# ALPHA1

Model B

## Circulator pumps

50/60 Hz

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# 1. Product data

TM06 4400 2315

Grundfos ALPHA1 model B is a complete range of circulator pumps with the following features:

- Integrated differential-pressure control enabling adjustment of pump performance to the actual system requirements.
- High-torque start.
- Display showing the actual power consumption in watt.
- Motor based on permanent-magnet rotor and compact-stator technology.

ALPHA1 is energy-optimised and complies with the ErP Directive, Commission Regulation (EC) No 641/2009 and Commission Regulation (EU) No 622/2012 which has been effective as from 1 January 2013.

**ALPHA1 offers a host of advantages:**

| | |
|---|---|
| **Energy savings** | Automatic control of the differential pressure. |
| **Flexibility** | Suitable for installation in existing systems. |
| **Automatic deblocking** | Continuously restarting with the highest possible torque. |
| **Comfort** | Low-noise operation. |
| **Safety** | Built-in electrical and thermal protection of the pump. |
| **User friendliness** | Simple setting and operation. |
| **Alarms and warnings** | Alarms indicated in the display. |

## Type key

| **Example** | **ALPHA1** | **25 - 40** | **180** |
|---|---|---|---|
| Pump range | | | |
| Nominal diameter (DN) of inlet and outlet ports [mm] (15 = G 1, 25 = G 1 1/2, 32 = G 2) | | | |
| Maximum head [dm] | | | |
| Cast-iron pump housing | | | |
| N: Stainless-steel pump housing | | | |
| Port-to-port length [mm] | | | |

## Model type

This data booklet covers all models. The model type is stated on the nameplate. See fig. 1.

TM06 9103 4317

**Fig. 1** Model type on the nameplate

## Performance range

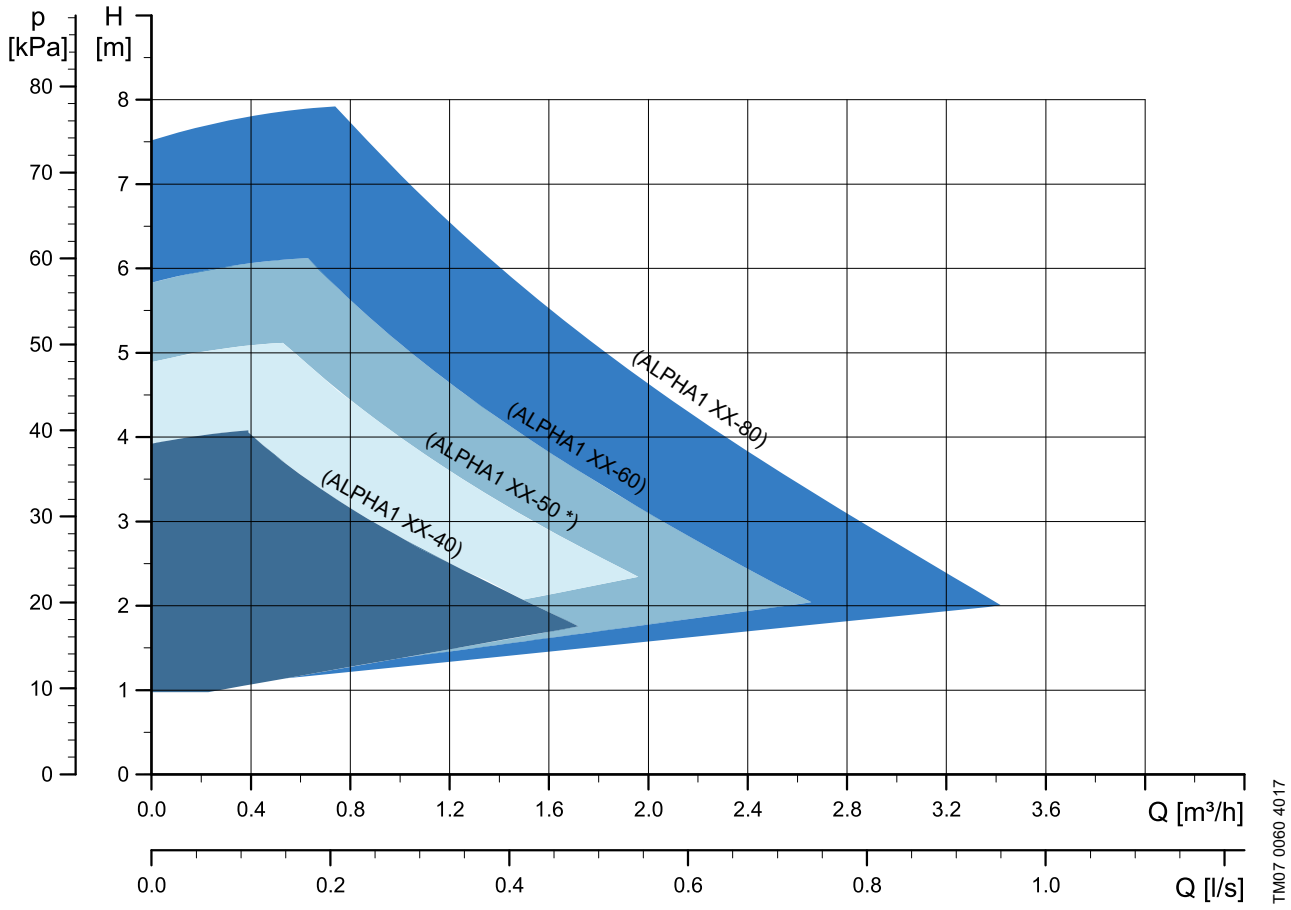



**Fig. 2** Performance range, ALPHA1

## Applications

ALPHA1 is designed for circulating liquids in heating systems. Pumps with stainless-steel pump housing can also be used in domestic hot-water systems.

ALPHA1 is suitable for systems with constant or variable flows where it is desirable to optimise the pump duty point. You can select the appropriate pump type for a heating system according to the following guidelines:

| Range | Radiator system (Δt 20 °C) | Underfloor heating (Δt 5 °C) | Pump type |
|---|---|---|---|
| [$m^2$] | [$m^3$/h] | [$m^3$/h] | ALPHA1 |
| 80-120 | 0.4 | 1.5 | XX-40 |
| 120-160 | 0.5 | 2.0 | XX-50* |
| 160-200 | 0.6 | 2.5 | XX-60 |
| 200-300 | 0.8 | 3.5 | XX-80 |

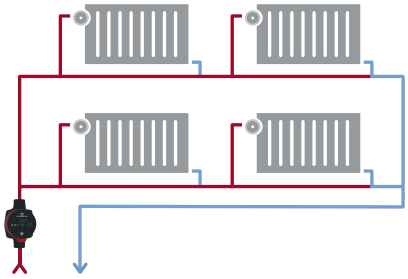
* Not available in all countries.

**Note:** The data are approximate values. Grundfos cannot be held responsible for wrong sizing of pumps in heating systems.

ALPHA1 is especially suitable for the following:

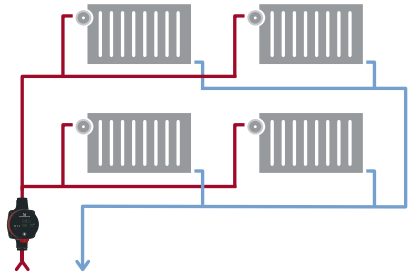
- Installation in existing systems where the differential pressure of the pump is too high during periods of reduced flow demand.
- Installation in new systems for fully automatic adjustment of the performance to flow demands without the use of bypass valves or similar expensive components.

### Examples of systems



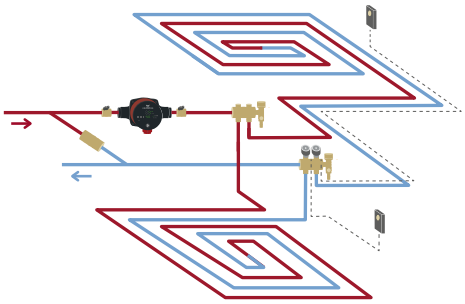
TM06 8563 1417

**Fig. 3** One-pipe heating system



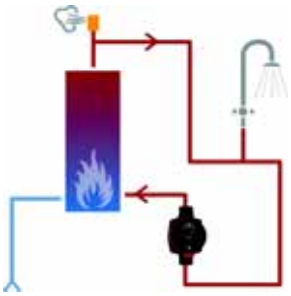
TM06 8561 1417

**Fig. 4** Two-pipe heating system



TM06 8560 1417

**Fig. 5** Underfloor heating system



TM06 8562 1417

**Fig. 6** Domestic hot-water recirculation system

# 2. Construction

ALPHA1 is designed for long and trouble-free operation as a canned-rotor type, i.e. the pump and motor form an integral unit without shaft seal, with only one gasket for sealing. The bearings are lubricated by the pumped liquid. These constructions ensure maintenance-free operation.

The pump is characterised by the following:

- Permanent-magnet rotor and compact-stator motor which contributes 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 or stainless-steel pump housing which contributes to flexibility. Compact design featuring a pump head with integrated control box and operating panel which fits into most common installations.

## Sectional drawing

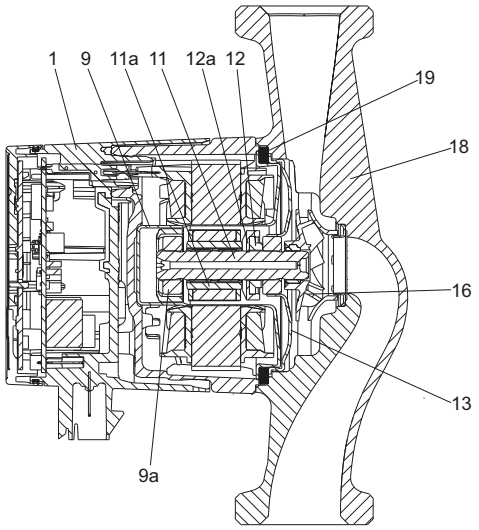



**Fig. 7** Position numbers

## Material specification

| Pos. | Description | Material | EN/DIN | AISI/ASTM |
|---|---|---|---|---|
| 1 | Controller complete | Composite, PC | | |
| 9 | Rotor can | Stainless steel | 1.4401 | 316 |
| 9a | Radial bearing | Ceramics | | |
| 11 | Shaft | Ceramics | | |
| 11a | Rotor cladding | Stainless steel | 1.4401 | 316 |
| 12 | Thrust bearing | Carbon | | |
| 12a | Thrust bearing retainer | EPDM rubber | | |
| 13 | Bearing plate | Stainless steel | 1.4301 | 304 |
| 16 | Impeller | Composite, PES | | |
| 18 | Pump housing | Cast iron | EN-GJL-150 | A48-150B |
| | | Stainless steel | 1.4308 | 351 CF8 |
| 19 | Gasket | EPDM rubber | | |

## Motor and control box

The motor is a 4-pole synchronous permanent-magnet motor.

The pump controller is incorporated in the control box, which is fitted to the stator housing and connected to the stator via a terminal plug.

The control box has an integrated operating panel with a push-button and a 2-digit 7-segment display. See fig. 8.

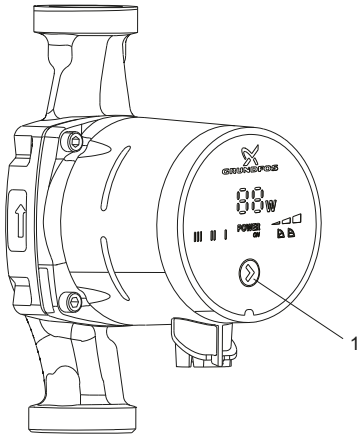



**Fig. 8** Position of push-buttons

The display is on when you have switched on the power supply. The display shows the actual pump power consumption in watt (integer)

Figures 9 and 10 show the possible control box positions in heating systems as well as in air-conditioning and cold-water systems.

