UPS2

Circulator pumps

50/60 Hz

EuP 2015 READY
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Table of contents

1. Product introduction

The UPS2 is a complete range of circulator pumps with the following features:

- integrated differential-pressure control enabling adjustment of pump performance to the actual system requirement
- motor based on permanent-magnet/compact-rotor technology.

The pumps are energy-optimised and comply with the requirements of the EuP directive.

TM05 7745 1613

Fig. 1 EuP ready

The installation of a UPS2 will reduce power consumption considerably, reduce noise from thermostatic valves and similar fittings and improve the control of the system.

The UPS2 range offers a host of advantages:

Energy savings

High-efficient permanent-magnet motors.

Flexibility

Suitable for installation in existing systems.

Comfort

Low-noise operation.

Safety

Built-in electrical and thermal protection of the pump.

User friendliness

Simple setting and operation.

Type key

Example	**UPS2**	**15 - 40/50/60**	**130**

- Pump range
- Nominal diameter (DN) of suction and discharge ports [mm] (15 = 1"*, 25 = 1 1/2", PH = pump head only)
- Maximum head [dm] of the UPS pump types that can be replaced by the UPS2
- Port-to-port length [mm]

* Exception: UK version, size 15 = 1 1/2".

Performance range

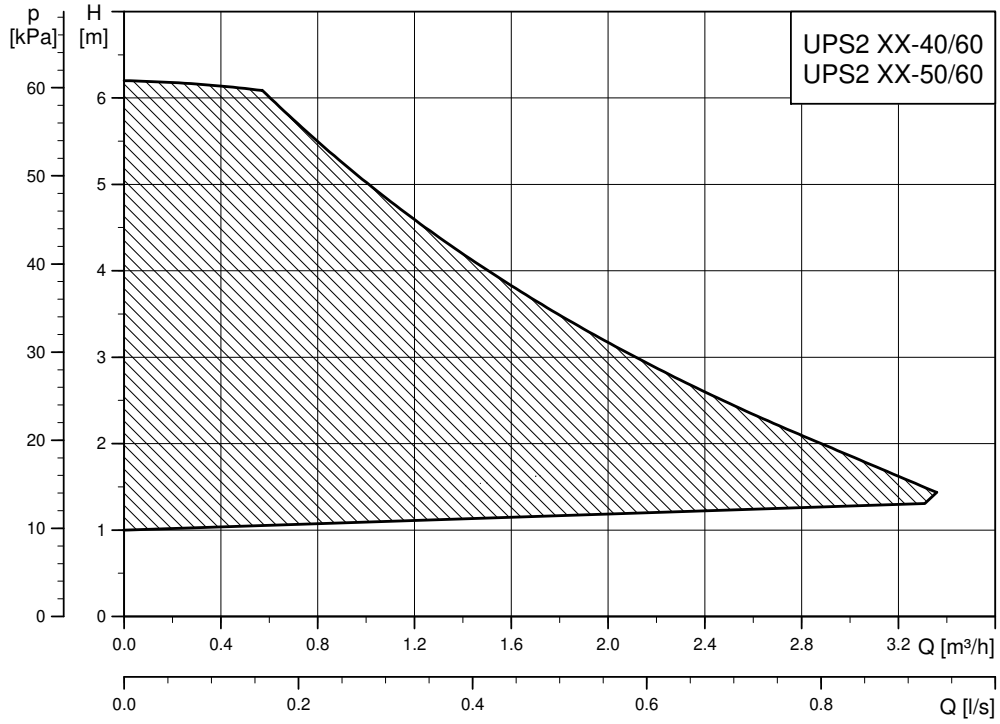

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Fig. 2 Performance range

2. Applications

The UPS2 is designed specifically for domestic heating systems. The pumps are used primarily for one- and two-pipe heating systems, but are, for example, also suitable for mixing loops in large systems.

