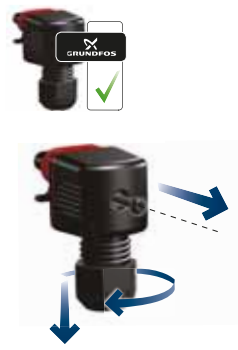
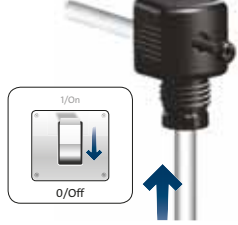
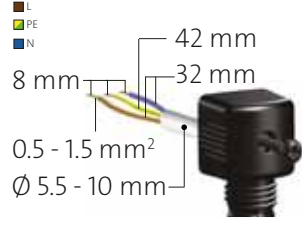
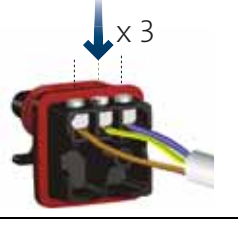
Death or serious personal injury

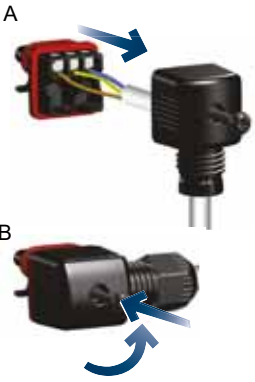
- In case of an insulation fault, the fault current may be a pulsating DC. Observe national legislation about requirements for and selection of Residual Current Device (RCD) when installing the pump.



- The motor requires no external motor protection.
- Check that the supply voltage and frequency correspond to the values stated on the nameplate. See section [5.4.1 Nameplate](#).
- Connect the pump to the power supply with the plug supplied with the pump. See steps 1 to 7.

3.5 Assembling the installer plug

Step	Action	Illustration
1	Loosen the cable gland and unscrew the union nut in the centre of the terminal cover.	 TM06 8542 0918
2	Detach the terminal cover.	 TM06 8543 0918
3	Pull the power cable through the cable gland and terminal cover.	 TM06 8544 0918
4	Strip the cable conductors as illustrated.	 TM06 8545 0918
5	Loosen the screws on the power supply plug and connect the cable conductors.	 TM06 8546 0918 - TM06 8547 0918
6	Tighten the screws on the power supply plug.	 TM06 8548 0918

Step	Action	Illustration
7	Refit the terminal cover. See A. Note: It is possible to turn the power supply plug on the side for a 90 ° cable entry. See B.	 TM06 8549 0918 - TM06 8550 0918
8	Tighten the union nut.	 TM06 8551 0918
9	Tighten the cable gland onto the power supply plug.	 TM06 8552 0918
10	Insert the power supply plug into the male plug on the pump.	 TM07 0376 1518

3.6 Insulating the pump housing

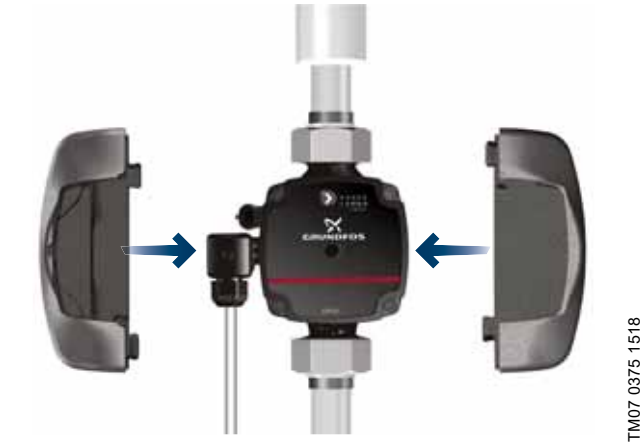


Fig. 6 Insulating the pump housing

You can reduce the heat loss from the pump and pipe by insulating the pump housing and the pipe with insulating shells, which can be ordered as an accessory. See section [5.5.2 Insulating shells](#).



Do not insulate the control box or cover the operating panel.

4. Starting up the product

4.1 Before startup

Do not start the pump until the system has been filled with liquid and vented. Make sure that the required minimum inlet pressure is available at the pump inlet. See section 10. [Technical data](#).

When using the pump for the first time, the system must be vented. See section 4.3 [Venting the pump](#). The pump is self-venting through the system.

4.2 Starting up the pump

Step	Action	Illustration	
1	Open the inlet and outlet valves.		TM07 0377 1518
2	Switch on the power supply.		TM06 8555 1317
3	The lights in the operating panel indicates that the power supply has been switched on and the pump is running.		TM07 0378 1518

4.3 Venting the pump



Fig. 7 Venting the pump

Small air pockets trapped inside the pump may cause noise when starting up the pump. However, because the pump is self-venting through the system, the noise ceases over a period of time.