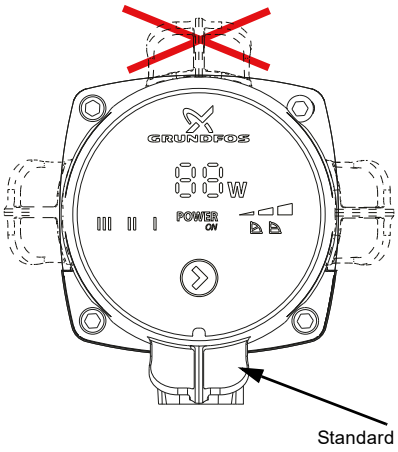



**Fig. 9** Possible control box positions, heating systems

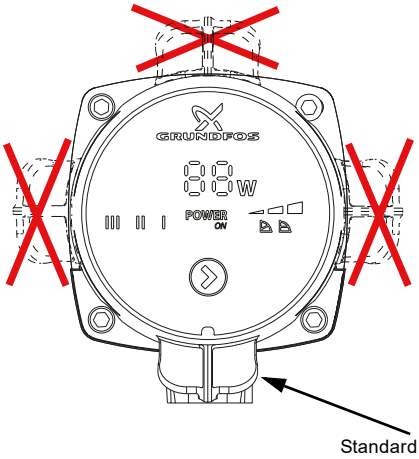



**Fig. 10** Possible control box position, air-conditioning and cold-water systems

The plug incorporates cable relief and a locking function for securing the connection of the power cable. See also page 28.

**Fig. 11** ALPHA plugs

| Pos. | Description |
|---|---|
| 1 | ALPHA plug with cable gland, standard plug connector, complete |
| 2 | ALPHA plug angled 90 ° left, with cable gland |
| 3 | ALPHA plug angled 90 ° left, including 4 m cable |

# 3. Operation

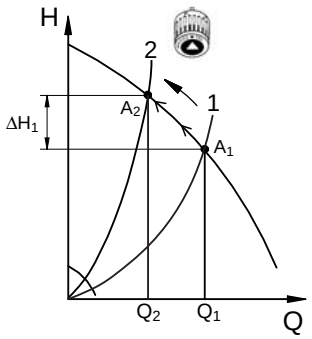
## Advantages of ALPHA1 pump control

In ALPHA1, control is effected by adapting the differential pressure to the flow (proportional-pressure and constant-pressure control).

Contrary to an uncontrolled pump, the proportional-pressure-controlled ALPHA1 reduces the differential pressure as a result of falling heat demand.

If the heat demand falls, for instance due to solar radiation, the thermostatic radiator valves will close, and, for the uncontrolled pump, the flow resistance of the system will rise, for instance from $A_1$ to $A_2$. See fig. 12.

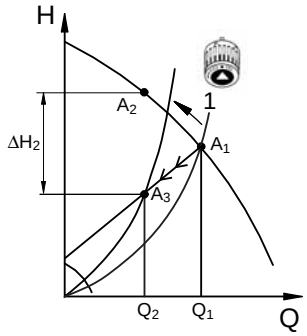
In a heating system with an uncontrolled pump, this situation will cause a pressure rise in the system by $\Delta H_1$.




TM01 9119 5002

**Fig. 12** Uncontrolled pump

In a system with an ALPHA1 pump set to proportional-pressure control, the differential pressure will be reduced by $\Delta H_2$ and result in reduced energy consumption. See fig. 13.




TM01 9120 5002

**Fig. 13** Pump in proportional-pressure control mode

## Overview of control mode

| Application | Control mode |
|---|---|
| Floor heating | Constant pressure |
| Two-pipe system | Proportional pressure |
| Boiler-shunt | Speed 1, 2 or 3 |
| One-pipe system | Speed 1, 2 or 3 or constant pressure |
| Domestic hot water | Speed 1, 2 or 3 |

In case of a blocked rotor, the pump will start vibrating automatically with a frequency of around 3 Hz during startup. Any dirt deposits that might prevent the impeller from rotating will be broken up swiftly, and the pump will resume normal operation.

# Operating conditions

## Pumped liquids

The pump is suitable for the following liquids:

- clean, thin, non-aggressive and non-explosive liquids, not containing solid particles or fibres
- cooling liquids, not containing mineral oil
- softened water.

The kinematic viscosity of water is $\upsilon$ = 1 $mm^2/s$ (1 cSt) at 20 °C. If you use the pump 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 approximately 10 $mm^2/s$ (10 cSt) and a reduction of pump performance by approximately 15 %.

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

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

### Liquid temperature

ALPHA1 pumps: 2-110 °C.

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

| Ambient temperature [°C] | Liquid temperature |
|---|---|
| | Min. [°C] |
| 0 | 2 |
| 10 | 10 |
| 20 | 20 |
| 30 | 30 |
| 35 | 35 |
| 40 | 40 |

The ALPHA1 pump can, however, run at ambient temperatures higher than the liquid temperature if the plug connection in the pump head is pointing downwards. See figs 9 and 10.

### Ambient temperature

0-40 °C.

### Relative humidity

Maximum 95 %.

### System pressure

PN 10: Maximum 1.0 MPa (10 bar).

### Inlet pressure

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

| Liquid temperature | 75 °C | 90 °C | 110 °C |
|---|---|---|---|
| Inlet pressure | 0.5 m head | 2.8 m head | 10.8 m head |
| | 0.005 MPa | 0.028 MPa | 0.108 MPa |
| | 0.05 bar | 0.28 bar | 1.08 bar |

## Technical data

### Sound pressure level

≤ 43 dB(A).

### Electrical data

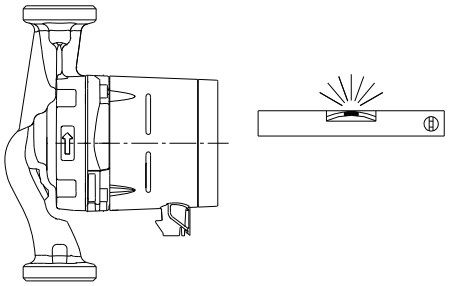
| | |
|---|---|
| **Supply voltage** | 1 x 230 V ± 10 %, 50/60 Hz, PE. |
| **Motor protection** | The pump requires no external motor protection. |
| **Enclosure class** | IPX4D. |
| **Insulation class** | F. |
| **Temperature class** | TF110 to EN 60335-2-51. |
| **EMC (electromagnetic compatibility)** | EMC Directive (2014/30/EU) |

## Installation and startup

### Installation

In most cases, the installation of ALPHA1 is reduced to the mechanical installation and connection to the power supply.

Always install the pump with horizontal motor shaft.



TM05 2522 0112

**Fig. 14** Horizontal motor shaft

### Startup

Do not start the pump until the system has been filled with liquid. Make sure that the required minimum inlet pressure is available at the pump inlet.

When using the pump for the first time, the system must be vented at the highest point.

The pump is self-venting through the system.

### Setting the pump

With the push-button on the control box, you can set the electronically controlled pump to the following:

- three proportional-pressure curves (PP1, PP2, PP3)
- three constant-pressure curves (CP1, CP2, CP3)
- three constant curves or constant speeds (I, II, III).

The pump will start up in PP2 mode, which is set from factory.

# ALPHA1, the choice for heating systems

The heating required in a building varies greatly during the day due to changing outdoor temperatures, solar radiation and heat emanating from people, electric appliances etc.

Add to this that the need for heating may vary from one section of the building to another and that the thermostatic valves of some radiators may have been turned down by the users.

These circumstances will cause an uncontrolled pump to produce a too high differential pressure when the heat demand is low.

Possible consequences:

- too high energy consumption
- irregular control of the system
- noise in thermostatic radiator valves and similar fittings.

Grundfos ALPHA1 controls the differential pressure by adjusting the pump performance to the actual heating demand, without the use of external components.

The pump has the following control modes:

- proportional-pressure control
- constant-pressure control
- constant-curve control.

See also section *Advantages of ALPHA1 pump control* on page 7.

## Proportional-pressure control

Proportional-pressure control adjusts the pump performance to the actual heat demand in the system, but the pump performance follows the selected performance curve, PP1, PP2 or PP3. See fig. 15 where PP2 has been selected. See section *Change of performance* on page 10 for further information.

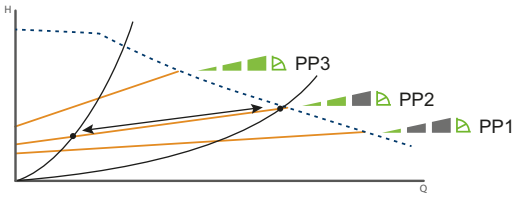



**Fig. 15** Three proportional-pressure curves and settings

## Constant-pressure control

Constant-pressure control adjusts the pump performance to the actual heat demand in the system, but the pump performance follows the selected performance curve, CP1, CP2 or CP3. See fig. 16 where CP1 has been selected. See section *Change of performance* on page 10 for further information.

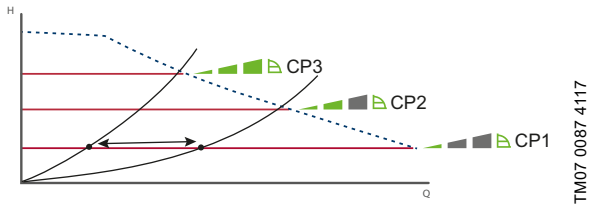



**Fig. 16** Three constant-pressure curves and settings

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

## Constant-curve control

At constant-curve/constant-speed operation, the pump runs at a constant speed, independent of the actual flow demand in the system. The pump performance follows the selected performance curve, I, II or III. See fig. 17 where II has been selected. See section *Change of performance* on page 10 for further information.

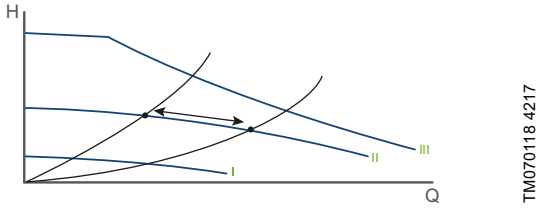



**Fig. 17** Three constant-curve/constant-speed settings

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

## Change of performance

You can change the pump performance (flow rate and head) by pressing the control box push-button as indicated in fig. 18 and the table below.

