

ALPHA1 model D

Circulator pump



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1. Product introduction

Product description

ALPHA1 is a high-efficiency circulator pump fitted with an electronically commutated motor and designed for circulating liquids in heating and air conditioning systems.

ALPHA1 is equipped with intelligent controls and offers three control modes:

- constant pressure
- proportional pressure
- constant curve.

Each mode has three adjustable speed settings.

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 symbols on the pump operating panel.

Applications

The product is 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 system¹⁾
- fan coil.

¹⁾ Mix of radiators, underfloor heating and/or domestic hot water cylinder.

Features and benefits

ALPHA1 has the following features and benefits:

Feature	Benefits
Robust start	The non-magnetic shaft and bearings reduce the risk of blockages from dirt or magnetite, while the bearing system helps prevent 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.
Dry-running protection	The dry-running protection feature prevents the pump from operating without water, protecting the circulator pump.
Ceramic shaft and bearings	Ceramic shafts 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.
Installer plug	The installer plug features a toolless design, simplifying the installation process.
Ambient temperature	At 55 °C the pump is designed to ensure optimal performance and longevity when integrated in heating appliances.
Acoustic noise	At 25 db(A) the pump guarantees silent operation, which enhances the comfort of living and working spaces.

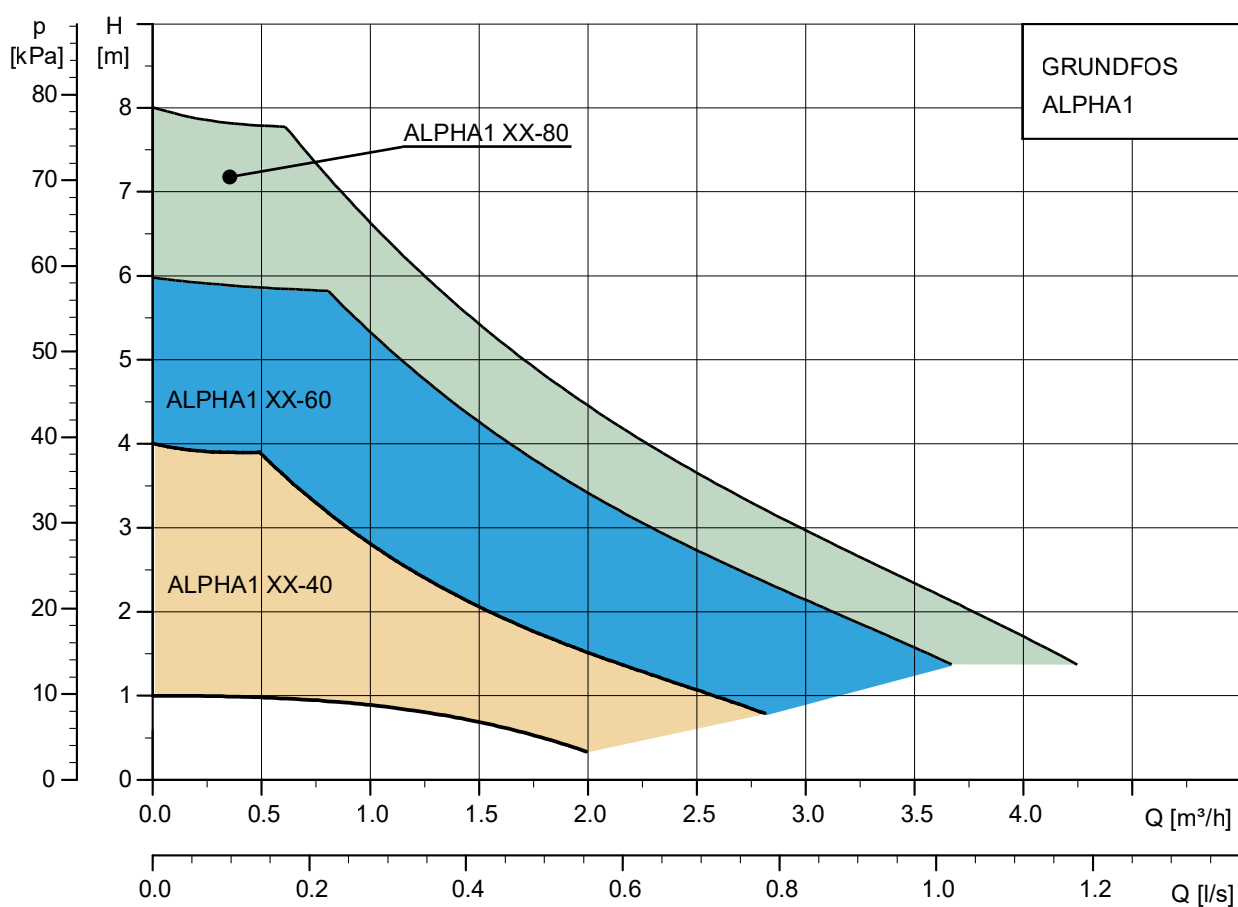
Type key

Example: ALPHA1 32-40 180 220-240 V

Code	Explanation	Designation
ALPHA1	Grundfos circulator pump	Pump type
32	Nominal diameter (DN) of inlet and outlet ports	Connections
40	Maximum head [dm]	
130	Port-to-port length [mm]	
220-240 V	Voltage	

