

# UPS4 GO, ALPHA2 GO

Circulator pump



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# 1. Product introduction

## Product description

UPS4 GO is a high-efficiency circulator pump fitted with an electronically commutated motor and designed for circulating liquids in heating and air conditioning systems.

UPS4 GO is equipped with intelligent controls and offers three control modes:

- constant pressure
- proportional pressure
- constant curve.

Each mode has three adjustable speed settings.

Replacement of older integrated and stand-alone circulator pumps, including replicating curves, is made easy by using the Grundfos GO app and operating panel.

The toolless installer plug enables a fast and easy electrical connection.

The automatic self-venting ability and dry-running protection ensure quiet operation and reliability of the pump.

The product features robust startup which reduces the risk of blockages from dirt, magnetite and limescale build-up. In the unlikely case of a blocked pump, the motor continuously attempts to start at the highest possible torque, ensuring startup in tough conditions.

The ceramic shaft and bearings experience minimal wear, resulting in a longer lifespan and a reduced likelihood of noise in the system due to increased bearing clearance from wear.

Fault finding is fast and easy by using the error codes on the pump operating panel.

## Product description

ALPHA2 GO is a high-efficiency circulator pump fitted with an electronically commutated motor and designed for circulating liquids in heating and air conditioning systems.

The Grundfos GO app offers a range of digital features that simplify the setup process for both new and replacement installations.

By using Grundfos GO, you can easily verify compatibility when replacing integrated and stand-alone circulator pumps, including replicating exact pump curves.

ALPHA2 GO is designed with intelligent controls modes:

- constant pressure
- proportional pressure
- constant flow
- constant curve.

Each mode has adjustable setpoints.

- The AUTOADAPT setting, available for constant and proportional pressure, removes the need to manually select the pump setpoint.
- The PWM input allows for precise control of the speed, better enabling complete system optimization.

The toolless installer plug results in fast and easy electrical connection.

The automatic self-venting ability and dry-running protection ensure quiet operation and reliability of the pump.

The product features robust startup which reduces the risk of blockages from dirt, magnetite and limescale build-up. In the unlikely case of a blocked pump, the motor attempts to continuously start at the highest possible torque, ensuring startup in tough conditions.

The ceramic shaft and bearings experience minimal wear, resulting in a longer lifespan and a reduced likelihood of noise in the system due to increased bearing clearance from wear.

When the system air detection and venting feature detects air in the system, the circulator pump pulsates to more effectively push air to the closest air removal device.

Grundfos GO also provides the ability to conveniently fault-find the system through the event log and historical trend data for flow, head, estimated media temperature and on-cycle durations.

## Features

Feature	UPS4	ALPHA2 GO
Light field indicating power consumption [W], head [m] and flow rate [m <sup>3</sup> /h]	• <sup>1)</sup>	•
Improved power connector	•	•
Dry-running protection	•	•
Robust startup	•	•
Self-venting pump	•	•
Replacement of older boiler pumps	•	-
Replacement of new boiler pumps	-	•
Guided setup via Grundfos GO	-	•
Improved AUTOADAPT	-	•
System venting	-	•
Air detection and venting	-	•
Warning and alarm log	-	•
Software update	-	•
System diagnostics	-	•
Night setback	-	•
Balancing	-	•
Bypass valve mode	-	•

<sup>1)</sup> For UPS4 GO the light field can only show power consumption [W].

## Benefits

- The toolless power plug ensures easy installation.
- Dry-running protection, self-venting, robust startup and guided setup result in less callbacks.

The following benefits are only applicable for ALPHA2 GO:

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- Easy setup due to the guided setup in Grundfos GO and the light fields indications on the operating panel.
- The AUTOADAPT, night setback and balancing functions provide high comfort and energy savings.
- Easy troubleshooting by means of the light fields indications on the operating panel and Grundfos GO where you can see the event log and system diagnostics.
- Software updates ensures that the pump is always up to date.

## Type key

Example: UPS4 GO 25-65 130 220-240 V

Example: ALPHA2 GO 25-40 180 220-240 V

Code	Explanation	Designation
UPS4 GO ALPHA2 GO	Grundfos circulator pump	Pump type
25	Nominal diameter (DN) of inlet and outlet ports	Connections
40 65	Maximum head [dm]	
130 180	Port-to-port length [mm]	
220-240 V	Voltage	

## Applications

The products are designed for domestic building applications such as:

- heating systems
- air conditioning.

We recommend using the products in following applications:

- radiator systems
- underfloor heating
- domestic hot-water cylinder or production.
- mixed system<sup>2)</sup>
- fan coil.

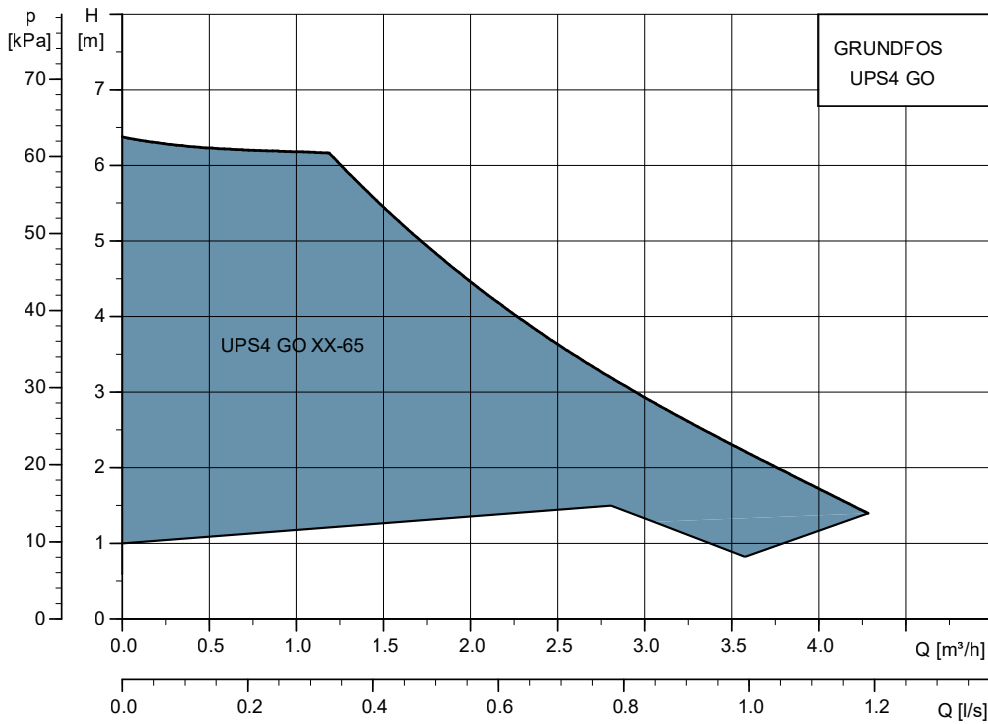
2) Mix of radiators, underfloor heating and/or domestic hot water cylinder.

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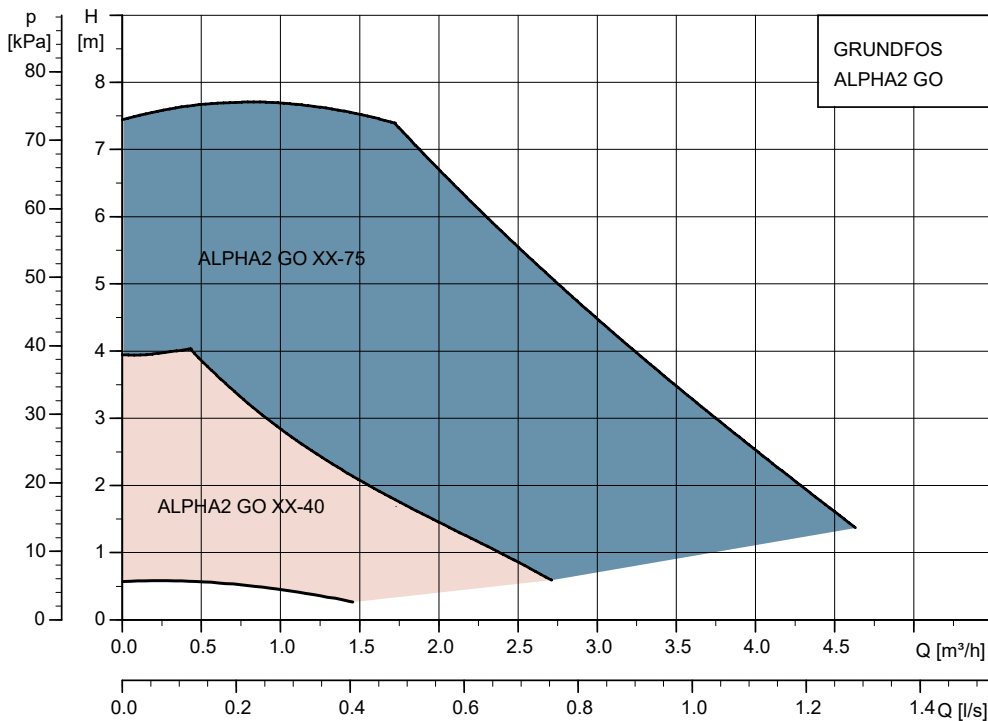
## Performance range

A performance curve is crucial for selecting the right pump. It shows the head (pressure) that a pump can produce at different flow rates. The highest point on the Y-axis indicates the shut-off pressure (maximum head at zero flow), while the highest point on the X-axis shows the maximum flow at zero head.



