

ALPHA2

Circulator pumps



1. General description	3	10. Grundfos Product Center	36
Type key	3		
Model type	3		
Performance range	4		
2. Applications	5		
ALPHA2, the best choice for heating systems	6		
AUTOADAPT	6		
ALPHA2 features	8		
3. Operating conditions	9		
Pumped liquids	9		
Technical data	9		
4. Construction	10		
Sectional drawing	10		
Material specification	10		
Motor and control box	10		
Unique air vent system	11		
5. Installation and startup	12		
Installation	12		
Startup	12		
Setting the pump	12		
6. Guide to performance curves	15		
Curve conditions	17		
7. Performance curves and technical data	18		
ALPHA2 15-40	18		
ALPHA2 15-50	19		
ALPHA2 15-60	20		
ALPHA2 15-80	21		
ALPHA2 20-40 N	22		
ALPHA2 20-60 N	23		
ALPHA2 25-40 (N)	24		
ALPHA2 25-50 (N)	25		
ALPHA2 25-60 (N)	26		
ALPHA2 25-80 (N)	27		
ALPHA2 32-40 (N)	28		
ALPHA2 32-50 (N)	29		
ALPHA2 32-60 (N)	30		
ALPHA2 32-80 (N)	31		
8. Accessories	32		
Unions and valve kits	32		
Insulating kits	32		
ALPHA plugs	33		
ALPHA Reader	33		
9. Product numbers	34		
ALPHA2 for the D-A-CH market (Germany, Austria and Switzerland)	34		
ALPHA2 for the international market	34		
ALPHA2 for the EAC market	35		

1. General description



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Grundfos ALPHA2 is a complete range of circulator pumps with the following features:

- AUTOADAPT function which is suitable for most installations.
- Integrated differential-pressure control enabling adjustment of pump performance to the actual system requirements.
- Automatic night setback, selectable.
- Manual summer mode.
- Dry-running protection.
- ALPHA Reader compatible from ALPHA2 model E.
- High-torque start.
- Display showing the actual power consumption in watt or the actual flow rate in m³/h.
- Motor based on permanent-magnet rotor/compact-stator technology.

ALPHA2 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.

The installation of an ALPHA2 pump will reduce the power consumption considerably, reduce noise from thermostatic radiator valves and similar fittings and improve the control of the system.

ALPHA2 offers a host of advantages:

Energy savings	Automatic control of the differential pressure.
Flexibility	Suitable for installation in existing systems.
Night setback	Automatic night setback, selectable.
Manual summer mode	Summer mode, selectable.
Dry-running protection	Protection of the pump against dry running during start and normal operation.

Compatible with ALPHA Reader ¹⁾	Support for hydronic balancing of radiators and underfloor heating in heating systems.
High-torque start	Improved startup under harsh conditions.
Comfort	Low-noise operation.
Safety	Built-in electrical and thermal protection of the pump.
User friendliness	Simple setting and operation.
Alarms	Alarms indicated in the display.
Warnings	Warnings indicated in the display.

¹⁾ Depending on the model

Type key

Example ALPHA2 25-40 180

Code	Explanation
ALPHA2	Pump range
25 -	Nominal diameter (DN) of inlet and outlet ports [mm] (15 = G 1 ²⁾ , 25 = G 1 1/2, 32 = G 2)
40	Maximum head [dm]
	Cast-iron pump housing
	N: Stainless-steel pump housing
	A: Pump housing with air separator
180	Port-to-port length [mm]

²⁾ Exception: UK version, size 15 = G 1 1/2.

Model type

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



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Model type on the nameplate

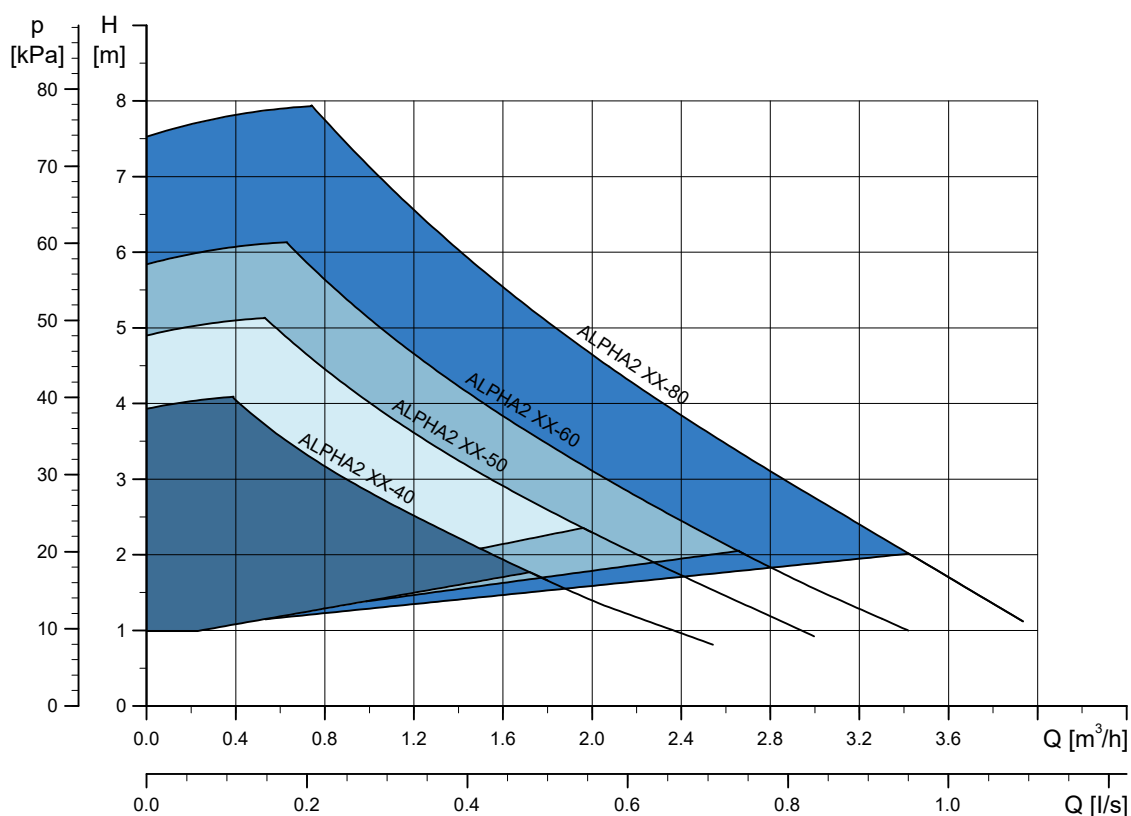
The table below shows the ALPHA2 models with built-in functions and features.

Functions/features	ALPHA2 model B	ALPHA2 model C	ALPHA2 model D	ALPHA2 model E
Starts from	PC 12xx ³⁾	PC 14xx ³⁾	PC 15xx ³⁾	PC 17xx ³⁾
AUTOADAPT	•	•	•	•
Proportional pressure	•	•	•	•
Constant pressure	•	•	•	•
Constant curve	•	•	•	•
Automatic night setback	•	•	•	•
Manual summer mode		•	•	•
Dry-running protection			•	•
ALPHA Reader				•
High-torque start			•	•
ALPHA2XX-40	•	•	•	•
ALPHA2XX-50 ⁴⁾	•	•	•	•
ALPHA2XX-60	•	•	•	•
ALPHA2XX-80		•	•	•

3) Production code (Year-Week)

4) Not available in all countries

Performance range



TM070902

Performance range, ALPHA2

2. Applications

ALPHA2 is designed for circulating liquids in heating systems. You can also use pumps with stainless-steel pump housing in domestic hot-water systems.

ALPHA2 is suitable for the following:

- Systems with constant or variable flows where it is desirable to optimise the pump duty point.
- Systems where night setback is desired
- Systems where the differential pressure of the pump is too high during periods of reduced flow demand.
- Systems with variable flows such as two-pipe heating systems with thermostatic valves for radiators or underfloor heating.
- Systems with constant or slightly variable flows such as one-pipe heating systems.

The pump is also ideal when operating in systems requiring an automatic adjustment of differential pressure to flow demands without the use of expensive bypass valves and similar components.

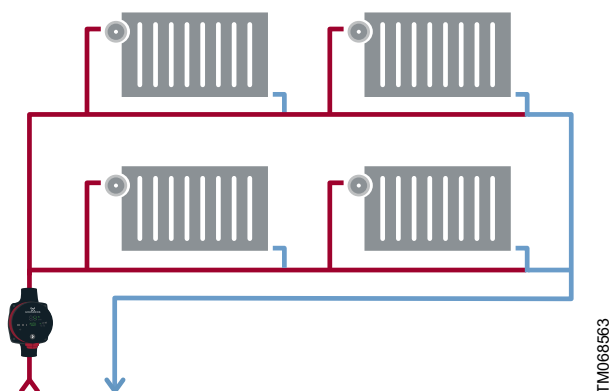
If an automatic bypass valve is installed to ensure a minimum flow, you must adjust the differential pressure control of the circulator pump in a way to ensure the function of the automatic bypass valve. For example, select a constant-pressure curve that is higher than the differential pressure of the valve.

You can select the appropriate pump type for a heating system according to the following guidelines:

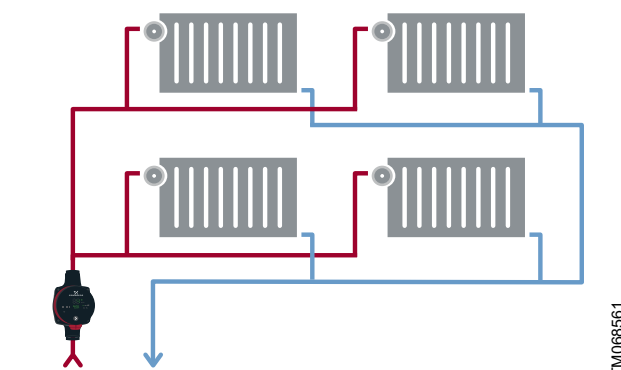
Range	Radiator system (Δt 20 °C)	Underfloor heating (Δt 5 °C)	Pump type
[m ²]	[m ³ /h]	[m ³ /h]	ALPHA2
80-120	0.4	1.5	XX-40
120-160	0.5	2.0	XX-50
160-200	0.6	2.4	XX-60
200-300	0.8	3.5	XX-80

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

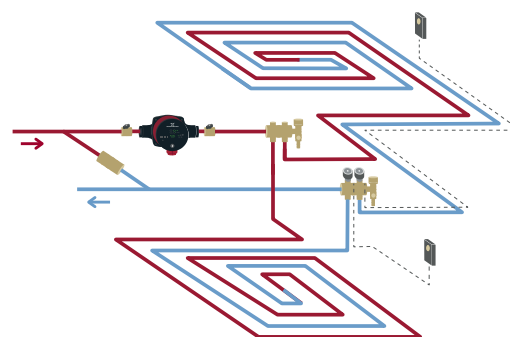
Examples of systems



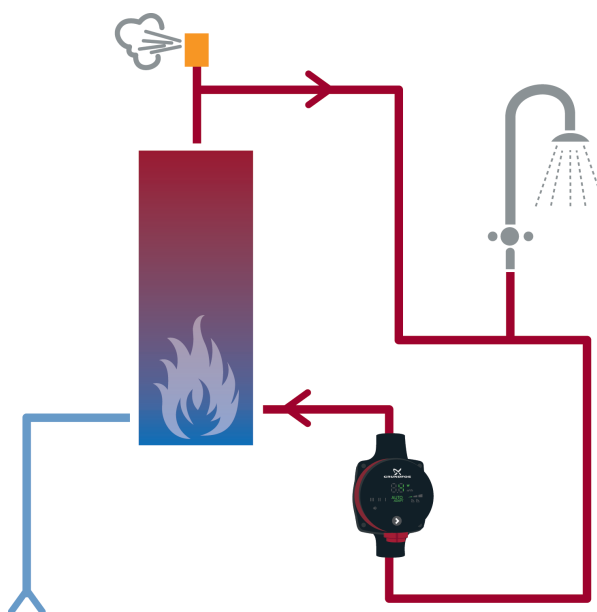
One-pipe heating system



Two-pipe heating system



Underfloor heating system



Domestic hot-water recirculation system

ALPHA2, the best 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.

ALPHA2 automatically controls the differential pressure by adjusting the pump performance to the actual heat demand, without the use of external components.

The pump has the following control modes:

- AUTOADAPT
- proportional pressure
- constant pressure
- constant curve .

AUTOADAPT

The integrated AUTOADAPT function is especially developed for the following:

- underfloor heating systems
- two-pipe heating systems.

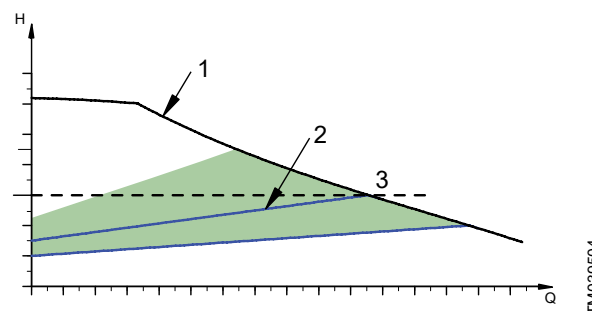
In AUTOADAPT mode, the pump is set to proportional-pressure control. The function is designed to continuously adapt the setting to the actual heating demand in the system.

