ALPHA2 L

Model C

Installation and operating instructions

Original installation and operating instructions

These installation and operating instructions describe ALPHA 2 L.

Sections 1-5 give the information necessary to be able to unpack, install and start up the product in a safe way.

Sections 6-12 give important information about the product, as well as information on service, fault finding and disposal of the product.

CONTENTS

1. General information

1.1 Target group

Read this document and the quick guide before installing 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.

1.2 Hazard statements

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

DANGER

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

WARNING

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

CAUTION

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

The hazard statements are structured in the following way:

SIGNAL WORD

Description of hazard

Consequence of ignoring the warning.

- Action to avoid the hazard.

1.3 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

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

Check that the voltage and frequency of the product match the voltage and frequency of the installation site. See section *6.4.1 Nameplate*.

2.2 Scope of delivery

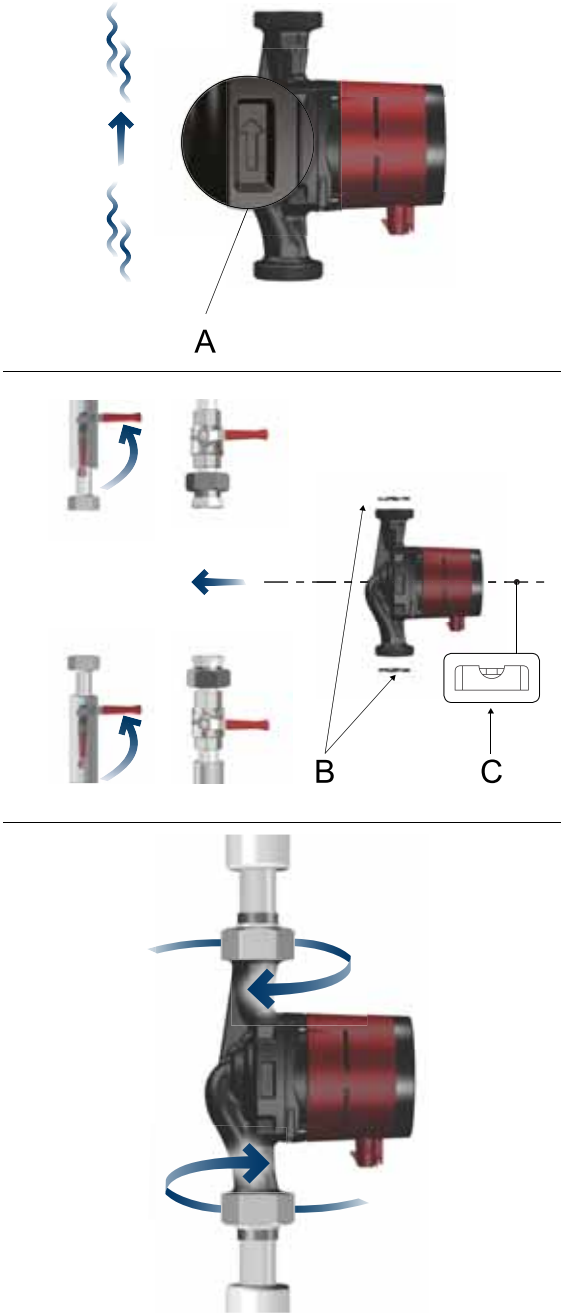
The box contains the following items:

- ALPHA2 L pump
- ALPHA plug
- insulating shells
- two gaskets
- quick guide.

3. Installing the product

3.1 Mechanical installation

3.1.1 Mounting the product



TM07 1193 1118

Fig. 1 Mounting the product

The arrows on the pump housing indicate the flow direction through the pump. See fig. 1 (A).

1. Fit the two gaskets when you mount the pump in the pipe. See fig. 1 (B).
2. Install the pump with a horizontal motor shaft. See fig. 1 (C). See also section *3.3 Control box positions*.
3. Tighten the fittings.

3.2 Positioning the pump

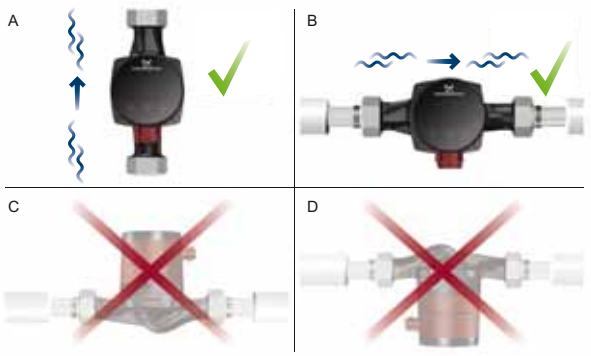


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Fig. 2 Control box positions

Always install the pump with a horizontal motor shaft.

- Pump installed correctly in a vertical pipe. See fig. 2 (A).
- Pump installed correctly in a horizontal pipe. See fig. 2 (B).
- Do not install the pump with a vertical motor shaft. See fig. 2 (C and D).

3.3 Control box positions

3.3.1 Positioning of the control box

You can position the control box so that the plug is positioned at 3, 6 and 9 o'clock. See fig. 3.

TM07 7828 4520

Fig. 3 Control box positions, heating systems

3.3.2 Positioning the control box in air-conditioning and cold-water systems

Position the control box so that the plug is pointing downwards in applications where liquid temperature is below 2 °C. See fig. 4.

TM06 9091 4520

Fig. 4 Control box position, air-conditioning and cold-water systems

3.3.3 Changing the control box position

WARNING

Pressurised system

Minor or moderate personal injury

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

CAUTION

Hot surface

Minor or moderate personal injury

- Position the pump so that persons cannot accidentally come into contact with hot surfaces.