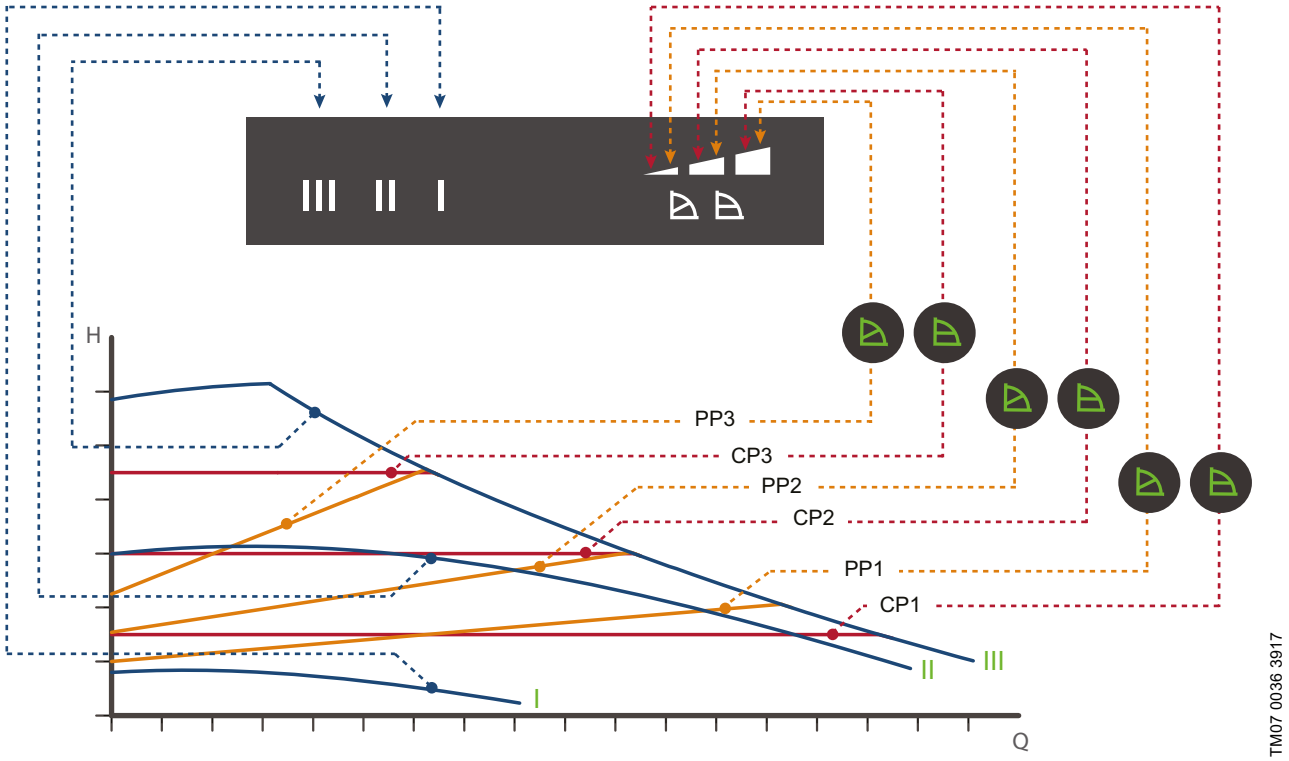



**Fig. 18** Pump setting in relation to pump performance

| 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 in the system. See fig. 18.<br>The head (pressure) is reduced at falling heat demand and increased at rising heat demand. |
| PP2 | Intermediate proportional-pressure curve | The duty point of the pump will move up or down on the intermediate proportional-pressure curve, depending on the heat demand in the system. See fig. 18.<br>The head (pressure) is reduced at falling heat demand and increased at rising heat demand. |
| PP3 | 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 in the system. See fig. 18.<br>The head (pressure) 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. 18.<br>The head (pressure) is kept constant, irrespective of the heat demand. |
| CP2 | Intermediate constant-pressure curve | The duty point of the pump will move out or in on the intermediate constant-pressure curve, depending on the heat demand in the system. See fig. 18.<br>The head (pressure) is kept constant, irrespective of the heat demand. |
| CP3 | 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. 18.<br>The head (pressure) 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.<br>In speed III, the pump is set to run on the maximum curve under all operating conditions. See fig. 18.<br>You can obtain quick venting of the pump by setting the pump to speed III for a short period. |
| II | Speed II | The pump runs on a constant curve which means that it runs at a constant speed.<br>In speed II, the pump is set to run on the intermediate curve under all operating conditions. See fig. 18. |
| I | Speed I | The pump runs on a constant curve which means that it runs at a constant speed.<br>In speed I, the pump is set to run on the minimum curve under all operating conditions. See fig. 18. |

# 4. Performance curves

## Curve charts

### How to read the curve charts

Each pump setting has its own performance curve (Q/H curve). A power curve, P1, belongs to each Q/H curve. The power curve shows the pump power consumption in watt at a given Q/H curve.

The P1 value corresponds to the value that you can read from the pump display. See fig. 19.

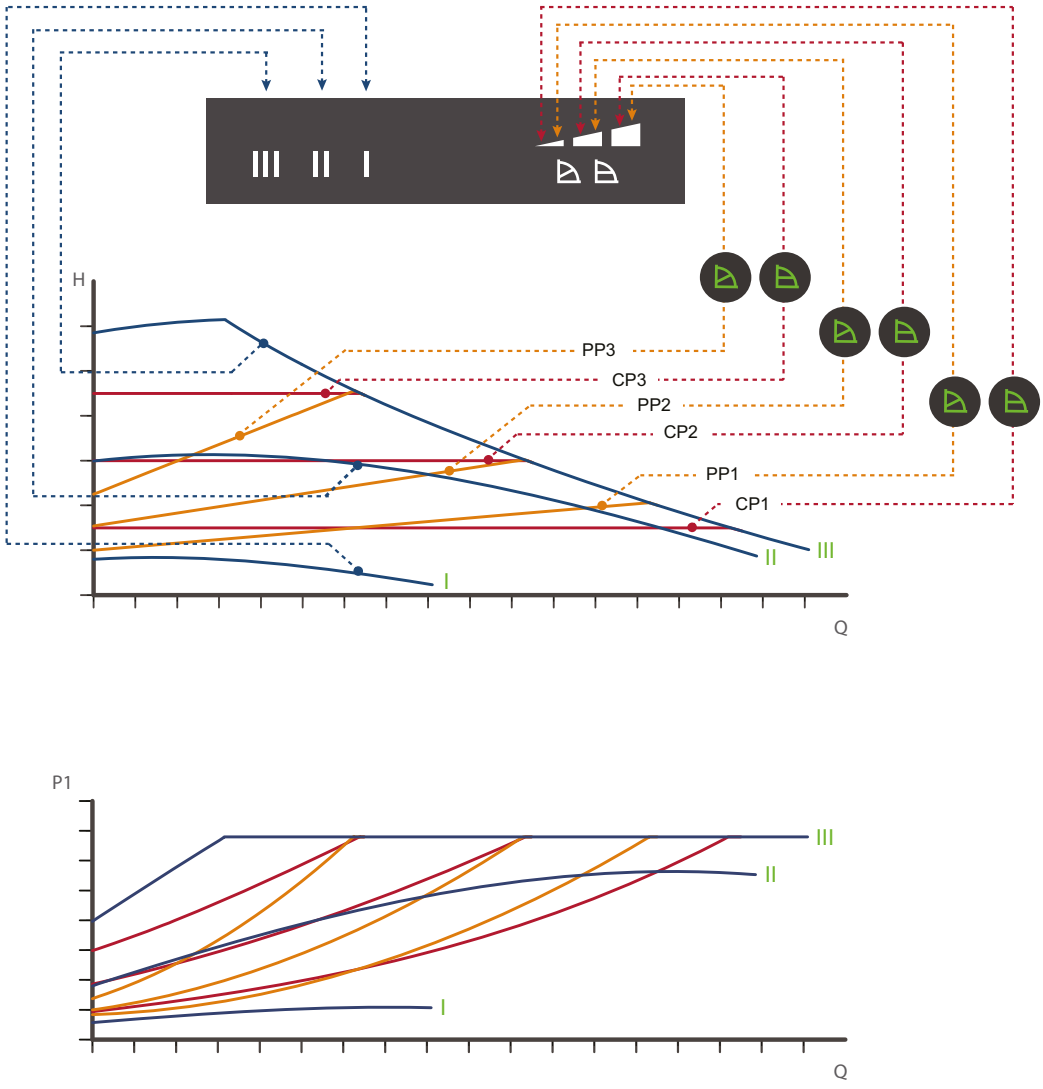



**Fig. 19** Performance curves in relation to pump setting

| Setting | Pump curve |
|---|---|
| PP1 | Lowest proportional-pressure curve |
| PP2 | Intermediate proportional-pressure curve |
| PP3 | Highest proportional-pressure curve |
| CP1 | Lowest constant-pressure curve |
| CP2 | Intermediate constant-pressure curve |
| CP3 | Highest constant-pressure curve |
| III | Constant curve/constant speed III |
| II | Constant curve/constant speed II |
| I | Constant curve/constant speed I |

## Curve conditions

The guidelines below apply to the performance curves on pages 17 to 29:

- Test liquid: airless water.
- The curves apply to a density of ρ = 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, make individual measurements.
- The curves for speeds I, II and III are marked.
- The curves apply to a kinematic viscosity of υ = 0.474 mm$^2$/s (0.474 cSt).
- The conversion between head H [m] and pressure p [kPa] has been made for water with a density of ρ = 1000 kg/m$^3$. For liquids with other densities, for example hot water, the outlet pressure is proportional to the density.
- Curves obtained according to EN 16297.

### Energy efficiency

For ALPHA1 pumps, the energy efficiency index (EEI) is EEI ≤ 0.20. The ALPHA1 EEI is below the ErP 2015 requirements and equal to the benchmark for most efficient circulators. See fig. 20.

The benchmark for the most efficient circulators is EEI ≤ 0.20.

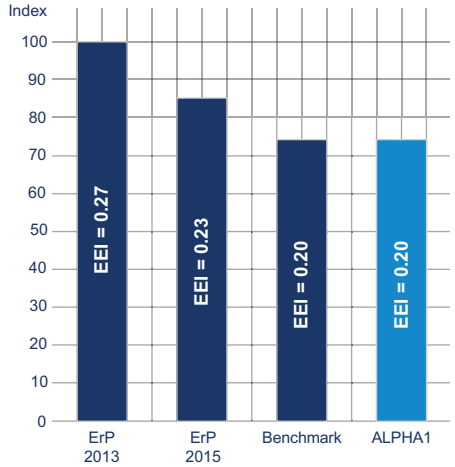
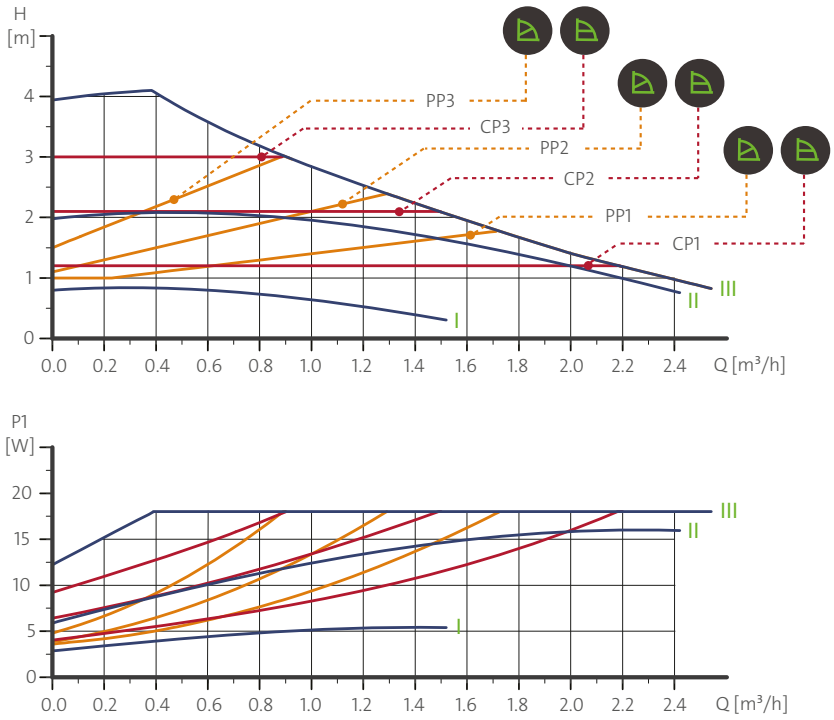



**Fig. 20** EEI limits and the current positioning of the ALPHA1

With an energy efficiency index (EEI) below the EuP 2015 requirement level, you can achieve considerable energy savings compared to a typical circulator pump and thus a remarkably fast return on investment.