To speed up the venting process, do as follows:

1. Set the pump to speed III using the button on the operating panel.
2. Let the pump run for minimum 30 minutes. How fast the pump is vented depends on the system size and design.

When you have vented the pump, that is when the noise has ceased, set the pump according to the recommendations. See section 6. [Control functions](#).



The pump must not run dry.



The pump is from factory set to constant curve III.

TM07 1416 1618

5. Product introduction

5.1 Product description

UPS3 can be used as stand-alone or integrated circulator pump in existing systems as replacement or in new systems with either variable or constant flow rate.

The speed can be controlled by a low-voltage PWM (Pulse Width Modulation) signal.

High-efficiency ECM (Electronically Commutated Motor) pumps, such as UPS3, must not be speed-controlled by an external speed controller varying or pulsing the supply voltage.

5.1.1 Model type

These installation and operating instructions cover UPS3. The model type is stated on the packaging and nameplate.

5.2 Applications

The pump is designed for circulating liquids in all heating systems. The pumps are suitable for the following systems:

- Systems with constant or variable flows where it is desirable to optimise the pump duty point.
- Installation in existing systems where the differential pressure of the pump is too high during periods of reduced flow demand.
- Installation in new systems for automatic adjustment of the performance to flow demands without the use of bypass valves or similar expensive components.

5.3 Pumped liquids

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.



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

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

Mixtures of water with antifreeze media such as glycol with a kinematic viscosity lower than 10 mm²/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.

5.4 Identification

5.4.1 Nameplate

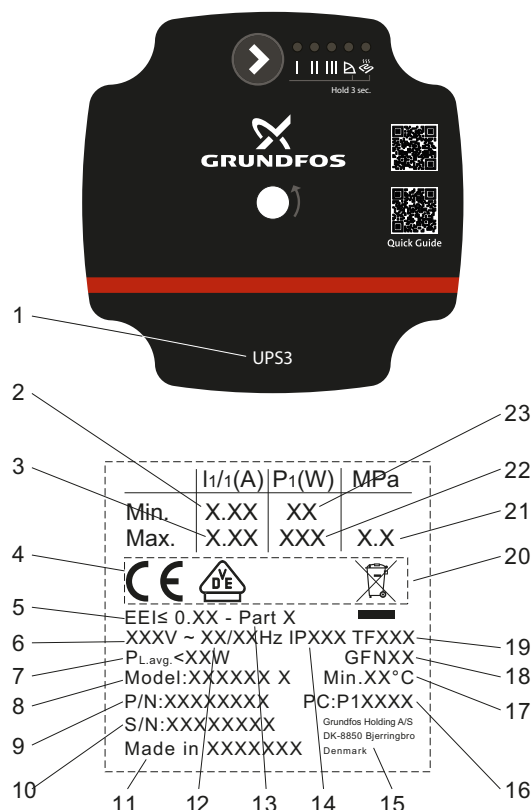


Fig. 8 Nameplate

Pos.	Description
1	Pump name
2	Minimum current [A]
3	Maximum current [A]
4	CE mark and approvals
5	Energy Efficiency Index, EEI
6	Voltage [V]
7	Average power input PL, avg (Ecodesign regulation)
8	Model designation
9	Product number
10	Serial number
11	Country of origin
12	Frequency [Hz]
13	Part, according to EEI
14	Enclosure class
15	Manufacturer's name and address
16	Production code: • 1st and 2nd figures: Production site code • 3rd and 4th figures: year • 5th and 6th figures: week
17	Minimum liquid temperature
18	Product mark (legal product code)
19	TF class
20	Crossed-out wheeled bin according to EN 50419
21	Maximum system pressure
22	Maximum input power [W]
23	Minimum input power [W]

TM07 0791 1618

5.4.2 Type key

Example	UPS3	15	50/65	130
Pump type				
Nominal diameter (DN) of inlet and outlet ports [mm]				
Maximum head [dm]				
[]: Cast-iron pump housing				
Port-to-port length [mm]				

5.5 Accessories

5.5.1 Unions and valve kits

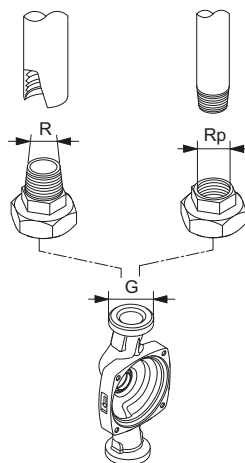
Product numbers, unions					
Union nut with internal threads			Union nut with external threads		
UPS3	Connection				
		3/4	1	1 1/4	
15-xx	G 1 1/2	529921	529922	529821	529925 529924

Note: The product numbers are always for one complete set, including gaskets. The product number for the standard sizes is printed in bold.