AUTOADAPT selects the best control curve under the given operating conditions. AUTOADAPT optimises the position of the proportional-pressure curve via three steps.

First, it analyses the heating system, which the circulator pump is a part of. Then, on the basis of this analysis, AUTOADAPT verifies whether the pump pressure is too high, too low or correct. Hereby it selects the optimum proportional-pressure curve for the system within the AUTOADAPT performance range. See fig. [AUTOADAPT performance range](#). Finally, the pump is controlled according to the selected proportional-pressure curve. The pump will continue this cycle as long as it is running.

You cannot expect an optimum pump setting from day one.

If the power supply fails or is disconnected, the pump stores the AUTOADAPT setting in an internal memory and resumes the automatic adjustment when the power supply has been restored.



AUTOADAPT performance range

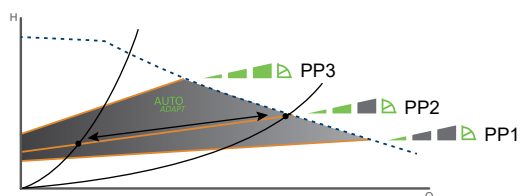
Pos.	Description
1	Max. curve
2	Proportional-pressure curve
3	Setpoint

The AUTOADAPT function differs from other control functions as it moves the control curve within a performance range. The marked area indicates the limits for the movement of the proportional-pressure curve. See fig. [AUTOADAPT performance range](#).

In a system with an uncontrolled pump, a pressure rise will often cause flow-generated noise in the thermostatic radiator valves. This noise will be reduced considerably with ALPHA2.

Proportional pressure

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. [Three proportional-pressure curves/settings](#) where PP2 has been selected. See [Change of performance](#) on page [Change of performance](#) for further information.

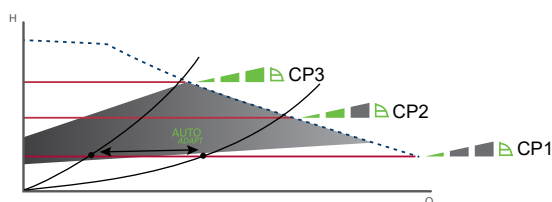


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Three proportional-pressure curves/settings

Constant pressure

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. [Three constant-pressure curves/settings](#) where CP1 has been selected. See [Change of performance](#) on page [Change of performance](#) for further information.



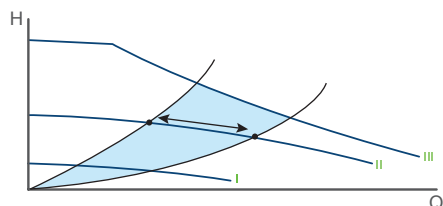
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Three constant-pressure curves/settings

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

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. [Three constant-curve/constant-speed settings](#) where II has been selected. See [Change of performance](#) on page [Change of performance](#) for further information.



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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.

Advantages of ALPHA pump control

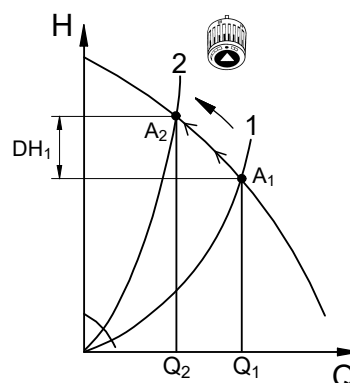
In ALPHA2, control is effected by adapting the differential pressure to the flow (proportional-pressure and constant-pressure control).

Contrary to an uncontrolled pump, the proportional-pressure-controlled ALPHA2 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. [Uncontrolled pump](#).

[Uncontrolled pump](#).

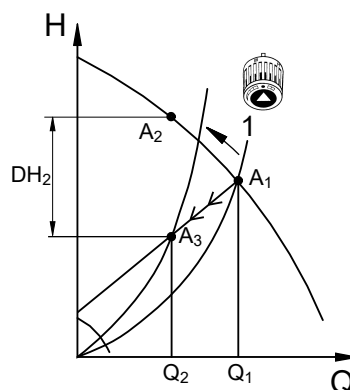
In a heating system with an uncontrolled pump, this situation will cause a pressure rise in the system by ΔH_1 .



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Uncontrolled pump

In a system with an ALPHA2 pump set to proportional-pressure control, the differential pressure will be reduced by ΔH_2 and result in reduced energy consumption. See fig. [Pump in proportional-pressure control mode](#).



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Pump in proportional-pressure control mode

Overview of control mode

Application	Control mode
Underfloor heating	Constant pressure
Two pipe system	AUTOADAPT or proportional pressure
Ventilation	Speed 1, 2 or 3
Boiler-shunt	Speed 1, 2 or 3
One pipe system	Constant pressure or speed 1, 2 or 3
Domestic hot water	Speed 1, 2 or 3

ALPHA2 features

Automatic night setback

You enable the automatic night setback with the  button on the control box.

Factory setting: Disabled.

Note: If you have set the pump to speed I, II or III, you cannot enable automatic night setback.

Once you have enabled automatic night setback, the pump automatically changes between normal duty and night setback. The changeover depends on the flow-pipe temperature measured by the integrated temperature sensor.

Function

If automatic night setback is to be used in the system, you must install the pump in the flow pipe.

Changeover between normal duty and night setback depends on the flow-pipe temperature.

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

Changeover to normal duty takes place without a time lag when the flow-pipe temperature has increased by approx. 10 °C.

Manual summer mode

You can select the manual summer mode as from ALPHA2 model C.

You enable the manual summer mode with the  button on the front of the control box.

Function

In the manual summer mode, the pump is automatically started at low speed to avoid blocking the rotor as well as sticky valves and non-return valves. The display is turned off.

If any alarms occur during the manual summer mode, no alarms will be shown. When you deactivate the manual summer mode again, only the actual alarms will be displayed.

You deactivate the manual summer mode by pressing any of the buttons, and then the pump returns to the previous mode and setting.

If you have enabled the automatic night setback mode before setting the manual summer mode, the pump will return to automatic night setback mode after the manual summer mode.

Dry-running protection

Dry-running protection is active as from ALPHA2 model D

The active dry-run feature protects the reliable wet-runner design of the ALPHA2 pump.

Dry-running protection protects the pump against dry running during start and normal operation. The user will be informed via an error code in the display.

ALPHA Reader

ALPHA Reader is an accessory

Compatible with ALPHA2 model E.

This feature is used for hydronic balancing radiators and underfloor heating in heating systems in a fast and safe way for the benefit of the installer as well as the end-user.

ALPHA Reader provides read-out of internal data from the pump. See fig. [ALPHA2 and an ALPHA Reader](#). The data will be transmitted to the handheld device, e.g. smartphone or tablet. In order to perform a balancing of the system, you must download the *Grundfos GO balance* app which is available in Apple App Store and Google Play.

ALPHA Reader is only necessary during hydraulic balancing and can be removed afterwards. See also [ALPHA Reader](#).



ALPHA2 and an ALPHA Reader

High-torque start

High-torque start is active as from ALPHA2 model D

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.

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3. 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 $\nu = 1 \text{ mm}^2/\text{s}$ (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 approx. 10 mm²/s (10 cSt) and a reduction of pump performance by approx. 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.

Technical data

Liquid temperature

ALPHA2 pumps: 2-110 °C.

In domestic hot-water systems, we recommend that you keep the liquid temperature between 50 and 65 °C to eliminate the risk of lime precipitation.

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]	Max. [°C]
0	2	110
10	10	110
20	20	110
30	30	110
35	35	90
40	40	70

The ALPHA2 pump can, however, run at ambient temperatures higher than the liquid temperature if the plug connection in the pump head is pointing downwards. See figures [Possible control box positions, heating systems](#) and [Possible control box position, air-conditioning and cold-water systems](#).

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
	0.5 m head	2.8 m head	10.8 m head
Inlet pressure	0.005 MPa	0.028 MPa	0.108 MPa
	0.05 bar	0.28 bar	1.08 bar

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.
Relative air humidity	Maximum 95 %.
Ambient temperature	0-40 °C.
Temperature class	TF110 to EN 60335-2-51.
EMC (electromagnetic compatibility)	EMC Directive (2014/30/EU)
Sound pressure level	≤ 43 dB(A).

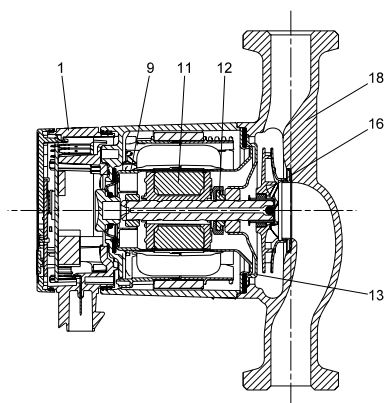
4. Construction

ALPHA2 is designed for long and trouble-free operation as a canned-rotor type, i.e. 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/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.
- Automatic venting which contributes to easy commissioning.
- Compact design featuring pump head with integrated control box and operating panel which fits into most common installations.

Sectional drawing



Position numbers

TM039728

Material specification

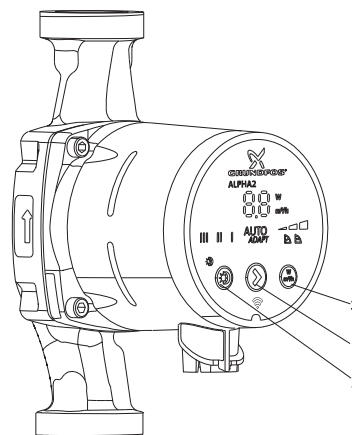
Pos.	Description	Material	EN/DIN	AISI/ASTM
1	Controller complete	Composite, PC		
9	Rotor can	Stainless steel	1.4401	316
9a	Radial bearing	Ceramics		
11	Shaft	Ceramics		
11a	Rotor cladding	Stainless steel	1.4401	316
12	Thrust bearing	Carbon		
12a	Thrust bearing retainer	EPDM rubber		
13	Bearing plate	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 three push-buttons (1, 2 and 3) and a 2-digit 7-segment display. See fig. *Position of push-buttons*.



Position of push-buttons

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Pos.	Description
1	Push-button for selection of pump setting.
2	Push-button for enabling or disabling of automatic night setback or manual summer mode. You have to activate both settings manually.
3	Push-button for selection of parameter to be shown in the display, i.e. actual power consumption in watt or actual flowrate in m ³ /h.

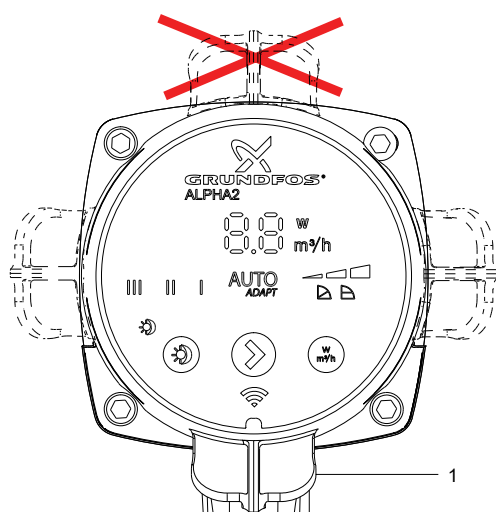
The display is on when you have switched on the power supply. The display shows the actual pump power consumption in watt (integer) or the actual flowrate in m³/h, in steps of 0.1 m³/h, during operation.

Faults preventing the pump from operating properly are indicated by fault codes in the display, for example in the case of a blocked rotor.

The following faults can be indicated in the display:

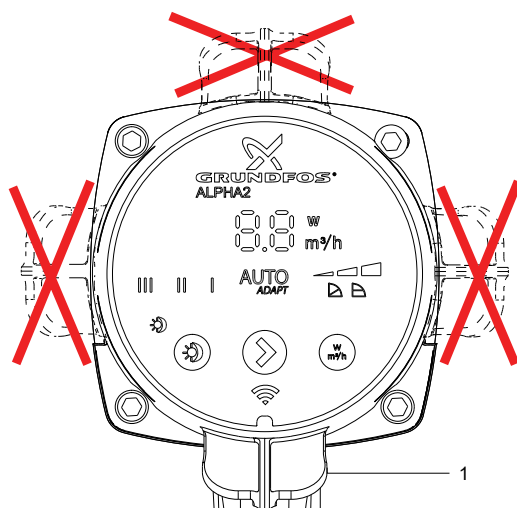
- E1: blocked rotor
- E2: insufficient supply voltage
- E3: electrical fault
- E4: dry-run.

Figures *Possible control box positions, heating systems* and *Possible control box position, air-conditioning and cold-water systems* show the possible control box positions in heating systems as well as in air-conditioning and cold-water systems.