Performance range

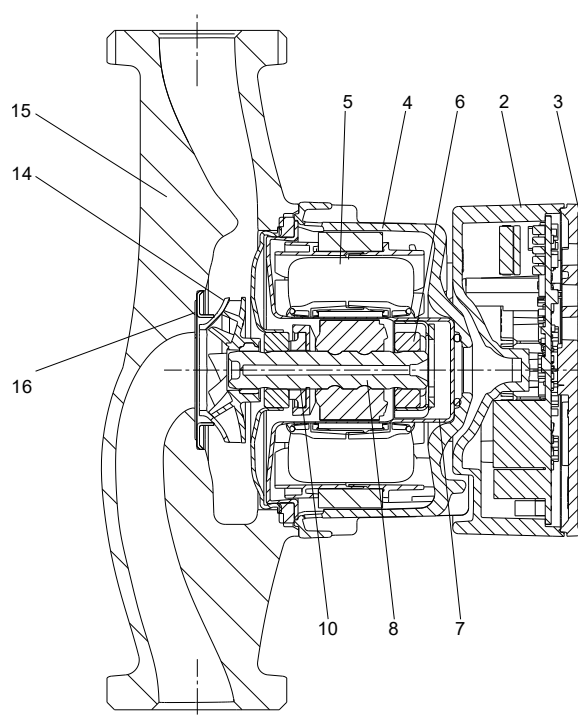
A performance curve is crucial for selecting the right pump. It shows the head (pressure) that a pump can produce at different flow rates. The highest point on the Y-axis indicates the shut-off pressure (maximum head at zero flow), while the highest point on the X-axis shows the maximum flow at zero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



Performance curves, ALPHA1

2. Construction

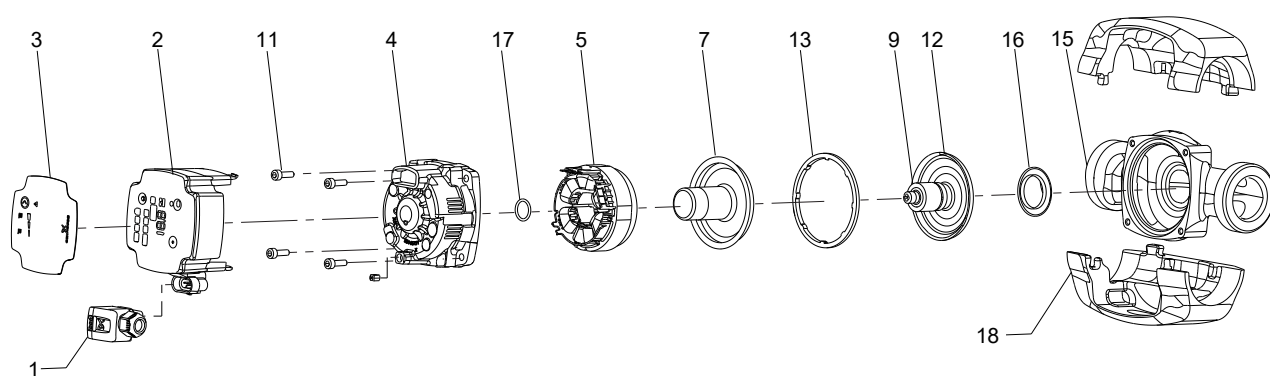
Sectional view



TM089299

ALPHA1

Exploded view



TM089291

ALPHA1

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	
9	Rotor	NdFeB or injection moulded ferrite	
	Rotor tube	Stainless steel	1.4521
	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
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.

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
Temperature class	TF110 to EN 60335-2-51
Inrush current	< 4 A
Insulation class	F
Relative humidity	Max. 95 %
Max. outlet pressure	1.0 MPa (10 bar)
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, G 2

Product size

	Max. flow rate (Q) [m ³ /h]	Max. head (H) [m]
XX-40	2.7	4.0
XX-60	3.5	6.0
XX-80	3.9	8.0

Power usage (approximate)

	Min.	Max.
XX-40	3 W	27 W
XX-60	4 W	45 W
XX-80	4 W	60 W

Liquid temperature

	Max. ambient temperature 55 °C	Max. ambient temperature 70 °C
XX-40	2 to 110 °C	2 to 75 °C
XX-60	-10 to +110 °C	-10 to +75 °C
XX-80	-10 to +110 °C	-10 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 mm²/s (15 cSt).