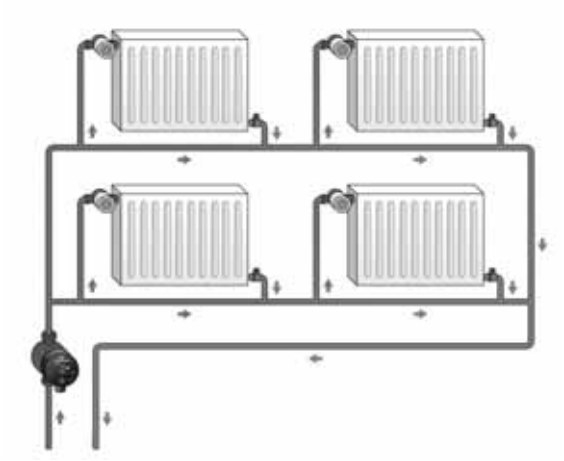

Fig. 1 One-pipe heating system

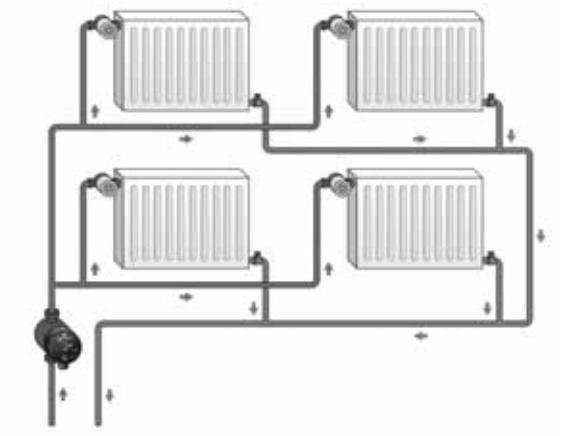

Fig. 2 Two-pipe heating system

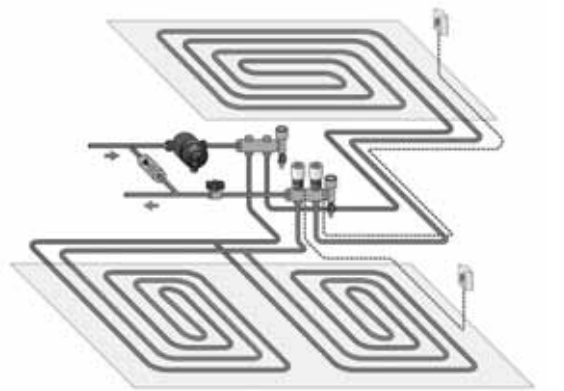

Fig. 3 Underfloor heating system

UPS replacement

The UPS2 is the perfect replacement option to optimise efficiency in domestic heating systems. The most modern technology has been used in the development and manufacturing of the UPS2 pumps. With an EEI value ≤ 0.23, the pump is designed to meet the efficiency demands of the 2015 EuP directive.

The UPS2 is designed specifically to meet performance and dimensional demands in relation to replacement of existing UPS pumps.

The UPS2 is available as a pump head (PH version) which can be fitted to the pump housing of existing UPS pumps. We offer this solution for the replacement of all UPS pump types. This is a very time-efficient and simple replacement solution as the pump housing does not need to be removed from the pipework.

Design benefits which make the UPS2 the ideal replacement pump:

- direct compatibility
- compact pump head
- cable plug integrated in control box
- performance change in terms of speed setting
- easy-to-read interface.

The table below shows a comparison of the speed setting of an existing UPS pump and a UPS2 pump.

Existing pump Head [m]	Speed setting of existing UPS pump	Equivalent speed setting of UPS2
4	I, II, III	I
5	I	I
	II	II
	III	II
6	I	I
	II	II
	III	III

See section *Control of the pump*, page 8, for further details.

Pumped liquids

The pump is suitable for clean, thin, non-aggressive and non-explosive liquids, not containing solid particles, fibres or mineral oil.

The pump must not be used for the transfer of flammable liquids, such as diesel oil, petrol and similar liquids.

Control of heating systems

The heating required in a building varies greatly during the day due to changing outdoor temperatures, solar radiation and heat emanating from human beings, 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 be turned down by the users.

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

Possible consequences:

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

The UPS2 automatically controls the differential pressure by adjusting the pump performance to the actual heating demand, without the use of external components.

Advantages of pump control

In the UPS2, control is effected by adapting the differential pressure to the flow. Contrary to an uncontrolled pump, the proportional-pressure-controlled UPS2 pump reduces the differential pressure in case of falling heating demand.

If the heating demand falls, for instance due to solar radiation, the 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.