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Performance curves, UPS4 GO



TM090532

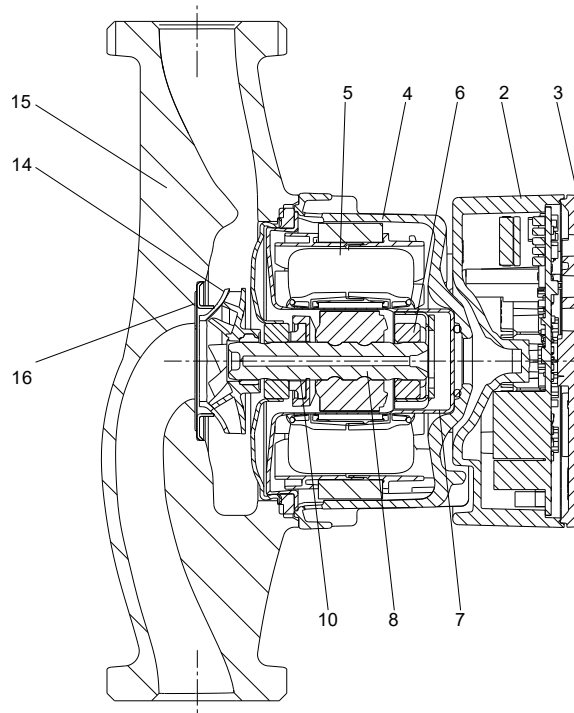
Performance curves, ALPHA2 GO

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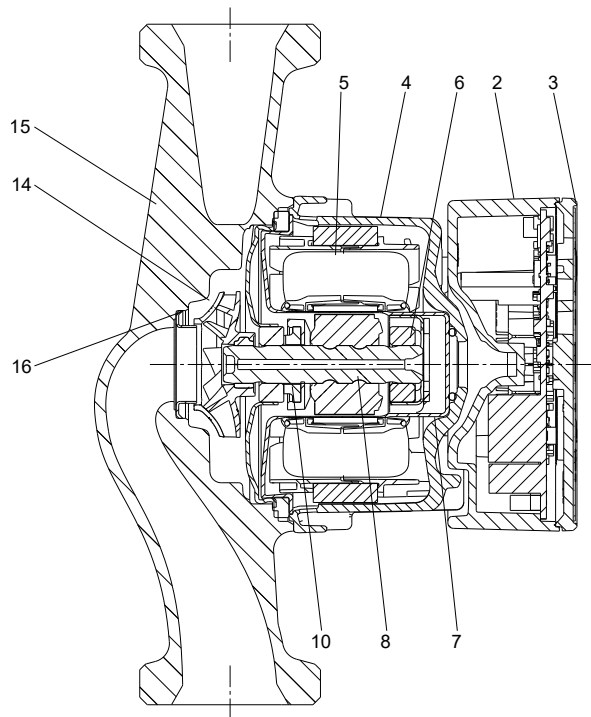
# 2. Construction

## Sectional view



TM089299

UPS4 GO



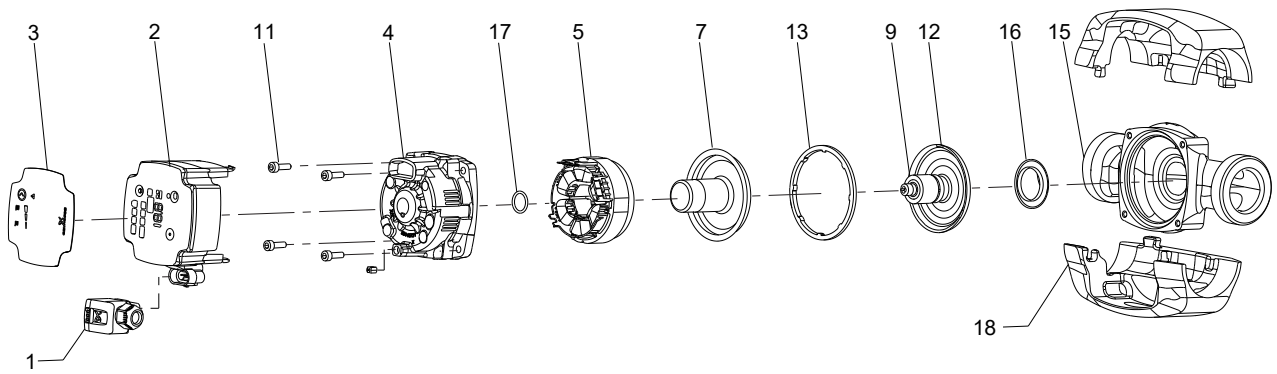
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ALPHA2 GO

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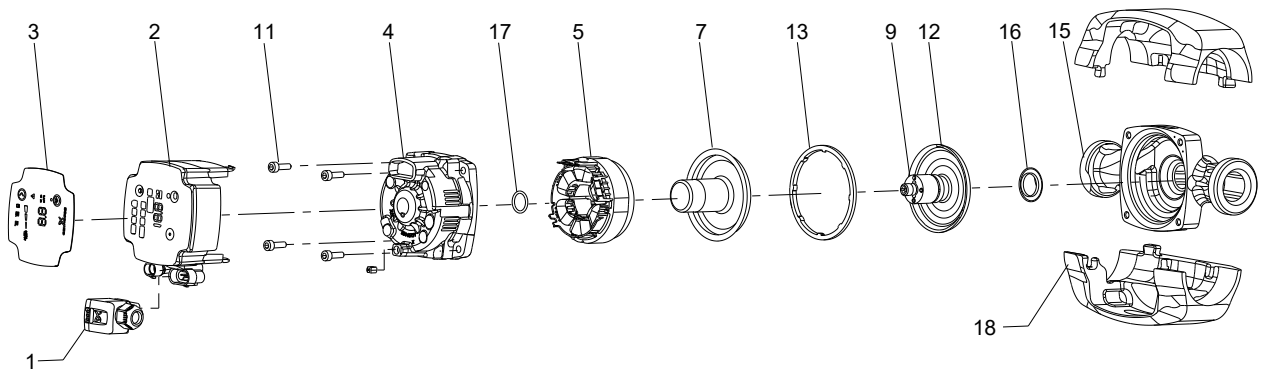
See product

**Exploded view**



TM089291

**UPS4 GO**



TM089292

**ALPHA2 GO**

**Material specification**

Pos.	Component	Material	EN/DIN
1	Plug	Composite PA6-GF30	
2	Control box	Composite PC-GF10 FR	
	Control electronics	Printed circuit board with surface mounted device components	
3	Front foil	LEXAN 8A13F	
4	Stator housing	Aluminium, silumin	
5	Stator	Copper wire	
	Stator lamination	Laminated iron	
6	Radial bearing	Ceramics	
7	Rotor can	Stainless steel	1.4401
8	Shaft	Ceramics	
	Rotor	NdFeB or injection moulded ferrite	
	Rotor tube	Stainless steel	1.4521
9	Rotor cladding	Stainless steel	1.4401/1.4301
	Bush	Stainless steel	1.4301
10	Thrust bearing	Carbon	
	Thrust bearing retainer	EPDM	
11	Screws	Steel	
12	Bearing plate	Stainless steel	1.4301
13	Gasket	EPDM	
14	Impeller	Composite / PES 20 or 30% GF	
15	Pump housing	Cast iron GG15	EN-GJL-150

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Pos.	Component	Material	EN/DIN
16	Neck ring	Stainless steel	1.4301
17	O-ring	EPDM	
18	Insulating shells	EPP	

## Mechanical construction

This product is designed for long and trouble-free operation as a canned-rotor type, that is pump and motor form an integral unit without shaft seal, with only one gasket for sealing. The bearings are lubricated by the pumped liquid. This construction ensures maintenance-free operation.

The pump is characterised by the following:

- Permanent-magnet rotor and compact-stator motor which contribute to high efficiency and high starting torque.
- Ceramic shaft and radial bearings which contribute to long life.
- Carbon thrust bearing which contributes to long life.
- Stainless-steel rotor can, bearing plate and rotor cladding which contribute to corrosion-free long life.
- Composite impeller which contributes to corrosion-free long life.
- Cast-iron pump housing.

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## 3. Operating conditions

### Technical data

Supply voltage	1 × 220-240 V, ± 6%, 50/60 Hz
Minimum supply voltage	160 VAC (runs with reduced performance)
Motor protection	The pump requires no external motor protection.
Enclosure class	Indoor use only IP44 IPX4D (only ALPHA2 K XX-75)
Temperature class	TF110 to EN 60335-2-51
Reaction time - power on	No specific requirements.
Reaction time - standby	< 1 s
Reaction time - speed change	< 1 s
Inrush current	< 4 A
Standby power consumption <sup>3)</sup> (only ALPHA2 GO) <sup>4)</sup>	< 0.7 W
Insulation class	F
Relative humidity	Max. 95 %
Max. outlet pressure	1.0 MPa (10 bar)
Surge robustness	> 3 W (DWCM)
Radio frequency radiation exposure	-6 dB CE/EN55014-1, CE/EN55014-2
Sound pressure level (LP)	< 25 dB(A)
Pump housing	Electrocoated cast iron
Connection type	G 1 1/2,

<sup>4)</sup> Applicable for pumps that are stopped and connected to the power supply. Only applicable for variants with the PWM functionality.

### Product size

	Max. flow rate (Q) [m <sup>3</sup> /h]	Max. head (H) [m]
XX-40 (ALPHA2 GO)	2.7	4.0
XX-65 (UPS4 GO)	3.9	6.5
XX-75 (ALPHA2 GO)	4.5	7.5

### Power usage (approximate)

	Min.	Max.
XX-40 (ALPHA2 GO)	3 W	21 W
XX-65 (UPS4 GO)	4 W	60 W
XX-75 (ALPHA2 GO)	3 W	75 W

### Liquid temperature

	Max. ambient temperature 55 °C	Max. ambient temperature 70 °C
XX-40 (ALPHA2 GO)	2 to 110 °C	2 to 75 °C
XX-65 (UPS4 GO)	-10 to +110 °C	-10 to +75 °C
XX-75 (ALPHA2 GO)	-10 to +110 °C	-10 to +75 °C
K XX-75 (ALPHA2 GO)	-20 to +110 °C	-20 to +75 °C

### Inlet pressure

Liquid temperature [°C]	Min. inlet pressure [bar]
75	0.05
95	0.5
110	1.08

### Pumped liquids

The product is suitable for the following liquids:

- 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 µS/cm.
- Mixtures of water with antifreeze media such as glycol or ethanol with a kinematic viscosity lower than 15 mm<sup>2</sup>/s (15 cSt).