# Performance curves and technical data

## ALPHA1 15-40




TM07 0056 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 18 | 0.18 |

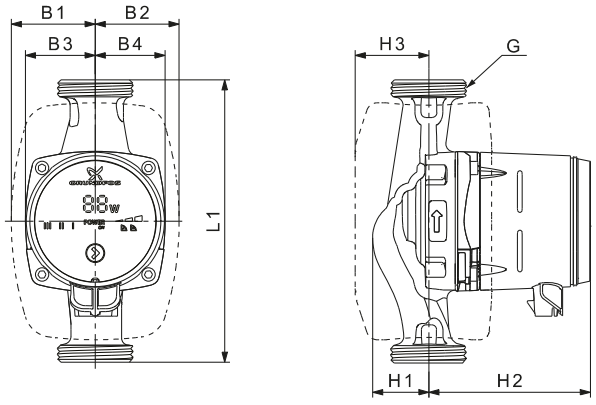
The pump incorporates overload protection.

Connections: See section *Unions and valve kits*, page 31.

System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

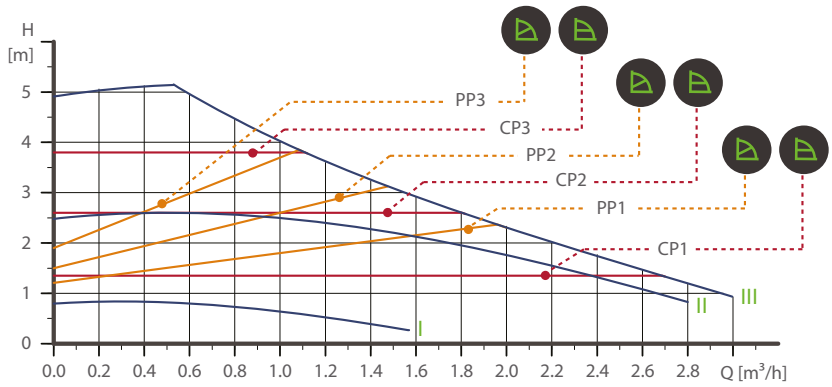
Specific EEI: ≤ 0.20.

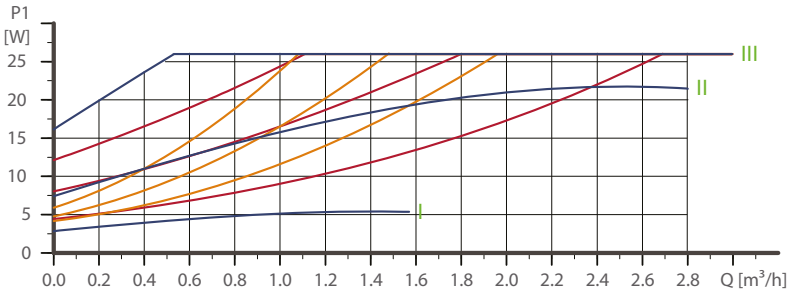



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 15-40 | 130 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 | 1.7 | 1.9 | 0.004 |

## ALPHA1 15-50




TM07 0057 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 26 | 0.24 |

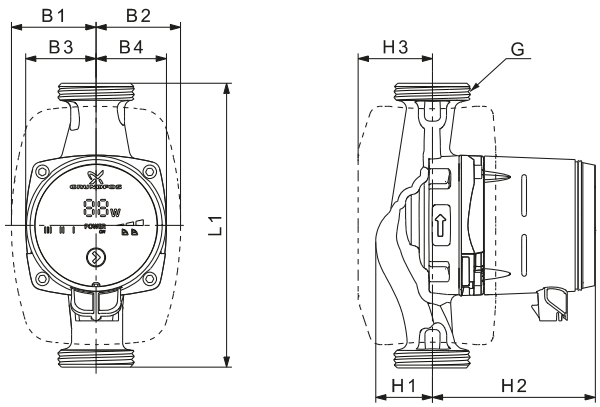
The pump incorporates overload protection.

Connections: See section *Unions and valve kits*, page 31.

System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

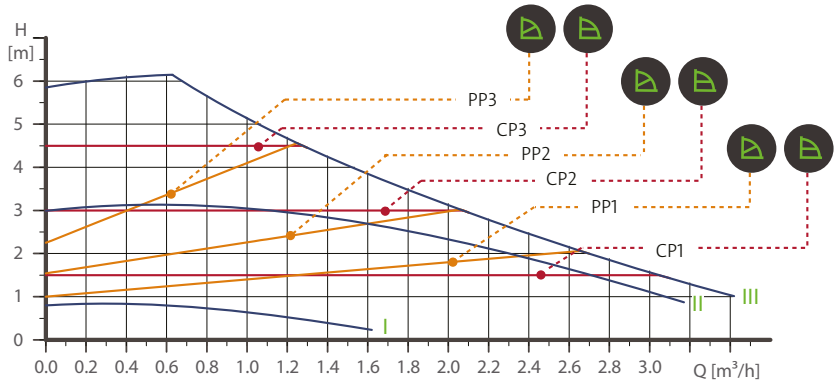
Specific EEI: ≤ 0.20.

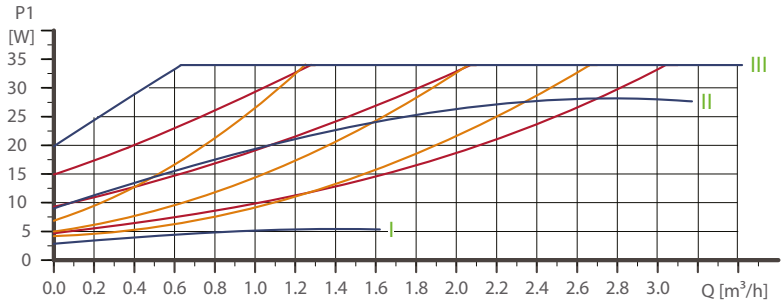



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 15-50 | 130 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 | 1.7 | 1.9 | 0.004 |

## ALPHA1 15-60




TM07 0058 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 34 | 0.32 |

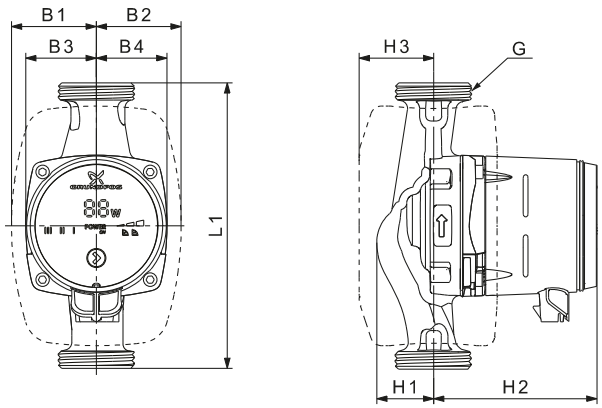
The pump incorporates overload protection.

Connections: See section *Unions and valve kits*, page 31.

System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

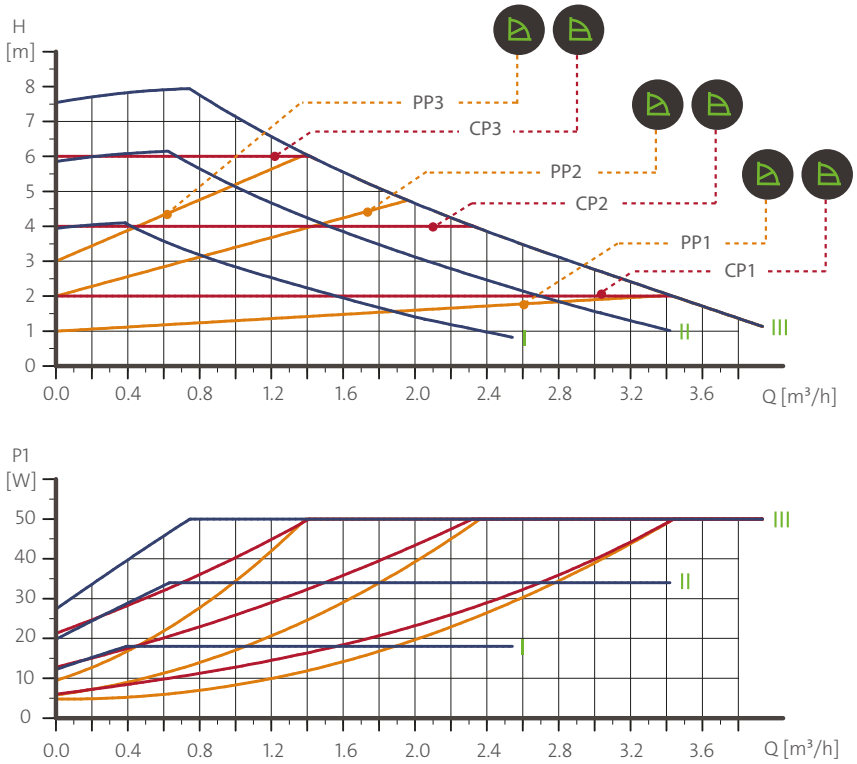
Specific EEI: ≤ 0.20.




TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 15-60 | 130 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 | 1.7 | 1.9 | 0.004 |

## ALPHA1 15-80

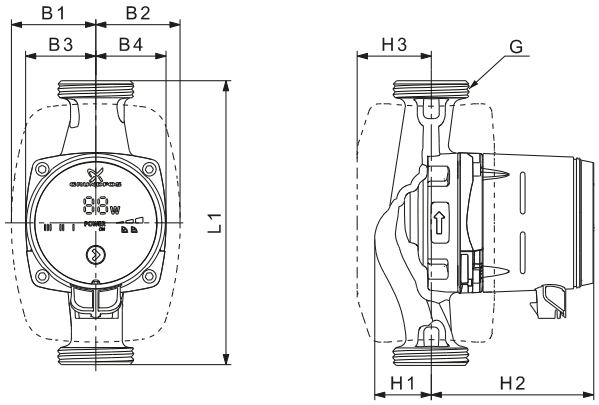



TM07 0059 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 50 | 0.44 |

The pump incorporates overload protection.