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

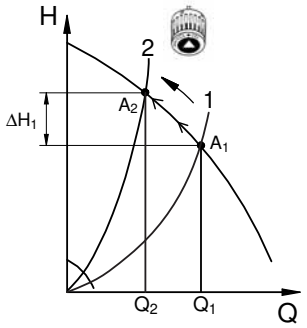

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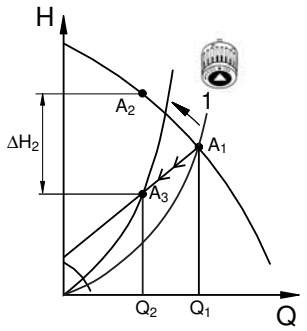
Fig. 4 Uncontrolled pump

In a system with a UPS2 pump, the pressure will be reduced by ΔH_2.



TM01 9120 5002

Fig. 5 Pump in proportional-pressure control mode

In a system with an uncontrolled pump, a pressure rise will often cause flow-generated noise in the thermostatic valves. This noise will be reduced considerably with the UPS2.

The UPS2 has three proportional-pressure curves which are close to the best efficiency point.

As the pump is the obvious UPS replacement option, the three fixed speeds are under normal conditions the best choice from a user's point of view.

3. Construction

UPS2 pumps are of the canned-rotor type, i.e. pump and motor form an integral unit without shaft seal and with only two gaskets for sealing. The bearings are lubricated by the pumped liquid.

The pumps are characterised by the following:

- integrated proportional-pressure control
- three fixed-speed curves
- integrated frequency converter
- permanent-magnet/compact-stator motor
- ceramic shaft and radial bearings
- carbon thrust bearing
- stainless-steel rotor can, bearing plate and rotor cladding
- composite impeller
- stainless-steel or cast-iron pump housing.
  UPS2 pumps are only available with cast-iron pump housing.
- design featuring pump head with integrated control box and control panel or the compact UPS2 design.

Sectional drawing

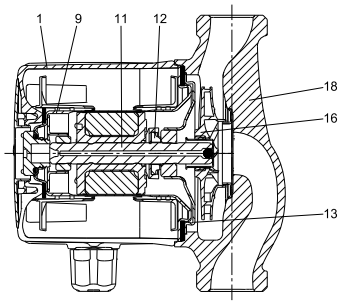


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Fig. 6 Position numbers

Material specification

Pos.	Description	Material	EN	AISI/ ASTM
1	Controller complete	Composite, PC		
9	Rotor can	Stainless steel	1.4301	304
	Radial bearing	Ceramics		
11	Shaft	Ceramics		
	Rotor cladding	Stainless steel	1.4301	304
12	Thrust bearing	Carbon		
	Thrust bearing retainer	EPDM rubber		
13	Bearing plate	Stainless steel	1.4301	304
16	Impeller	Composite, PP or PES		
18	Pump housing	Cast iron	EN-JL 1020	A48-25
	Gaskets	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 with screws.

Control panel

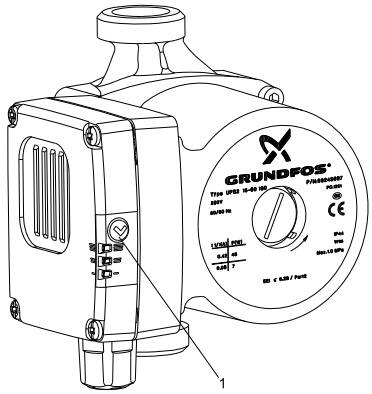

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Fig. 7 Push-button position

The UPS2 has a push-button (pos. 1) for selection of pump setting and light fields for indication of the selected pump setting. See fig. 7.

The light is on when the power supply has been switched on.

Control box positions

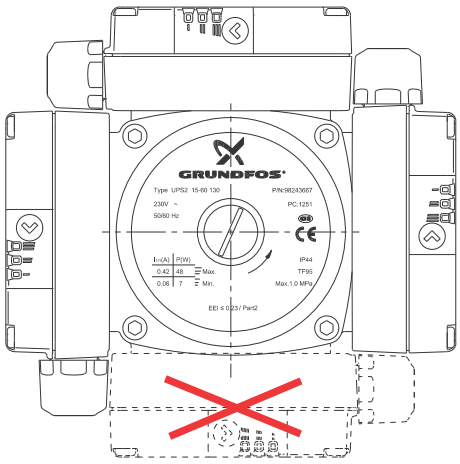

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Fig. 8 Possible control box positions

4. Installation and start-up

Installation

In most cases, the installation of the UPS2 is reduced to the mechanical installation and the connection to the power supply.