### Dry-running protection

The ALPHA2 GO features dry-running protection that safeguards the pump during both startup and normal operation. UPS4 GO provides dry-running protection solely during normal operation.

#### Startup (only ALPHA2 GO)

If water has not been detected before (new pump), the pump does a detection cycle to verify that water is present. If water is not detected during the first cycle, the pump retries several times.

If water is still not detected, the pump stops, the warning and alarm symbol on the operating panel is flashing red and the error code E4 is displayed on the operating panel.

#### Normal operation

If dry running is detected during normal operation, the pump retries several times. If dry running continues, the pump stops, the warning and alarm symbol on the display is flashing red and the error code E4 is displayed on the operating panel.

The pump can be restarted by pressing the **Selection** button on the pump. The pump repeats the dry-running detection every 25 hours to verify that the pump is not running dry. Note: The pump can sustain 25 hours of dry-running operation.

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## 4. Installation and operating instructions

### Mechanical installation



Make sure the pump orientation is correct.



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

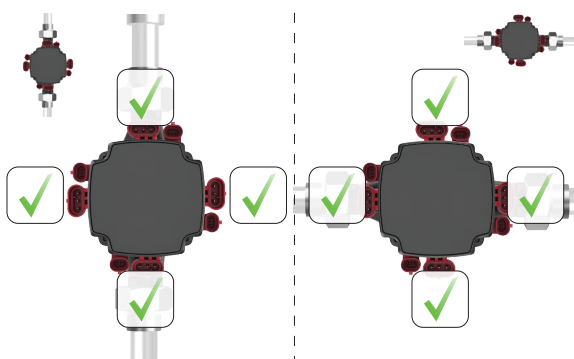


The arrows on the pump housing indicate the flow direction through the pump.

1. Close the inlet and outlet valves.
2. Fit the two gaskets supplied with the pump, when you mount the pump in the pipes.
3. Tighten the unions.
4. Make sure to use an allowed control box position.
5. Mount the power plug.
6. Mount the PWM signal plug if used (only ALPHA2 GO).

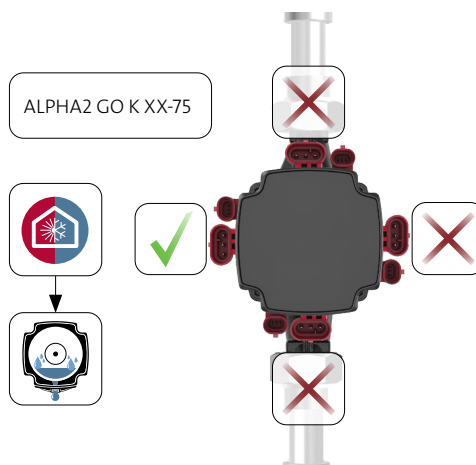
### Control box position

The control box can be turned in steps of  $90^\circ$ .



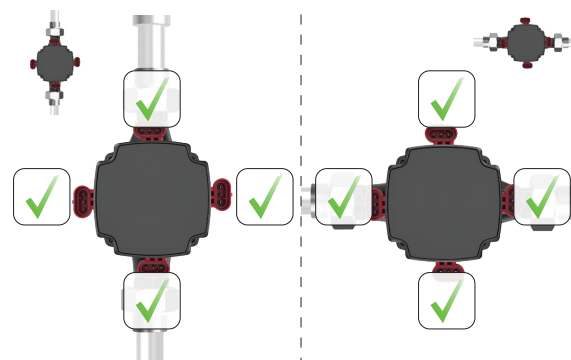
ALPHA2 GO

TM087893



ALPHA2 GO K XX-75

ALPHA2 GO K version



Only UPS4 GO

TM088798

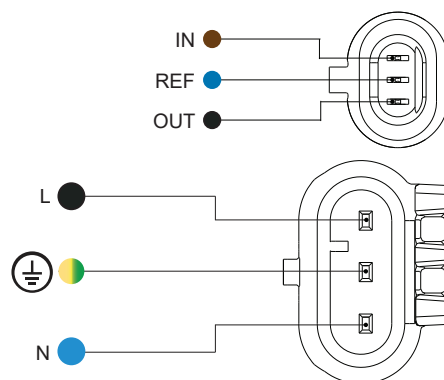
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### Electrical connection

The pump requires no external motor protection.

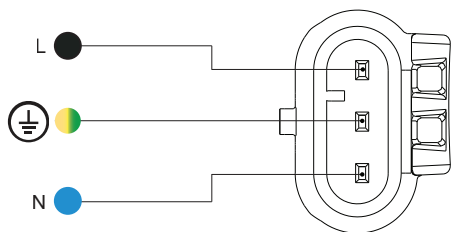
Check that the supply voltage and frequency correspond to the values stated on the nameplate.

### Wiring diagram



Power and signal plug

TM089307



TM089308

**Power plug**

Pos.	Description	Wire colour
IN	PWM input	Brown
REF	Signal reference	Blue
OUT	PWM output	Black
L	Phase	Black or brown
	Earth	Yellow/green
N	Neutral	Blue



TM089772

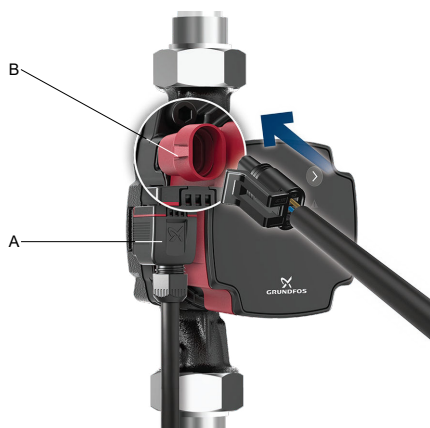
Pos.	Description
A	Power inlet (superseal)

**Control box connections**

All control boxes have two electrical inlets placed on one side:

- power inlet
- signal inlet.

The signal inlet is galvanically isolated from the power supply of the circulator pump. There is therefore no risk of electrical shock if touching the signal inlet. Furthermore, the signal plug is "water tight" protecting against ingress of liquids into the control box.



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Pos.	Description
A	Power inlet (superseal)
B	Signal inlet (mini superseal)

All control boxes have one power inlet on the side.

## Operating panel

LEDs and buttons on the pump display.



ALPHA2 GO



UPS4 GO

Pos.	Description
1	Control mode The LED shows the operating mode of the product.
2	Settings for the selected control mode Use the <b>Selection</b> button to toggle between I, II and III.
3	QR code The QR code links to information about the pump and how to set it.
4	UPS4 GO: If lit, the pump is running in advanced mode. ALPHA2 GO: If lit, the pump has been set via Grundfos GO.
5	Selection button Use this button to select control mode and settings.
6	Warning and alarm A warning is indicated with yellow, and the pump continues operation. An alarm is indicated with red, and the pump stops.
7	Unit UPS4 GO: The LED shows the unit used for the number to the left. W = watt. ALPHA2 GO: The LED shows the unit used for the number to the left. W = watt, m = metre, m <sup>3</sup> /h = cubic metre per hour.









Pos.	Description
8	The LED indicates: <ul style="list-style-type: none"> <li>power consumption [W]</li> <li>head [m] (only ALPHA2 GO)</li> <li>flow rate [m<sup>3</sup>/h] (only ALPHA2 GO)</li> <li>error code</li> <li>pump replacement number (only UPS4 GO)</li> </ul>
9	Connect button Use this button to activate and deactivate the wireless Bluetooth connection. <ul style="list-style-type: none"> <li>Press the button once to activate Bluetooth.</li> <li>Press and hold the button for 15 seconds to deactivate Bluetooth.</li> </ul>
10	Lock The LED indicates that the operating panel is locked and no buttons can be used. The operating panel can only be locked and unlocked via Grundfos GO.

## Overview of LEDs

The LEDs indicate the control mode, setting and operating status.

### Factory setting

The pump is factory set to constant curve, setting II.

Active light fields	Description
	Advanced mode This mode makes it possible to replicate an older pump performance curve. When this function is active, the icon is lit and the control modes on the operating panel are switched off. On both UPS4 GO and ALPHA2 GO the guidance through Grundfos GO is required.
	Constant-pressure mode
	Proportional-pressure mode
	Setting I
	Setting II
	Setting III
	AUTOADAPT mode
	The pump is set to <b>STOP</b> in Grundfos GO or by an active PWM stop signal.

When the symbols for the constant-pressure and proportional-pressure modes are off, the pump is running in constant-curve mode.

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## 5. Control and communication UPS4

### Control modes

UPS4 GO can be set to the following control modes:

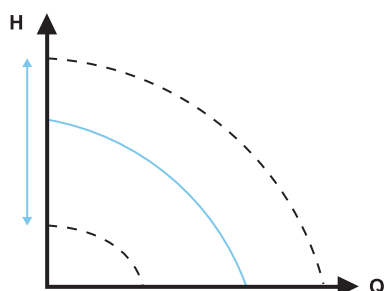
- constant curve
- proportional pressure
- constant pressure
- advanced mode.

All control modes, including advanced mode, can be set to pump setting I, II, III and can only be set on the operating panel.

### Constant curve

In the constant-curve mode, the pump runs at a constant curve, which means that it runs at constant speed or power. The pump performance follows the selected constant curve. This control mode is especially suitable in applications where the characteristics of the heating system are steady, and the emitters require a constant flow. The selection of the constant-curve setting depends on the characteristics of the heating system and the actual required flow and heat demand.

The curve's setpoint is user defined in Grundfos GO. The speed in percentage of maximum speed can be chosen anywhere between the minimum and maximum constant curve in intervals of 1 %.



TM071005

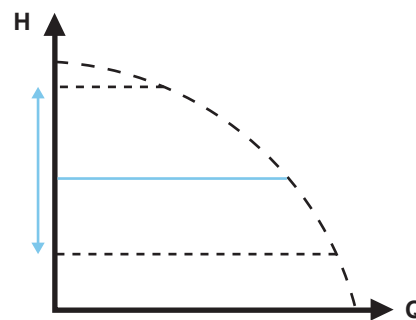
Constant curve

### Constant pressure

In the constant-pressure mode, the pump runs at constant pressure, which means the head (pressure difference) is kept constant, regardless of the heat demand (actual number of open zones). The pump performance follows the selected constant-pressure curve.