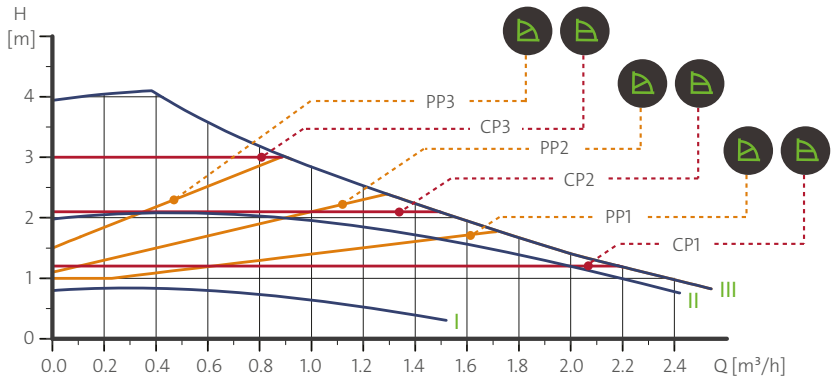
| | |
|---|---|
| Connections: | See section *Unions and valve kits*, page 31. |
| System pressure: | Maximum 1.0 MPa (10 bar). |
| Liquid temperature: | 2-110 °C (TF 110). |
| Specific EEI: | ≤ 0.20. |

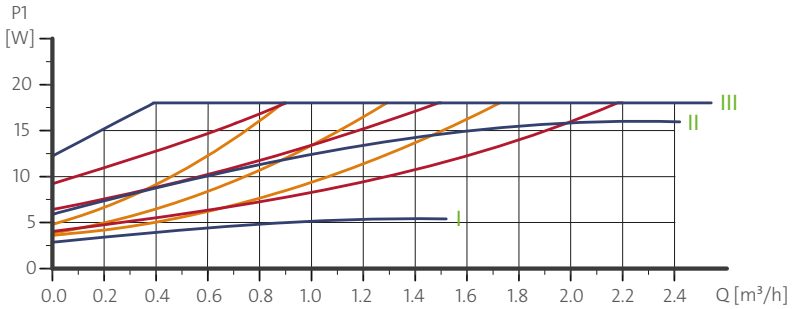



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 15-80 | 130 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 | 1.7 | 1.9 | 0.004 |

## ALPHA1 20-40 N



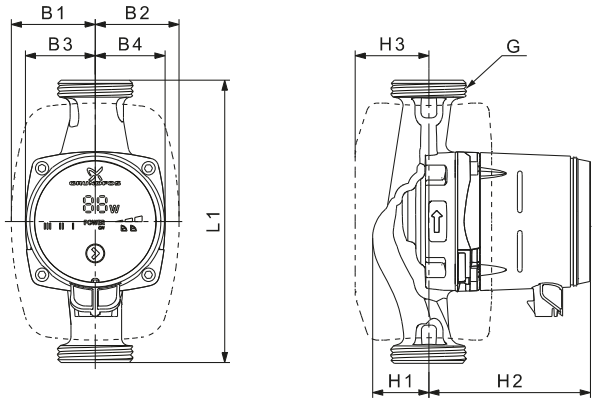




TM07 0056 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 18 | 0.18 |

The pump incorporates overload protection.

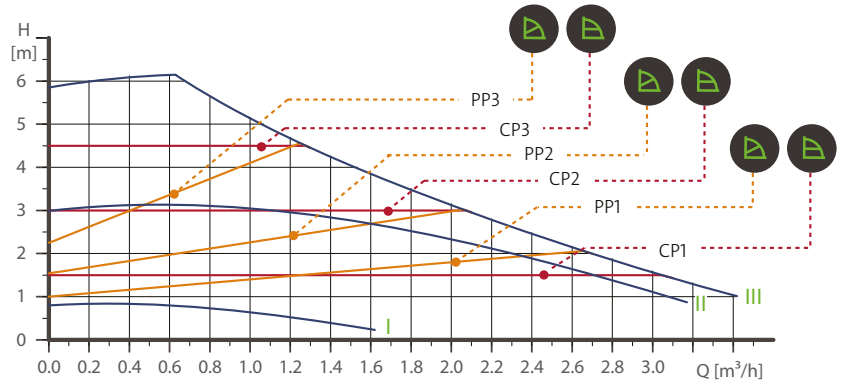
| | |
|---|---|
| Connections: | See section *Unions and valve kits*, page 31. |
| System pressure: | Maximum 1.0 MPa (10 bar). |
| Liquid temperature: | 2-110 °C (TF 110). |
| Specific EEI: | ≤ 0.20. |

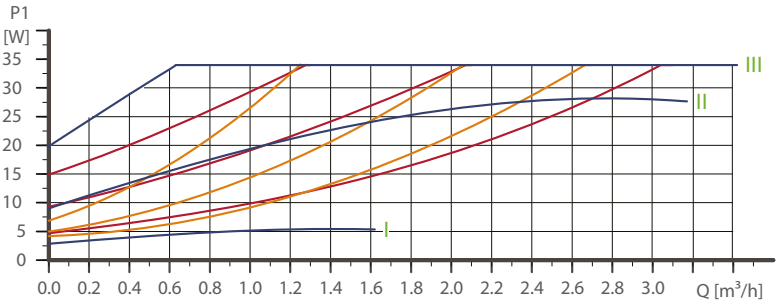



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [$m^3$] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 20-40 N | 150 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/4 | 2 | 2.1 | 0.004 |

## ALPHA1 20-60 N




TM07 0058 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 34 | 0.32 |

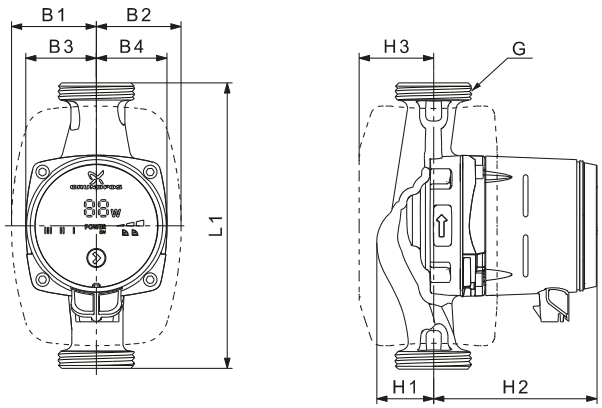
The pump incorporates overload protection.

Connections: See section *Unions and valve kits*, page 31.

System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

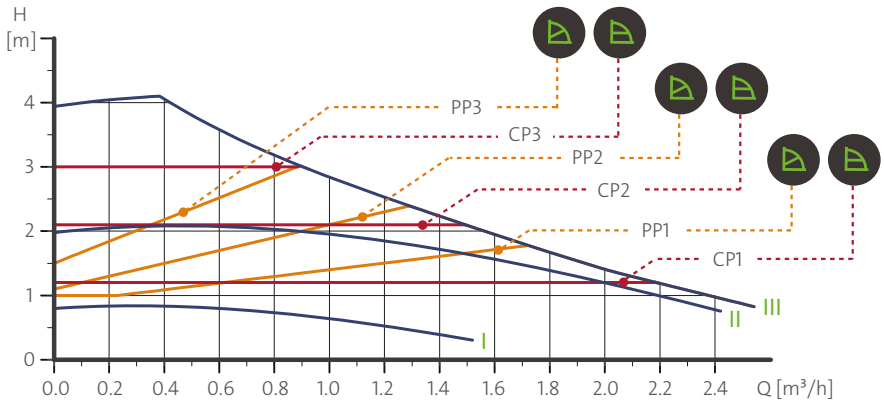
Specific EEI: ≤ 0.20.

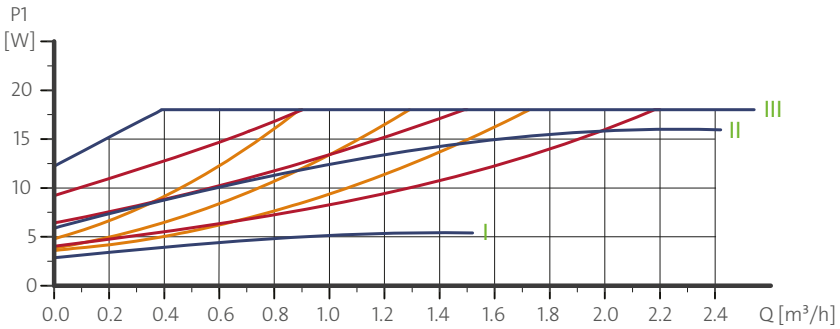



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 20-60 N | 150 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/4 | 2 | 2.1 | 0.004 |

## ALPHA1 25-40 (N)




TM070056 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 18 | 0.18 |

The pump incorporates overload protection.

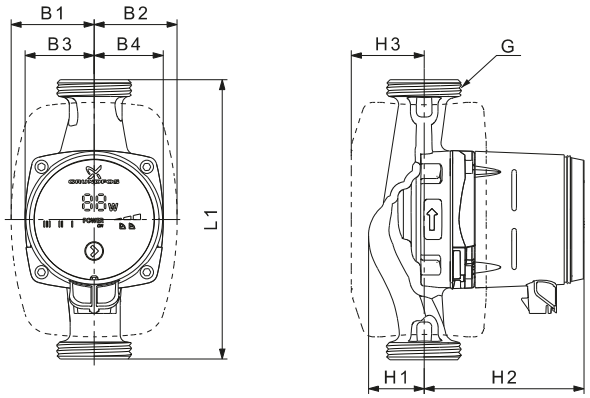
Connections: See section *Unions and valve kits*, page 31.

System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

Also available with: Stainless-steel pump housing, type N.

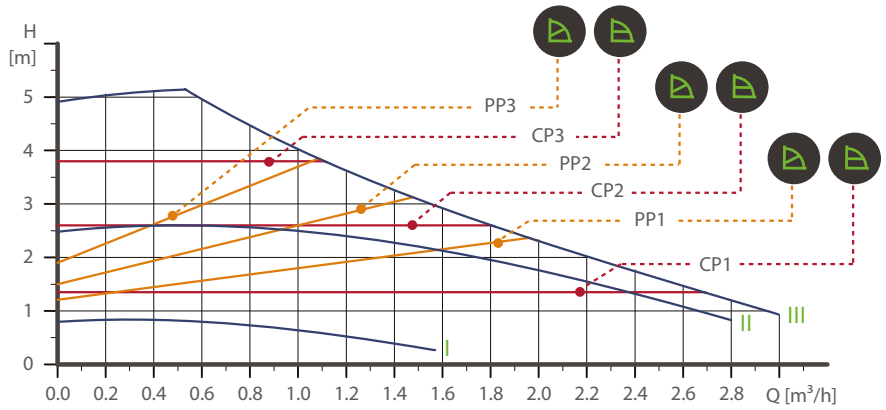
Specific EEI: ≤ 0.20.

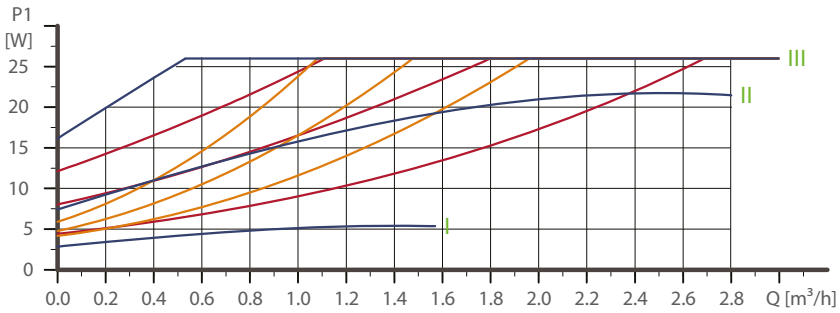



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 25-40 | 130 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/2 | 1.9 | 2.0 | 0.004 |
| ALPHA1 25-40 N | 130 | 54 | 54 | 44 | 44 | 37 | 104 | 47 | G 1 1/2 | 2.0 | 2.1 | 0.004 |
| ALPHA1 25-40 | 180 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/2 | 2.0 | 2.1 | 0.004 |
| ALPHA1 25-40 N | 180 | 54 | 54 | 44 | 44 | 37 | 104 | 47 | G 1 1/2 | 2.1 | 2.3 | 0.004 |

## ALPHA1 25-50 (N)




TM05 1673 4111

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 26 | 0.24 |

The pump incorporates overload protection.

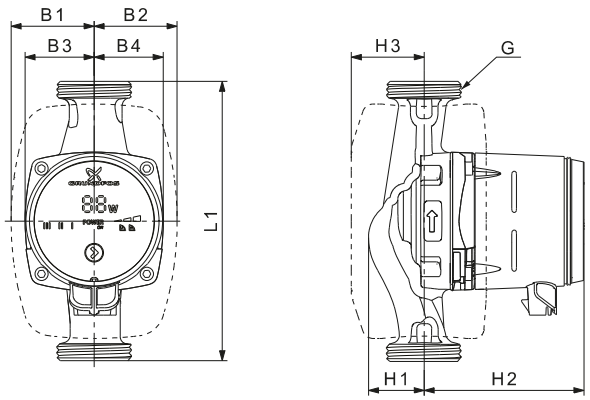
Connections: See section *Unions and valve kits*, page 31.