Dry-running protection

The dry-running protection protects the pump against dry running during normal operation.

Normal operation

If dry running is detected during normal operation, the pump retries several times. If dry running continues, the pump stops and the warning and alarm symbol on the display is flashing red four times.

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.

4. Installation and operation

Mechanical installation



Make sure the pump orientation is correct.



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

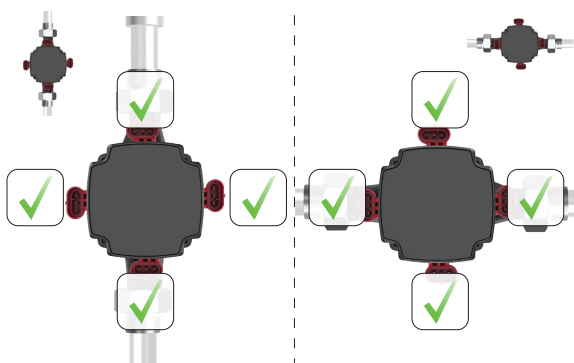


The arrows on the pump housing indicate the flow direction through the pump.

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.

Control box position

The control box can be turned in steps of 90° .



TM087894

Pos.	Description	Wire colour
	Earth	Yellow/green
N	Neutral	Blue

Control box connections

All control boxes have one power inlet on the side.



TM089772

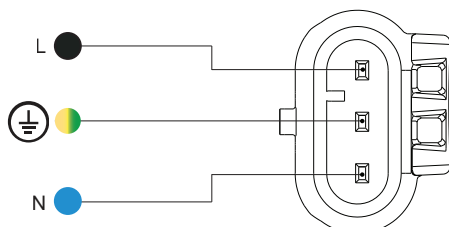
Pos.	Description
A	Power inlet (superseal)

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



TM089308

Power plug

Pos.	Description	Wire colour
L	Phase	Black or brown

Operating panel

LEDs and buttons on the pump display.



TMO87892

ALPHA1

Pos.	Description
1	Control mode The LED shows the operating mode of the product.
2	Settings for the selected control mode Use the Selection 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.
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.

Overview of LEDs

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

Factory setting

The pump is factory set to proportional pressure, setting II.

Active light fields	Description
	Proportional-pressure mode
	Constant-pressure mode
	Setting I
	Setting II
	Setting III

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

5. Control and communication

Control modes

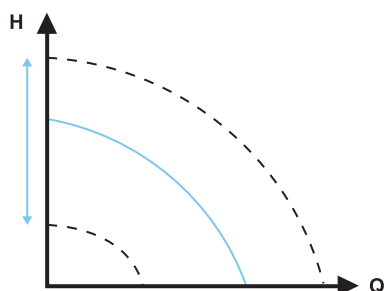
ALPHA1 can be set to the following control modes:

- constant curve
- proportional pressure
- constant pressure

All control modes can be set to pump setting I, II, III and only 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.



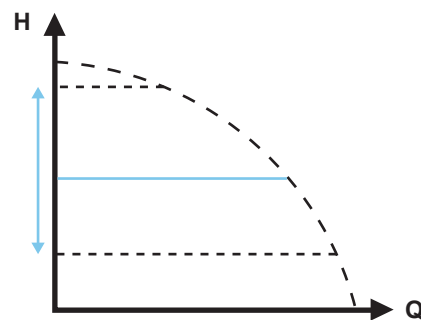
TM071005

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.



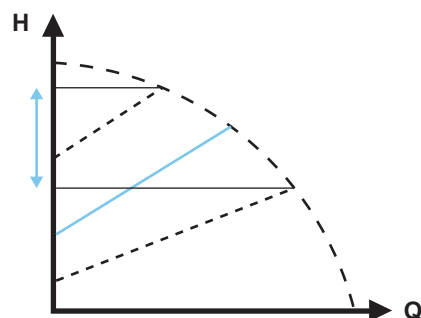
TM083818

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.



TM071003

Proportional-pressure settings

Setting of the product

The operating panel can be used for the following:

- Selecting proportional pressure (radiator system), constant pressure (underfloor heating system) or constant curve (speed).
- Selecting pump setting (I, II, III) for the three control modes available on the operating panel.

6. 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.

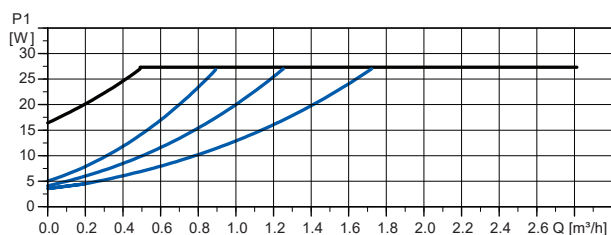
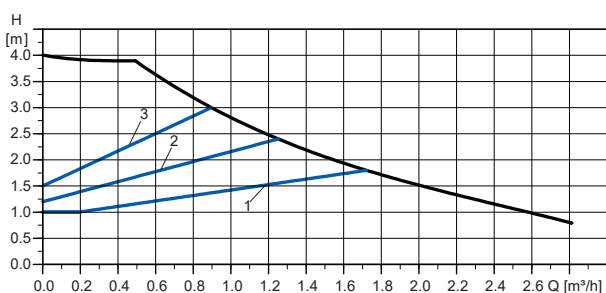
The power curve shows the pump power consumption in watt at a given performance curve.