This control mode is especially suitable for underfloor heating and applications where the pump is used to supply a common manifold for multiple zones. The head across each zone will remain constant, independent of how many zones request heat. Thus a constant flow in each zone will be maintained, independent of other zones. The selection of the constant-pressure setting depends on the characteristics of the zones in the heating system and the actual heat demand.

The curve's setpoint is user defined in Grundfos GO. The setpoint can be chosen anywhere between the minimum and maximum constant-pressure curve in intervals of 0.1 m.



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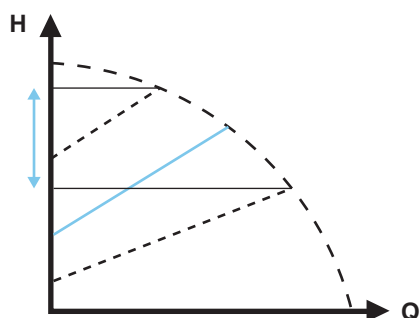
Constant pressure

## Proportional pressure

In the proportional-pressure mode, the pump runs at proportional pressure, which means the head (pressure) is reduced at falling heat demand and increased at rising heat demand. The pump performance follows the selected proportional-pressure curve. This control mode is especially suitable for applications where the heat emitters are equipped with a TRV (thermostatic radiator valve) which controls the flow depending on the room temperature. At increased flow, the losses in the distribution system (pipes and fittings) increase, hence the pumps increase the pressure to compensate and vice versa, hereby maintaining an almost constant differential pressure across the thermostatic radiator valve.

The proportional-pressure mode setpoint depends on the heating system's characteristics and the actual heat demand.

The curve's setpoint is user defined in Grundfos GO. The setpoint can be chosen anywhere between the minimum and maximum proportional curve in intervals of 0.1 m. The head against a closed valve is half the setpoint  $H_{set}$ , although never below 1 m.



TM071003

*Proportional-pressure settings*

## Replacement of a UPS pump

The product can be used to replace most existing integrated UPS circulator pumps. This means that when you replace an existing integrated pump, the new pump replicates the performance and configuration of the existing pump.

In the Grundfos GO app (via the **GO Replace** tool) or online via <https://grundfos.to/replace>, you can check the compatibility of the pump. During the replacement process, Grundfos GO guides you through the replacement process and helps setting up the new circulator pump to match the existing circulator pump.

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## 6. Control and communication ALPHA2 GO

### Control modes

ALPHA2 GO can be set to the following control modes:

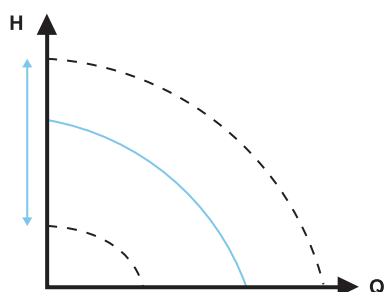
- constant curve
- proportional pressure
- constant pressure
- constant flow
- external control (PWM)
- advanced mode

All control modes can be set in Grundfos GO. However, only constant curve, constant pressure and proportional pressure can be set on the operating panel.

### Constant curve

In the constant-curve mode, the pump runs at a constant curve, which means that it runs at constant speed or power. The pump performance follows the selected constant curve. This control mode is especially suitable in applications where the characteristics of the heating system are steady, and the emitters require a constant flow. The selection of the constant-curve setting depends on the characteristics of the heating system and the actual required flow and heat demand.

The curve's setpoint is user defined in Grundfos GO. The speed in percentage of maximum speed can be chosen anywhere between the minimum and maximum constant curve in intervals of 1 %.



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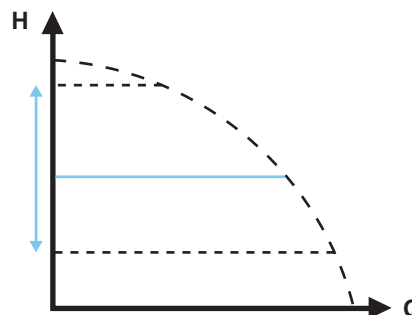
Constant curve

### Constant pressure

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This control mode is especially suitable for underfloor heating and applications where the pump is used to supply a common manifold for multiple zones. The head across each zone will remain constant, independent of how many zones request heat. Thus a constant flow in each zone will be maintained, independent of other zones. The selection of the constant-pressure setting depends on the characteristics of the zones in the heating system and the actual heat demand.

The curve's setpoint is user defined in Grundfos GO. The setpoint can be chosen anywhere between the minimum and maximum constant-pressure curve in intervals of 0.1 m.



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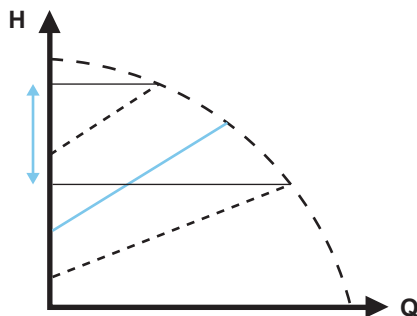
Constant pressure

## Proportional pressure

In the proportional-pressure mode, the pump runs at proportional pressure, which means the head (pressure) is reduced at falling heat demand and increased at rising heat demand. The pump performance follows the selected proportional-pressure curve. This control mode is especially suitable for applications where the heat emitters are equipped with a TRV (thermostatic radiator valve) which controls the flow depending on the room temperature. At increased flow, the losses in the distribution system (pipes and fittings) increase, hence the pumps increase the pressure to compensate and vice versa, hereby maintaining an almost constant differential pressure across the thermostatic radiator valve.

The proportional-pressure mode setpoint depends on the heating system's characteristics and the actual heat demand.

The curve's setpoint is user defined in Grundfos GO. The setpoint can be chosen anywhere between the minimum and maximum proportional curve in intervals of 0.1 m. The head against a closed valve is half the setpoint  $H_{set}$ , although never below 1 m.



TM071003

Proportional-pressure settings

Pos.	Description
1	Constant-pressure curve
2	Proportional-pressure curve
3	Setpoint
4	AUTOADAPT performance range

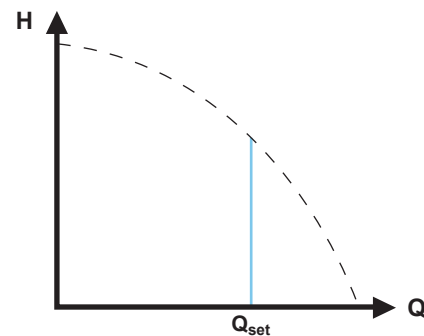
Do not expect an optimal pump setting from day one. If the power supply fails or is disconnected, the pump stores the AUTOADAPT setting in an internal memory and resumes the automatic adjustment when the power supply has been restored.

This function can only be set via Grundfos GO.

## Constant flow

In this control mode, the pump maintains a constant flow in the system independently of the head.

The curve's setpoint is user defined only in Grundfos GO. The setpoint can be chosen anywhere between the minimum and maximum flow curve in intervals of 0.1  $m^3/h$ .



TM071240

Constant-flow curve

We recommend that you select this control mode if you know the desired flow rate to the system.

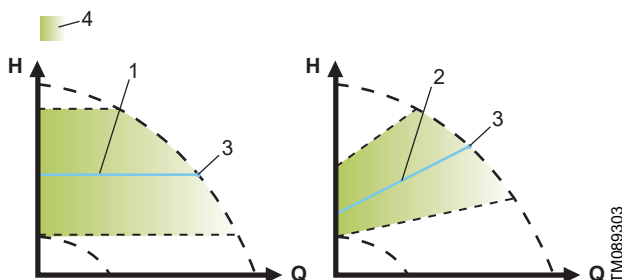
### Overview of ALPHA2 GO flow rates:

Pump variant	Lower flow limit [m <sup>3</sup> /h]	Upper flow limit [m <sup>3</sup> /h]
ALPHA2 GO XX-40	0.25	2.0
ALPHA2 GO XX-75	0.25	3.5

## AUTOADAPT

AUTOADAPT is an integrated function in the constant-pressure and proportional-pressure modes.

AUTOADAPT selects the best control curve under the given operating conditions. The pump performance is automatically adjusted to the actual heat demand, that is the size of the system and the changing heat demand over time, by continuously selecting either a proportional-pressure curve or constant-pressure curve within the AUTOADAPT performance range.



TM089303

AUTOADAPT

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## PWM signal

A PWM (Pulse Width Modulation) signal is used in pumps to control their speed and flow rate efficiently. External PWM control mode can only be selected via Grundfos GO.

Below is a description of the functions and benefits:

- **Speed control**

By adjusting the duty cycle of the PWM signal, the speed of the pump can be precisely controlled. This allows for variable speed operation, which is essential for applications requiring different flow rates at different times.

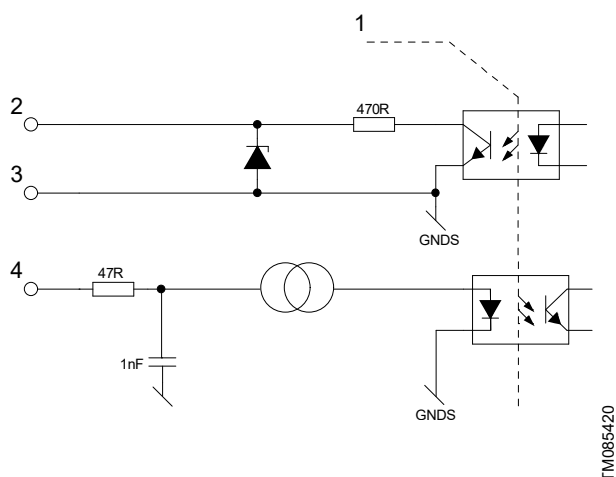
- **Feedback and monitoring**

PWM signals can also be used to monitor the pump's performance, such as measuring power consumption and detecting operating status.