The pump must always be installed with horizontal motor shaft.

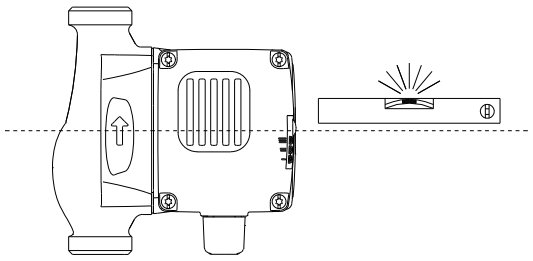

Fig. 9 Horizontal motor shaft

Electrical data

Supply voltage	1 x 230 V - 10 %/+ 10 %, 50/60 Hz, PE.
Motor protection	The pump requires no external motor protection.
Enclosure class	IP42.
Insulation class	F.
Relative air humidity	Maximum 95 %.
Ambient temperature	0 to +40 °C.
Temperature class	TF110 to CEN 335-2-51.
EMC (electromagnetic compatibility)	EN 61000-6-2 and EN 61000-6-3.
Sound pressure level	≤ 43 dB(A).

Start-up

The pump must not be started until the system has been filled with liquid and vented. Furthermore, the required minimum inlet pressure must be available at the pump inlet. The system cannot be vented through the pump.

The pump is self-venting and does not require venting before start-up.

Liquid temperature

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	95
10	10	95
20	20	95
30	30	95
35	35	95
40	40	95

System pressure

PN 10: Maximum 1.0 MPa (10 bar).

Inlet pressure

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

Liquid temperature		
75 °C	**90 °C**	**110 °C**
0.5 m head	2.8 m head	10.8 m head

Setting the pump

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

- three fixed-speed curves
- three proportional-pressure curves.

Factory setting

The UPS2 pump has been factory-set to speed III. See fig. 11.

At this setting, the pump will deliver its maximum performance, but the setting can be changed so that it matches the actual heating demand.

Control of the pump

The pump setting can be changed with a single press on the push-button.

Figure 10 illustrates how the UPS2 changes between the three speeds. This setting is indicated by a steady green light.

When the button has been pressed for 5 seconds, the pump will change from fixed-speed operation to proportional-pressure control.

Figure 10 also illustrates how the UPS2 changes between the three proportional-pressure curves. This setting is indicated by a flashing green light.

See section *Change of pump performance*, page 9, for further details.

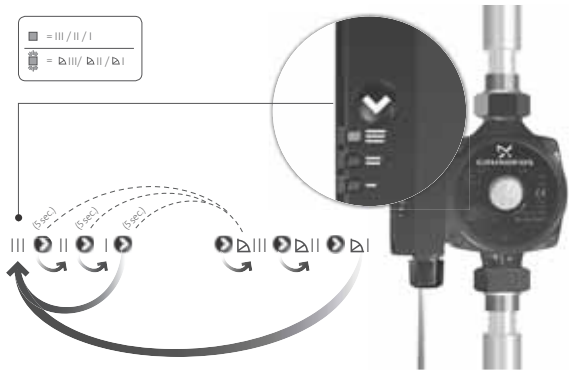

Fig. 10 Control modes

Change of pump performance

The pump performance (flow and head) can be changed by pressing the control box push-button as indicated in fig. 10 and the table below.