If you change the position of the control box, fill the system with the liquid to be pumped or open the isolating valves.

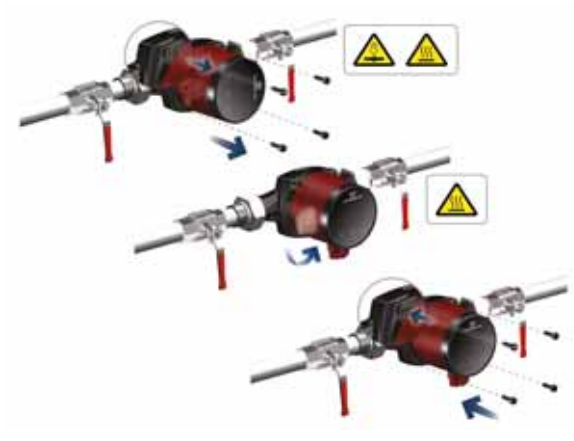

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Fig. 5 Changing the control box position

You can turn the control box in steps of 90 °.

1. Remove the four screws.
2. Turn the pump head to the desired position.
3. Insert and cross-tighten the screws.

3.4 Insulating the pump housing

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Fig. 6 Insulating the pump housing

You can reduce the heat loss from the pump by insulating the pump housing with the insulating shells supplied with the pump. See fig. 6.

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

4. Electrical installation

WARNING

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.

WARNING

Electric shock

Death or serious personal injury

- Connect the pump to earth.
  Connect the pump to an external main switch with a minimum contact gap of 3 mm in all poles.

WARNING

Electric shock

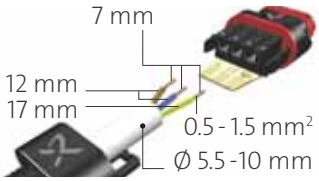
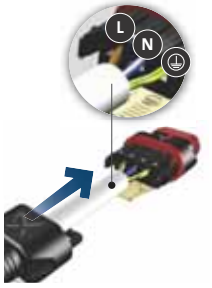
Death or serious personal injury

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

Carry out the electrical connection and protection in accordance with local regulations.

- The motor requires no external motor protection.
- Check that the supply voltage and frequency correspond to the values stated on the nameplate. See section *6.4.1 Nameplate*.
- Connect the pump to the power supply with the plug supplied with the pump. See steps 1 to 7.

4.1 Assembling the plug

Step	Action	Illustration
1	Fit the cable gland and plug cover to the cable. Strip the cable conductors as illustrated.	 TM05 5538 3812
2	Connect the cable conductors to the power supply plug.	 TM05 5539 3812
3	Bend the cable with the cable conductors pointing upwards.	 TM05 5540 3812
4	Pull out the conductor guide plate and throw it away.	 TM05 5541 3812
5	Click the plug cover onto the power supply plug.	 TM05 5542 3812
6	Screw the cable gland onto the power supply plug.	 TM05 5543 3812
7	Insert the power supply plug into the male plug in the pump control box.	 TM07 1194 1118

4.2 Dismantling the plug

Step	Action	Illustration
1	Loosen the cable gland and remove it from the plug.	 TM05 5545 3812
2	Pull off the plug cover while pressing on both sides.	 TM05 5546 3812
3	Add the conductor guide plate to loosen all three cable conductors at the same time. If the guide plate is missing, then loosen the cable conductors one by one by pressing a screwdriver gently into the terminal clip.	 TM05 5547 3812
4	The plug has now been removed from the power supply plug.	 TM05 5548 3812

5. Starting up the product

5.1 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 *9. Technical data*. For instructions on how to vent the system, see section *5.3 Venting the pump*.

5.2 First startup

After installing the product, see section *3. Installing the product*, turn on the power supply. The light in the operating panel shows that the power supply has been switched on. See fig. 7.

The pump is factory set to intermediate proportional-pressure curve, PP2.

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Fig. 7 Starting the pump

5.3 Venting the pump

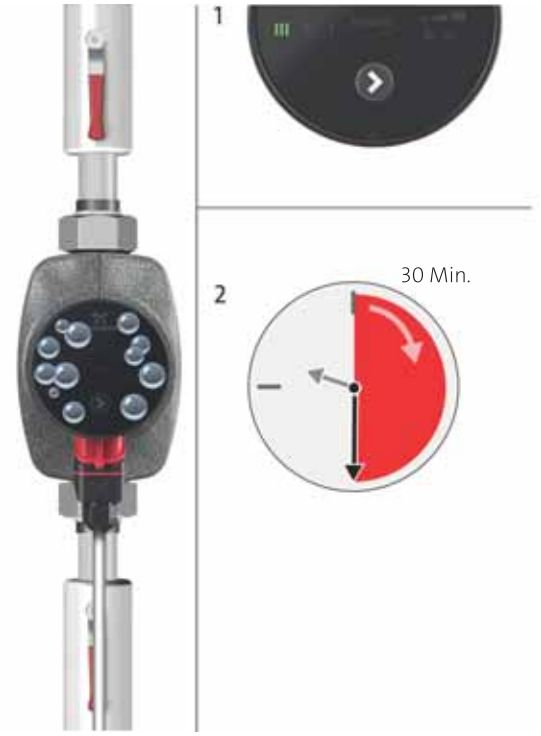

Fig. 8 Venting the pump

The pump is self-venting through the system. You do not have to vent the pump before startup.