## PWM interface

The PWM interface consists of an galvanically isolated circuit connecting the external control signal to the pump. The interface translates the external signal into a signal type that the microprocessor can understand.

The galvanically isolated interface ensures that the user cannot get into contact with dangerous voltage if the signal wires are touched when the pump is connected to power.



Schematic drawing, equivalent interface

Pos.	Description
1	Galvanic isolation
2	PWM output
3	Signal reference (without connection to protective earth)
4	PWM input

## Digital low-voltage PWM signal

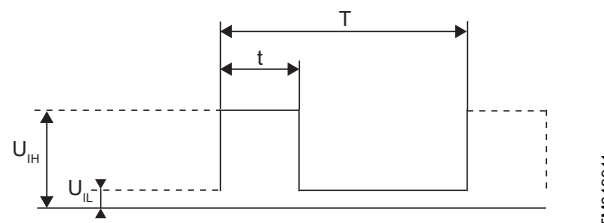
The square-wave PWM signal is designed for a frequency range of 100 to 1500 Hz for the standard input profiles. The PWM signal is used to select the speed (speed command) and as feedback signal. The PWM frequency on the feedback signal is fixed at 75 Hz in the pump.

### Duty cycle

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

Example	Rating
$T = 2 \text{ ms (500 Hz)}$	$U_{IH} = 4\text{-}24 \text{ V}$
$t = 0.6 \text{ ms}$	$U_{IL} \leq 1 \text{ V}$
$d \% = 100 \times 0.6 / 2 = 30 \%$	$4.5 \text{ mA} \leq I_H \leq 10 \text{ mA (depending on } U_{IH})$

### Example

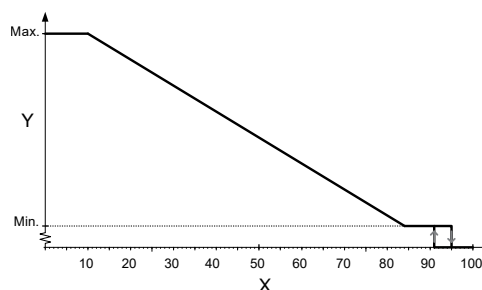


PWM signal

Abbreviation	Description
t	Duration of the pulse signal [s]
T	Total period of time [s]
$U_{IH}$	High-level input voltage
$U_{IL}$	Low-level input voltage

## 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.



PWM input profile A (heating)

Axis	Value
X	Input duty cycle
Y	Speed

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

## PWM feedback signal

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

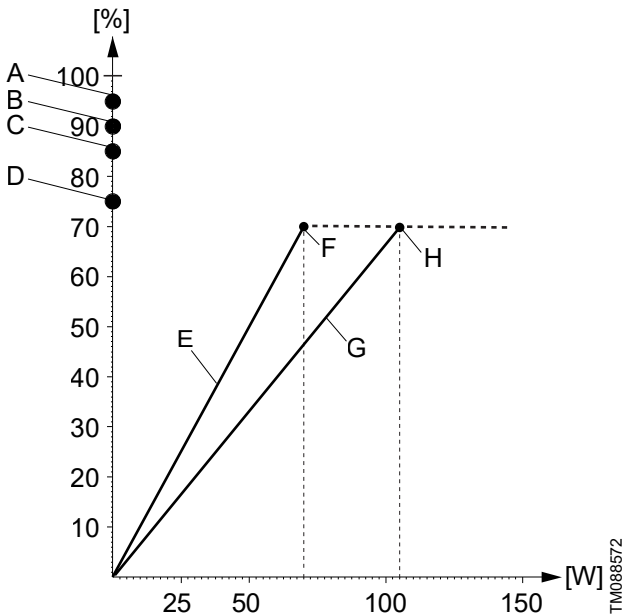
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- current power consumption or flow estimation
- warning
- alarm
- operating status.

### Alarms on power consumption

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



PWM feedback signal, power consumption

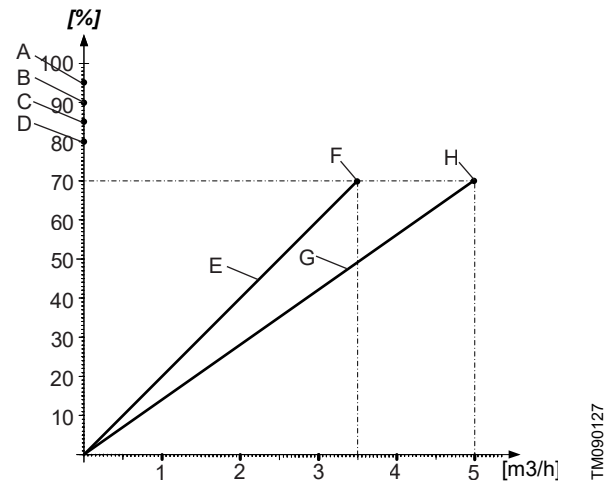
Pos.	Description
X-axis	Output power consumption [W]
Y-axis	Output duty cycle in percentage [%]
A	Standby (stop)
B	Alarm stop: fault, blocked pump
C	Alarm stop: electrical fault
D	Warning
E	Slope: 1 W / % PWM signal <b>Valid for ALPHA2 GO XX-40</b>
F	Saturation at 70 W
G	Slope: 1.5 W / % PWM signal <b>Valid for ALPHA2 GO XX-75</b>
H	Saturation at 105 W

PWM output duty cycle	Pump information
95 %	Standby (stop) by PWM duty cycle
90 %	Alarm, stop, blocked error
85 %	Alarm, stop, electrical error
75 %	Warning
0-70 %	Operating range

Output frequency: 75 Hz  $\pm$  5 %.

### Alarms on flow estimation

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



PWM feedback signal, flow estimation

Pos.	Description
X-axis	Output power consumption [m <sup>3</sup> /h]
Y-axis	Output duty cycle in percentage [%]
A	Standby (stop)
B	Alarm stop: fault, blocked pump
C	Alarm stop: electrical fault
D	Dry running
E	Slope: 0.05 m <sup>3</sup> /h / % PWM signal <b>Valid for ALPHA2 GO XX-40</b>
F	Saturation at 3.5 m <sup>3</sup> /h
G	Slope: 0.07 m <sup>3</sup> /h / % PWM signal <b>Valid for ALPHA2 GO XX-75</b>
H	Saturation at 5.0 m <sup>3</sup> /h

PWM output duty cycle	Pump information
95 %	Standby (stop) by PWM duty cycle
90 %	Alarm, stop, blocked error
85 %	Alarm, stop, electrical error
80 %	Dry running
0-70 %	Operating range

Output frequency: 75 Hz  $\pm$  5 %.

### Control signal data levels

PWM input duty cycle	Symbol	Value
PWM input frequency with high-speed optocoupler	F <sub>i</sub>	100-1500 Hz <sup>5)</sup>
Rated input voltage - high level	U <sub>iH</sub>	4-24 V
Rated input voltage - low level	U <sub>iL</sub>	< 1 V
High-level input current	I <sub>iH</sub>	< 10 mA
Input duty cycle	PWM	0-100 %

5) Only for standard profiles.

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PWM output duty cycle	Symbol	Value
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	D <sub>o</sub>	0-100
Output impedance	Z <sub>o</sub>	< 500 $\Omega$

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## 7. Setting of the UPS4 GO

The operating panel can be used for the following:

- Selecting proportional pressure, constant pressure or constant curve (speed).
- Selecting pump setting (I, II, III) for the three control modes available on the operating panel.
- Selecting the pump advanced mode to enable the pump to replicate a UPS pump performance.

### Venting the product

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. We recommend venting the pump in new installations or when the pipes have been emptied and refilled with water.

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## 8. Setting of the ALPHA2 GO

### Setting of the product, ALPHA2 GO

The operating panel can be used for the following:

- Connecting to Grundfos GO.
- Selecting proportional pressure, constant pressure or constant curve (speed).
- Selecting pump setting (I, II, III) for the three control modes available on the operating panel.

In Grundfos GO you can access all settings.

### Connecting the product to Grundfos GO

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

The connection can be started either from the operating panel or Grundfos GO. If you have several products installed, we recommend starting the connection from the operating panel.

#### Setting of the pump in Grundfos GO

Once the pump is connected to Grundfos GO, you can choose between **Use default settings** and **Start setup**. We recommend selecting **Start setup** which leads you to the guided setup.

By answering a few simple questions, the guided setup will help you select the optimal control mode and setpoint for the system, which reduces energy consumption and helps prevent potential noise problems.

If you select **Use default settings**, the pump uses the factory setting, constant curve, setting II.

#### Venting the product, ALPHA2 GO

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. We recommend venting the pump in new installations or when the pipes have been emptied and refilled with water. You can vent the pump via Grundfos GO.

- If you follow the guided setup, you are asked if you want to vent the pump now.
- If you do not follow the guided setup, you can access the venting settings via the **Settings** menu.

#### Replacement of UPM3 or UPM4 pump

ALPHA2 GO can be used to replace the majority of integrated UPM3 or UPM4 circulator pumps. This means that when replacing an existing circulator pump, the new ALPHA2 GO pump replicates the performance as well as PWM configuration of the existing circulator pump. In the Grundfos GO app (via the **GO Replace** tool) or online via <https://grundfos.to/replace>, you can check the compatibility of the pump.

During the replacement process, Grundfos GO guides you step-by-step through the setup of the new circulator pump to match the existing circulator pump. The

replication process can be initiated directly from the GO Replace tool or through the guided setup when initially connecting the pump to Grundfos GO.

#### Supported setting of an automatic bypass valve (ABV)

With the use of Grundfos GO it is possible to be guided through the setting of an automatic bypass valve (ABV). This ensures that the circulator pump is set in a control mode and with a setting which both ensures that the system is provided with the heating power needed and at the same time the valve only opens when needed, ensuring a minimum flow.

During normal operation the circulator pump operates with a predefined constant (differential) pressure setpoint defined during guided setup of the system. As the heat demand from the system decreases, the flow moves towards zero. However, when the flow reaches the minimum flow limit or the needed bypass flow (default 0.4 m<sup>3</sup>/h), the pump increases the differential pressure to activate the bypass valve, creating the required bypass flow.