Curve conditions

The guidelines below apply to the performance curves:

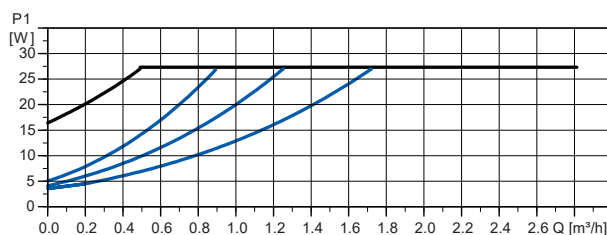
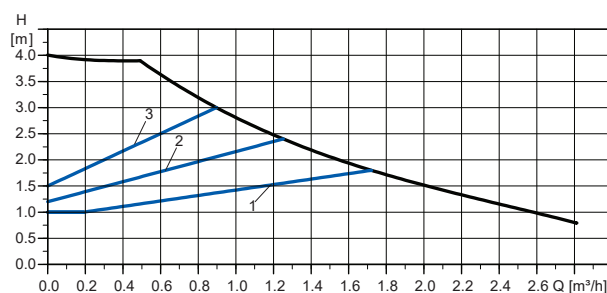
- Test liquid: airless water.
- The curves apply to a density of 998.2 kg/m^3 and a liquid temperature of $20 \text{ }^\circ\text{C}$.
- Curves are obtained according to EN 16297-1.
- Maximum curves are limited by speed and power
- The EEI values are obtained according to EN 16297 part 2.

ALPHA1 XX-40



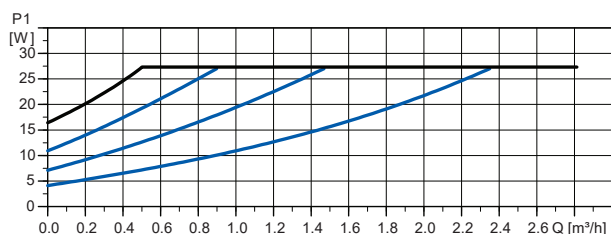
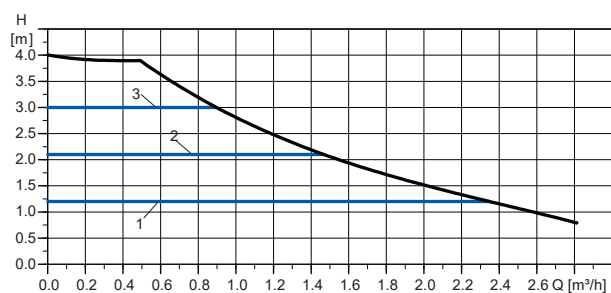
TM090151