G-threads have a cylindrical form in accordance with the EN ISO 228-1 standard and are not sealing the thread. It requires a flat gasket. You can only screw male G-threads (cylindrical) into female G-threads. The G-threads are standard thread on the pump housing.

R-threads are tapered external threads in accordance with the EN 10226-1 standard.

Rc- or Rp-threads are internal threads with either tapered or cylindrical (parallel) threads. You can screw male R-threads (conical) into female Rc- or Rp-threads. See fig. 9.



TM07 7425

Fig. 9 G-threads and R-threads

5.5.2 Insulating shells

The accessory set is tailored to the individual pump type. The insulating shells enclose the entire pump housing and are easy to fit around the pump.

Pump type	Product number
UPS3 15-50/65	99270706

5.5.3 Cables and plugs

The pump has two electrical connections: the power supply and the control signal connection.

Power supply connection

The installer plug is supplied with the pump and is available as an accessory.

Power cable adapters are also available as accessories.

Control signal connection

The control signal cable connection has three conductors: the signal input, the signal output and the signal reference. Connect the cable to the control box by a mini superseal plug. See [7.1 Setting the PWM input signal](#). The optional signal cable is available as an accessory. The cable length must not exceed 3 metres.



TM06 4414

Fig. 10 Mini superseal plug

Conductor	Colour
Signal input	Brown
Signal reference	Blue
Signal output	Black

Product	Product description	Length [mm]	Product number
	Installer plug		99439948
	Mini superseal signal cable (PWM input signal)	2000	99165309
	Superseal power cable	2000	99198990
	Power cable adapter: Superseal Molex cable adapter, overmoulded	150	99165311
	Power cable adapter: Superseal Volex cable adapter, overmoulded	150	99165312

6. Control functions

6.1 Operating panel



Fig. 11 Operating panel

Symbol	Description
	Button
I, II, III	Constant curve or constant speed curve I, II and III
	Proportional-pressure mode I, II
	Constant-pressure mode, I, II

The operating panel shows the following:

- The control mode, after pressing the button
- Alarm status

6.1.1 Alarm or warning

If the pump has detected one or more alarms or warnings, the first LED switches from green to red. When the fault has been resolved the operating panel switches back to operating status. See section 9. [Fault finding the product](#).

6.2 Control modes

The pump has seven different control modes. Learn more about them in the following sections.

6.2.1 Constant curve or constant speed, I, II or III (factory setting)

At constant-curve or constant-speed operation, the pump runs at a constant curve. The pump performance follows the selected performance curve I, II or III. See fig. 14 where II has been selected.

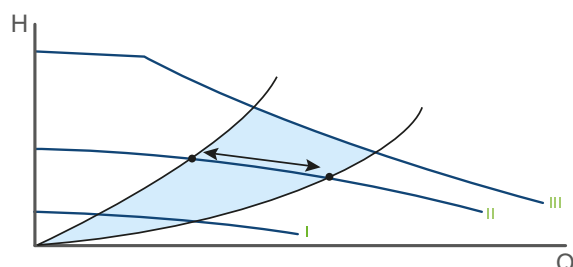


Fig. 12 Constant-curve/-speed curve

The selection of the constant-curve or constant-speed setting depends on the characteristics of the heating system in question.



The pump is factory-set to constant curve III.

System type	Recommended control mode	Alternative control mode
One-pipe heating system	Constant-pressure mode. See section 6.2.3 Constant pressure I, II .	Constant curve or constant speed, I, II or III.

6.2.2 Proportional pressure I, II

In proportional-pressure mode the pump performance follows the selected performance curve I or II and adjusts the pump performance to the actual heat demand in the system following the proportional-pressure curve.

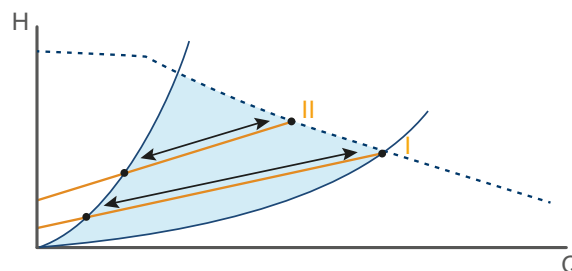


Fig. 13 Proportional-pressure curve

System type	Recommended control mode	Alternative control mode
Two-pipe system	Proportional-pressure mode*	Constant curve or constant speed I, II, III, see section 6.2.1 Constant curve or constant speed, I, II or III (factory setting) .

* Proportional pressure mode is not recommended in heating systems that include an automatic bypass valve to ensure a minimum flow for the heating appliances.

6.2.3 Constant pressure I, II

In constant-pressure mode the pump follows the selected constant-pressure curve I or II, adjusts the pump performance to the actual heat demand in the system following the selected constant-pressure curve.