TM052520

Possible control box positions, heating systems



TM052700

Possible control box position, air-conditioning and cold-water systems

Pos.	Description
1	Standard position

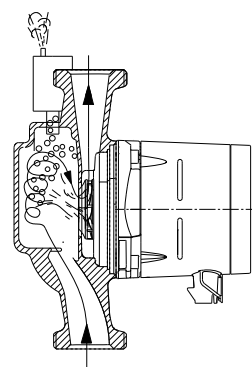
The plug incorporates cable relief and a locking function for securing the connection of the supply cable.

Unique air vent system

The pump housing with air separator is installed in systems where the liquid contains so much air that a circulator pump without air separator cannot start or keep up a continuous circulation. The pump housing is available only for upward water flows.

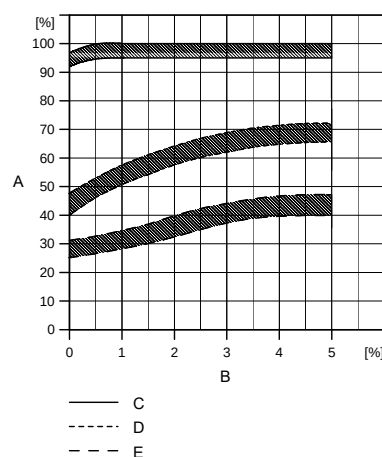
The air-containing liquid is guided from the inlet port to the nozzle of the air-separating chamber and caused to circulate considerably in the relatively large chamber, thus creating a relatively lower pressure at the back (top) of the chamber. This lower pressure combined with the reduced velocity of the liquid in the air-separating chamber will cause a separation of air from the liquid. Due to its lower density, the air will escape through an automatic air vent fitted to the air-separating chamber.

The pump housing has an Rp 3/8 tapping for fitting of an air vent. The air vent is not supplied with the pump.



TM052521

Pump housing with air-separating chamber



TM009101

Air separation

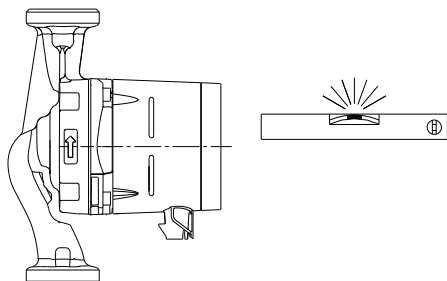
Pos.	Description
A	Air separation as %
B	Quantity of air as % of pumped liquid
C	Q = 0.5 m³/h
D	Q = 1.0 m³/h
E	Q = 1.25 m³/h

5. Installation and startup

Installation

In most cases, the installation of ALPHA2 is reduced to the mechanical installation and connection to the power supply.

Always install the pump with horizontal motor shaft.



TM052522

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:

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

Factory setting

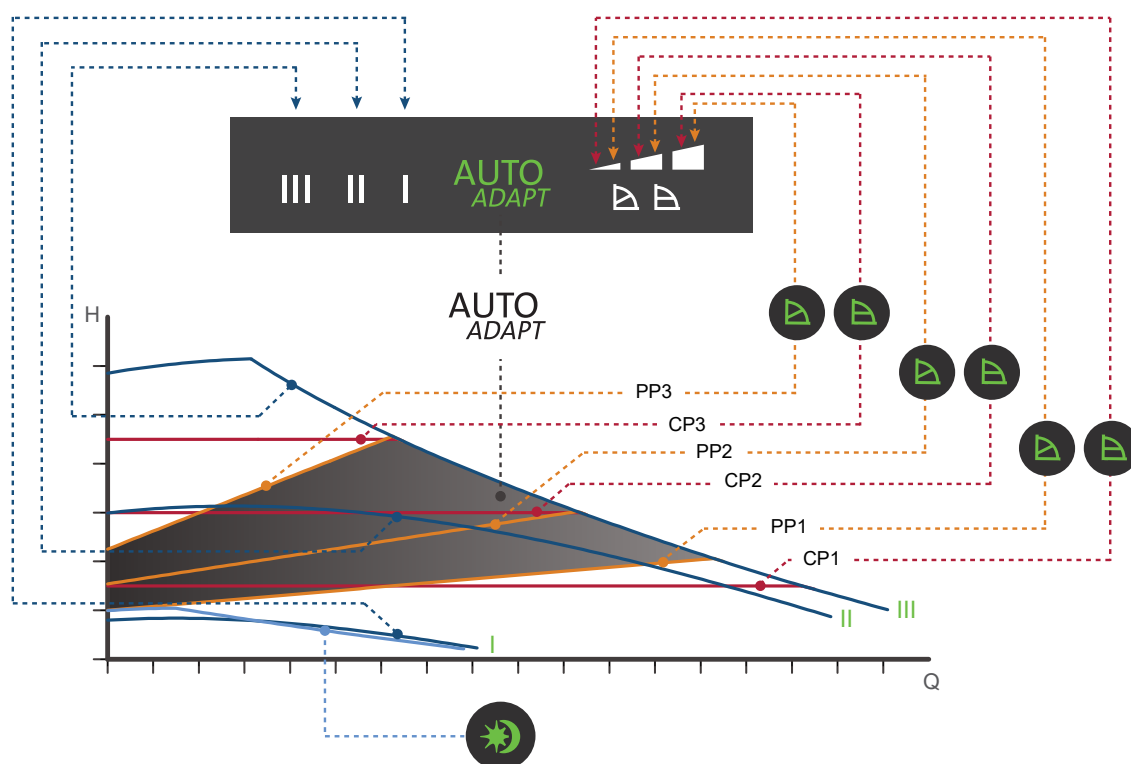
The push-buttons on the pump control box have been factory-set as shown in the table below.

These settings are suitable for a large majority of all single- and two-family houses.

Pump type	Setting	Automatic night setback	Manual summer mode
ALPHA2 XX-40			
ALPHA2 XX-50	AUTOADAPT	Disabled	Disabled
ALPHA2 XX-60			
ALPHA2 XX-80			

Change of performance

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



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Pump setting in relation to pump performance

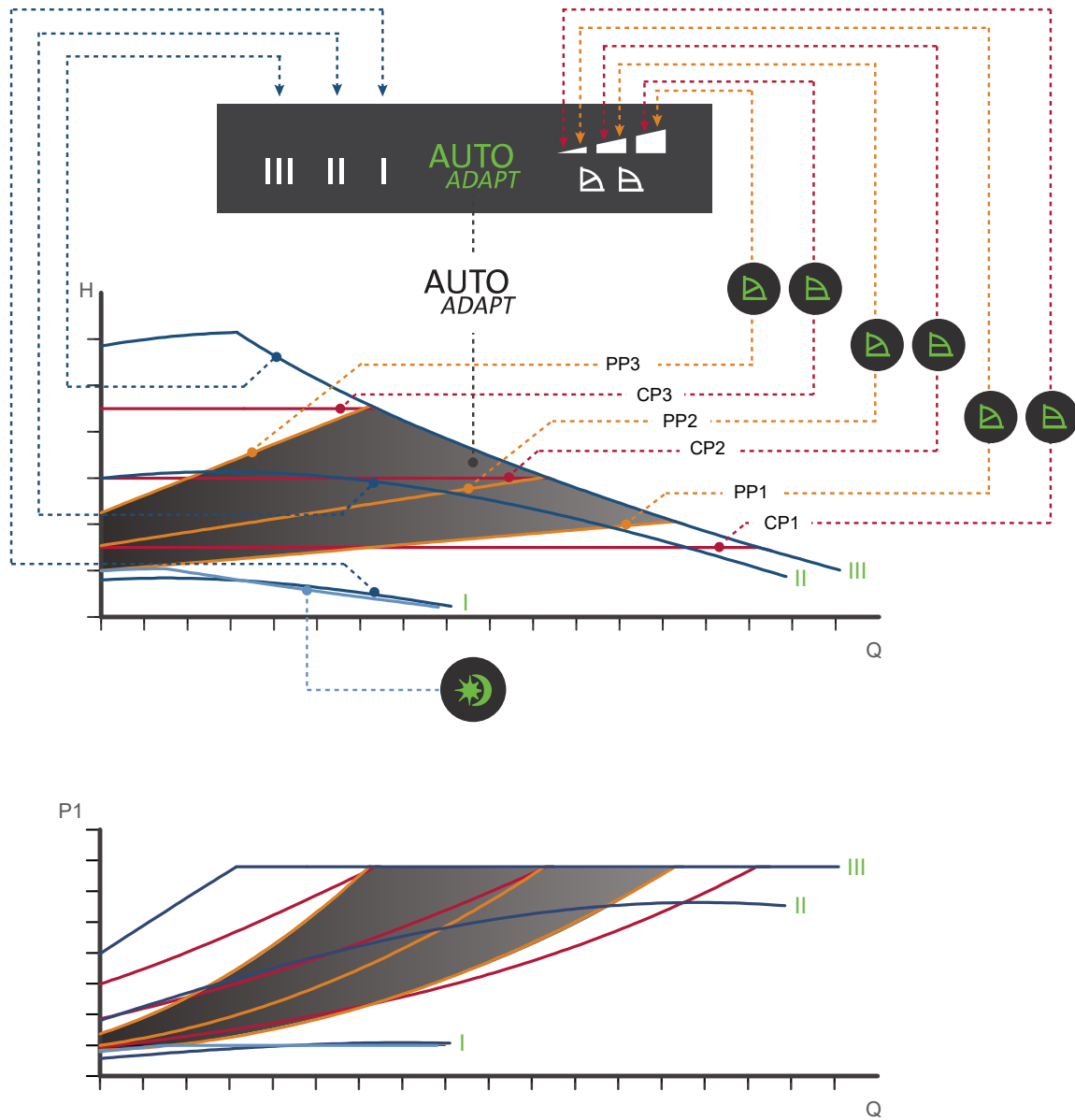
Setting	Pump curve	Function
AUTOADAPT factory setting	Highest to lowest proportional-pressure curve	The AUTOADAPT function enables the pump to control the pump performance automatically within a defined performance range. See fig. <i>Pump setting in relation to pump performance</i> . Adjustment of the pump performance to the size of the system. Adjustment of the pump performance to the variations in load over time. In AUTOADAPT, the pump is set to proportional-pressure control.
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. <i>Pump setting in relation to pump performance</i> . 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. <i>Pump setting in relation to pump performance</i> . 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. <i>Pump setting in relation to pump performance</i> . 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. <i>Pump setting in relation to pump performance</i> . 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. <i>Pump setting in relation to pump performance</i> . 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. <i>Pump setting in relation to pump performance</i> . 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. In speed III, the pump is set to run on the maximum curve under all operating conditions. See fig. <i>Pump setting in relation to pump performance</i> . You can obtain quick venting of the pump by setting the pump to speed III for a short period.

Setting	Pump curve	Function
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. Pump setting in relation to pump performance .
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. Pump setting in relation to pump performance .
	Automatic night setback and manual summer mode	The pump changes to the curve for automatic night setback, i.e. absolute minimum performance and power consumption, provided that certain conditions are met. In manual summer mode, the pump is automatically started frequently at low speed to avoid a blocking rotor. The display is turned off. See sections Automatic night setback and Manual summer mode .

6. Guide to performance curves

Each pump setting has its own performance curve (Q/H curve). However, AUTOADAPT covers a performance range. 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. [Performance curves in relation to pump setting](#).



Performance curves in relation to pump setting

Setting	Pump curve
AUTOADAPT (factory setting)	Setpoint within the marked area
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

TM052578

Setting	Pump 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 for automatic night setback/manual summer mode

Curve conditions

The guidelines below apply to the performance curves in section Performance curves and technical data:

- Test liquid: airless water.
- The curves apply to a density of $\rho = 983.2 \text{ kg/m}^3$ and a liquid temperature of 60°C .
- All curves show average values and must not be used as guarantee curves. If a specific minimum performance is required, make individual measurements.
- The curves for speeds I, II and III are marked.
- The curves apply to a kinematic viscosity of $\nu = 0.474 \text{ mm}^2/\text{s}$ (0.474 cSt).
- The conversion between head H [m] and pressure p [kPa] has been made for water with a density of $\rho = 1000 \text{ kg/m}^3$. For liquids with other densities, for example hot water, the outlet pressure is proportional to the density.
- Curves obtained according to EN 16297.

Symbols used on the following pages

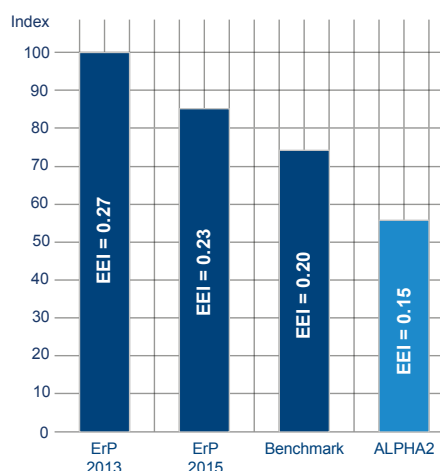
For ALPHA2 pumps, the energy efficiency index (EEI) is down to $\text{EEI} \leq 0.15$ and categorised as best in class.

ALPHA2 with AUTOADAPT function is the preferred choice for domestic installations and a true efficiency frontrunner.

The EEI is an indicator of the efficiency of the circulator and is the relation between the weighted average electrical input power of the ALPHA2 (considering standardized load profile) and the average input power of a standard circulator having the same hydraulic output power.