Proportional pressure



TM090151

Constant curve



TM090152

Constant pressure

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

EEI ≤ 0.20 Part 3

 $P_{L,avg} \leq 11.1 \text{ W}$

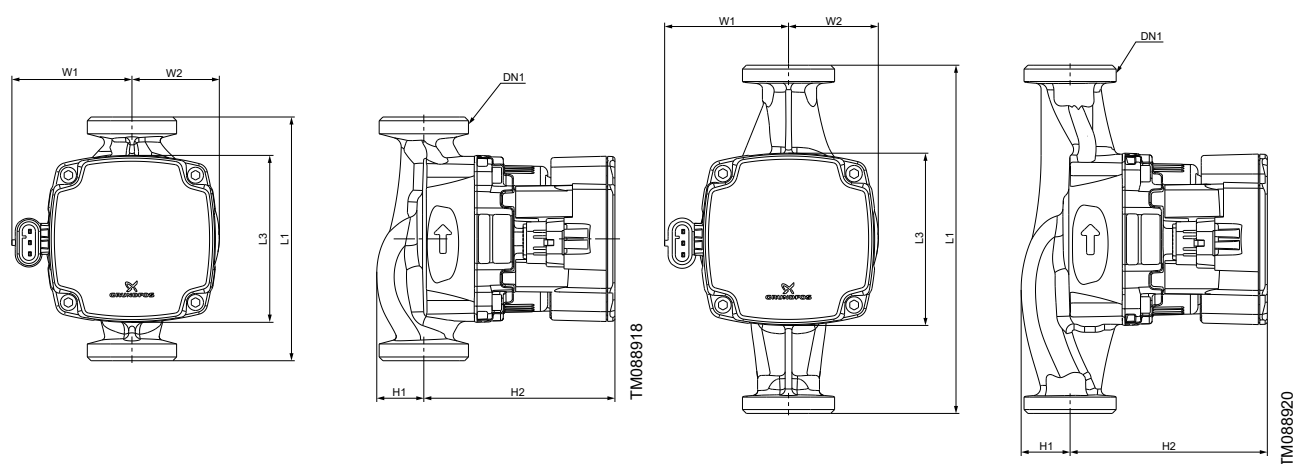
Electrical data, 1 × 220 - 240 V, 50 Hz

Speed	P_1 [W]	$I_{1/I}$ [A]
Min.	4	0.06
Max.	27	0.3

Technical data

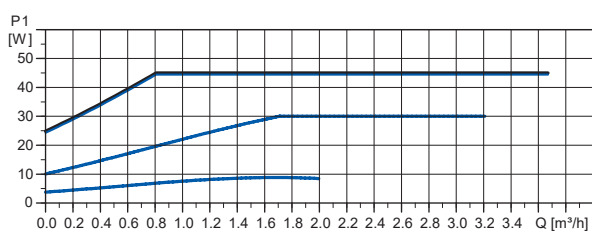
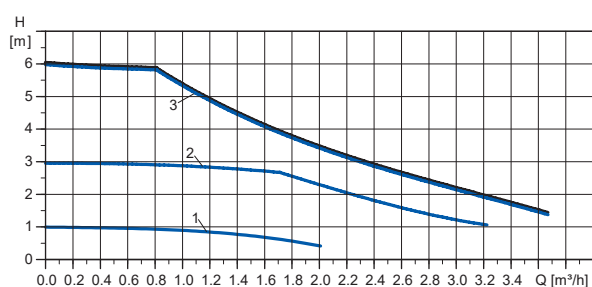
System pressure	Max. 1.0 MPa (10 bar)	Enclosure class	IP44
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	Motor protection	No external protection needed
Liquid temperature	2-110 °C (TF110)	Approval and marking	VDE, CE

Dimensions

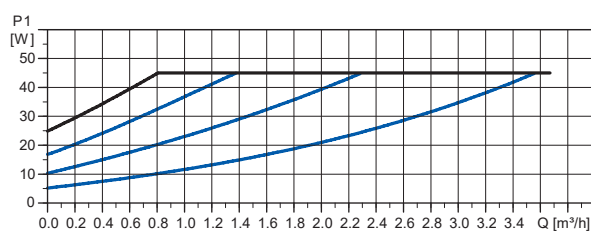
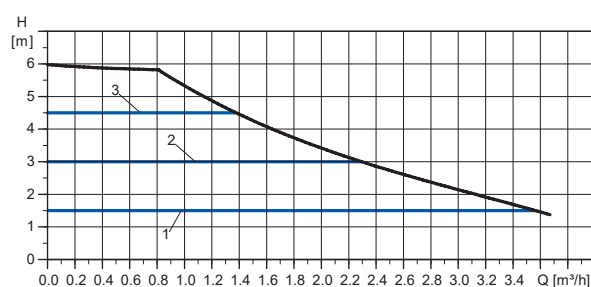


Pump type	Dimensions [mm]						DN1	Weight [kg]
	L1	L3	W1	W2	H1	H2		
ALPHA1 25-40 130	130	89	64	47	25	102	G 1 1/2	1.84
ALPHA1 25-40 180	180	89	64	47	25	102	G 1 1/2	1.93
ALPHA1 32-40 180	180	89	64	48	30	102	G 2	2.05

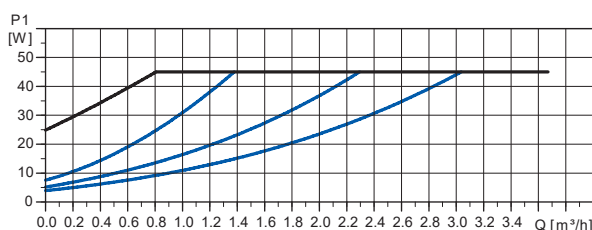
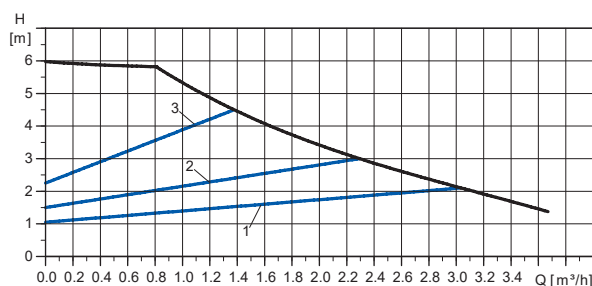
ALPHA1 XX-60