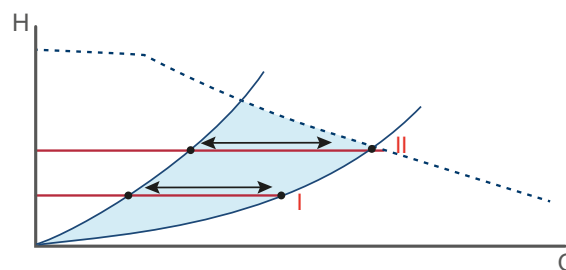


Fig. 14 Constant-pressure curve

System type	Recommended control mode	Alternative control mode
Underfloor heating system	Constant-pressure mode	Constant curve or constant speed I, II, III, see section 6.2.1 Constant curve or constant speed, I, II or III (factory setting) .

6.2.4 Changing from recommended to alternative pump setting

Heating systems are relatively slow systems that cannot be set to the optimum operation within minutes or hours.

If the recommended pump setting does not give the desired distribution of heat in the rooms of the house, change the pump setting to the shown alternative.

6.2.5 Selecting the control modes

Proportional pressure

We recommend proportional-pressure mode in variable flow systems with relatively large pressure losses in the distribution pipes such as:

- two-pipe heating systems with thermostatic valves and long distribution pipes
- two-pipe heating systems with thermostatic valves and high pressure losses in system parts with total flow
- primary circuit pumps in systems with large pressure losses in the primary circuit.

Note: Proportional-pressure mode is not recommended in heating systems that includes an automatic bypass valve to ensure a minimum flow for the heating appliances.

Constant pressure

We recommend constant-pressure mode in variable flow systems with relatively small pressure losses in the distribution pipes such as:

- two-pipe heating systems with thermostatic valves and dimensioned for natural circulation (former gravity systems)
- two-pipe heating systems with thermostatic valves and low pressure losses in system parts with total flow
- one-pipe heating systems with thermostatic valves or pipe balancing valves
- underfloor heating systems with zone valves
- primary circuit pumps in systems with small pressure losses in the primary circuit.

Constant curve

We recommend constant-curve mode in constant-flow systems, where both a constant flow rate and a constant head are required, such as:

- heat surfaces
- replacement for uncontrolled circulator pumps, for instance integrated in boilers.

6.3 Control signal

The pump can be controlled via a digital low-voltage pulse-width modulation (PWM) signal.

The square-wave PWM signal is designed for a 100 to 4,000 Hz frequency range. The PWM signal is used to select the speed (speed command) and as feedback signal. The PWM frequency on the feedback signal is fixed at 75 Hz in the circulator pump.

For instructions on how to set the connection, see section [7.1 Setting the PWM input signal](#).

Duty cycle

$$d \% = 100 \times t/T$$

Example	Rating
$T = 2 \text{ ms (500 Hz)}$	$U_{iH} = 4\text{--}24 \text{ V}$
$t = 0.6 \text{ ms}$	$U_{iL} \leq 1 \text{ V}$
$d \% = 100 \times 0.6 / 2 = 30 \%$	$I_{iH} \leq 10 \text{ mA (depending on } U_{iH})$

Example

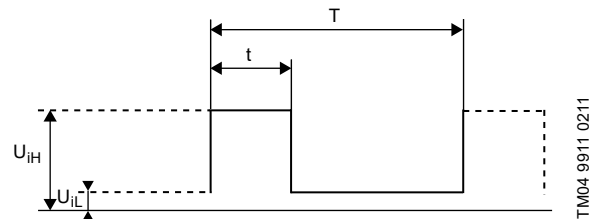


Fig. 15 PWM signal

Abbreviation	Description
T	Period of time [sec.]
d	Duty cycle [t/T]
U_{iH}	High-level input voltage
U_{iL}	Low-level input voltage
I_{iH}	High-level input current

6.3.1 Interface

The pump's interface consists of an electronic part connecting the external control signal to the circulator pump. The interface translates the external signal into a signal type that the microprocessor can understand.

In addition, the interface ensures that the user cannot get into contact with dangerous voltage if touching the signal wires when power is connected to the circulator pump.

Note: "Signal ref." is a signal reference with no connection to protective earth.

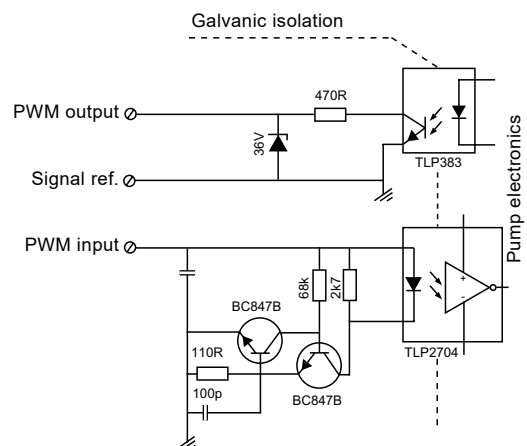


Fig. 16 Schematic drawing, interface

6.3.2 PWM input signal profile A (heating)

The pump runs on constant-speed curves depending on the PWM input signal. The speed decreases when the PWM value increases. If the PWM signal equals zero (0 VDC), the pump will switch to the control mode selected before connecting to a PWM signal.