The ALPHA2 EEI is far below the ErP 2015 requirements and even exceeds the best in class benchmark level. See fig. *EEI limits and the current positioning of the ALPHA2*.

The benchmark for the most efficient circulators is $\text{EEI} \leq 0.20$.



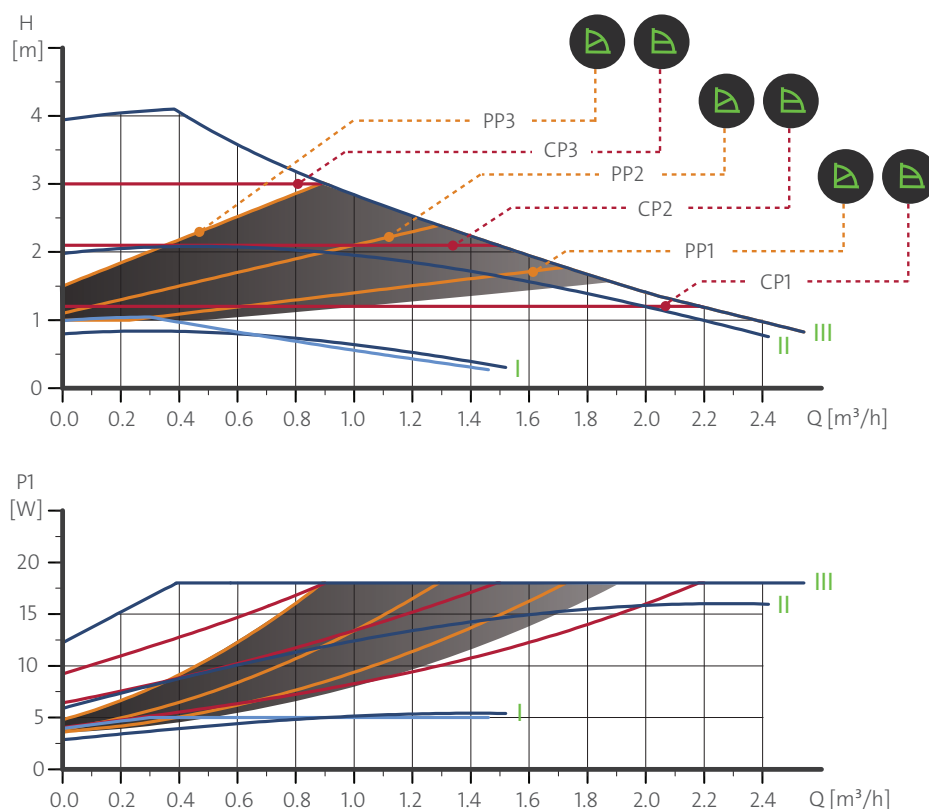
TM054002

EEI limits and the current positioning of the ALPHA2

With an energy efficiency index (EEI) well below the ErP benchmark level, you can achieve energy savings of up to 85 % compared to a typical circulator and thus a remarkably fast return on investment. This means, of course, that ALPHA2 more than meets the standards of the ErP legislation.

7. Performance curves and technical data

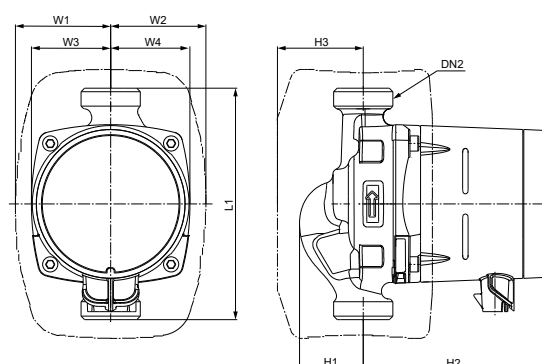
ALPHA2 15-40



TM051672

Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-18	0.04 - 0.18	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	18	0.18	Specific EEI:	≤ 0.15.

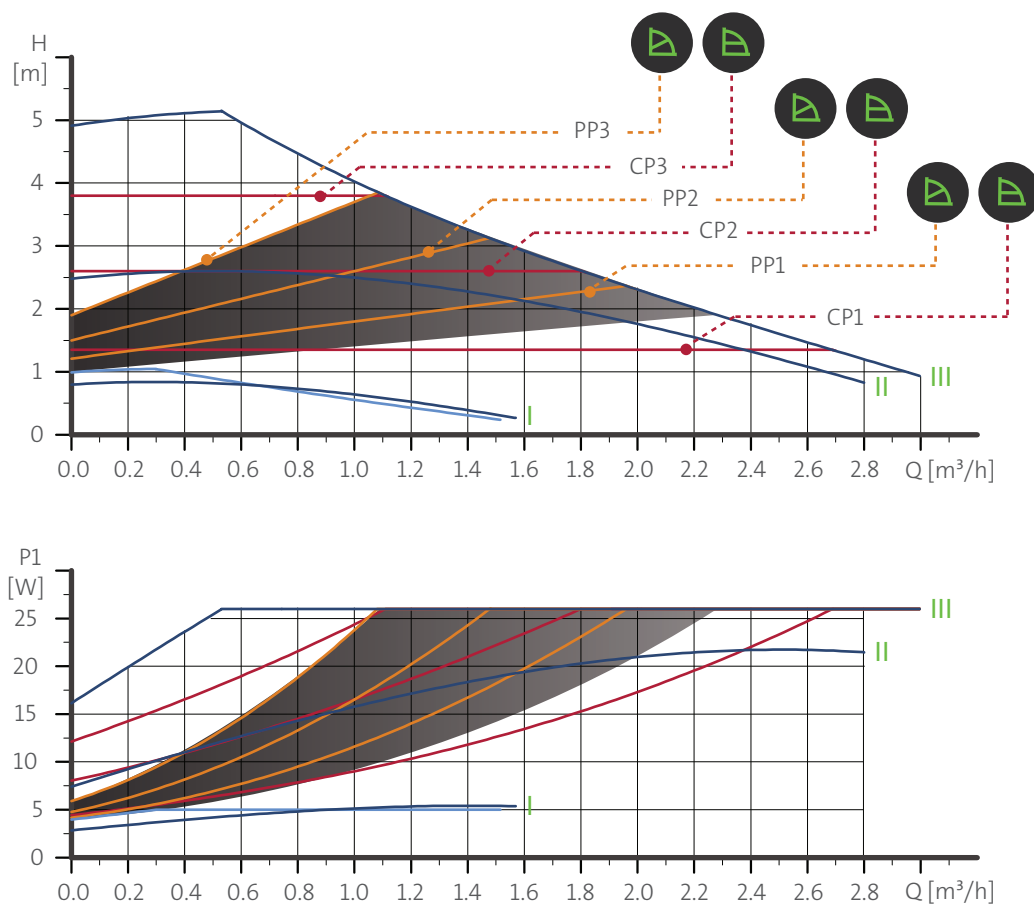
The pump incorporates overload protection.



TM083404

Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m³]
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	
ALPHA2 15-40	130	54	54	44	44	36	104	47	G 1	1.7	1.9	0.004

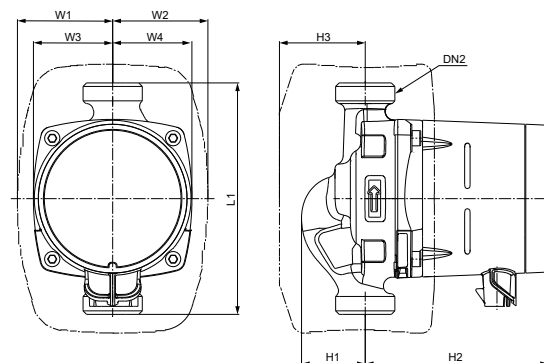
ALPHA2 15-50



TM051673

Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-26	0.04 - 0.24	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	26	0.24	Specific EEI:	≤ 0.16.

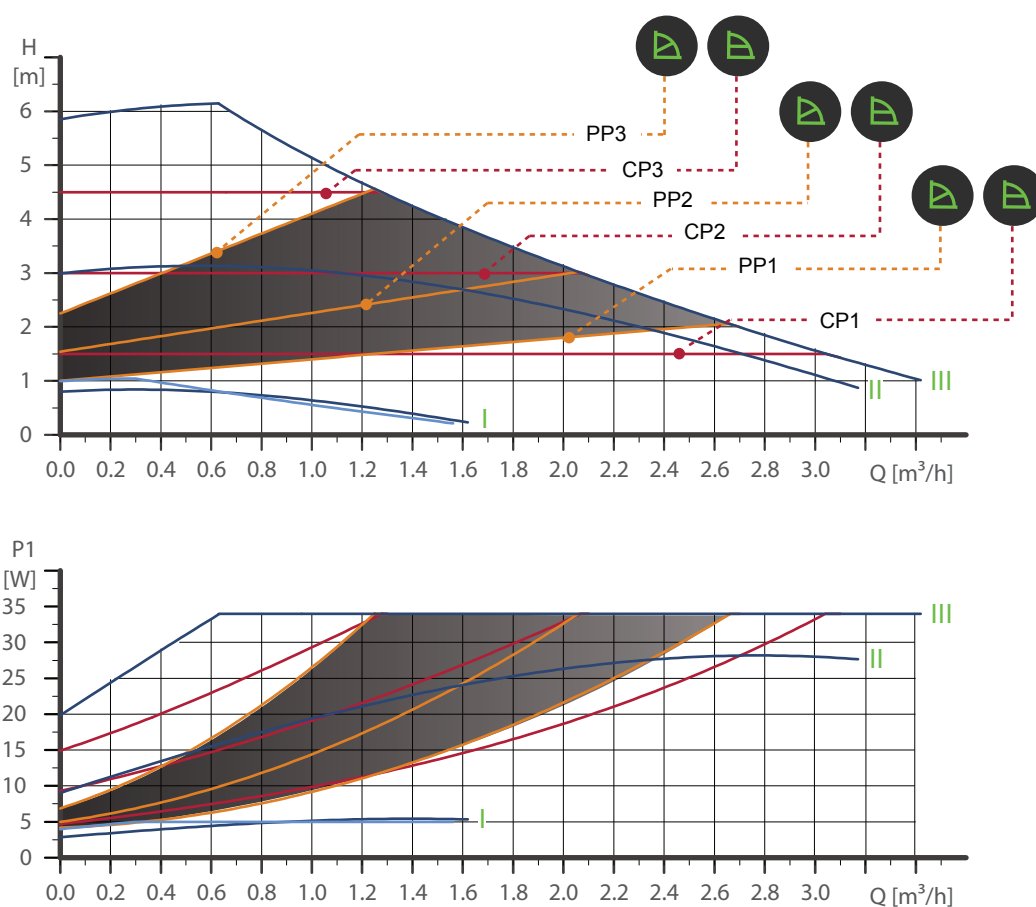
The pump incorporates overload protection.



TM083404

Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m³]
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	
ALPHA2 15-50	130	54	54	44	44	36	104	47	G 1	1.7	1.9	0.004

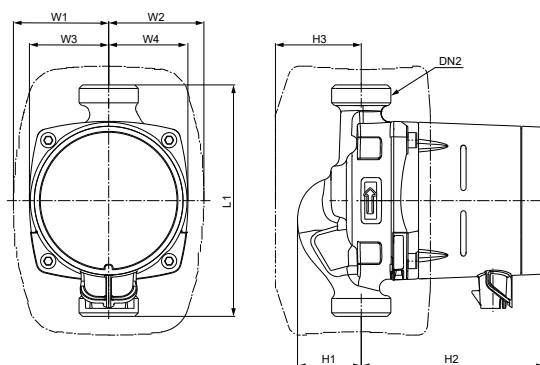
ALPHA2 15-60



TM051674

Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-34	0.04 - 0.32	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	34	0.32	Specific EEI:	≤ 0.17.