Air in the pump may cause noise. This noise ceases when the pump has run for a few minutes.

You obtain quick venting of the pump by setting the pump to speed III. How fast the pump is vented depends on the system size and design.

When you have vented the pump, i.e. when the noise has ceased, set the pump according to the recommendations. See section *7. Control functions*.

The pump must not run dry.

You cannot vent the system through the pump. See section *6. Product introduction*.

6. Product introduction

6.1 Product description

Fig. 9 Pumped liquids, warnings and operating conditions

ALPHA1 pumps are a complete range of circulator pumps.

6.1.1 Model type

These installation and operating instructions cover ALPHA2 L. The model type is stated on the packaging and nameplate. See figs 10.

Fig. 10 Model type on the packaging

6.2 Applications

The pump is designed for the circulation of water in heating systems as well as air-conditioning and cold-water systems.

Cold-water systems are defined as systems where the ambient temperature is higher than the temperature of the pumped liquid. The pump is the best choice for the following systems:

- underfloor heating systems
- one-pipe systems
- two-pipe systems.

The pump is suitable for the following:

- Systems with constant or variable flow rates where you want to optimise the setting of the pump duty point.
- Systems with variable flow-pipe temperature.

6.3 Pumped liquids

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 pump is suitable for the following liquids:

- Thin, clean, non-aggressive and non-explosive liquids, not containing solid particles or fibres.
- Cooling liquids, not containing mineral oil.
- Domestic hot water
  Maximum: 14 °dH
  Maximum: 65 °C
  Maximum peak: 70 °C.
  For water with a higher degree of hardness, we recommend that you use a direct-coupled TPE pump.
- Softened water.

The kinematic viscosity of water is 1 mm^2/s (1 cSt) at 20 °C. If the pump is used for a liquid with a higher viscosity, the hydraulic performance of the pump will be reduced.

Example: 50 % glycol at 20 °C means a viscosity of approx. 10 mm^2/s (10 cSt) and a reduction of the pump performance by approx. 15 %.

Do not use additives that can or will disturb the functionality of the pump.

When selecting a pump, take the viscosity of the pumped liquid into consideration.

For more information about the pumped liquids, warnings and operating conditions, see fig. 9.

CAUTION

Flammable material

Minor or moderate personal injury

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

WARNING

Biological hazard

Death or serious personal injury

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

CAUTION

Corrosive substance

Minor or moderate personal injury

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

6.4 Identification

6.4.1 Nameplate

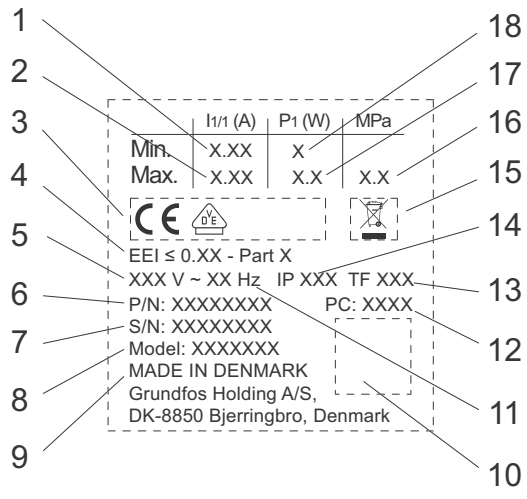

Fig. 11 Nameplate

Pos.	Description
1	Minimum rated current [A]
2	Maximum rated current [A]
3	CE mark and approvals
4	EEI: Energy Efficiency Index
5	Voltage [V]
6	Product number
7	Serial number
8	Pump model
9	Country of origin
10	Data matrix code
11	Frequency [Hz]
12	Production code: • 1st and 2nd figures: year • 3rd and 4th figures: week
13	Temperature class
14	Enclosure class
15	Crossed-out wheeled bin according to EN 50419
16	Maximum system pressure [MPa]
17	Minimum input power P1 [W]
18	Maximum input power P1 [W]

6.4.2 Type key

Example: ALPHA2 L 25 - 60 180

Code	Explanation
ALPHA2 L	Pump type
25	Nominal diameter (DN) of inlet and outlet ports [mm]
60	Maximum head [MPa]
-	[ ]: Cast-iron pump housing N: Stainless-steel pump housing
180	Port-to-port length [mm]

7. Control functions

7.1 Elements on the operating panel

Fig. 12 Operating panel

Pos.	Description
1	Light fields indicating the pump setting. See section *7.3 Light fields indicating the pump setting*.
2	Button for selection of pump setting.

7.2 Display

The display (1) is on when you have switched on the power supply.

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

7.3 Light fields indicating the pump setting

The pump has different performance settings which you can select between with the button. See fig. 12 (2).

Every time you press the button , the pump setting is changed.

The pump setting is indicated by light fields in the display. See fig. 13.

Fig. 13 Nine light fields

Active light fields	Description
Factory setting	Lowest proportional-pressure curve, PP1
	Highest proportional-pressure curve, PP2
	Lowest constant-pressure curve, CP1
	Highest constant-pressure curve, CP2
	Constant curve/constant speed III
	Constant curve/constant speed II
	Constant curve/constant speed I

For information about the function of the settings, see section *7.4 Control modes*.