TM090156



TM090155



TM090154

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

EEI ≤ 0.20 Part 3

 $P_{L,avg} \leq 18.7 \text{ W}$

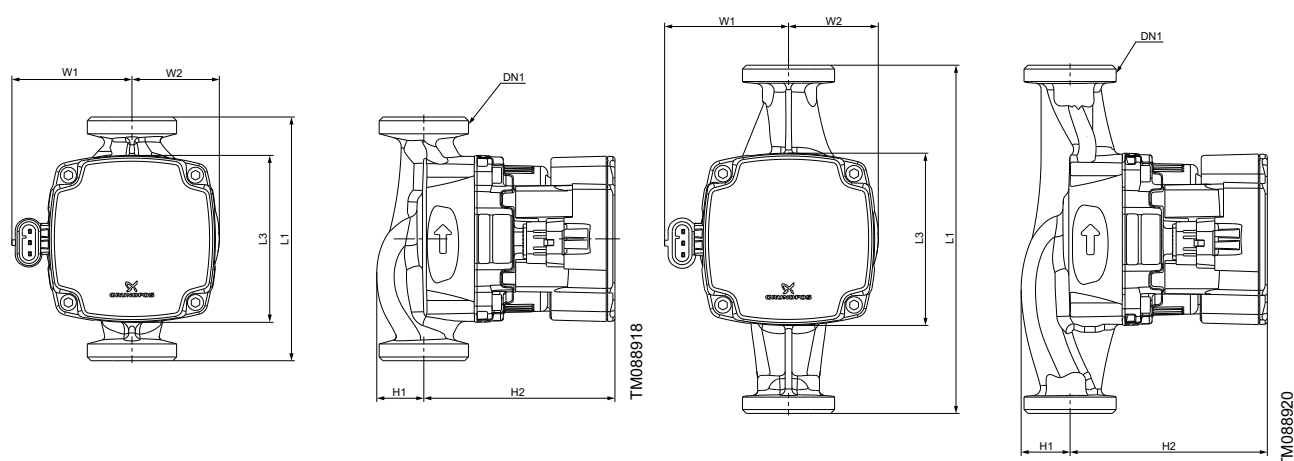
Electrical data, 1 × 220 - 240 V, 50 Hz2

- 240Speed	P ₁ [W]	I _{1/1} [A]
Min.	4	0.06
Max.	45	0.45

Technical data

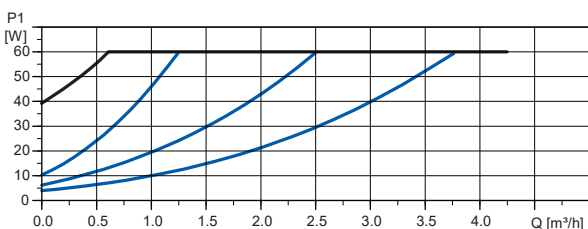
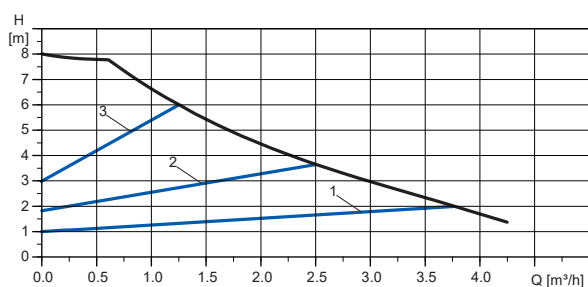
System pressure	Max. 1.0 MPa (10 bar)	Enclosure class	IP44
Min. inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature	Motor protection	No external protection needed
Liquid temperature	-10 to +110 °C (TF110)	Approval and marking	VDE, CE

Dimensions

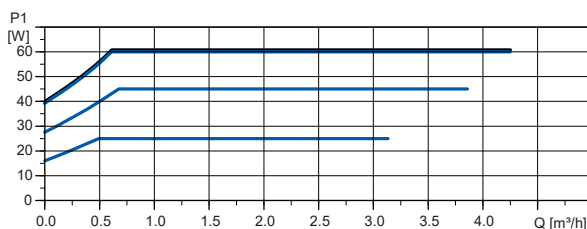
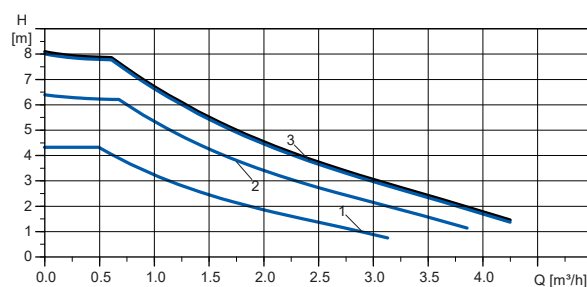


Pump type	Dimensions [mm]						DN1	Weight [kg]
	L1	L3	W1	W2	H1	H2		
ALPHA1 25-60 130	130	89	64	47	25	102	G 1 1/2	1.86
ALPHA1 25-60 180	180	89	64	47	25	102	G 1 1/2	1.97
ALPHA1 32-60 180	180	89	64	48	30	102	G 2	2.10