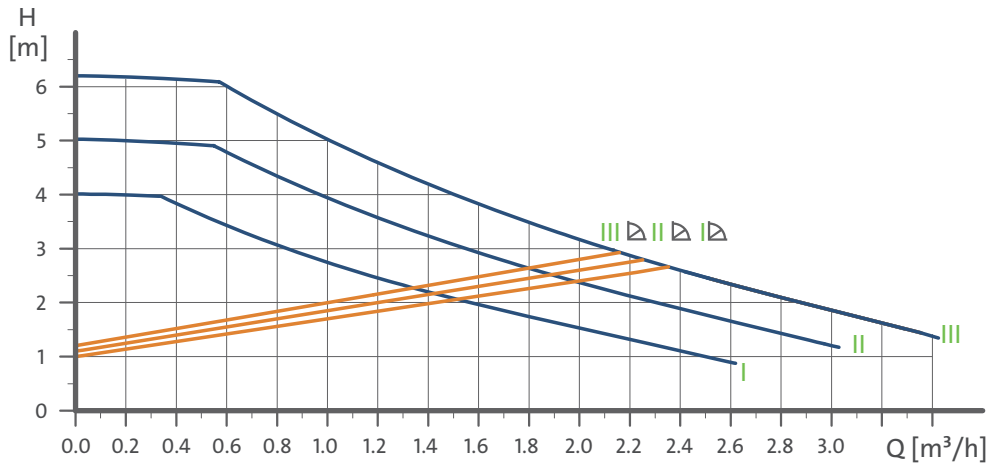

Fig. 11 Pump setting in relation to performance

Setting	Pump curve	Function
I	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. 11. The head (pressure) is reduced at falling heat demand and increased at rising heat demand.
II	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. 11. The head (pressure) is reduced at falling heat demand and increased at rising heat demand.
III	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. 11. The head (pressure) is reduced at falling heat demand and increased at rising heat demand.
III	Speed III	The pump runs at a constant speed and consequently on a constant curve. In speed III, the pump is set to run on the maximum curve under all operating conditions. See fig. 11. Quick venting of the pump can be obtained by setting the pump to speed III for a short period.
II	Speed II	The pump runs at a constant speed and consequently on a constant curve. In speed II, the pump is set to run on the intermediate curve under all operating conditions. See fig. 11.
I	Speed I	The pump runs at a constant speed and consequently on a constant curve. In speed I, the pump is set to run on the minimum curve under all operating conditions. See fig. 11.

5. Guide to performance curves

Energy labelling

The UPS2 is energy-optimised and complies with the EuP Directive (Commission Regulation (EC) No 641/2009) which has been effective since 1 January 2013.

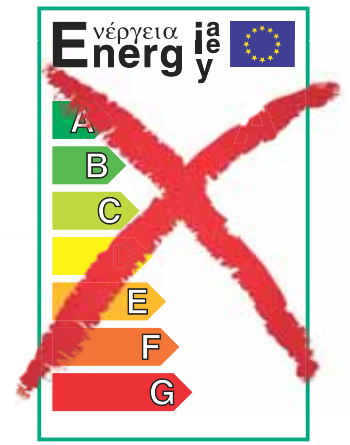

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Fig. 12 Old energy label

As from 1 January 2013, the old A to G energy label was replaced by the new energy efficiency index (EEI).

Only the best A-labelled circulator pumps will meet the new requirements.

For more information about the new energy directive, please visit:

Energy.grundfos.com

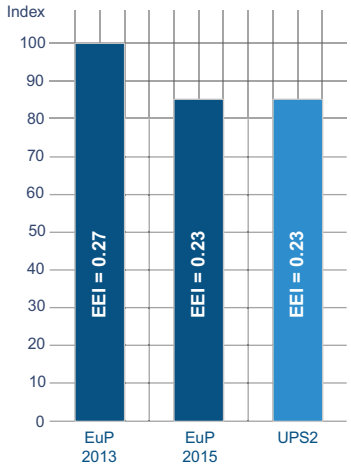
TM05 2683 0412

Curve conditions

The guidelines below apply to the performance curves on the following pages:

- Test liquid: airless water.
- The curves apply to a density of ρ = 983.2 kg/m^3 and a liquid temperature of +60 °C.
- All curves show average values and should not be used as guarantee curves. If a specific minimum performance is required, individual measurements must be made.
- The curves for speeds I, II and III are marked.
- The curves apply to a kinematic viscosity of 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 discharge pressure is proportional to the density.

The EEI values for UPS2 pumps are far below the EuP 2013 value and comply with the requirements for 2015. See fig. 13.