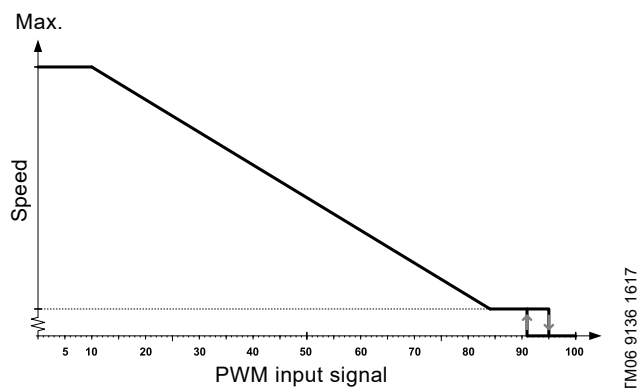


Fig. 17 PWM input signal profile A (heating)

PWM input signal [%]	Pump status
≤ 10	Maximum speed: max.
$> 10 / \leq 84$	Variable speed: min. to max.
$> 84 / \leq 91$	Minimum speed: IN
$> 91/95$	Hysteresis area: on/off
$> 95 \text{ or } \leq 100$	Standby mode: off

6.3.3 PWM feedback signal

The PWM feedback signal offers pump information like in bus systems:

- current power consumption (accuracy $\pm 2\%$ of PWM signal)
- warning
- alarm.

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 % because this alarm has a higher priority. See fig. 18.

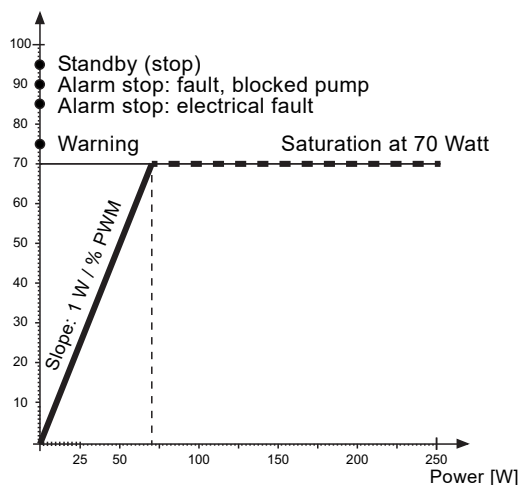


Fig. 18 PWM feedback signal - power consumption

Data

Maximum rating	Symbol	Value
PWM frequency input with high-speed optocoupler	f	100-4000 Hz
Guaranteed standby power consumption		< 1 W
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 %
PWM frequency output, open collector	f	75 Hz $\pm 5\%$
Accuracy of output signal regarding power consumption	-	$\pm 2\%$ (of PWM signal)
Output duty cycle	PWM	0-100 %
Collector emitter breakdown voltage on output transistor	U_c	< 70 V
Collector current on output transistor	I_c	< 50 mA
Maximum power dissipation on output resistor	P_R	125 mW
Zener diode working voltage	U_z	36 V
Maximum power dissipation in Zener diode	P_z	300 mW

6.4 Pump performance

Figure 19 shows the relation between pump setting and pump performance by means of curves.