During the setting of the bypass valve, the user is guided to adjust the valve setting so that the bypass valve remains closed when the pump is operating above the minimum flow. This is achieved by reducing the differential pressure to the predefined constant-pressure setpoint defined by the system.

Go to the guided setup in Grundfos GO. During a new setup, the user will be prompted to optimize the automatic bypass valve. Grundfos GO guides the user through the process of optimizing the valve settings.

#### Air detection and system venting

The product offers a **Continuous air detection and venting** feature which means the pump can detect air and push it quickly to the air removal device.

If the pump detects air, it runs a venting sequence which enables more air to escape compared to letting the pump run at maximum speed during the entire process.

During system venting, the air is pushed to the system vent.

The function can be enabled in Grundfos GO in the **Settings** menu.

During the guided setup, you are asked if you want to vent the pump and system now. This is a one time event and will not permanently enable this function. .

#### Flow limitation

You can set a minimum and maximum flow rate in Grundfos GO.

A minimum flow limit can be set to prevent the boiler from overheating. A maximum flow limit can be set to prevent noise in the system.

#### Night setback

This product offers a night setback function, which can only be activated via Grundfos GO in the **Settings** menu. With automatic night setback enabled, the pump automatically switches between normal operation and the automatic night setback curve.

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The pump switches to night setback when a flow-pipe temperature drop of more than 10 to 15 °C within approximately two hours is registered. The temperature drop must be at least 0.1 °C/min.

Changeover to normal operation takes place without a time lag when the flow-pipe temperature has increased by approximately 10 °C. You do not have to re-enable night setback if the power supply has been switched off.

If the power supply is switched off when the pump is running on the curve for night setback, the pump starts in normal operation. The pump changes back to the curve for night setback when the condition for night setback is fulfilled again.

If there is insufficient heat in the heating system, check whether night setback has been enabled. If yes, disable the function.

To ensure the optimum function of night setback, the following conditions must be fulfilled:

- The pump must be installed in the flow pipe.
- The boiler must incorporate automatic control of the liquid temperature.



Do not use automatic night setback when the pump is installed in the return pipe of the heating system.



Automatic night setback is available in all control modes.

## Trend data

In the **Trend data** menu in Grundfos GO, you can see system data for the last 10 or 100 on-cycles. An on-cycle is the period from when the pump turns on until it turns off. If the pump runs continuously for more than 24 hours, one on-cycle is registered and a new on-cycle will start even though the pump has not yet turned off.

You can see the following data:

- **Duration of each on-cycle**
- **Flow**
- **Head**
- **Estimated media temperature.**

You can use the trend data for system optimization and fault finding.

## Update of the pump software

When the pump is connected to a mobile device and the Internet, it is possible to update the pump's software. Once the connection to Grundfos GO is established, the pump automatically checks for available updates, and a pop-up notification appears in Grundfos GO.

## Grundfos GO Balance

The Grundfos GO Balance app is a powerful tool designed to simplify the hydronic balancing process for heating systems, particularly for two-string radiator systems and underfloor heating.

It includes the following features:

- **Guided balancing process:**  
The app provides step-by-step instructions to help with balancing the heating systems effectively, ensuring optimal performance.

- **Real-time flow data:**  
Grundfos GO Balance receives real-time flow data from the pump, allowing it to automatically calculate the necessary adjustments for each radiator.
- **Documentation:**  
Once the system is balanced, Grundfos GO Balance generates a report that can be e-mailed or printed, providing a record of the work done.

Grundfos GO Balance enhances efficiency and accuracy in hydronic balancing, making it a valuable tool for professionals and DIY enthusiasts.

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## 9. Performance curves and technical data

### Guide to performance curves

Each pump setting 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 curve.

### Curve conditions

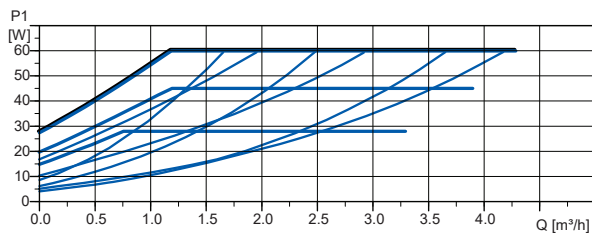
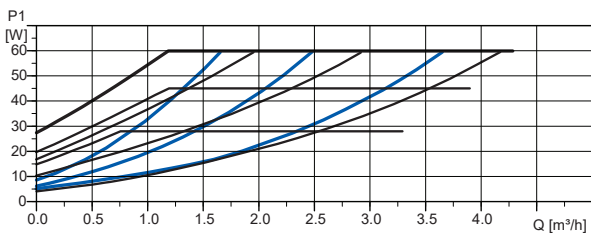
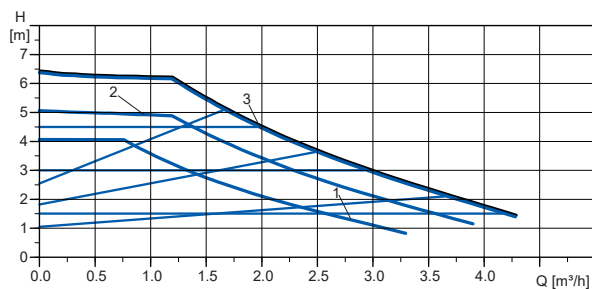
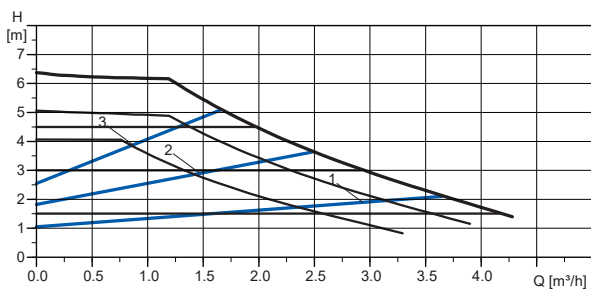
The guidelines below apply to the performance curves:

- Test liquid: airless water.
- The curves apply to a density of  $998.2 \text{ kg/m}^3$  and a liquid temperature of  $20 \text{ }^\circ\text{C}$ .
- Curves are obtained according to EN 16297-1.
- Maximum curves are limited by speed and power
- The EEI values are obtained according to EN 16297 part 2.

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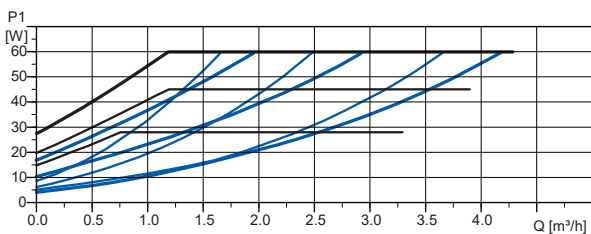
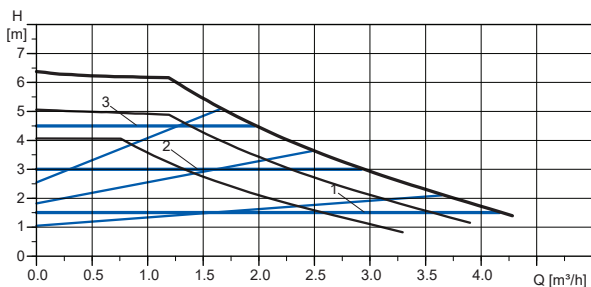
See product

UPS4 GO 25-65



TM090162

TM090164



TM090163

Pos.	Description
1	Setting I
2	Setting II
3	Setting III

EEI ≤ 0.20 Part 3

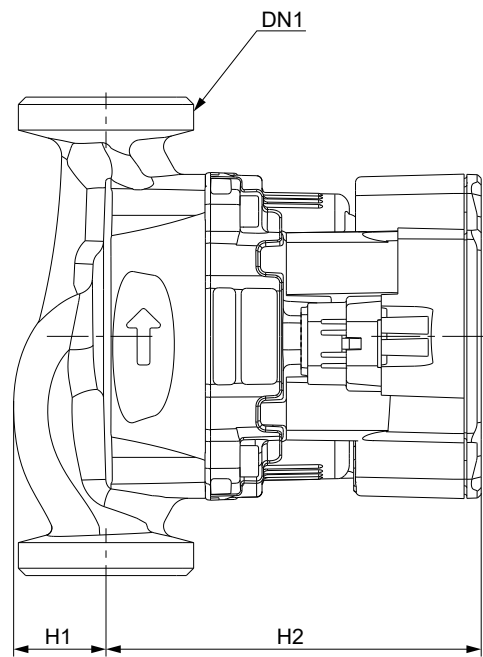
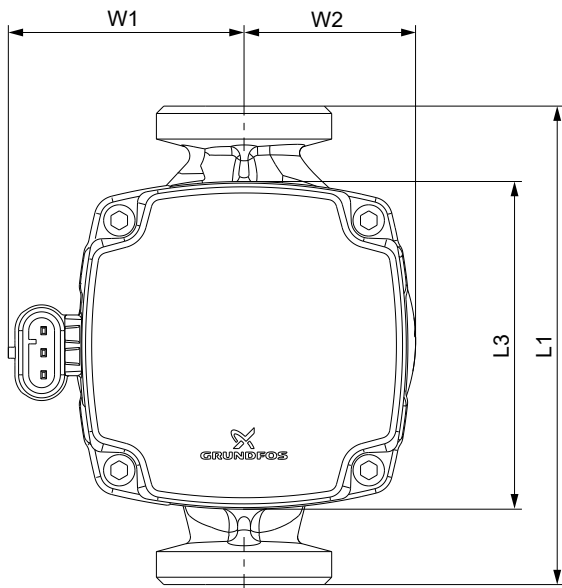
$P_{L,avg} \leq 24.2 \text{ W}$

Electrical data, 1 × 220 - 240 V, 50 Hz		
Speed	$P_1$ [W]	$I_{1/1}$ [A]
Min.	4	0.06
Max.	60	0.6