7.4 Control modes

7.4.1 Pump setting for two-pipe heating systems

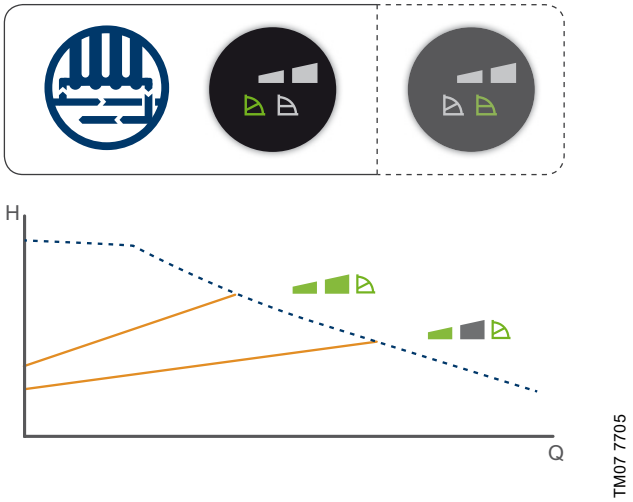

Fig. 14 Selection of pump setting for system type

Recommended and alternative pump settings according to fig. 14:

Heating system	Pump setting	
	Recommended	Alternative
Two-pipe system	Proportional-pressure curve, PP1 or PP2 *	Constant-pressure curve, CP1 or CP2 *

* See section *10.1 Guide to performance curves*.

Proportional-pressure curve, PP1 or PP2

Proportional-pressure control adjusts the pump performance to the actual heat demand in the system. The pump performance follows the selected performance curve, PP1 or PP2. See fig. 15 where PP1 has been selected. For further information, see section *10.1 Guide to performance curves*.

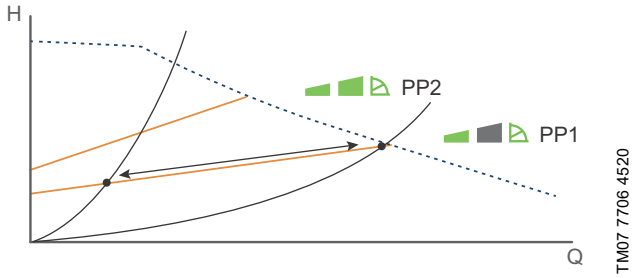

Fig. 15 The proportional-pressure curves and settings

The selection of the proportional-pressure setting depends on the characteristics of the heating system and the actual heat demand.

7.4.2 Pump setting for one-pipe heating systems

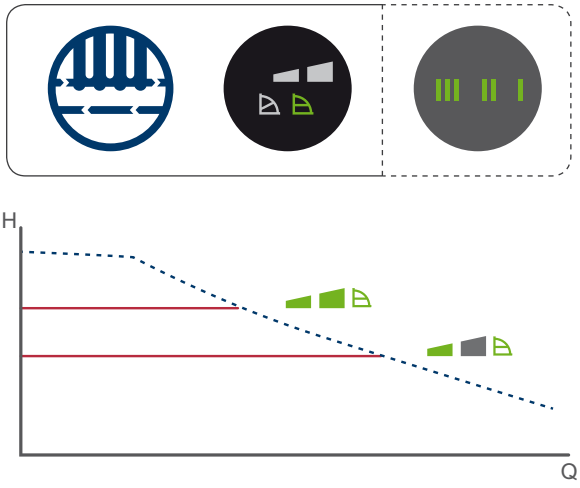

Fig. 16 Selection of pump setting for system type

Recommended and alternative pump settings according to fig. 16:

Heating system	Pump setting	
	Recommended	Alternative
One-pipe system	Constant-pressure curve, CP1 or CP2 *	Constant curve/constant speed, I, II or III*

* See section *10.1 Guide to performance curves*.

Constant-pressure curve, CP1 or CP2

The constant-pressure control adjusts the flow rate to the actual heat demand in the system keeping a constant pressure at the same time. The pump performance follows the selected performance curve, CP1 or CP2. See fig. 17 where CP1 has been selected. For further information, see section *10.1 Guide to performance curves*.

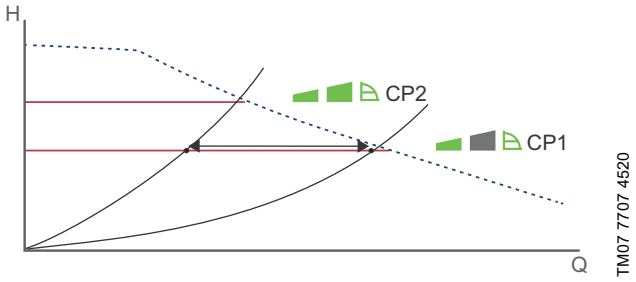

Fig. 17 The constant-pressure curves and settings

The selection of the constant-pressure setting depends on the characteristics of the heating system and the actual heat demand.

7.4.3 Pump setting for underfloor heating systems

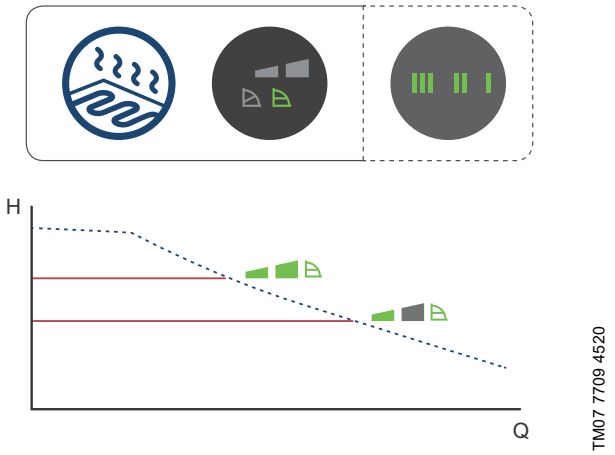

Fig. 18 Selection of pump setting for system type

Recommended and alternative pump settings according to fig. 18:

System type	Pump setting	
	Recommended	Alternative
Underfloor heating	Constant-pressure curve, CP1 or CP2 *	Constant curve/constant speed, I, II or III

* See section *10.1 Guide to performance curves*.