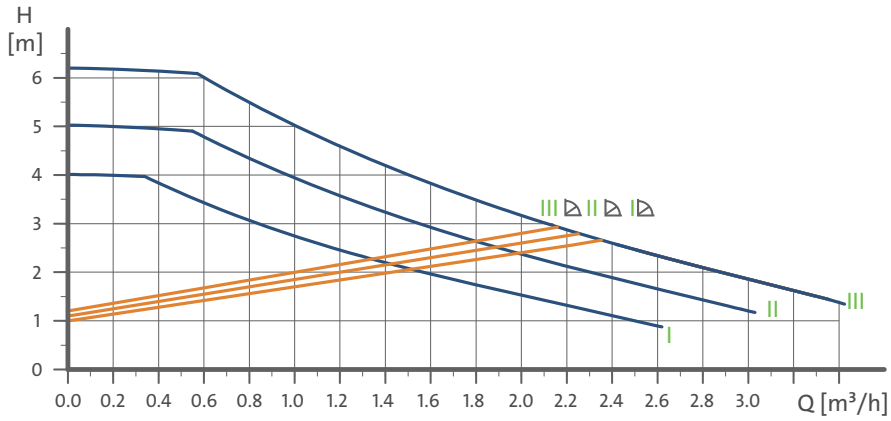
TM05 7834 1613

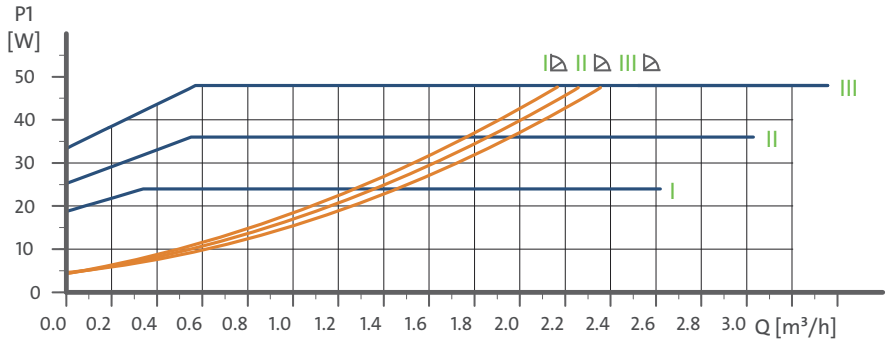
Fig. 13 EEI limits and the current positioning of the UPS2

6. Performance curves and technical data

UPS2 15-40/60 130, UPS2 25-40/60 130, UPS2 PH-40/60

1 x 230 V, 50/60 Hz



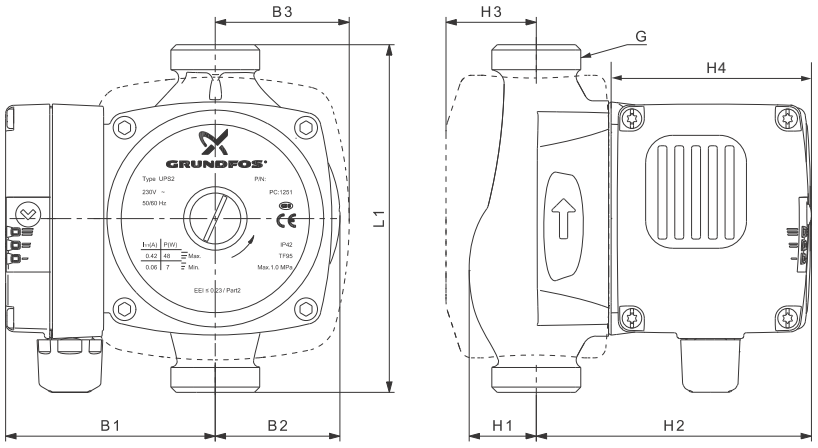


TM05 5403 3612

Speed	P1 [W]	$I_{1/1}$ [A]
Min.	7	0.06
Max.	48	0.42

The pump incorporates overload protection.

Connections:	See *Insulating kits*, page 13.
System pressure:	Max. 10 bar.
Liquid temperature:	+2 to +95 °C (TF 95).