Technical data			
System pressure	Max. 1.0 MPa (10 bar)	Enclosure class	IP44

Technical data			
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	Motor protection	No external protection needed
Liquid temperature	-10 to +110 °C (TF110)	Approval and marking	UKCA

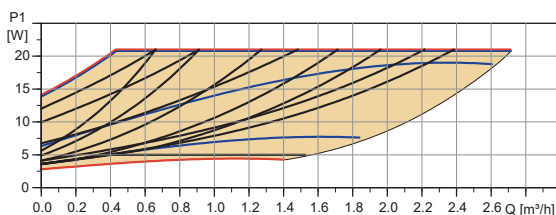
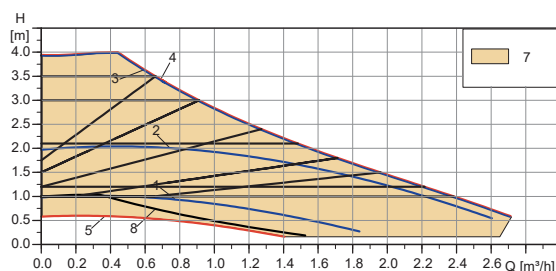
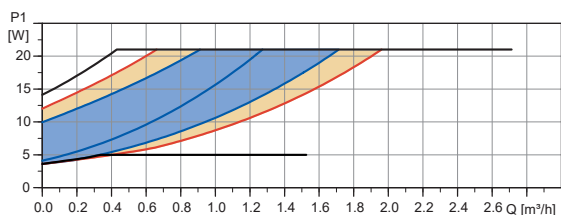
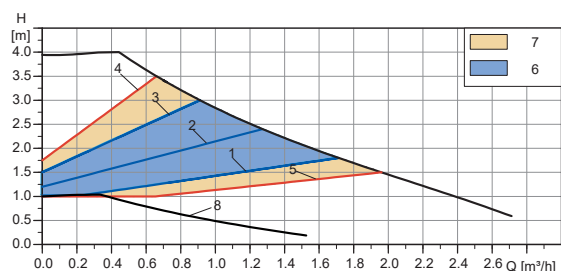
**Dimensions**



TM068918

Pump type	Dimensions [mm]						DN1	Weight [kg]
	L1	L3	W1	W2	H1	H2		
UPS4 GO 25-65 130	130	89	64	47	25	102	G 1 1/2	1.86

# ALPHA2 GO XX-40

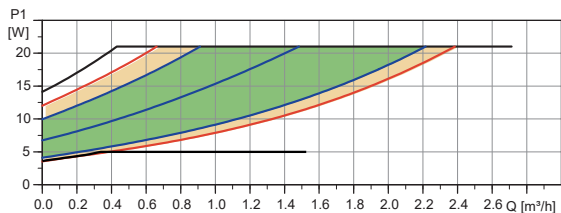
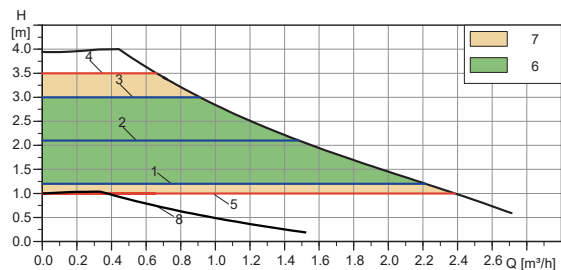


TM090142

Constant pressure

Proportional pressure

Constant curve



Constant pressure

Pos.	Description
1	Setting I
2	Setting II
3	Setting III
4	Max. manual setpoint via Grundfos GO
5	Min. manual setpoint via Grundfos GO
6	AUTOADAPT range
7	Manual setpoint range
8	Night setback curve

Constant pressure

EEl ≤ 0.20 Part 3

PL,avg ≤ 12 W

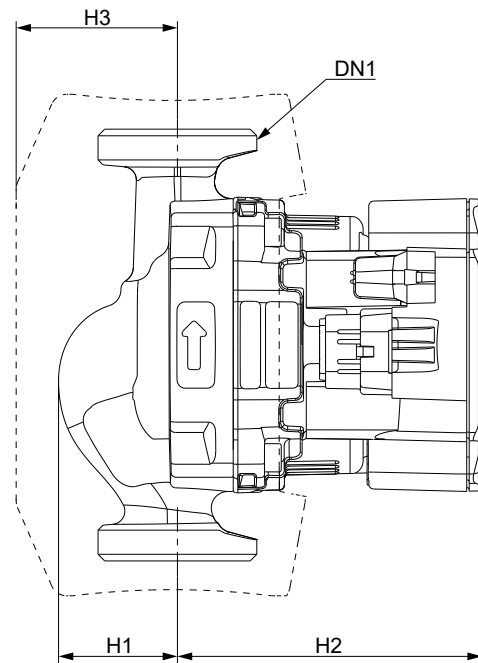
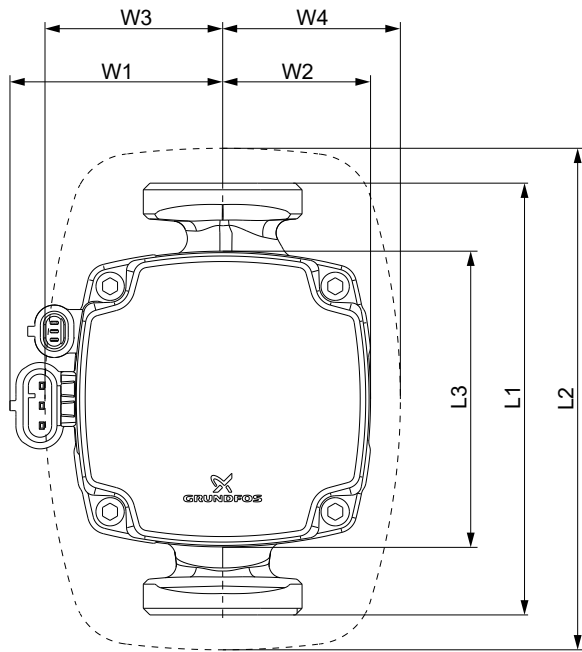
Electrical data, 1 × 230 V, 50 Hz		
Speed	P <sub>1</sub> [W]	I <sub>1/1</sub> [A]
Min.	3	0.04
Max.	18 / 21	0.22 / 0.26

Technical data		
System pressure	Max. 1.0 MPa (10 bar)	Enclosure class IP44

Technical data		
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	Motor protection No external protection needed
Liquid temperature	2-110 °C (TF110) -10 to +110 °C (TF110)	Approval and marking UKCA

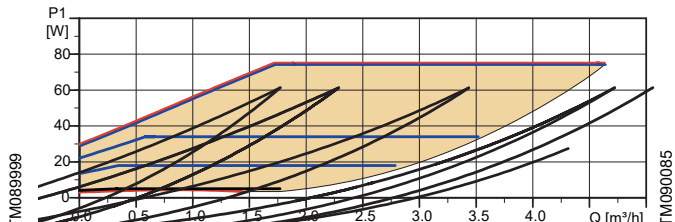
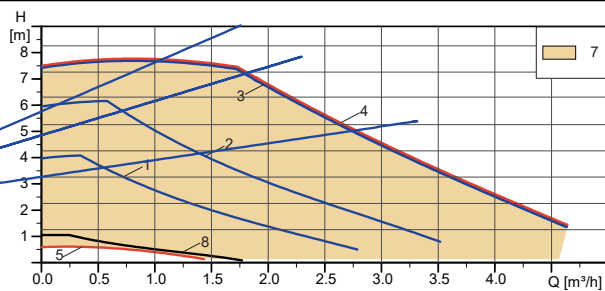
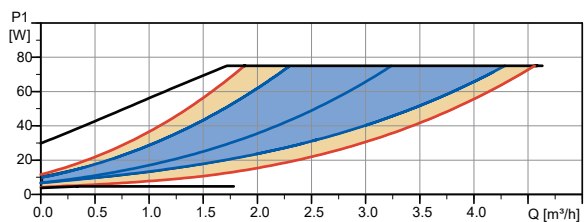
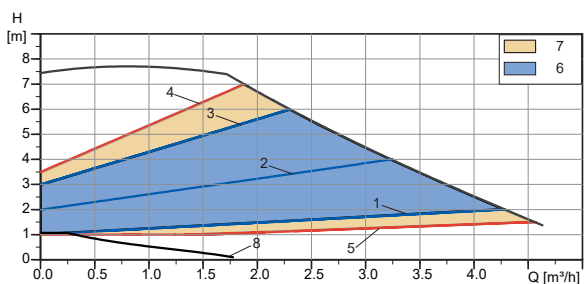
Dimensions



TM088925

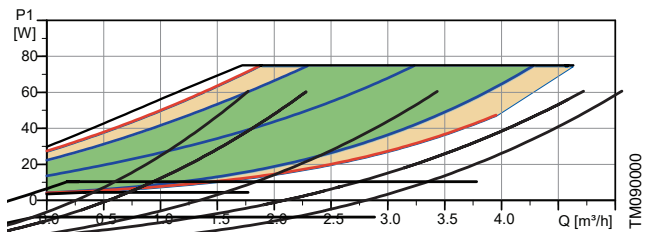
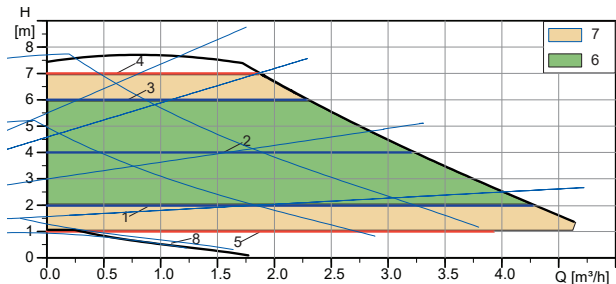
Pump type	Dimensions [mm]										DN 1	Weight [kg]
	L1	L2	L3	W1	W2	W3	W4	H1	H2	H3		
ALPHA2 GO 25-40 130	130	151	89	64	46	53.5	53.5	36	92	87	G 1 1/2	1.81