System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

Also available with: Stainless-steel pump housing, type N.

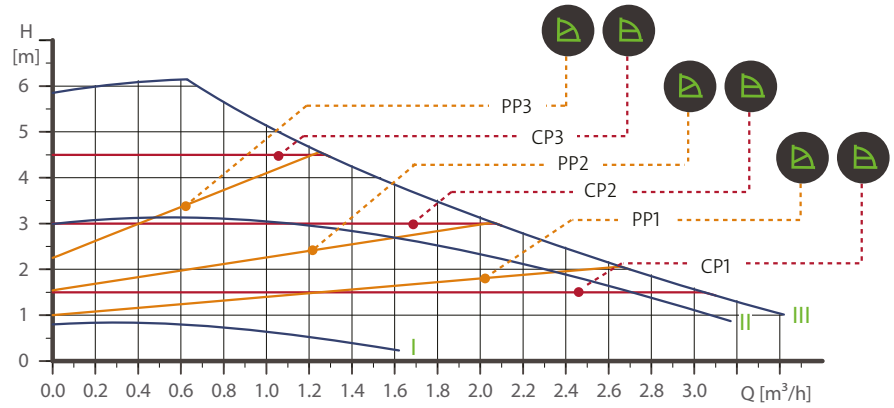
Specific EEI: ≤ 0.20.

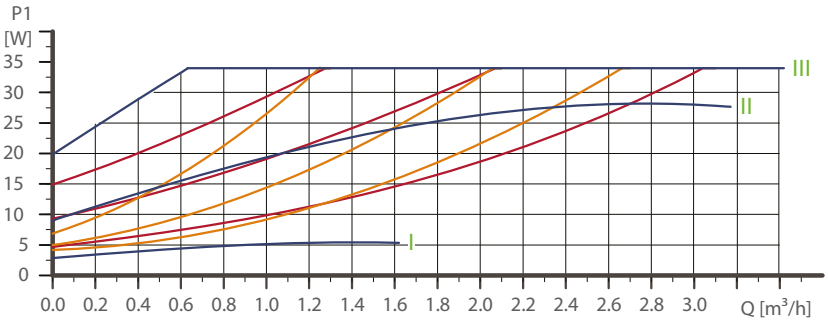



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 25-50 | 130 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/2 | 1.9 | 2.0 | 0.004 |
| ALPHA1 25-50 N | 130 | 54 | 54 | 44 | 44 | 37 | 104 | 47 | G 1 1/2 | 2.0 | 2.1 | 0.004 |
| ALPHA1 25-50 | 180 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/2 | 2.0 | 2.1 | 0.004 |
| ALPHA1 25-50 N | 180 | 54 | 54 | 44 | 44 | 37 | 104 | 47 | G 1 1/2 | 2.1 | 2.3 | 0.004 |

## ALPHA1 25-60 (N)



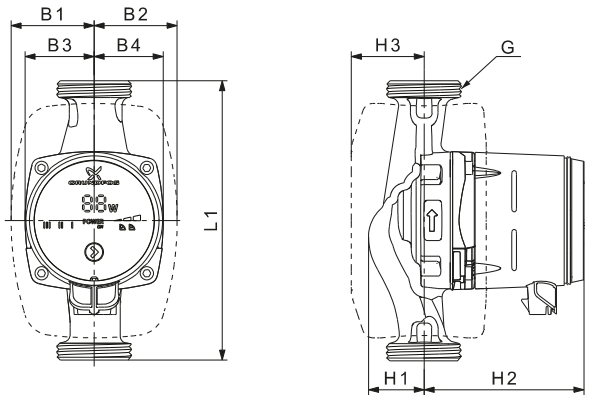




TM07 0058 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 34 | 0.32 |

The pump incorporates overload protection.

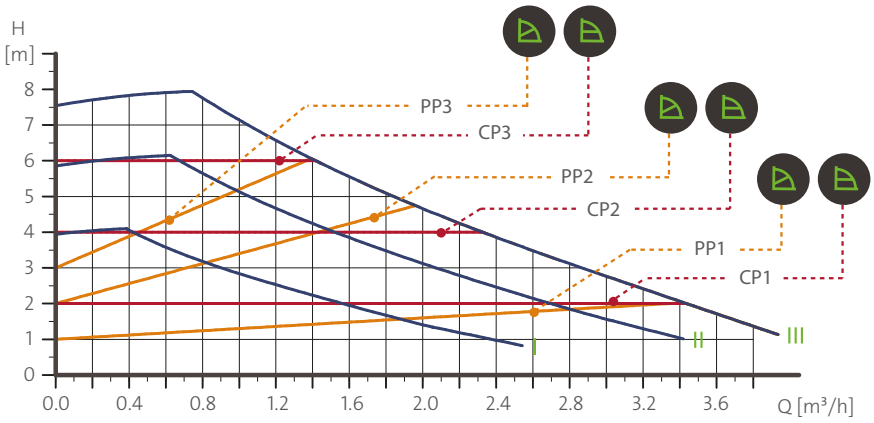
| | |
|---|---|
| Connections: | See section *Unions and valve kits*, page 31. |
| System pressure: | Maximum 1.0 MPa (10 bar). |
| Liquid temperature: | 2-110 °C (TF 110). |
| Also available with: | Stainless-steel pump housing, type N. |
| Specific EEI: | ≤ 0.20. |

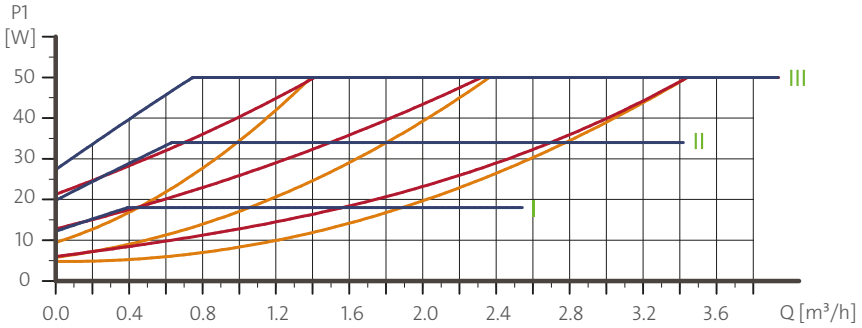



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 25-60 | 130 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/2 | 1.9 | 2.0 | 0.004 |
| ALPHA1 25-60 N | 130 | 54 | 54 | 44 | 44 | 37 | 104 | 47 | G 1 1/2 | 2.0 | 2.1 | 0.004 |
| ALPHA1 25-60 | 180 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/2 | 2.0 | 2.1 | 0.004 |
| ALPHA1 25-60 N | 180 | 54 | 54 | 44 | 44 | 37 | 104 | 47 | G 1 1/2 | 2.1 | 2.3 | 0.004 |

## ALPHA1 25-80 (N)




TM07 0059 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 50 | 0.44 |

The pump incorporates overload protection.

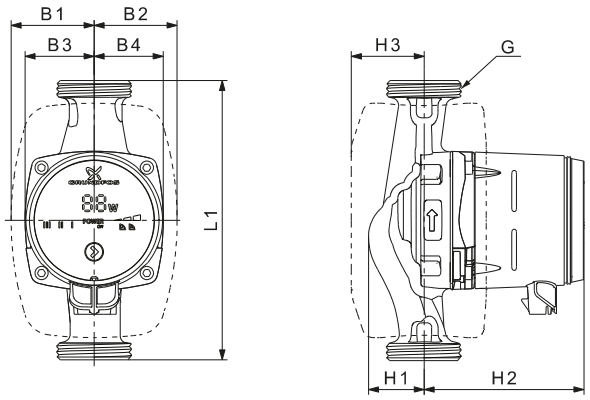
Connections: See section *Unions and valve kits*, page 31.

System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

Also available with: Stainless-steel pump housing, type N.

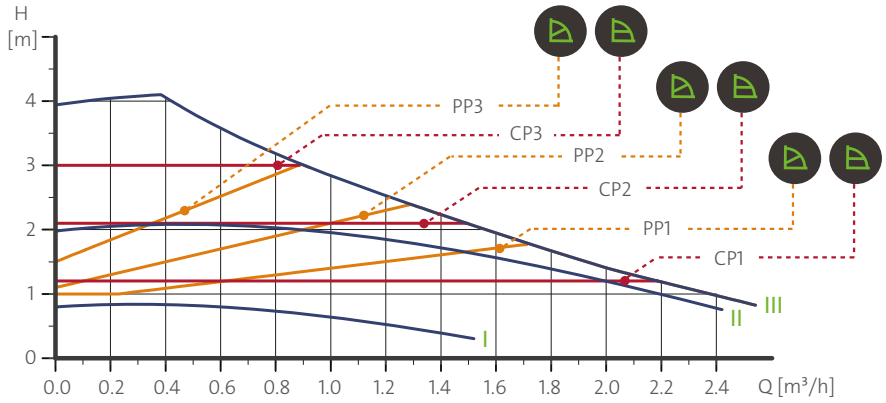
Specific EEI: ≤ 0.20.

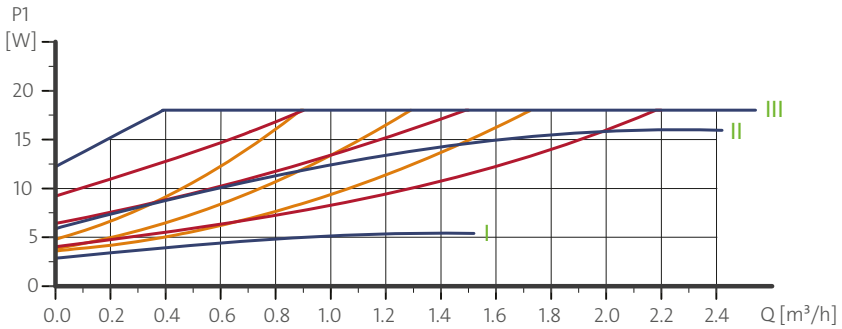



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [$m^3$] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 25-80 | 130 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/2 | 1.9 | 2.0 | 0.004 |
| ALPHA1 25-80 N | 130 | 54 | 54 | 44 | 44 | 37 | 104 | 47 | G 1 1/2 | 2.0 | 2.1 | 0.004 |
| ALPHA1 25-80 | 180 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 1 1/2 | 2.0 | 2.1 | 0.004 |
| ALPHA1 25-80 N | 180 | 54 | 54 | 44 | 44 | 37 | 104 | 47 | G 1 1/2 | 2.1 | 2.3 | 0.004 |

## ALPHA1 32-40




TM07 0056 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 18 | 0.18 |

The pump incorporates overload protection.

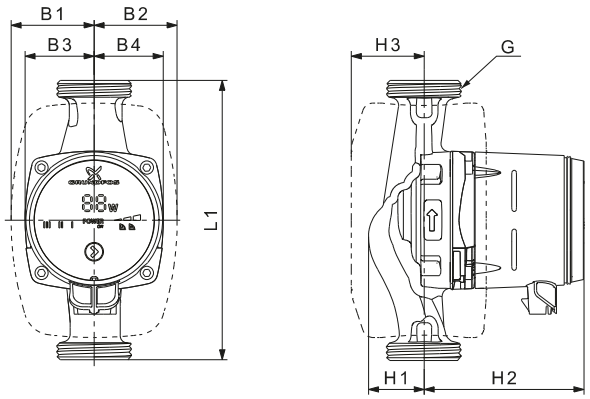
Connections: See section *Unions and valve kits*, page 31.