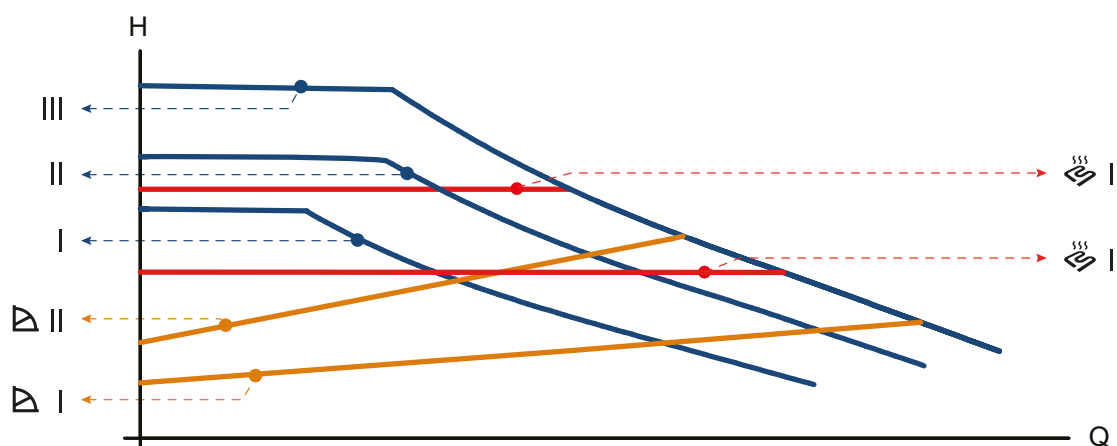


Fig. 19 Pump setting in relation to pump performance

Setting	Pump curve	Function
I	Constant curve or constant speed I	The pump runs at a constant speed and consequently on a constant curve. At speed I, the pump is set to run on the minimum curve under all operating conditions.
II	Constant curve or constant speed II	The pump runs at a constant speed and consequently on a constant curve. At speed II, the pump is set to run on the intermediate curve under all operating conditions.
III	Constant curve or constant speed III (factory setting)	The pump runs at a constant speed and consequently on a constant curve. At speed III, the pump is set to run on the maximum curve under all operating conditions. Quick venting of the pump can be obtained by setting the pump to speed III for a short period.
	Proportional-pressure mode I, II	The duty point of the pump will move up or down on a proportional-pressure curve, depending on the heat demand in the system. The head (pressure) is reduced at falling heat demand and increased at rising heat demand.
	Constant-pressure mode I, II	The duty point of the pump will move out or in on a constant-pressure curve, depending on the heat demand in the system. The head (pressure) is kept constant, irrespective of the heat demand.

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7. Setting the product

To set the product use the button on the operating panel. Every time you press the button, the pump setting is changed. The LEDs will indicate the chosen control mode. To learn more about each control mode, see section [6.2 Control modes](#).

To select a proportional-pressure or constant-pressure curve, press and hold the button for 3 seconds. To return to constant-curve settings, press and hold the button for 3 seconds.

Control modes for constant curve

Display	Control mode
	Constant curve 1
	Constant curve 2
	Constant curve 3
	PWM profile A The LED flashes.

Control modes for proportional-pressure and constant-pressure curve

Display	Control mode
	Proportional pressure 1 The LEDs flash.
	Proportional pressure 2 The LEDs flash.
	Constant pressure 1 The LEDs flash.
	Constant pressure 2 The LEDs flash.



The pump is factory set to constant curve III.

7.1 Setting the PWM input signal

To enable the external control mode (PWM profile A), you need a signal cable connected to an external system. The cable connection has three conductors: the signal input, the signal output and the signal reference.

Conductor	Colour
Signal input	Brown
Signal reference	Blue
Signal output	Black

The cable is not supplied with the pump but can be ordered as an accessory.



The cable must be connected to the control box via a mini superseal plug. See [fig. 20](#).



Fig. 20 Mini superseal plug

Set the signal connection

1. Make sure that the pump is turned off.
2. Locate the PWM signal connection on the pump.
The three pins inside the signal connection are not energised.
3. Connect the signal cable with the mini superseal plug.
4. Switch on the power supply.
5. The pump automatically detects if a valid PWM signal is available after which it enables the control mode on the pump. See [fig. 8](#). If the pump does not detect a PWM signal or if the signal equals 0, the pump will switch to the control mode selected before connecting to a PWM signal.



1 x 230 V - 15 %/+ 10 %
~ 50/60 Hz ⚡

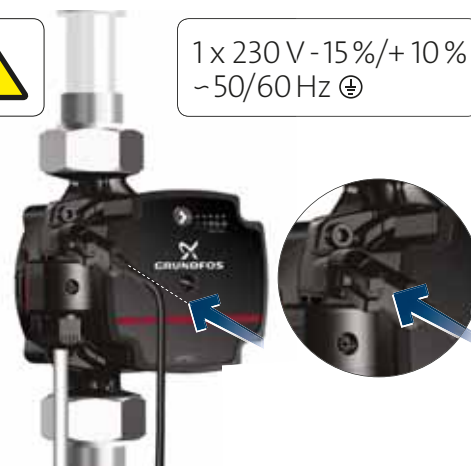


Fig. 21 Connecting the signal cable to UPS3

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8. Servicing the product

DANGER

Electric shock



Death or serious personal injury

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

DANGER

Electric shock



Death or serious personal injury

- Switch off the power supply before starting any work on the product. Make sure that the power supply cannot be accidentally switched on.

CAUTION

Hot surface



Minor or moderate 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.

CAUTION

Pressurised system



Minor or moderate personal injury

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



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

8.1 Dismantling the product

1. Switch off the power supply.
2. Pull out the plug. For instructions on how to dismantle the plug, see section [8.2 Dismantling the plug](#).
3. Close the two isolating valves on both sides of the pump.
4. Loosen the fittings.
5. Remove the pump from the system.

8.2 Dismantling the plug

1. Loosen the cable gland and unscrew the union nut in the centre of the terminal cover.
2. Detach the terminal cover.
3. Loosen the screws on the power supply plug and disconnect the cable conductors.
4. Pull the power cable back through the cable gland and terminal cover.