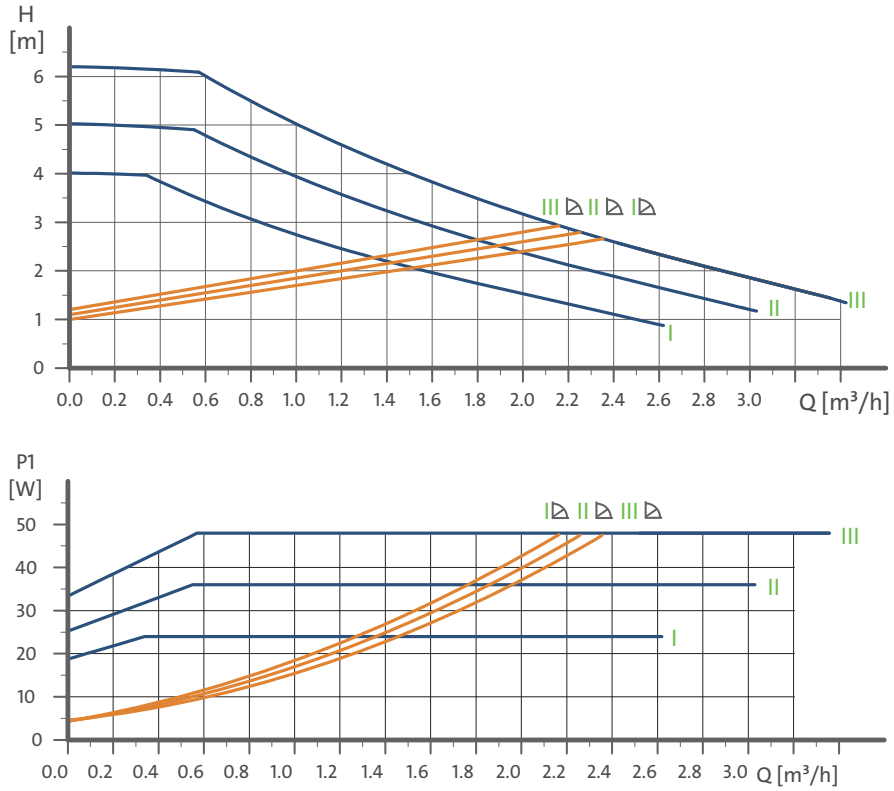


TM05 5202 3612

Pump type	Dimensions [mm]										Weights [kg]		Ship. vol. [m³]
	EEI ≤	L1	B1	B2	B3	H1	H2	H3	H4	G	Net	Gross	
UPS2 15-40/60	0.23	130	79	47	75	28	102	60	76	1	2.5	2.7	0.004
UPS2 25-40/60	0.23	130	79	47	75	29	102	60	76	1 1/2	2.7	2.9	0.004
UPS2 PH-40/60	0.23	-	-	-	-	-	-	-	76	-	1.7	1.9	0.004

UPS2 15-50/60 130, UPS2 PH-50/60

1 x 230 V, 50/60 Hz

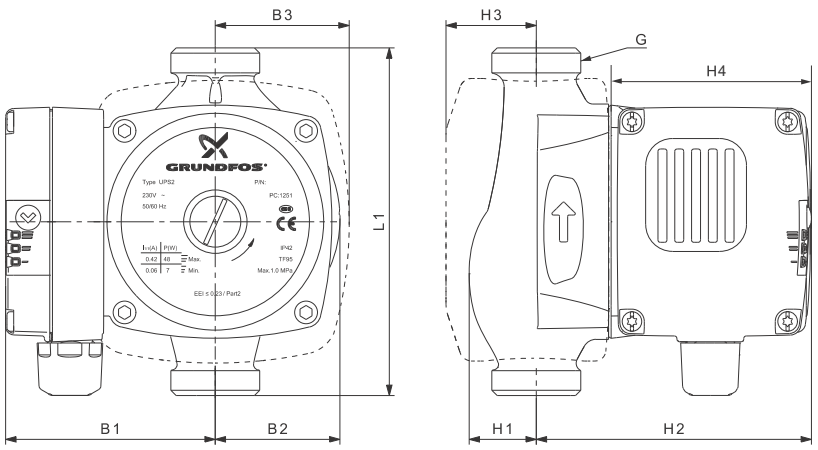


TM05 5403 3612

Speed	P1 [W]	$I_{1/1}$ [A]
Min.	7	0.06
Max.	48	0.42

The pump incorporates overload protection.

Connections:	See *Insulating kits*, page 13.
System pressure:	Max. 10 bar.
Liquid temperature:	+2 to +95 °C (TF 95).