System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

Also available with: Stainless-steel pump housing, type N.

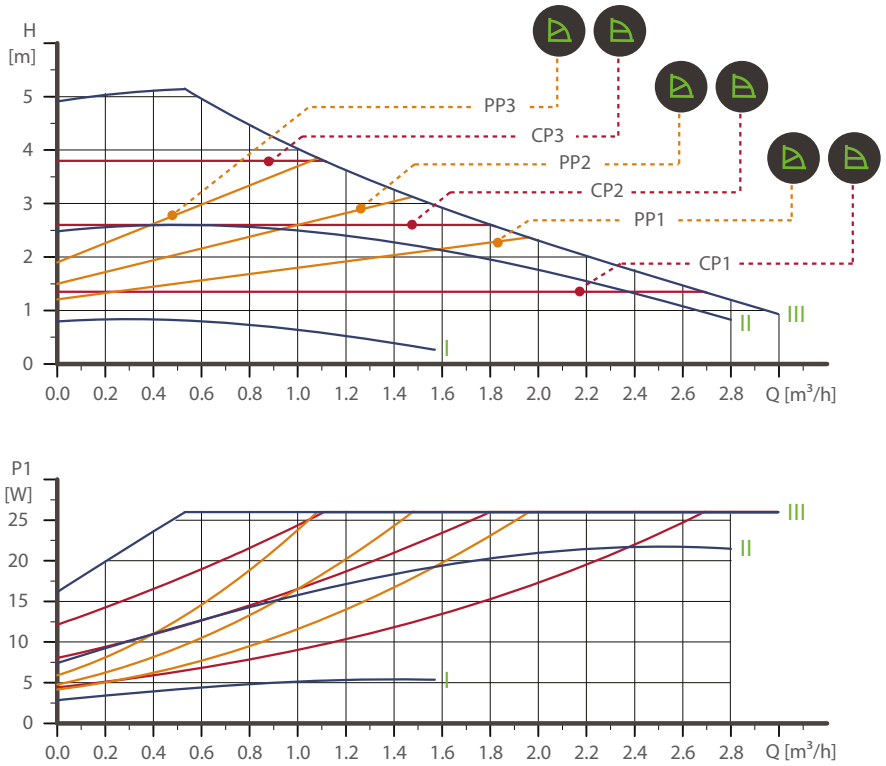
Specific EEI: ≤ 0.20.




TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 32-40 | 180 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 2 | 2.1 | 2.3 | 0.004 |

## ALPHA1 32-50

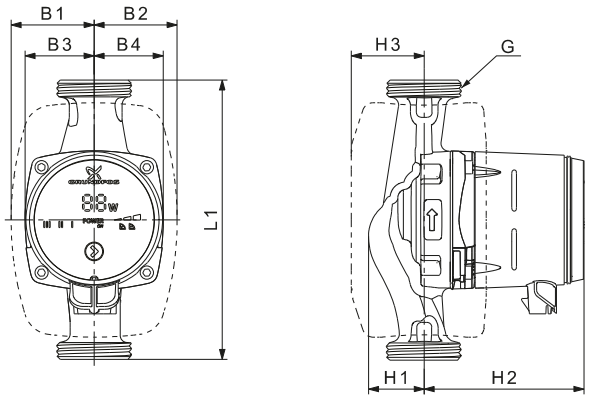



TM07 0057 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 26 | 0.24 |

The pump incorporates overload protection.

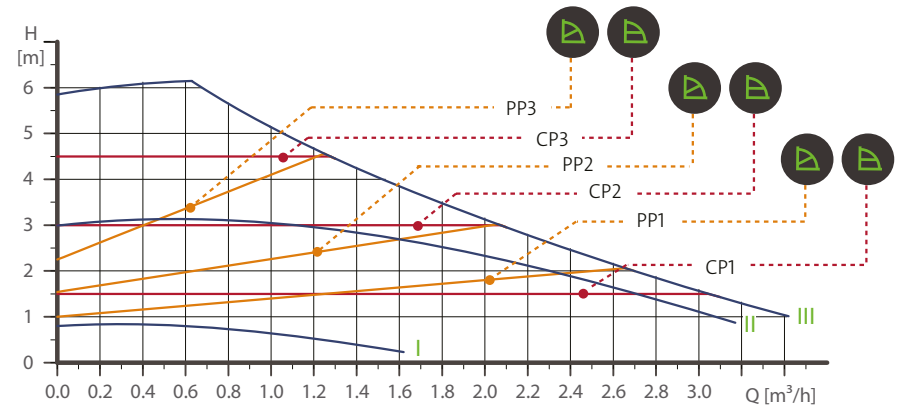
| | |
|---|---|
| Connections: | See section *Unions and valve kits*, page 31. |
| System pressure: | Maximum 1.0 MPa (10 bar). |
| Liquid temperature: | 2-110 °C (TF 110). |
| Also available with: | Stainless-steel pump housing, type N. |
| Specific EEI: | ≤ 0.20. |

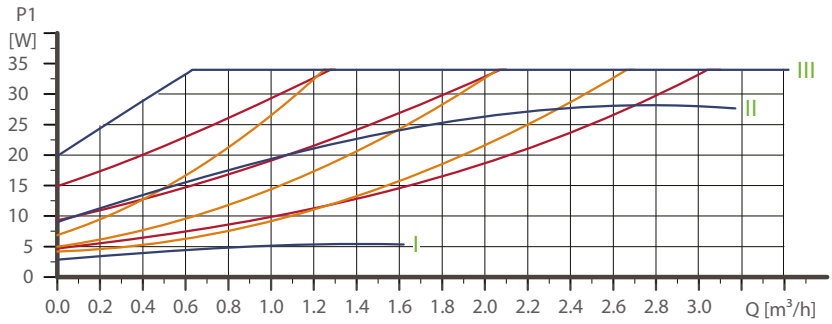



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [$m^3$] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 32-50 | 180 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 2 | 2.1 | 2.3 | 0.004 |

## ALPHA1 32-60




TM07 0058 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 34 | 0.32 |

The pump incorporates overload protection.

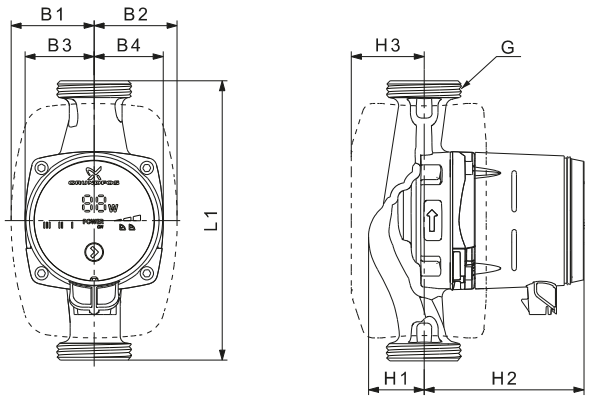
Connections: See section *Unions and valve kits*, page 31.

System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

Also available with: Stainless-steel pump housing, type N.

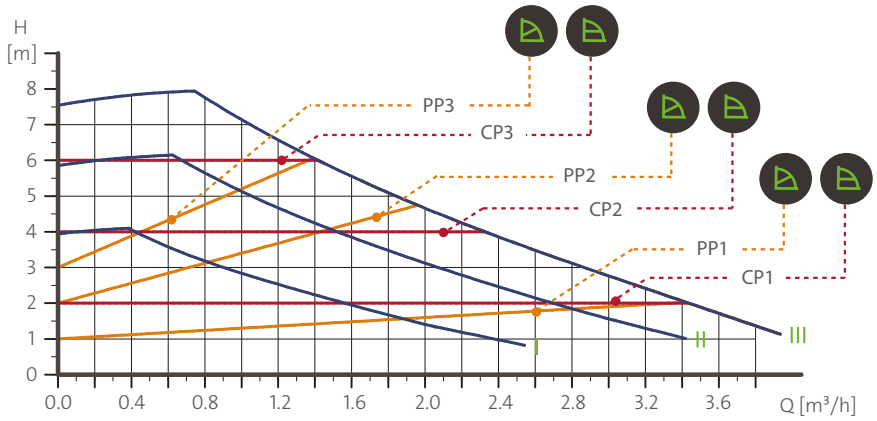
Specific EEI: ≤ 0.20.

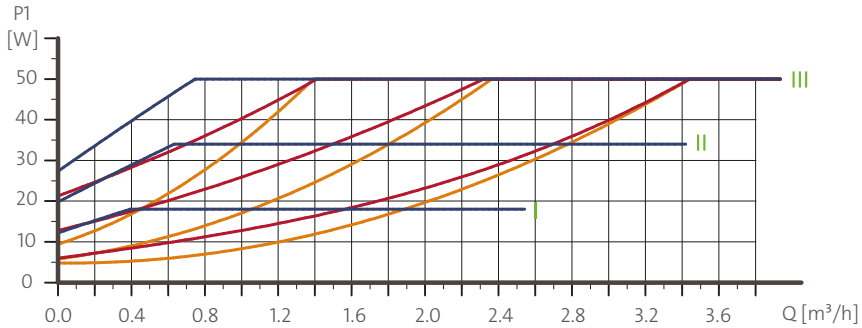



TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 32-60 | 180 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 2 | 2.1 | 2.3 | 0.004 |

## ALPHA1 32-80 (N)




TM07 0059 4017

| Speed | P1 [W] | $I_1$ [A] |
|---|---|---|
| **Min.** | 3 | 0.04 |
| **Max.** | 50 | 0.44 |

The pump incorporates overload protection.

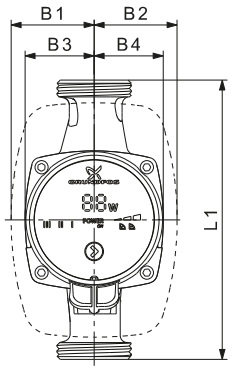
Connections: See section *Unions and valve kits*, page 31.

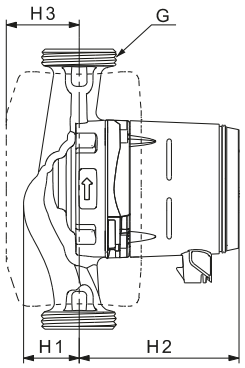
System pressure: Maximum 1.0 MPa (10 bar).

Liquid temperature: 2-110 °C (TF 110).

Also available with: Stainless-steel pump housing, type N.

Specific EEI: ≤ 0.20.



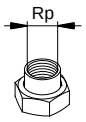
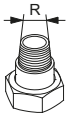
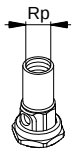
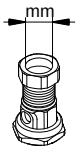
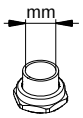




TM07 0102 4217

| Pump type | Dimensions [mm] | | | | | | | | | Weights [kg] | | Ship. vol. [m³] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | B1 | B2 | B3 | B4 | H1 | H2 | H3 | G | Net | Gross | |
| ALPHA1 32-80 | 180 | 54 | 54 | 44 | 44 | 36 | 104 | 47 | G 2 | 2.1 | 2.3 | 0.004 |

# 5. Accessories

## Unions

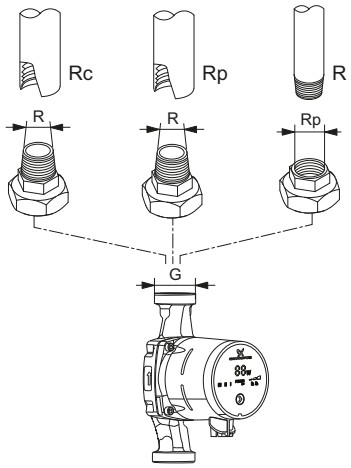
| Product numbers, unions | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Union nut with internal threads | | | Union nut with external threads | | Ball valve with internal threads | | | Ball valve with compression fitting | | Union nut with soldering fitting | | | |
| ALPHA1 | Connection |  | | |  | |  | | |  | |  | | | |
| | | 3/4 | 1 | 1 1/4 | 1 | 1 1/4 | 3/4 | 1 | 1 1/4 | ∅22 | ∅28 | ∅18 | ∅22 | ∅28 | ∅42 |
| 25-xx | G 1 1/2 | 529921 | **529922** | 529821 | 529925 | 529924 | | | | | | | | | |
| 25-xx N | | 529971 | **529972** | | | | 519805 | 519806 | 519807 | 519808 | 519809 | 529977 | 529978 | 529979 | |
| 32-xx | G 2 | | 509921 | **509922** | | | | | | | | | | | |
| 32-xx N | | | | **509971** | | | | | | | | | | | 529995 |

Note: The product numbers are always for one complete set, including gaskets.
The product numbers for the 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. 21.