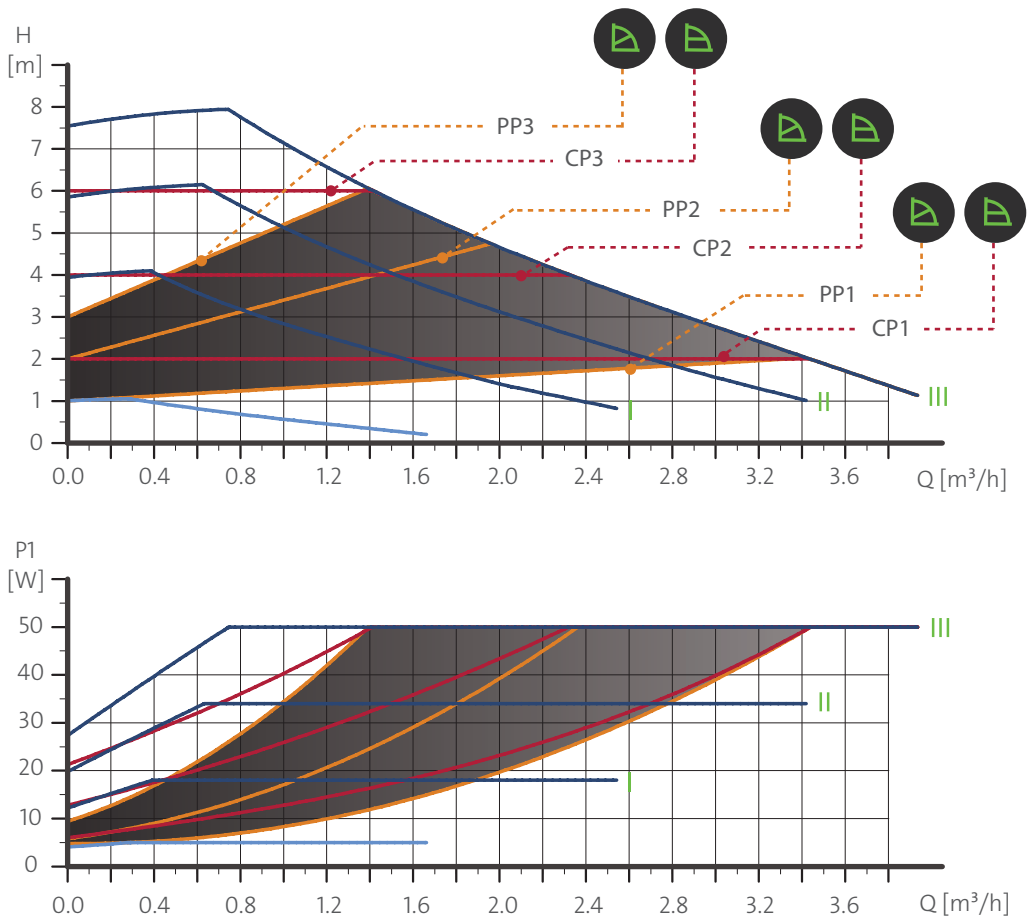
The pump incorporates overload protection.



TM083404

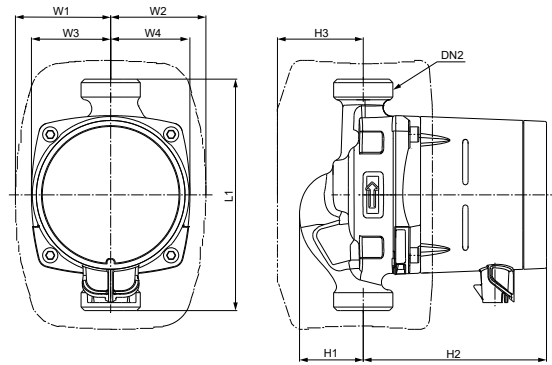
Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m³]
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	
ALPHA2 15-60	130	54	54	44	44	36	104	47	G 1	1.7	1.9	0.004

ALPHA2 15-80



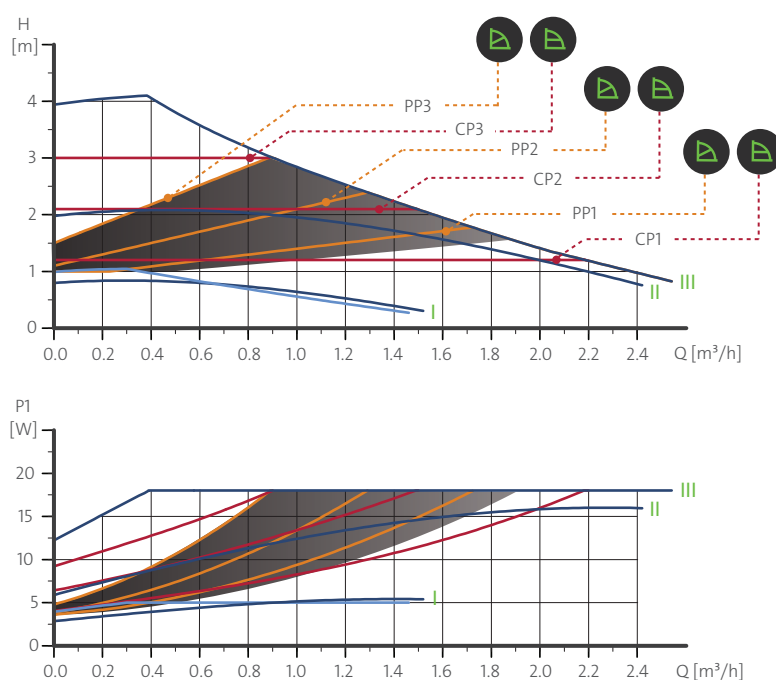
Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-50	0.04 - 0.44	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	50	0.44	Specific EEI:	≤ 0.18.

The pump incorporates overload protection.



Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m³]
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	
ALPHA2 15-80	130	54	54	44	44	36	104	47	G 1	1.7	1.9	0.004

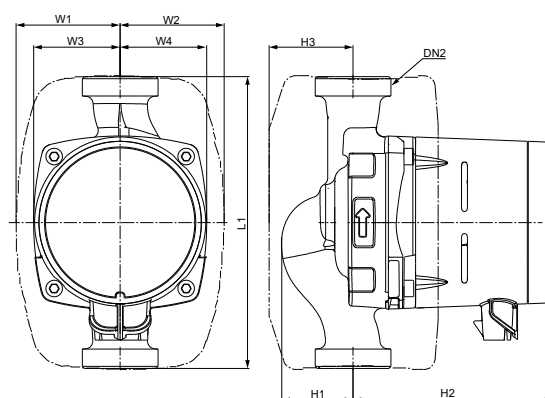
ALPHA2 20-40 N



TM051672

Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-18	0.04 - 0.18	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	18	0.18	Specific EEI:	≤ 0.15.

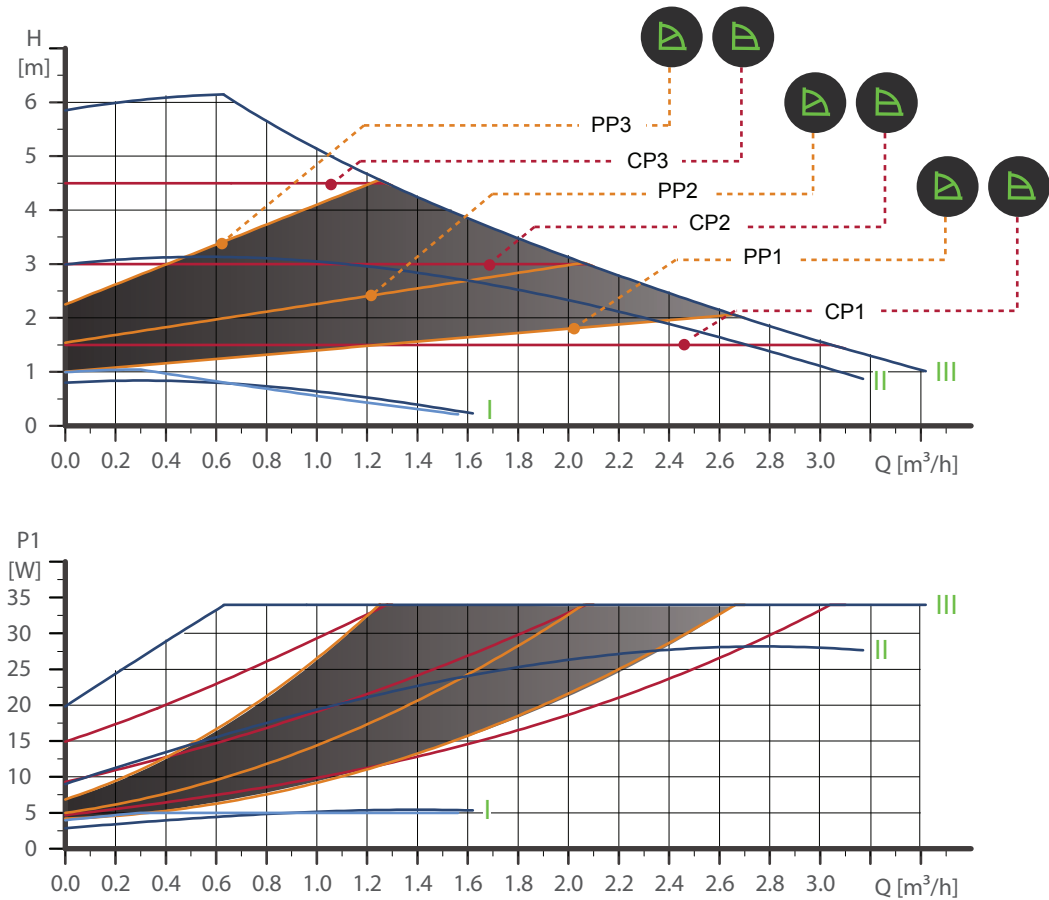
The pump incorporates overload protection.



TM083406

Pump type	Dimensions [mm]									Weights [kg]		Ship. vol.
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	[m³]
ALPHA2 20-40 N	150	54	54	44	44	37	104	47	G 1 1/4	2.0	2.1	0.004

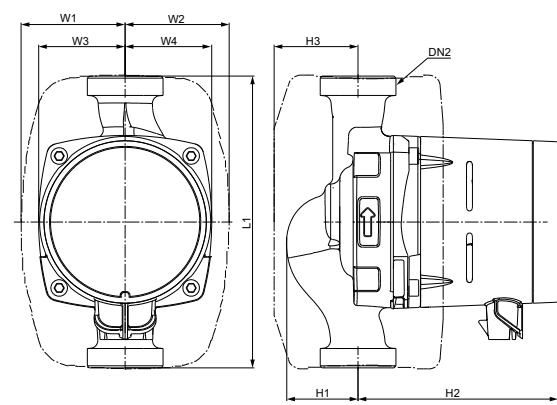
ALPHA2 20-60 N



TM051674

Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-34	0.04 - 0.32	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	34	0.32	Specific EEI:	≤ 0.17.

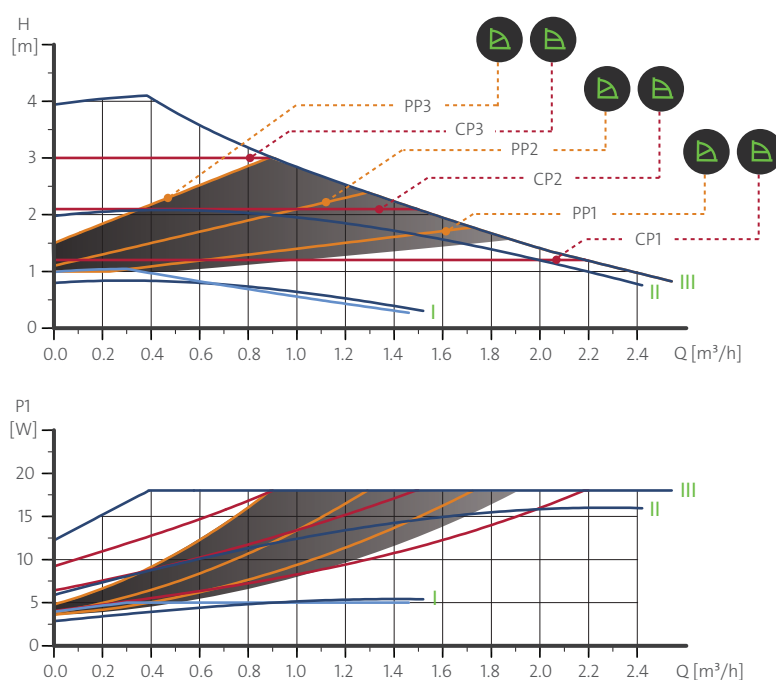
The pump incorporates overload protection.



TM083406

Pump type	Dimensions [mm]								Weights [kg]		Ship. vol.	
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	[m³]
ALPHA2 20-60 N	150	54	54	44	44	37	104	47	G 1 1/4	2.0	2.1	0.004

ALPHA2 25-40 (N)

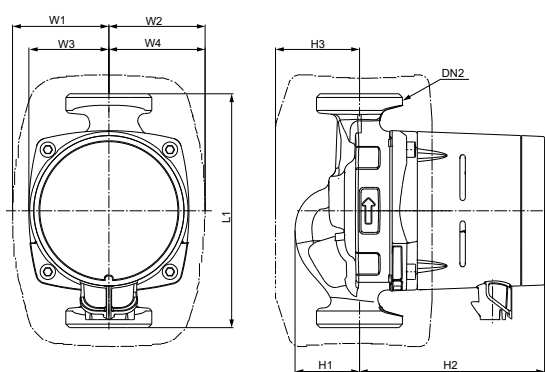


TM051672

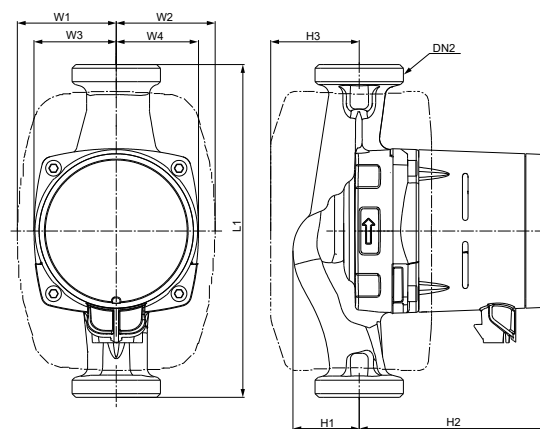
Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-18	0.04 - 0.18	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	18	0.18	Also available with:	Stainless-steel pump housing, type N.
The pump incorporates overload protection.			Specific EEI:	≤ 0.15.