Constant-pressure curve, CP1 or CP2

The constant-pressure control adjusts the flow rate to the actual heat demand in the system keeping a constant pressure at the same time. The pump performance follows the selected performance curve, CP1 or CP2. See fig. 19 where CP1 has been selected. For further information, see section *10.1 Guide to performance curves*.

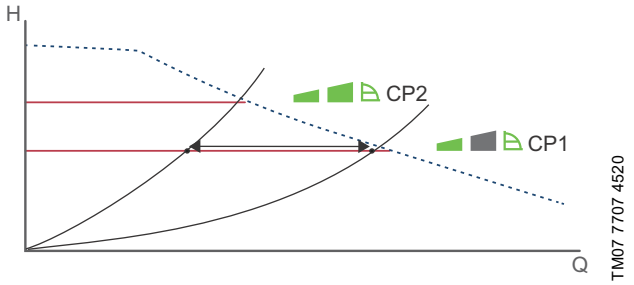

Fig. 19 The constant-pressure curves and settings

The selection of the constant-pressure setting depends on the characteristics of the heating system and the actual heat demand.

7.4.4 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.

7.5 Pump performance

Relation between pump setting and pump performance.

Figure 20 shows the relation between pump setting and pump performance by means of curves. See also section *10. Performance curves*.

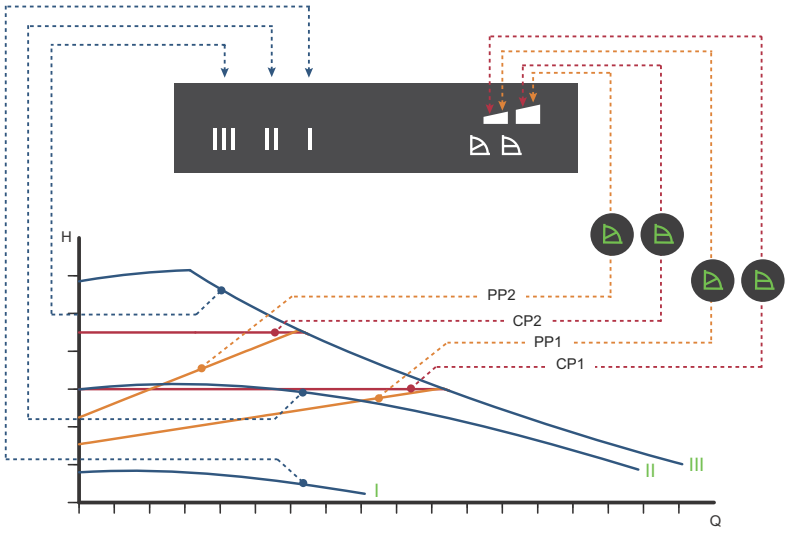

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Fig. 20 Pump setting in relation to pump performance

Setting	Pump curve	Function
PP1	Lowest proportional-pressure curve	The duty point of the pump will move up or down on the lowest proportional-pressure curve, depending on the heat demand. See fig. 20. The head is reduced at falling heat demand and increased at rising heat demand.
PP2	Highest proportional-pressure curve	The duty point of the pump will move up or down on the highest proportional-pressure curve, depending on the heat demand. See fig. 20. The head is reduced at falling heat demand and increased at rising heat demand.
CP1	Lowest constant-pressure curve	The duty point of the pump will move out or in on the lowest constant-pressure curve, depending on the heat demand in the system. See fig. 20. The head is kept constant, irrespective of the heat demand.
CP2	Highest constant-pressure curve	The duty point of the pump will move out or in on the highest constant-pressure curve, depending on the heat demand in the system. See fig. 20. The head is kept constant, irrespective of the heat demand.
III	Speed III	The pump runs on a constant curve which means that it runs at a constant speed. In speed III, the pump is set to run on the maximum curve under all operating conditions. See fig. 20. You obtain quick venting of the pump by setting the pump to speed III for a short period. See section *5.3 Venting the pump*.
II	Speed II	The pump runs on a constant curve which means that it runs at a constant speed. In speed II, the pump is set to run on the intermediate curve under all operating conditions. See fig. 20.
I	Speed I	The pump runs on a constant curve which means that it runs at a constant speed. In speed I, the pump is set to run on the minimum curve under all operating conditions. See fig. 20.

8. Fault finding the product

WARNING

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.

WARNING

Pressurised system

Minor or moderate personal injury

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

High-torque start

If the shaft is blocked and you cannot start the pump, the display indicates the alarm "E 1 - "- -"", with a delay of 20 minutes.

The pump attempts to restart until the pump is powered off.

During the start attempts, the pump vibrates due to the high-torque load.