ALPHA1 XX-80



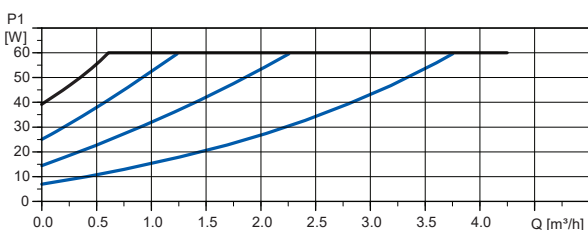
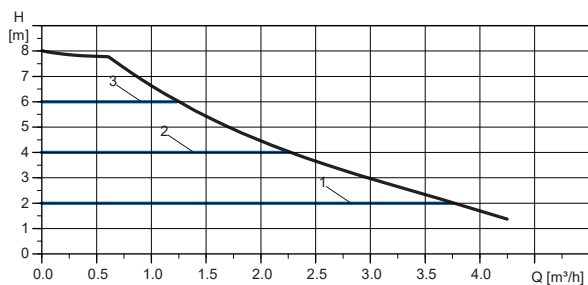
TM090165



Constant curve

Proportional pressure

Constant curve



TM090166

Constant pressure

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

EEI ≤ 0.20 Part 3

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

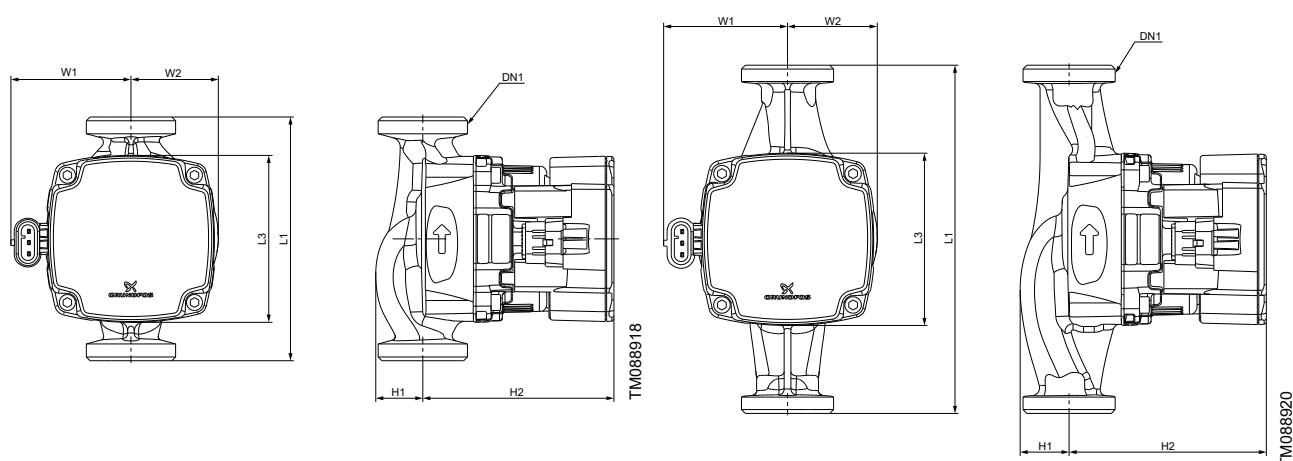
Electrical data, 1 × 220 - 240 V, 50 Hz

Speed	P ₁ [W]	I _{1/I} [A]
Min.	4	0.06
Max.	60	0.6

Technical data

System pressure	Max. 1.0 MPa (10 bar)	Enclosure class	IP44
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	VDE, CE

Dimensions



Pump type	Dimensions [mm]						DN1	Weight [kg]
	L1	L3	W1	W2	H1	H2		
ALPHA1 25-80 130	130	89	64	47	25	102	G 1 1/2	1.86
ALPHA1 25-80 180	180	89	64	47	25	102	G 1 1/2	1.97
ALPHA1 32-80 180	180	89	64	48	30	102	G 2	2.10

7. Accessories

Cables and plugs

Power supply connection

The installer plug is both supplied with the pump and available as a spare part.

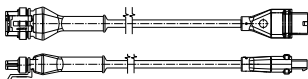
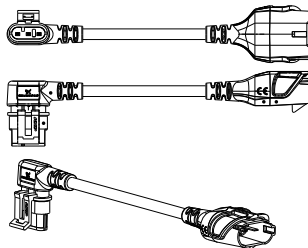
Power cable adapters are available as accessories.



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

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.