ALPHA 25-XX 130

ALPHA 25-XX 180



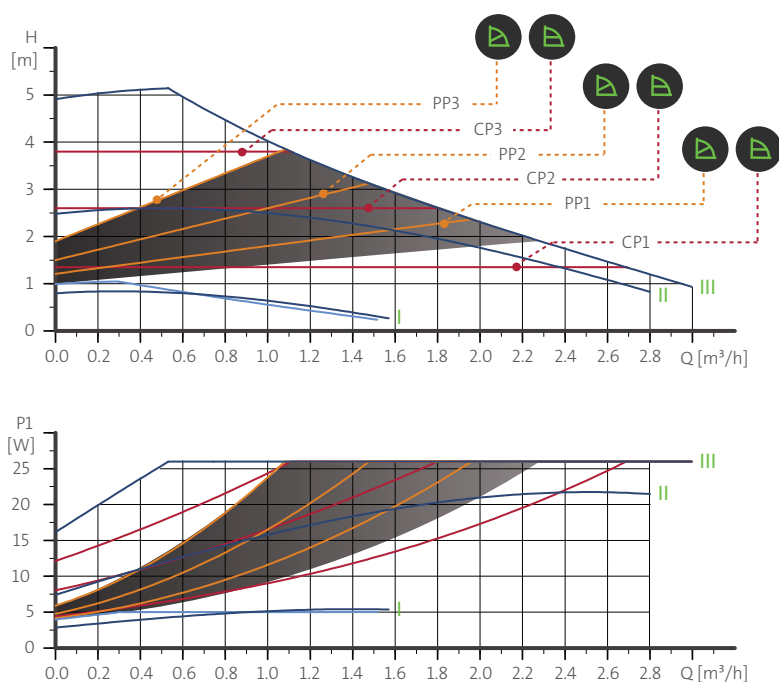
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TM083407

Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m³]
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	
ALPHA2 25-40	130	54	54	44	44	36	104	47	G 1 1/2	1.9	2.0	0.004
ALPHA2 25-40 N	130	54	54	44	44	37	104	47	G 1 1/2	2.0	2.1	0.004
ALPHA2 25-40	180	54	54	44	44	36	104	47	G 1 1/2	2.0	2.1	0.004
ALPHA2 25-40 N	180	54	54	44	44	37	104	47	G 1 1/2	2.1	2.3	0.004

ALPHA2 25-50 (N)

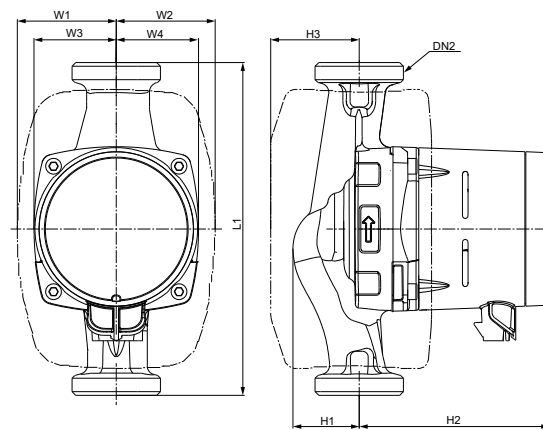
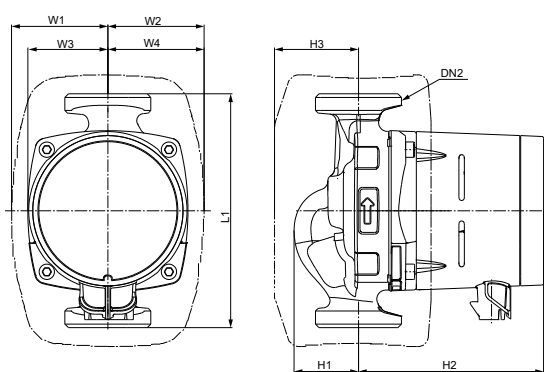


TM051673

Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-26	0.04 - 0.24	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	26	0.24	Also available with:	Stainless-steel pump housing, type N.
The pump incorporates overload protection.			Specific EEI:	≤ 0.16.

ALPHA 25-XX 130

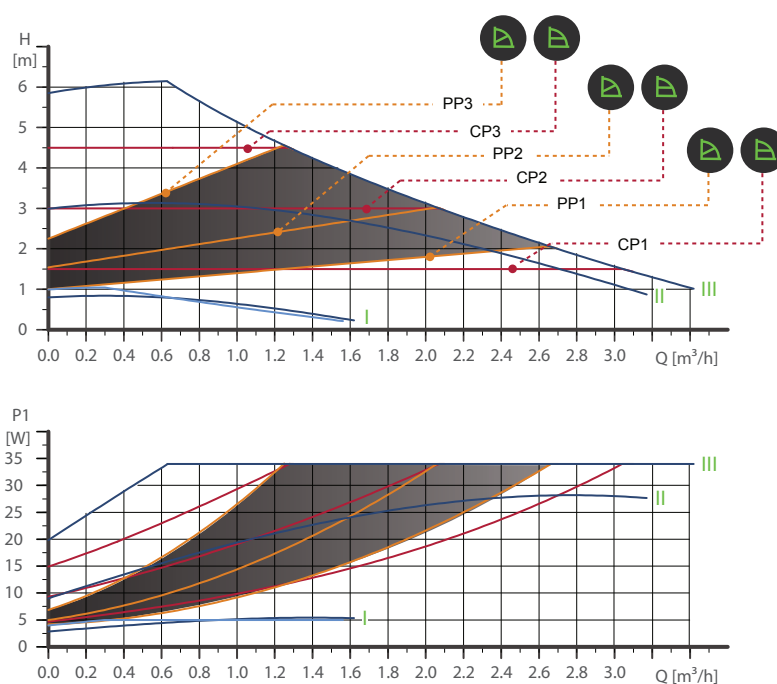
ALPHA 25-XX 180



Pump type	Dimensions [mm]								Weights [kg]		Ship. vol. [m³]	
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net		Gross
ALPHA2 25-50	130	54	54	44	44	36	104	52	G 1 1/2	1.9	2.0	0.004
ALPHA2 25-50 N	130	54	54	44	44	37	104	52	G 1 1/2	2.0	2.1	0.004
ALPHA2 25-50	180	54	54	44	44	36	104	52	G 1 1/2	2.0	2.1	0.004
ALPHA2 25-50 N	180	54	54	44	44	37	104	52	G 1 1/2	2.1	2.3	0.004

See product numbers and QR codes in Product numbers.

ALPHA2 25-60 (N)

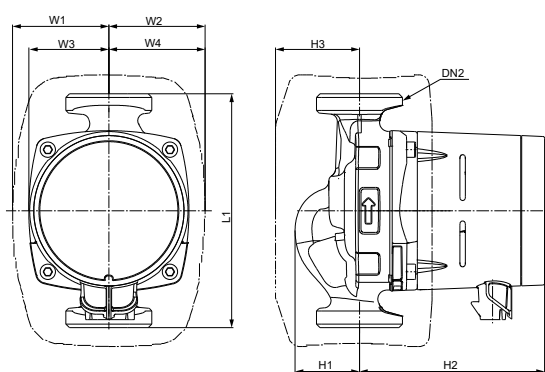


TM051674

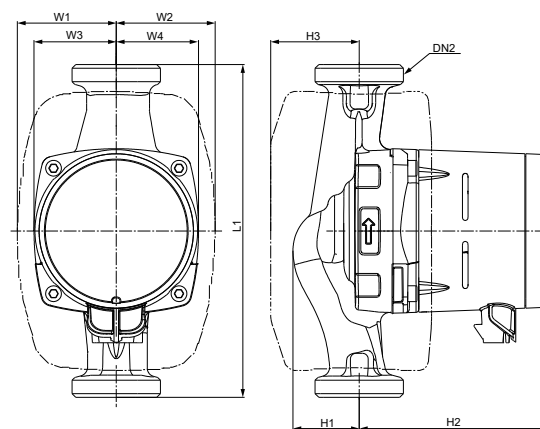
Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-34	0.04 - 0.32	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	34	0.32	Also available with:	Stainless-steel pump housing, type N.
The pump incorporates overload protection.			Specific EEI:	≤ 0.17.

ALPHA 25-XX 130

ALPHA 25-XX 180



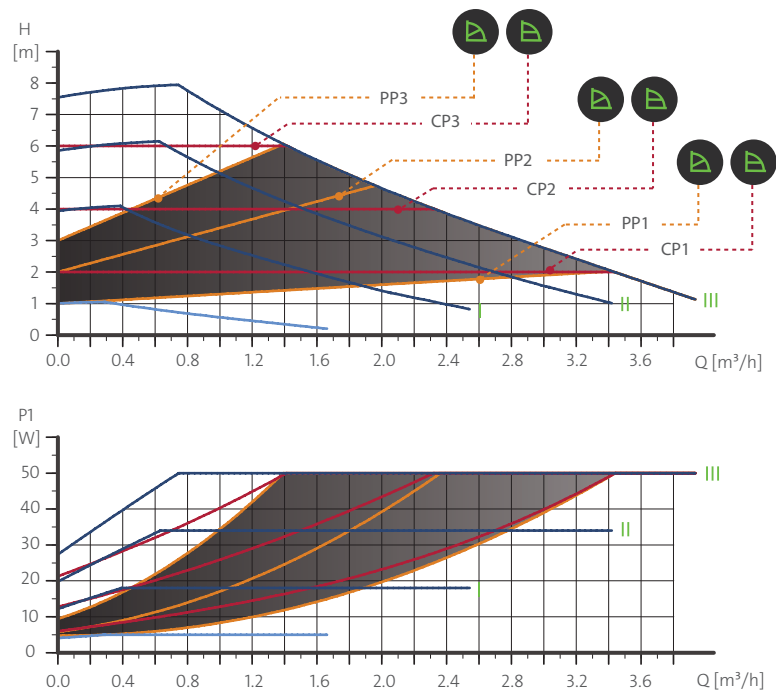
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Pump type	Dimensions [mm]								Weights [kg]		Ship. vol. [m³]	
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net		Gross
ALPHA2 25-60	130	54	54	44	44	36	104	47	G 1 1/2	1.9	2.0	0.004
ALPHA2 25-60 N	130	54	54	44	44	37	104	47	G 1 1/2	2.0	2.1	0.004
ALPHA2 25-60	180	54	54	44	44	36	104	47	G 1 1/2	2.0	2.1	0.004
ALPHA2 25-60 N	180	54	54	44	44	37	104	47	G 1 1/2	2.1	2.3	0.004

ALPHA2 25-80 (N)

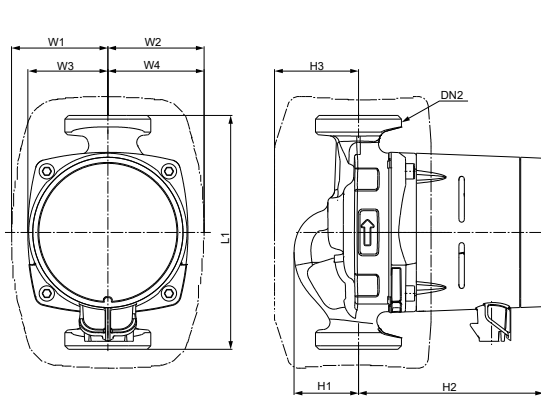


TM061285

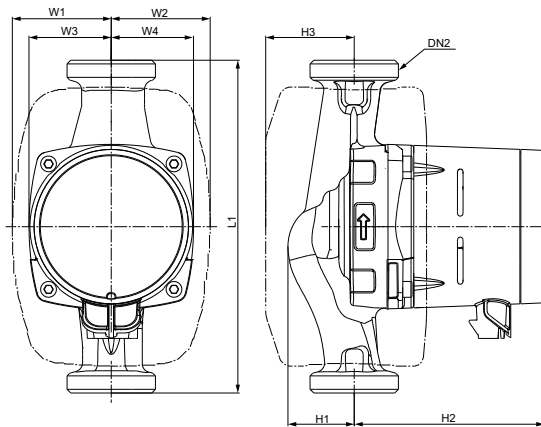
Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-50	0.04 - 0.44	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	50	0.44	Also available with:	Stainless-steel pump housing, type N.
The pump incorporates overload protection.			Specific EEI:	≤ 0.18.