Fault	Operating panel	Cause	Remedy
1. The pump does not run.	Light off.	a) A fuse in the installation is blown.	Replace the fuse.
		b) The current-operated or voltage-operated circuit breaker has tripped.	Cut in the circuit breaker.
		c) The pump is defective.	Replace the pump.
	Changes between "- -" and "E 1".	a) The rotor is blocked.	Remove the impurities.
	Changes between "- -" and "E 2".	a) Insufficient supply voltage.	Make sure that the supply voltage falls within the specified range.
	Changes between "- -" and "E 3".	a) Electrical fault.	Replace the pump.
2. Noise in the system.	No warning is indicated on the display.	a) Air in the system.	Vent the system.
		b) The flow rate is too high.	Reduce the suction head.
3. Noise in the pump.	No warning is indicated on the display.	a) Air in the pump.	Let the pump run. The pump vents itself over time. See section *5.3 Venting the pump*.
		b) The inlet pressure is too low.	Increase the inlet pressure, or make sure that the air volume in the expansion tank is sufficient, if installed.
4. Insufficient heat.	No warning is indicated on the display.	a) The pump performance is too low.	Change the pump setting to increase the pump performance. See *7.4.4 Changing from recommended to alternative pump setting*.

9. Technical data

9.1 Data and operating conditions

Supply voltage	1 x 230 V ± 10 %, 50 or 60 Hz, PE	
Motor protection	The pump requires no external motor protection.	
Enclosure class	IPX4D	
Insulation class	F	
Relative humidity	Maximum 95 % RH	
System pressure	Maximum 1.0 MPa, 10 bar, 102 m head	
Inlet pressure	**Liquid temperature**	**Minimum inlet pressure**
	≤ 75 °C	0.005 MPa, 0.05 bar, 0.5 m head
	90 °C	0.028 MPa, 0.28 bar, 2.8 m head
	110 °C	0.108 MPa, 1.08 bar, 10.8 m head
EMC (electromagnetic compatibility)	EMC Directive (2014/30/EU). Standards used: EN 55014-1:2006/A1:2009/A2:2011 EN 55014-2:2015 EN 61000-3-2:2014 EN 61000-3-3:2013	
Sound-pressure level	The sound-pressure level of the pump is lower than 43 dB(A).	
Ambient temperature	0-40 °C	
Temperature class	TF110 to EN 60335-2-51	
Surface temperature	The maximum surface temperature will not exceed 125 °C.	
Liquid temperature	2-110 °C	
Specific EEI values	EEI ≤ 0.20	

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

Ambient temperature [°C]	**Liquid temperature**	
	Min. [°C]	**Max. [°C]**
0	2	110
10	10	110
20	20	110
30	30	110
35	35	90
40	40	70

The pump can, however, run at ambient temperatures higher than the liquid temperature if the plug connection in the pump head is pointing downwards.

9.2 Dimensions

Dimensional sketches and table of dimensions.

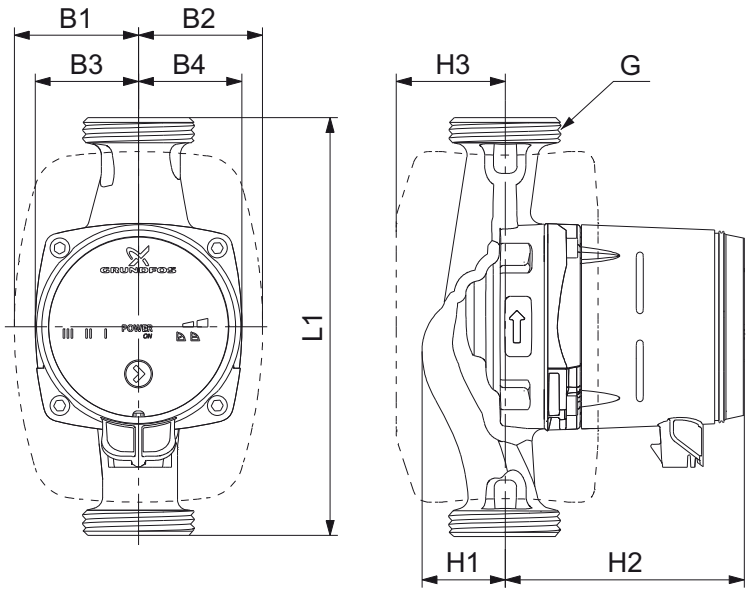

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Fig. 21 ALPHA2 L

Pump type	Dimensions								
	L1	B1	B2	B3	B4	H1	H2	H3	G
ALPHA1 25-40	180	54	54	44	44	36	104	47	G1 1/2
ALPHA1 25-60	130	54	54	44	44	36	104	47	G1 1/2
ALPHA1 25-60	180	54	54	44	44	36	104	47	G1 1/2
ALPHA1 32-40	180	54	54	44	44	36	104	47	G2
ALPHA1 32-60	180	54	54	44	44	36	104	47	G2

10. Performance curves

10.1 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.

The P1 value corresponds to the value that you can read from the pump display. See fig. 22.