9. Fault finding the product

If the pump has detected one or more alarms, the first LED switches from green to red. When an alarm is active, the LEDs indicate the alarm type as defined in fig. 22.



If multiple alarms are active at the same time, the LEDs only show the error with the highest priority. The priority is defined by the sequence of the table.

When there is no active alarm anymore, the operating panel switches back to operating status and the first LED switches from red to green.

DANGER

Electric shock

Death or serious personal injury

- Switch off the power supply before starting any work on the product. Make sure that the power supply cannot be accidentally switched on.



CAUTION

Hot surface

Minor or moderate 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.



CAUTION

Pressurised system

Minor or moderate personal injury

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



Display	Status	Solution
	Alarm The pump stops. The pump is blocked.	Deblock the shaft. See section 9.1 Deblocking the shaft .
	Warning The pump keeps running. The supply voltage is low.	Make sure that there is sufficient voltage supply to the pump.
	Alarm The pump stops. Electrical error.	Replace the pump and return the pump your supplier.

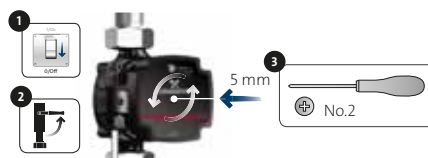


Fig. 22 Fault finding table

9.1 Deblocking the shaft

If the pump is blocked it is necessary to deblock the shaft. The pump deblocking device is accessible from the front of the pump without having to demount the control box. The force of the device is high enough to deblock pumps, which are seized by lime, for example if the pump has been turned off during summer.

Course of action:

1. Switch off the power supply.
2. Close the valves.
3. Locate the deblocking screw in the centre of the control box. Use a star screwdriver with a size 2 Phillips tip to push the deblocking screw inwards.
4. When the screw can be turned counterclockwise, the shaft has been deblocked. Repeat step 3, if necessary.

5. Switch on the power supply.

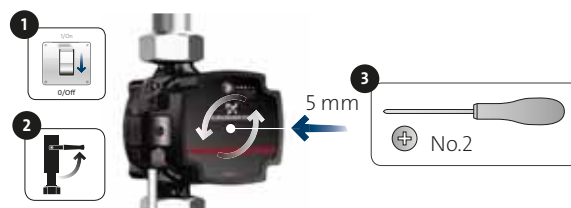


Fig. 23 Deblocking the shaft



Before, during and after the deblocking, the device is tight and must not release any water.

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10. Technical data

Operating conditions		
Sound pressure level	The sound pressure level of the pump is lower than 32 dB(A).	
Relative humidity	Maximum 95 %, non-condensing environment	
System pressure	PN 10: Maximum 1.0 MPa (10 bar)	
Inlet pressure	Liquid temperature	Minimum inlet pressure
	75 °C	0.005 MPa, 0.05 bar, 0.5 m head
	95 °C	0.05 MPa, 0.5 bar, 5 m head
Maximum inlet pressure	1 MPa (10 bar)	
Ambient temperature	0-55 °C	
Liquid temperature	2-95 °C	
Liquid	Maximum water/propylene glycol mixture is 50 %	
Viscosity	Maximum 10 mm ² /s	
Maximum altitude of installation	2000 m above sea level	
Electrical data		
Supply voltage	1 x 230 V - 15 %/+ 10 %, 50/60 Hz, PE	
Insulation class	F	
Standby power consumption	< 1 W	
Inrush current	< 4 A	
Minimum switching time power on/off	No specific requirements	
Miscellaneous data		
Motor protection	The pump requires no external motor protection.	
Enclosure class	IPX4D	
Temperature class (TF)	TF95	
Specific EEI values	UPS3 15-50/65: EEI ≤ 0.20	

To avoid condensation in the stator, the liquid temperature must always be higher than the ambient temperature.

Reduced supply voltage

The pump operation is ensured above 160 VAC with reduced performance. If the voltage falls below 190 VAC, a low-voltage warning is sent via the PWM signal. If the voltage falls below 150 VAC, the pump stops and shows an alarm.