ALPHA 25-XX 130

ALPHA 25-XX 180



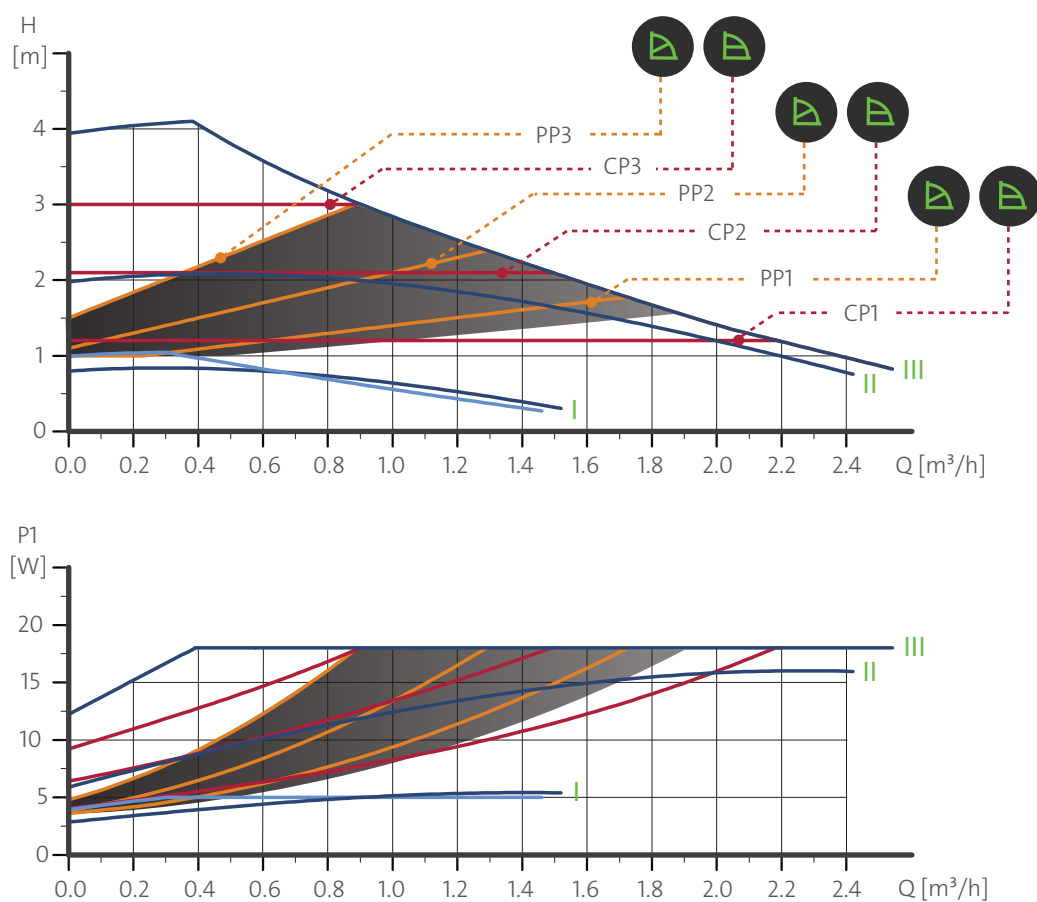
TM083405



TM083407

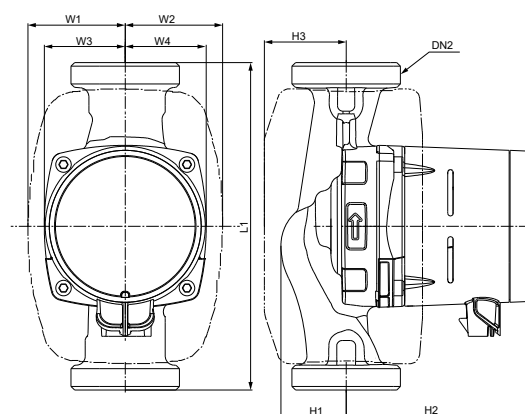
Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m³]
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	
ALPHA2 25-80	130	54	54	44	44	36	104	47	G 1 1/2	1.9	2.0	0.004
ALPHA2 25-80 N	130	54	54	44	44	37	104	47	G 1 1/2	2.0	2.1	0.004
ALPHA2 25-80	180	54	54	44	44	36	104	47	G 1 1/2	2.0	2.1	0.004
ALPHA2 25-80 N	180	54	54	44	44	37	104	47	G 1 1/2	2.1	2.3	0.004

ALPHA2 32-40 (N)



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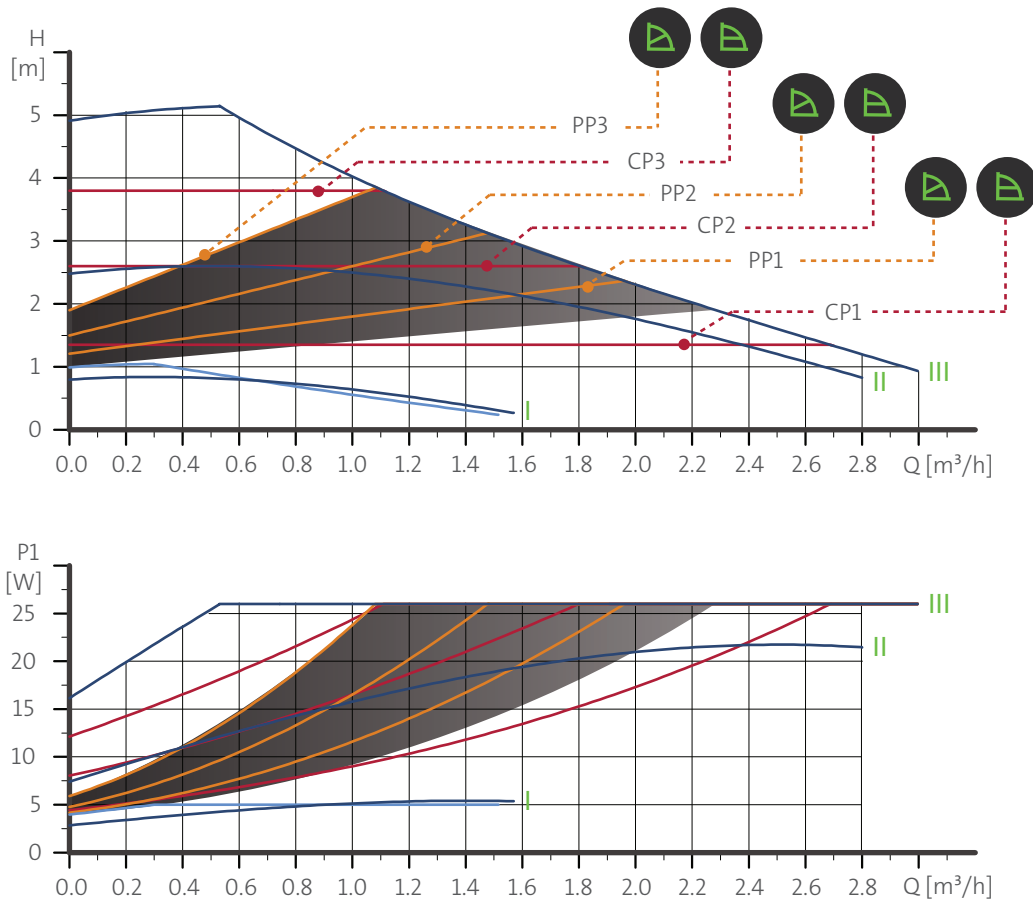
Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-18	0.04 - 0.18	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	18	0.18	Also available with:	Stainless-steel pump housing, type N.
The pump incorporates overload protection.			Specific EEI:	≤ 0.15.



TM083408

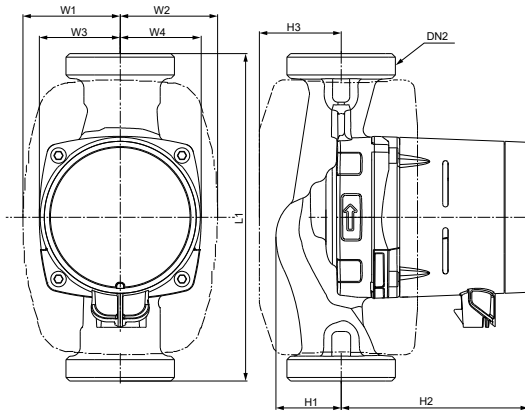
Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m³]
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	
ALPHA2 32-40	180	54	54	44	44	36	104	47	G 2	2.1	2.3	0.004
ALPHA2 32-40 N	180	54	54	44	44	37	104	47	G 2	2.3	2.4	0.004

ALPHA2 32-50 (N)



TM051673

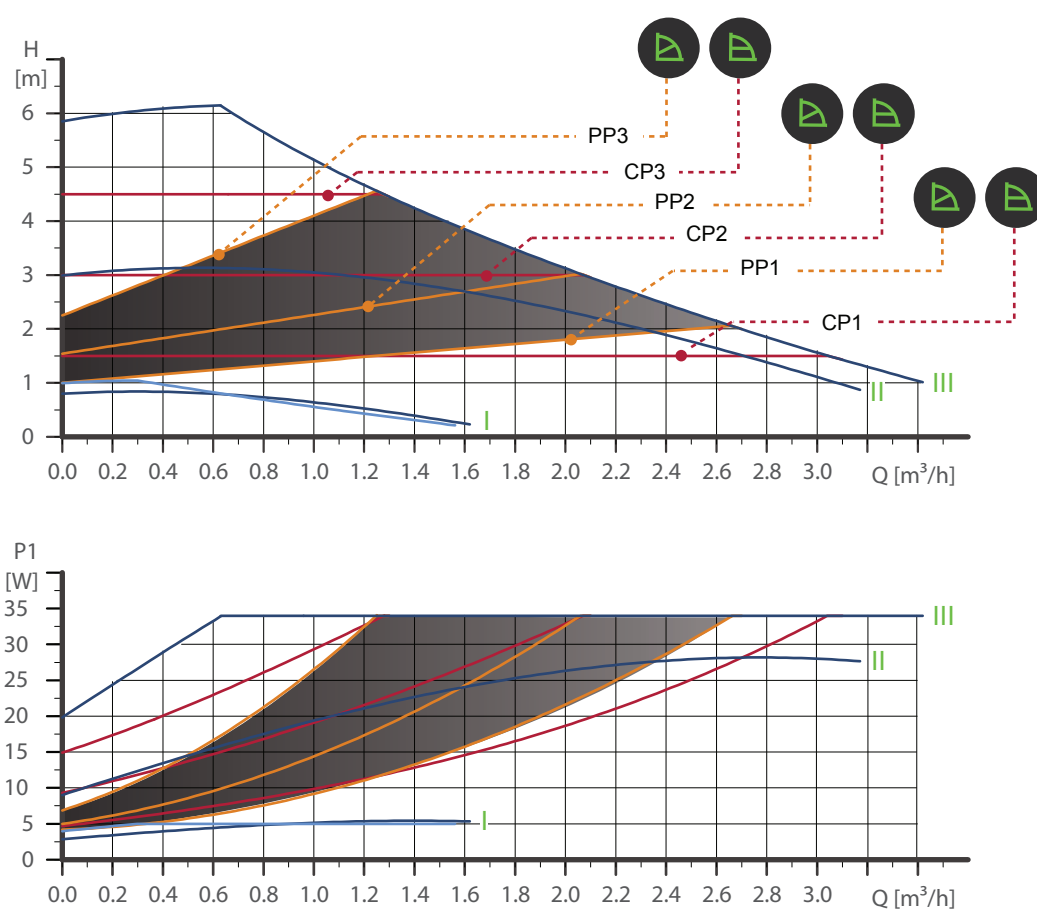
Speed	P1 [W]	I _l [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-26	0.04 - 0.24	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	26	0.24	Also available with:	Stainless-steel pump housing, type N.
The pump incorporates overload protection.			Specific EEI:	≤ 0.16.