TM07 0321 4817

**Fig. 21** Thread types and combinations (examples)

## Insulating shells

The pump is supplied with two insulating shells.

The insulating kit, which is tailored to the individual pump type, encloses the entire pump housing. It is easy to fit the two insulating shells around the pump. See fig. 22.

| Pump type | Product number |
|---|---|
| ALPHA1 XX-XX 130 | 98091786 |
| ALPHA1 XX-XX 180 | 98091787 |

TM06 9093 4317

**Fig. 22** Insulating shells

# ALPHA plugs

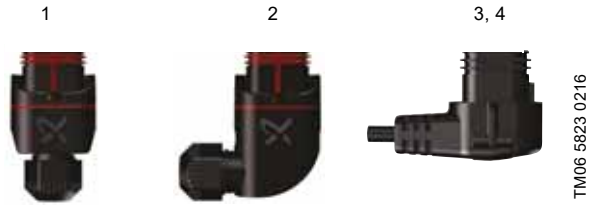



**Fig. 23** ALPHA plugs

| Pos. | Description | Product number |
|---|---|---|
| 1 | ALPHA plug with cable gland, standard plug connector, complete | 98284561 |
| 2 | ALPHA plug angled 90 ° left, with cable gland | 98610291 |
| 3 | ALPHA plug angled 90 ° left, including 4 m cable | 96884669 |
| 4* | ALPHA plug angled 90 ° left, including 1 m cable and integrated NTC protection resistor | 97844632 |

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

# 6. Product numbers

## ALPHA1 for the D-A-CH market (Germany, Austria and Switzerland)

**Note:** Click on the product number and go directly to the performance curve in Grundfos Product Center (GPC).

| Pump type | Port-to-port length [mm] | Connection | Product number | Data sheet Page | Weights gross [kg] | Ship. vol. [$m^3$] |
|---|---|---|---|---|---|---|
| ALPHA1 15-40 | 130 | G 1 | 99236206 | 13 | 1.9 | 0.004 |
| ALPHA1 15-60 | 130 | G 1 | 99160397 | 15 | 1.9 | 0.004 |
| ALPHA1 15-80 | 130 | G 1 | 99345904 | 16 | 1.9 | 0.004 |
| ALPHA1 20-40 N | 150 | G 1 1/4 | 99452324 | 17 | 2.1 | 0.004 |
| ALPHA1 20-60 N | 150 | G 1 1/4 | 99452327 | 18 | 2.1 | 0.004 |
| ALPHA1 25-40 | 130 | G 1 1/2 | 99236213 | 19 | 2.0 | 0.004 |
| ALPHA1 25-60 | 130 | G 1 1/2 | 99160418 | 21 | 2.0 | 0.004 |
| ALPHA1 25-80 | 130 | G 1 1/2 | 99345909 | 22 | 2.0 | 0.004 |
| ALPHA1 25-40 | 180 | G 1 1/2 | 99236214 | 19 | 2.1 | 0.004 |
| ALPHA1 25-40 N | 180 | G 1 1/2 | 99236218 | 19 | 2.3 | 0.004 |
| ALPHA1 25-60 | 180 | G 1 1/2 | 99160420 | 21 | 2.1 | 0.004 |
| ALPHA1 25-60 N | 180 | G 1 1/2 | 99160424 | 21 | 2.3 | 0.004 |
| ALPHA1 25-80 | 180 | G 1 1/2 | 99345910 | 22 | 2.1 | 0.004 |
| ALPHA1 32-40 | 180 | G 2 | 99236216 | 23 | 2.3 | 0.004 |
| ALPHA1 32-60 | 180 | G 2 | 99160423 | 25 | 2.3 | 0.004 |
| ALPHA1 32-80 | 180 | G 2 | 99345911 | 26 | 2.3 | 0.004 |

## ALPHA1 for the international market

**Note:** Click on the product number and go directly to the performance curve in Grundfos Product Center (GPC).

| Pump type | Port-to-port length [mm] | Connection | Product number | Data sheet Page | Weights gross [kg] | Ship. vol. [$m^3$] |
|---|---|---|---|---|---|---|
| ALPHA1 15-40 | 130 | G 1 | 99199550 | 13 | 1.9 | 0.004 |
| ALPHA2 15-50 | 130 | G 1 | 99199573 | 14 | 1.9 | 0.004 |
| ALPHA1 15-60 | 130 | G 1 | 99199551 | 15 | 1.9 | 0.004 |
| ALPHA1 15-80 | 130 | G 1 | 99199595 | 16 | 1.9 | 0.004 |
| ALPHA1 20-40 N | 150 | G 1 1/4 | 99452178 | 17 | 2.1 | 0.004 |
| ALPHA1 20-60 N | 150 | G 1 1/4 | 99452182 | 18 | 2.1 | 0.004 |
| ALPHA1 25-40 | 130 | G 1 1/2 | 99199574 | 19 | 2.0 | 0.004 |
| ALPHA1 25-40 N | 130 | G 1 1/2 | 99199587 | 19 | 2.1 | 0.004 |
| ALPHA1 25-50 | 130 | G 1 1/2 | 99199578 | 20 | 2.0 | 0.004 |
| ALPHA1 25-50 N | 130 | G 1 1/2 | 99199588 | 20 | 2.1 | 0.004 |
| ALPHA1 25-60 | 130 | G 1 1/2 | 99199575 | 21 | 2.0 | 0.004 |
| ALPHA1 25-60 N | 130 | G 1 1/2 | 99199589 | 21 | 2.1 | 0.004 |
| ALPHA1 25-80 | 130 | G 1 1/2 | 99199596 | 22 | 2.0 | 0.004 |
| ALPHA1 25-80 N | 130 | G 1 1/2 | 99199590 | 22 | 2.1 | 0.004 |
| ALPHA1 25-40 | 180 | G 1 1/2 | 99199576 | 19 | 2.1 | 0.004 |
| ALPHA1 25-40 N | 180 | G 1 1/2 | 99199591 | 19 | 2.3 | 0.004 |
| ALPHA1 25-50 | 180 | G 1 1/2 | 99348059 | 20 | 2.1 | 0.004 |
| ALPHA1 25-50 N | 180 | G 1 1/2 | 99199592 | 20 | 2.3 | 0.004 |
| ALPHA1 25-60 | 180 | G 1 1/2 | 99199579 | 21 | 2.1 | 0.004 |
| ALPHA1 25-60 N | 180 | G 1 1/2 | 99199593 | 21 | 2.3 | 0.004 |
| ALPHA1 25-80 | 180 | G 1 1/2 | 99199577 | 22 | 2.1 | 0.004 |
| ALPHA1 25-80 N | 180 | G 1 1/2 | 99199594 | 22 | 2.3 | 0.004 |
| ALPHA1 32-40 | 180 | G 2 | 99199580 | 23 | 2.3 | 0.004 |
| ALPHA1 32-50 | 180 | G 2 | 99348063 | 24 | 2.3 | 0.004 |
| ALPHA1 32-60 | 180 | G 2 | 99199581 | 25 | 2.3 | 0.004 |
| ALPHA1 32-80 | 180 | G 2 | 99199597 | 26 | 2.4 | 0.004 |

# 7. Grundfos Product Center

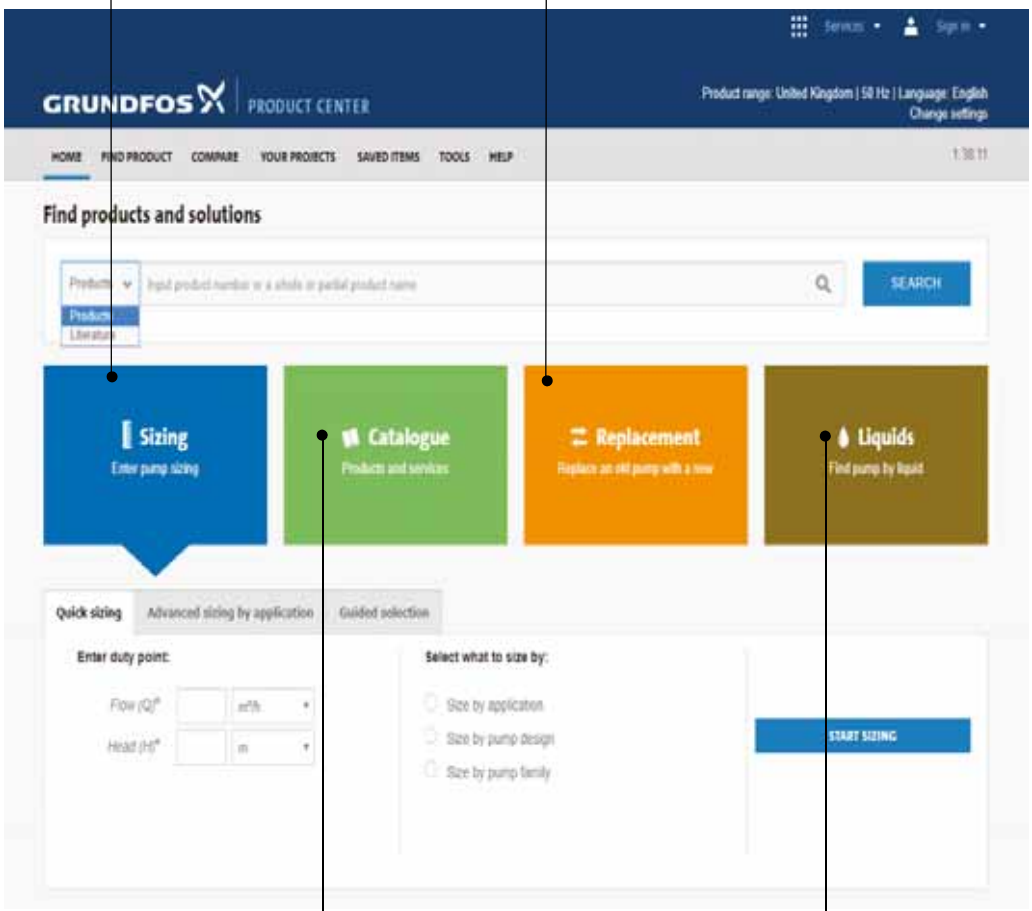
*Online search and sizing tool to help you make the right choice.*

*http://product-selection.grundfos.com*

"SIZING" enables you to size a pump based on entered data and selection choices.

"REPLACEMENT" enables you to find a replacement product. Search results will include information on the following:

- the lowest purchase price
- the lowest energy consumption
- the lowest total life cycle cost.




"CATALOGUE" gives you access to the Grundfos product catalogue.

"LIQUIDS" enables you to find pumps designed for aggressive, flammable or other special liquids.

### 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.

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