# ALPHA2 (K) GO XX-75



Proportional pressure

Constant curve



Pos.	Description
1	Setting I
2	Setting II
3	Setting III
4	Max. manual setpoint via Grundfos GO
5	Min. manual setpoint via Grundfos GO
6	AUTOADAPT range
7	Manual setpoint range
8	Night setback curve

Constant pressure

EEl ≤ 0.19 Part 3

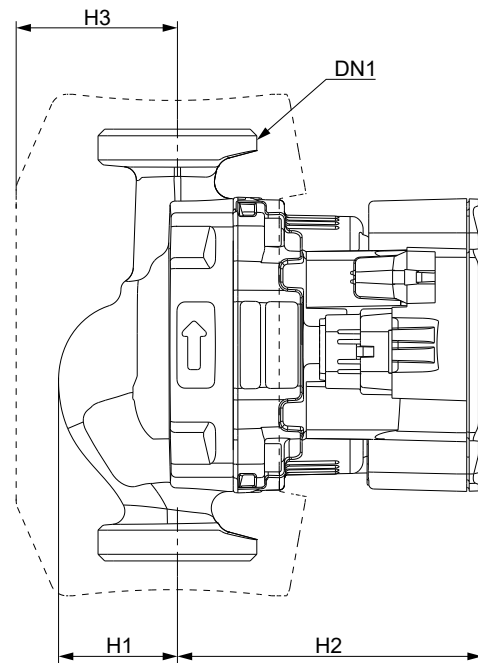
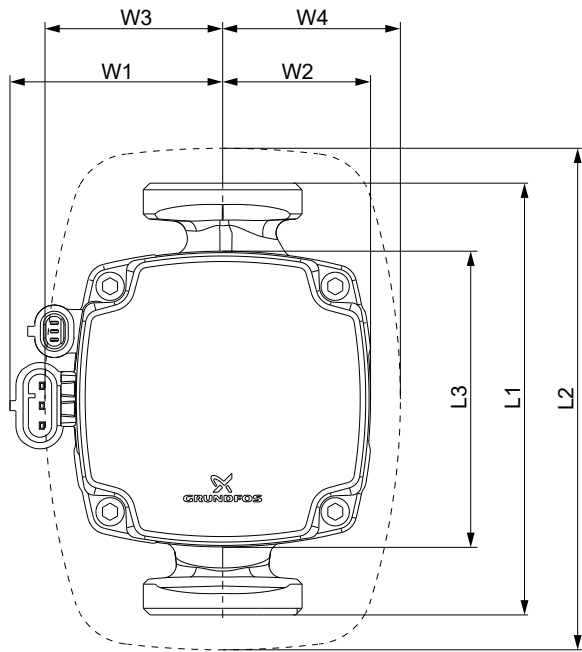
$P_{L,avg} \leq 31W$

Electrical data, 1 × 230 V, 50 Hz		
Speed	P <sub>1</sub> [W]	I <sub>1/1</sub> [A]
Min.	3	0.04
Max.	75	0.68

Technical data			
System pressure	Max. 1.0 MPa (10 bar)	Enclosure class	IP44 K-version: IPX4D

Technical data			
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	Motor protection	No external protection needed
Liquid temperature	-10 to +110 °C (TF110) K-version: -20 to +110 °C	Approval and marking	UKCA

Dimensions



TM068925

Pump type	Dimensions [mm]										DN1	Weight [kg]
	L1	L2	L3	W1	W2	W3	W4	H1	H2	H3		
ALPHA2 GO 25-75 130	130	151	89	64	46	53.5	53.5	36	92	87	G 1 1/2	1.81
ALPHA2 GO K 25-75 130	130	151	89	64	46	53.5	53.5	36	92	87	G 1 1/2	1.81

# 10. Accessories

## Cables and plugs

UPS4 GO is equipped with only one electrical connection, while ALPHA2 GO has two connections: a power supply and a control signal connection.

### Power supply connection

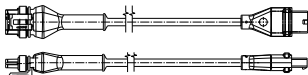
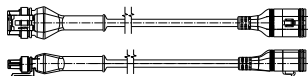
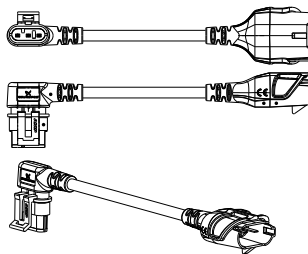
The installer plug is both supplied with the pump and available as a spare part. Power cable adapters are available as accessories.



TM067298

Product description	Product number
Installer plug	99439948

### Power cable adapters


	Description	Length [mm]	Product number
	TM090121 Superseal Molex cable adapter, overmoulded, with rubber cap	150	99165311
	TM090122 Superseal Volex cable adapter, overmoulded, with rubber cap	150	99165312
	TM090123 Superseal to ALPHA plug	145	93296229

### Control signal connection (only ALPHA2 GO)

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. The optional signal cable is available as an accessory. The cable length must not exceed 3 metres.

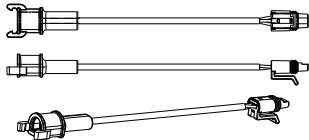
Conductor	Colour
Signal input	Brown
Signal reference	Blue
Signal output	Black

### Signal cable and adapter

	Description	Length [mm]	Product number
	TM060610 Mini superseal signal cable	2000	99165309

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See product

	Description	Length [mm]	Product number
	TM090124 Mini superseal to FCI signal cable adapter	150	93348101

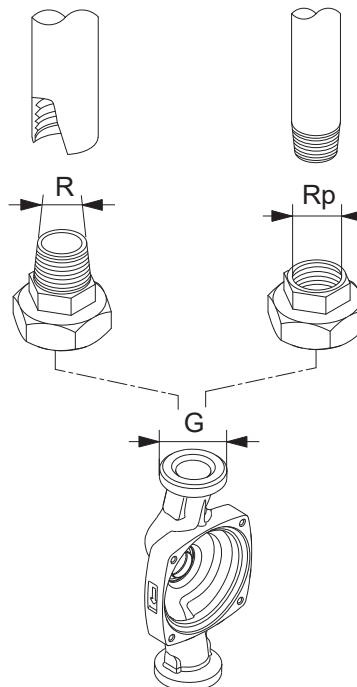
### Insulating shells

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
UPS4 GO	93035646
ALPHA2 GO	92872333

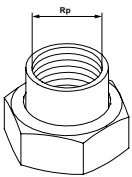
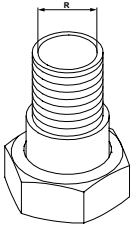


Insulating shells



G-threads and R-threads

### Unions and valve kits

		Product numbers, unions				
ALPHAX	Connection					
		3/4	1	1 1/4	1	1 1/4
25-xx	G 1 1/2	529921	99672022	529821	529925	529924
32-xx	G 2		509921	99672033		

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 cylindrical male G-threads, 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 threads. You can screw conical male R-threads into female Rc- or Rp-threads. See fig. G-threads and R-threads.

## 11. Product numbers

### UPS4 GO

Pump type	Port-to-port length [mm]	Connection	Product number
UPS4 GO 25-65	130	G 1 1/2	<a href="#">93074168</a>

### ALPHA2 GO

Pump type	Port-to-port length [mm]	Connection	Product number
ALPHA2 GO 25-40	130	G 1 1/2	<a href="#">93074270</a>
ALPHA2 GO 25-75	130	G 1 1/2	<a href="#">93074268</a>
ALPHA2 GO K 25-75	130	G 1 1/2	<a href="#">93074267</a>
ALPHA2 GO 25-90	130	G 1 1/2	<a href="#">93074264</a>

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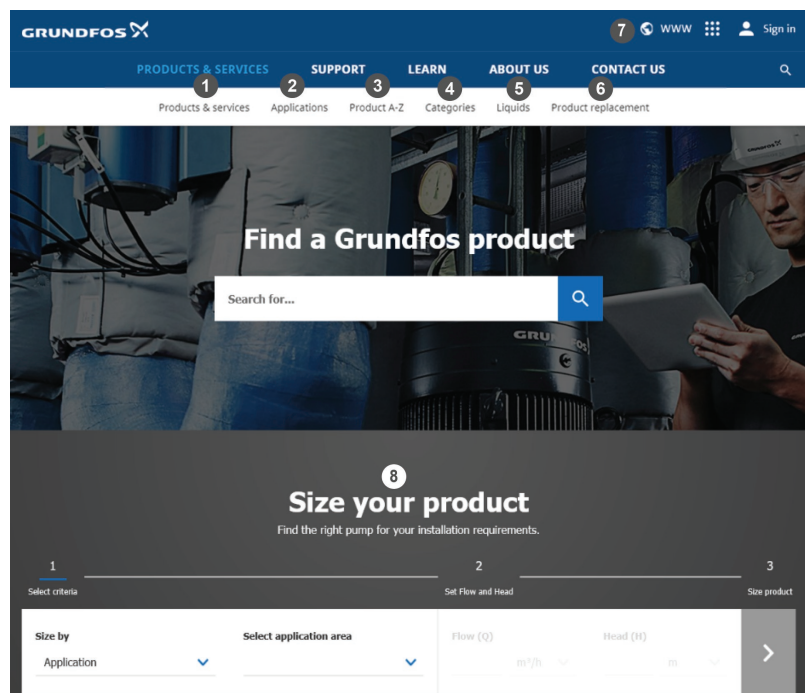
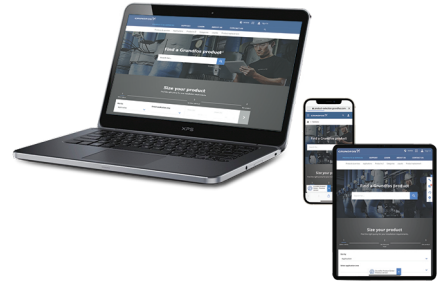
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On the product pages, you can download installation and operating instructions, data booklets, service instructions, etc., in PDF format.



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6	<b>Product replacement</b> enables you to find a suitable replacement.
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