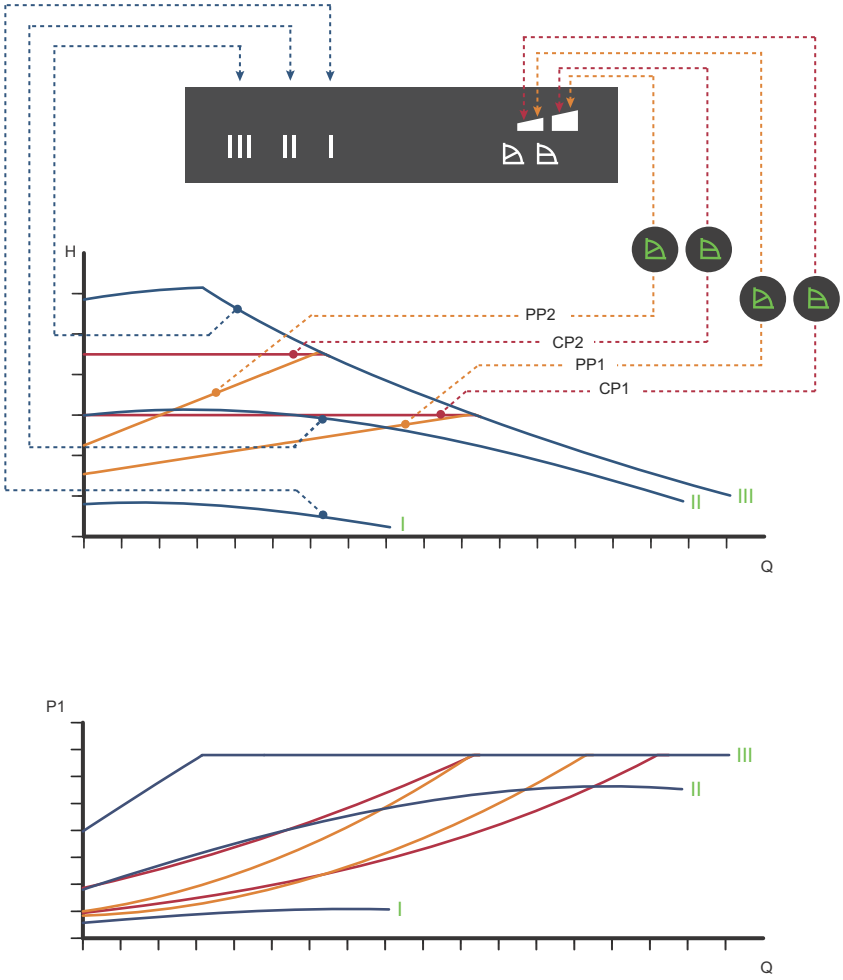

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Fig. 22 Performance curves in relation to pump setting

Setting	Pump curve
PP1	Lowest proportional-pressure curve
PP2	Highest proportional-pressure curve
CP1	Lowest constant-pressure curve
CP2	Highest constant-pressure curve
III	Constant curve or constant speed III
II	Constant curve or constant speed II
I	Constant curve or constant speed I

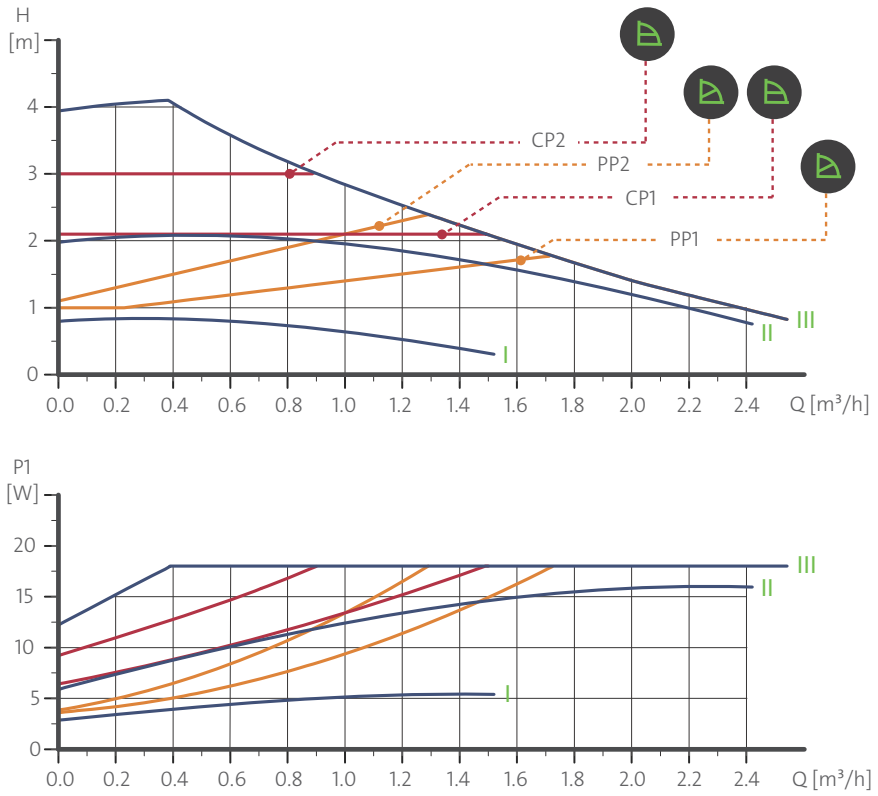
For further information about pump settings, see section *7. Control functions*

10.2 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 983.2 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 0.474 mm^2/s (0.474 cSt).
- Curves are obtained according to EN 16297.