TM083408

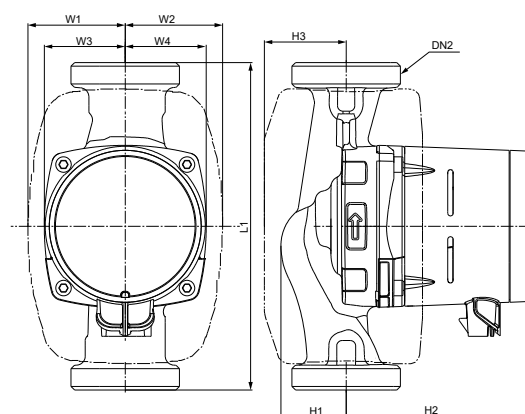
Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m³]
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	
ALPHA2 32-50	180	54	54	44	44	36	104	47	G 2	2.1	2.3	0.004
ALPHA2 32-50 N	180	54	54	44	44	37	104	47	G 2	2.3	2.4	0.004

ALPHA2 32-60 (N)



TM051674

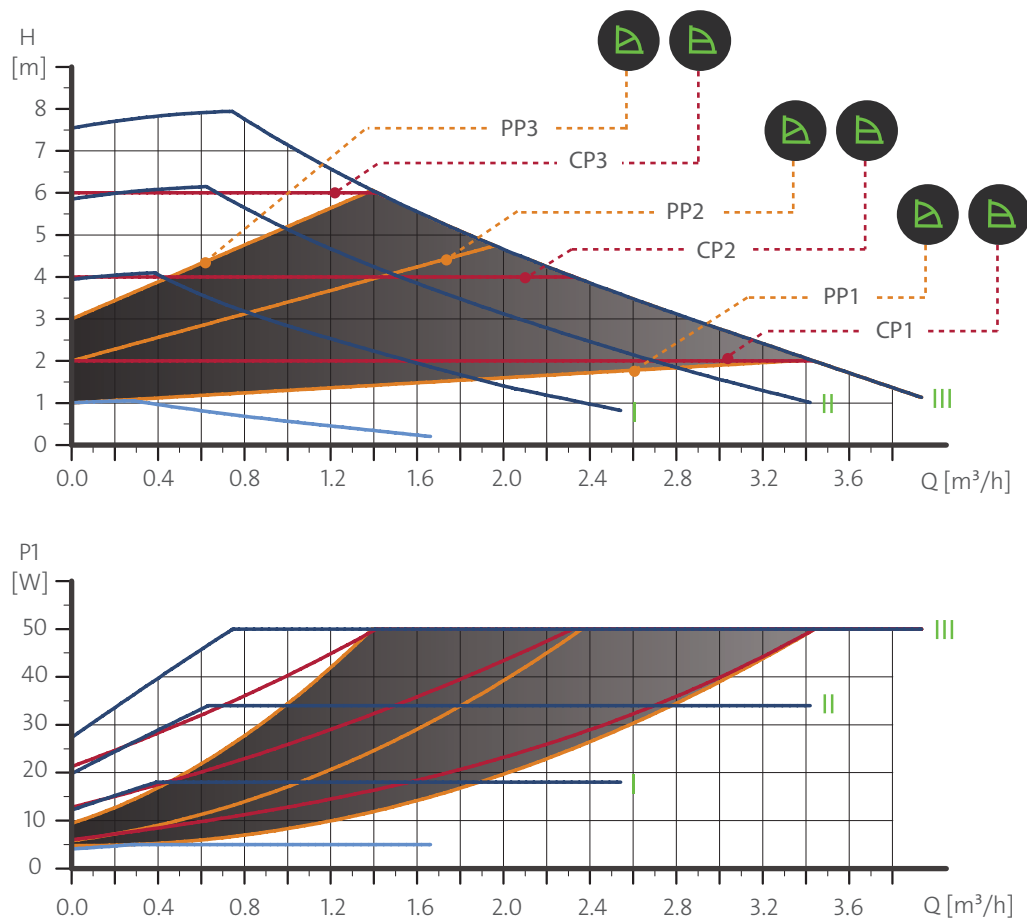
Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-34	0.04 - 0.32	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	34	0.32	Also available with:	Stainless-steel pump housing, type N.
The pump incorporates overload protection.			Specific EEI:	≤ 0.17.



TM083408

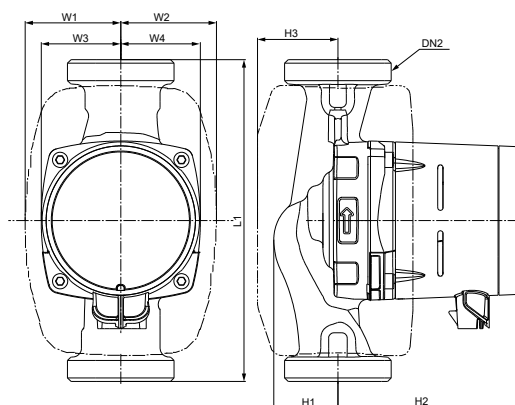
Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m³]
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net	Gross	
ALPHA2 32-60	180	54	54	44	44	36	104	47	G 2	2.1	2.3	0.004
ALPHA2 32-60 N	180	54	54	44	44	37	104	47	G 2	2.3	2.4	0.004

ALPHA2 32-80 (N)



TM061285

Speed	P1 [W]	I ₁ [A]	Connections:	See 8.1 Unions and valve kits.
AUTOADAPT	4-50	0.04 - 0.44	System pressure:	Maximum 1.0 MPa (10 bar).
Min.	3	0.04	Liquid temperature:	2-110 °C (TF 110).
Max.	50	0.44	Also available with:	Stainless-steel pump housing, type N.
The pump incorporates overload protection.			Specific EEI:	≤ 0.18.

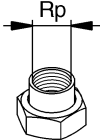
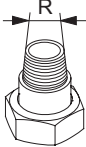
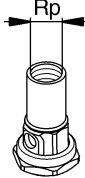
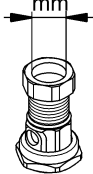
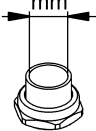


TM083408

Pump type	Dimensions [mm]								Weights [kg]		Ship. vol. [m³]	
	L1	W1	W2	W3	W4	H1	H2	H3	DN2	Net		Gross
ALPHA2 32-80	180	54	54	44	44	36	104	47	G 2	2.1	2.3	0.004
ALPHA2 32-80 N	180	54	54	44	44	37	104	47	G 2	2.3	2.4	0.004

8. Accessories

Unions and valve kits

		Product numbers, unions													
ALPHA2	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
15-xx ⁵⁾	G 1														
15-xx N ⁵⁾															
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										

5) When ordering for UK 15-xx versions, use product numbers for 25-xx (G 1 1/2)

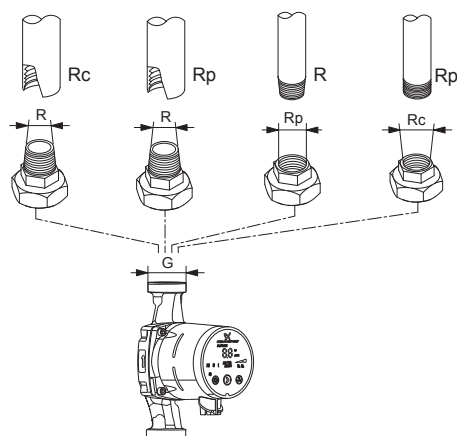
Note: The product numbers are always for one complete set, incl. gaskets.
The product numbers for the very standard sizes are printed in bold.

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 10226-1 standard.

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

[Thread types and combinations \(examples\)](#).



Thread types and combinations (examples)

Insulating kits

The pump is supplied with two insulating shells. Type A pumps with air-separating chamber are not supplied with insulating shells, but you can order them as an accessory. See the table below.

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 the figure below.

Pump type	Product number
ALPHA2 XX-XX 130	98091786
ALPHA2 XX-XX 180	98091787
ALPHA2 XX-XX A	505822



Insulating shells

ALPHA plugs



TM065823

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 ⁶⁾	ALPHA plug angled 90 ° left, including 1 m cable and integrated NTC protection resistor	97844632

6) 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.

ALPHA Reader



TM068574

The ALPHA Reader unit MI401 is the receiver and transmitter of pump performance data. The unit broadcasts the measured data from the pump to an Android or iOS-based mobile device via Bluetooth. The unit uses a small lithium battery.

The unit is together with the Grundfos GO Balance app used for balancing heating system primarily in one- and two family houses. The app guides you through a number of steps where information on installation and measurements from the pump is being collected. In a two-pipe system or an underfloor heating system, the app calculates the balancing values for each of the valves. On the basis of these values, the app guides you through the adjustment of each presetting valve in the system.

The app is available for both Android and iOS devices, and you can download it free of charge from Google Play and App Store.

Description	Product number
ALPHA Reader MI401	98916967

9. Product numbers

ALPHA2 for the D-A-CH market (Germany, Austria and Switzerland)

Model E

Pump type	Port-to-port length [mm]	Connection	Product number
ALPHA2 15-40	130	G 1	99261679
ALPHA2 15-60	130	G 1	99261696
ALPHA2 15-80	130	G 1	99261699
ALPHA2 25-40	130	G 1 1/2	99261701
ALPHA2 25-40 N	130	G 1 1/2	99271964
ALPHA2 25-60	130	G 1 1/2	99261724
ALPHA2 25-60 N	130	G 1 1/2	99271967
ALPHA2 25-80	130	G 1 1/2	99261726
ALPHA2 25-80 N	130	G 1 1/2	99271968
ALPHA2 25-40	180	G 1 1/2	99260497
ALPHA2 25-40 N	180	G 1 1/2	99271969
ALPHA2 25-60	180	G 1 1/2	99261730
ALPHA2 25-60 N	180	G 1 1/2	99271971
ALPHA2 25-80	180	G 1 1/2	99261732
ALPHA2 25-80 N	180	G 1 1/2	99271972
ALPHA2 32-40	180	G 2	99261735
ALPHA2 32-40 N	180	G 2	99271994
ALPHA2 32-60	180	G 2	99261737
ALPHA2 32-60 N	180	G 2	99271995
ALPHA2 32-80	180	G 2	99261738
ALPHA2 32-80 N	180	G 2	99271996

ALPHA2 for the international market

Model E

Pump type	Port-to-port length [mm]	Connection	Product number
ALPHA2 15-40	130	G 1	99411107
ALPHA2 15-50	130	G 1	99411113
ALPHA2 15-60	130	G 1	99411114
ALPHA2 15-80	130	G 1	99411116
ALPHA2 20-40 N	150	G 1 1/4	92505498
ALPHA 20-60 N	150	G 1 1/4	92505511
ALPHA2 25-40	130	G 1 1/2	99411143
ALPHA2 25-40 N	130	G 1 1/2	99411272
ALPHA2 25-50	130	G 1 1/2	99411146
ALPHA2 25-50 N	130	G 1 1/2	99411286
ALPHA2 25-60	130	G 1 1/2	99411150
ALPHA2 25-60 N	130	G 1 1/2	99411287
ALPHA2 25-80	130	G 1 1/2	99411163
ALPHA2 25-80 N	130	G 1 1/2	99411289
ALPHA2 25-40	180	G 1 1/2	99411165
ALPHA2 25-40 N	180	G 1 1/2	99411365
ALPHA2 25-50	180	G 1 1/2	99411173
ALPHA2 25-50 N	180	G 1 1/2	99411371
ALPHA2 25-60	180	G 1 1/2	99411175
ALPHA2 25-60 N	180	G 1 1/2	99411424
ALPHA2 25-80	180	G 1 1/2	99411178

Pump type	Port-to-port length [mm]	Connection	Product number
ALPHA2 25-80 N	180	G 1 1/2	99411428
ALPHA2 32-40	180	G 2	99411207
ALPHA2 32-40 N	180	G 2	99411432
ALPHA2 32-50	180	G 2	99411215
ALPHA2 32-50 N	180	G 2	99411445
ALPHA2 32-60	180	G 2	99411221
ALPHA2 32-60 N	180	G 2	99411448
ALPHA2 32-80	180	G 2	99411263
ALPHA2 32-80 N	180	G 2	99411449

ALPHA2 for the EAC market

Model E

Pump type	Port-to-port length [mm]	Connection	Product number
ALPHA2 25-40 ⁷⁾	180	G 1 1/2	99420002
ALPHA2 25-60 ⁷⁾	180	G 1 1/2	99420013
ALPHA2 25-80 ⁷⁾	180	G 1 1/2	99420015
ALPHA2 32-40	180	G 2	99420016
ALPHA2 32-60	180	G 2	99420018
ALPHA2 32-80	180	G 2	99420020

⁷⁾ Including union kit Rp 1"

10. Grundfos Product Center

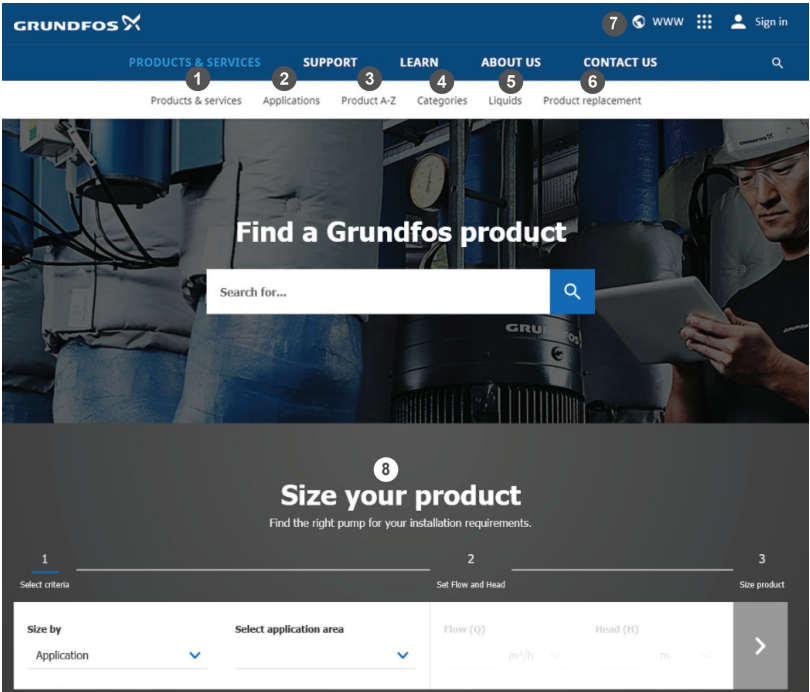
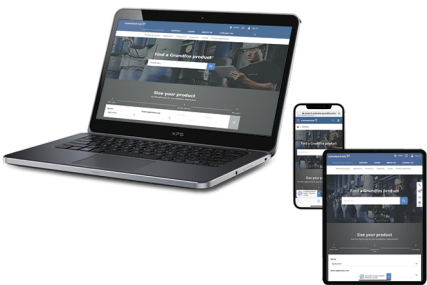
Online search and sizing tool to help you make the right choice.
From the international view, you can select your specific country to view the product range available to you.
International view: <http://product-selection.grundfos.com>

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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