10.1 Dimensions, UPS3 15-50/65

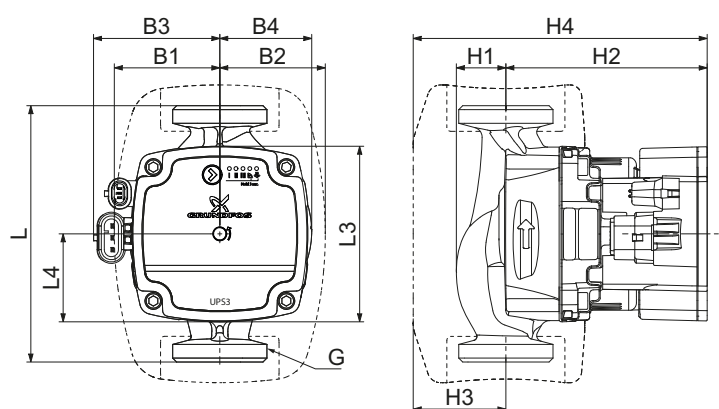


Fig. 24 UPS3 15-50/65

Pump type	Dimensions [mm]											
	L	L3	L4	B1	B2	B3	B4	H1	H2	H3	H4	G
UPS3 15-50/65	130	89	45	54	54	64	47	25	102	47	149	G 1 1/2

11. Performance curves

Each pump has its own performance curve.

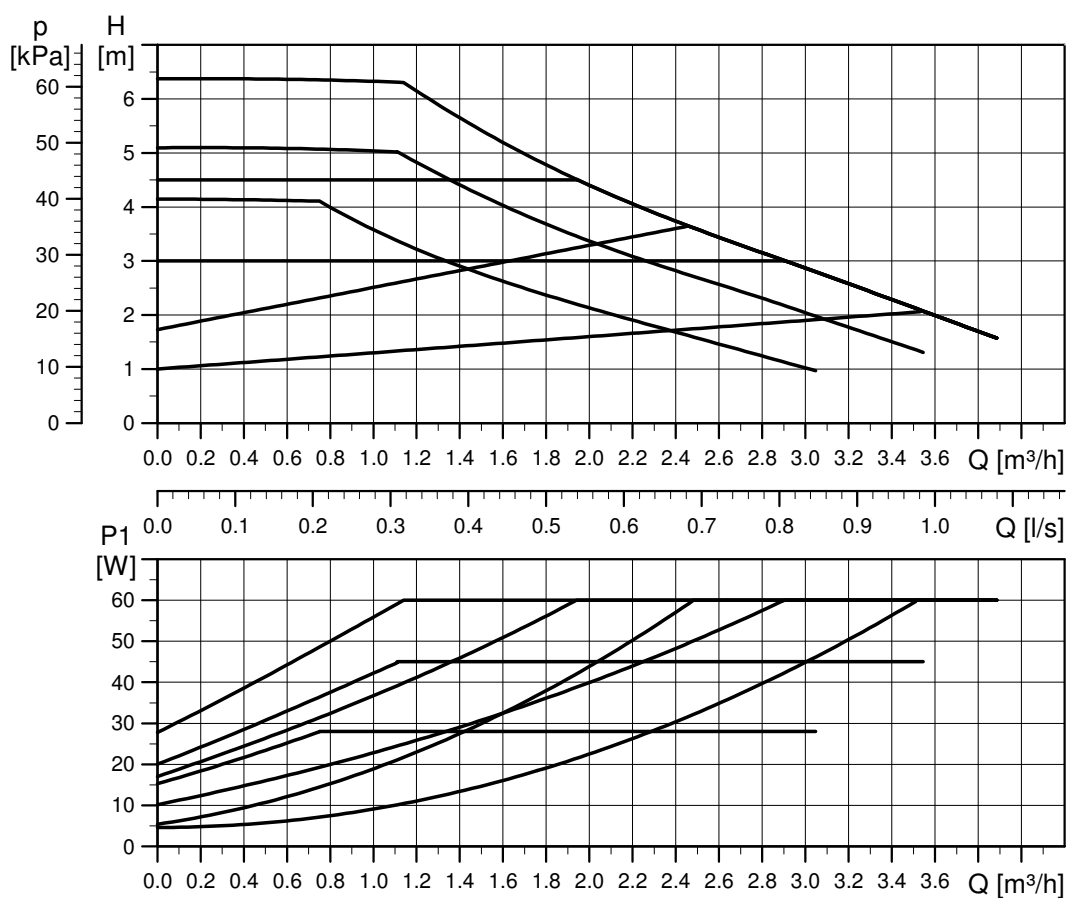
A power curve, P1, belongs to each performance curve. The power curve shows the pump power consumption in watt at a given performance.

11.1 Curve conditions

The guidelines below apply to the performance curves on the following pages:

- Test liquid: airless water.
- The curves apply to a density of $\rho = 983.2 \text{ kg/m}^3$ and a liquid temperature of 60°C .
- All curves show average values and must not be used as guarantee curves. If a specific minimum performance is required, individual measurements must be made.
- The curves for speeds I, II and III are marked.
- The curves apply to a kinematic viscosity of $\nu = 0.474 \text{ mm}^2/\text{s}$ (0.474 cSt).
- The EEI values obtained according to EN 16297 part 3.

11.2 Performance curve, UPS3 15-50/65



Setting	P1 [W]	I ₁ [A]
Min.	4	0.05
Max.	60	0.52

12. 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 your supplier.



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.

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