10.3 Performance curves, ALPHA2 L, XX-40



TM07 7698 4420

Fig. 23 ALPHA2 L, XX-40

Setting	P1 [W]	$I_{1/1}$ [A]
Min.	3	0.04
Max.	18	0.18

10.4 Performance curves, ALPHA2 L, XX-60

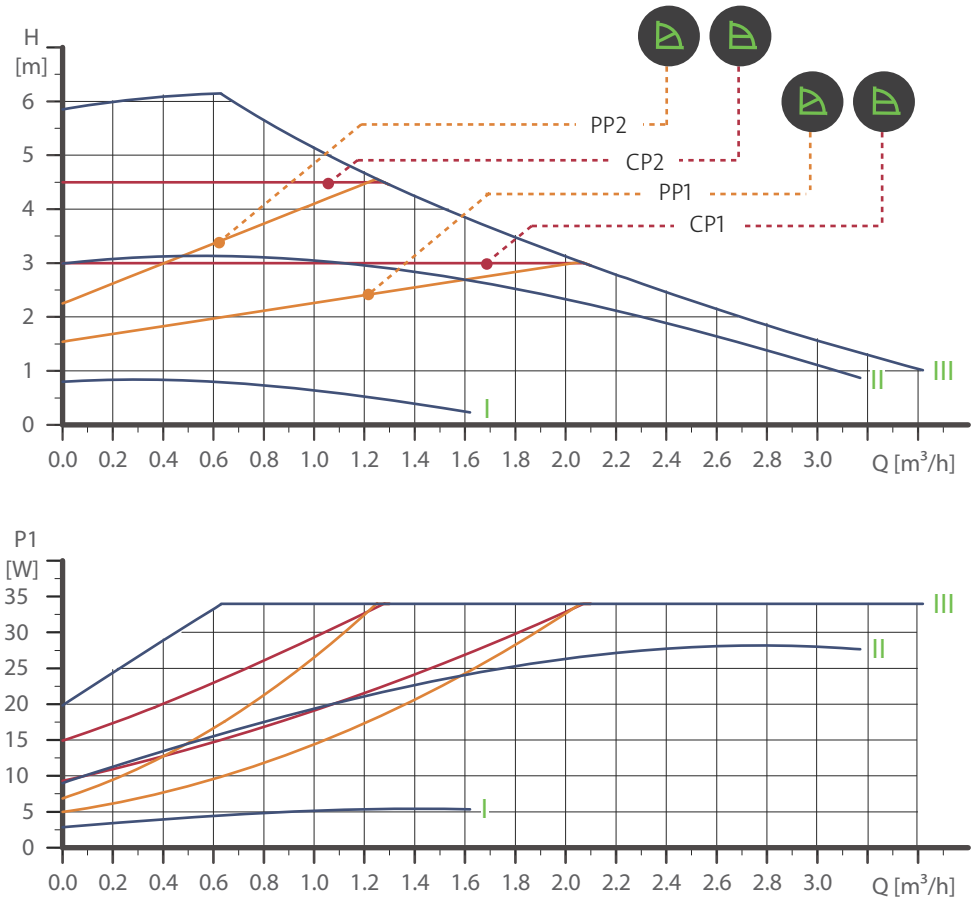


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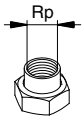
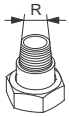
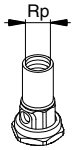
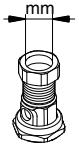
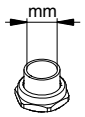
Fig. 24 ALPHA2 L, XX-60

Setting	P1 [W]	$I_{1/1}$ [A]
Min.	3	0.04
Max.	34	0.32

11. Accessories

11.1 Unions

Product numbers, unions

ALPHA1	Connection	Union nut with internal threads			Union nut with external threads		Ball valve with internal threads			Ball valve with compression fitting		Union nut with soldering fitting			
															
		3/4	1	1 1/4	1	1 1/4	3/4	1	1 1/4	Ø22	Ø28	Ø18	Ø22	Ø28	Ø42
25-xx	G 1 1/2	529921	**529922**	529821	529925	529924									
25-xx N	G 1 1/2	529971	**529972**				519805	519806	519807	519808	519809	529977	529978	529979	
32-xx	G 2		509921	**509922**											
32-xx N	G 2			**509971**											529995

Note: The product numbers are always for one complete set, incl. gaskets.

The product numbers for the very standard sizes are 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 10226-2 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. 25.

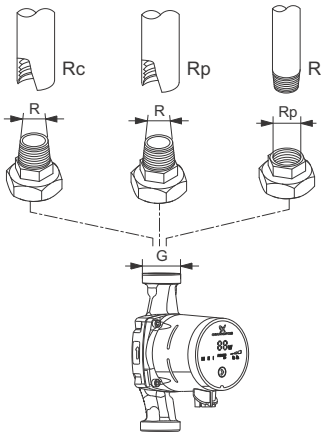


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Fig. 25 Examples of thread types and combinations

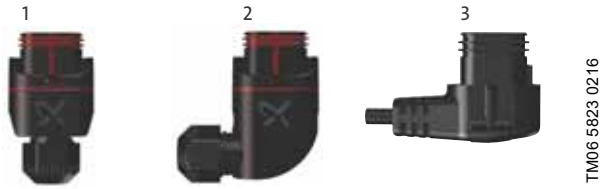
11.2 Insulating shells

The pump is supplied with two 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. See fig. 26.

Pump type	Product number
ALPHA2 L XX-XX 130	98091786
ALPHA2 L XX-XX 180	98091787

Fig. 26 Insulating shells

11.3 ALPHA plugs



Pos.	Description	Product number
1	ALPHA straight plug, standard plug connector, complete	98284561
2	ALPHA angle plug, standard angle plug connection, complete	98610291
3	ALPHA plug, 90 ° bend to the left, including 4 m cable	96884669
*	ALPHA plug, 90 ° bend to the left, including 1 m cable and integrated NTC protection resistor	97844632

* This special cable with an active built-in NTC protection circuit reduces possible inrush currents. To be used in case of, for instance, poor quality of relay components that are sensitive to inrush current.

12. Disposing of the product

WARNING

Magnetic field

Death or serious personal injury

- Persons with pacemakers dismantling this product must exercise caution when handling the magnetic materials embedded in the rotor.

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

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

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

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

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