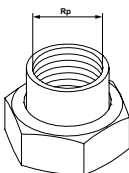
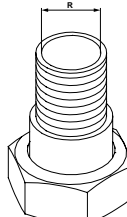
Pump type	Product number
ALPHA1	93035646



TM089764

Insulating shells

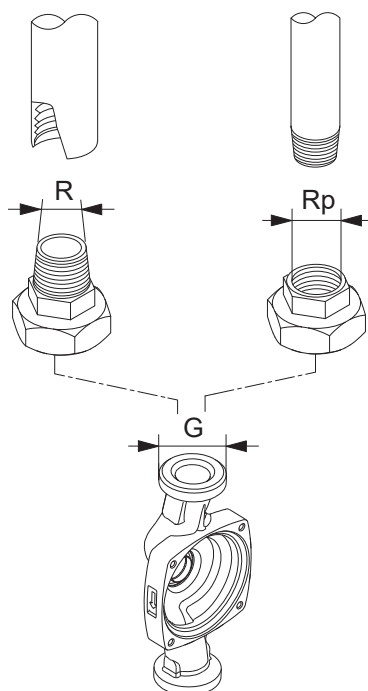
Unions and valve kits

		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.



TN077425

G-threads and R-threads

8. Product numbers

ALPHA1

Pump type	Port-to-port length [mm]	Connection	Product number
ALPHA1 25-40	130	G 1 1/2	93094214
ALPHA1 25-40	180	G 1 1/2	93074166
ALPHA1 25-60	180	G 1 1/2	93074163
ALPHA1 25-60	130	G 1 1/2	93074164
ALPHA1 25-80	130	G 1 1/2	93074176
ALPHA1 25-80	180	G 1 1/2	93074177
ALPHA1 32-40	180	G 2	93074165
ALPHA1 32-60	180	G 2	93074162
ALPHA1 32-80	180	G 2	93074174

9. Document quality feedback

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10. Grundfos Product Center

Online search and sizing tool to help you make the right choice.

From the international view, you can select your specific country to view the product range available to you.

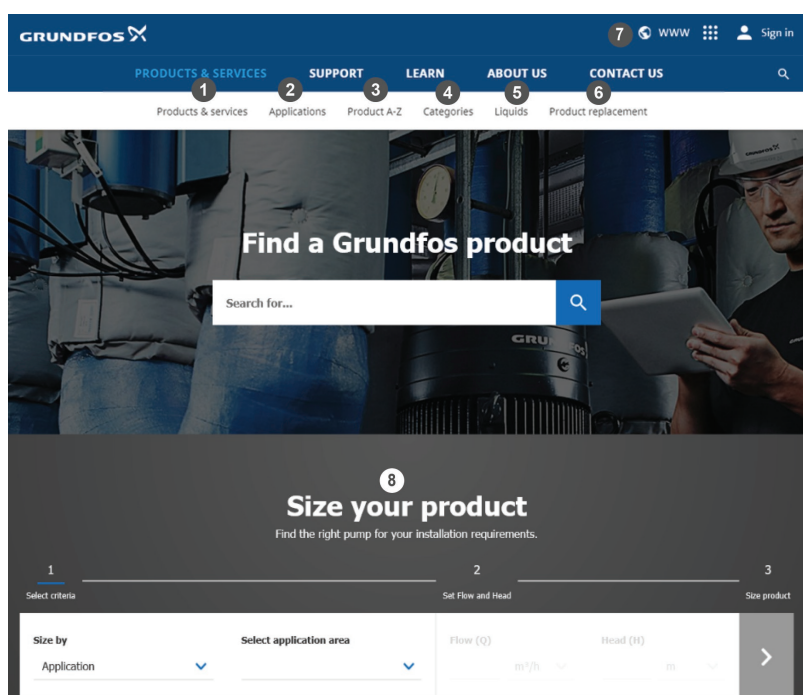
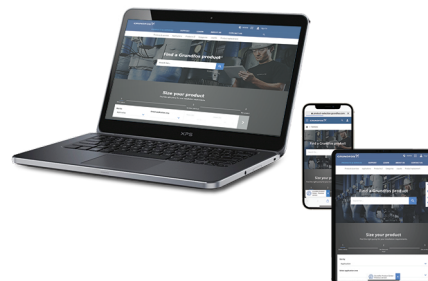
International view: <http://product-selection.grundfos.com>

All the information you need in one place

Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items - including complete projects - right on the main page.

Downloads

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



When you select your country, you will see the menus below. Note that some menus may not be available depending on the country.

Example: <https://product-selection.grundfos.com/uk>

Pos.	Description
1	Products & services enables you to find products and documents by typing a product number or name into the search field.
2	Applications enables you to choose an application to see how Grundfos can help you design and optimise your system.
3	Products A-Z enables you to look through a list of all the Grundfos products.
4	Categories enables you to look for a product category.
5	Liquids enables you to find pumps designed for aggressive, flammable or other special liquids.
6	Product replacement enables you to find a suitable replacement.
7	WWW enables you to select the country, which changes the language, the available product range and the structure of the website.
8	Sizing enables you to size a product based on your application and operating conditions.

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