TM05 5202 3612

Pump type	Dimensions [mm]										Weights [kg]		Ship. vol. [m³]
	EEI ≤	L1	B1	B2	B3	H1	H2	H3	H4	G	Net	Gross	
UPS2 15-50/60	0.23	130	79	47	75	29	102	60	76	1 1/2	2.7	2.9	0.004
UPS2 PH-50/60	0.23	-	-	-	-	-	-	-	76	-	1.7	1.9	0.004

7. Accessories

Union and valve kits

Pump type	Description	Material	Product number
UPS2 25-40/60	3/4" unions	Cast iron	529921
UPS2 15-50/60	1" unions	Cast iron	529922

Insulating kits

UPS2 pumps can be fitted with two insulating shells.

The insulation thickness of the insulating shells corresponds to the nominal diameter of the pump.

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

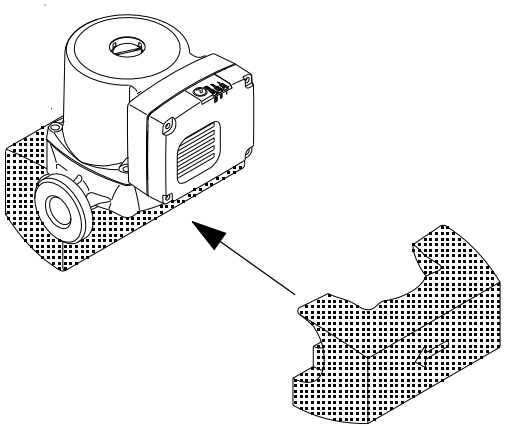


Fig. 14 Insulating shells

Pump type	Product number
Insulating shells for UPS2	505821

8. Product range

UPS2

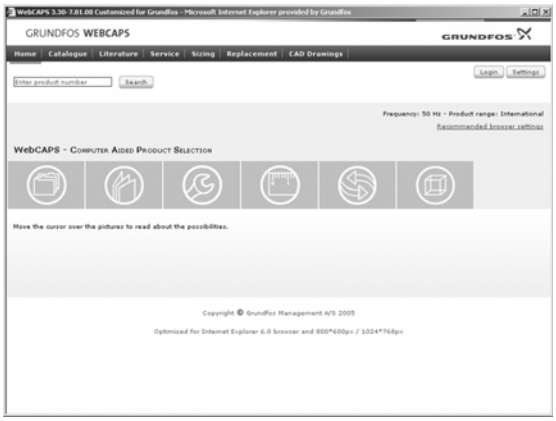
Pump type	Port-to-port length [mm]	Connection	Voltage [V] 50/60 Hz	Product number	Data sheet Page
UPS2 15-40/60	130	G 1	230	98243667	11
UPS2 25-40/60	130	G 1 1/2		98243668	
UPS2 PH-40/60	-	-		98334567	

UPS2, UK

Pump type	Port-to-port length [mm]	Connection	Voltage [V] 50/60 Hz	Product number	Data sheet Page
UPS2 15-50/60	130	G 1 1/2	230	98334549	12
UPS2 PH-50/60	-	-		98334563	

9. Further product information

WebCAPS

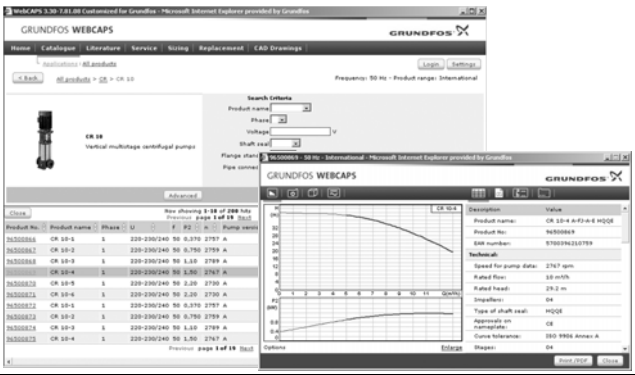


WebCAPS is a **Web**-based **C**omputer **A**ided **P**roduct **S**election program available on www.grundfos.com.

WebCAPS contains detailed information on more than 220,000 Grundfos products in more than 30 languages.

Information in WebCAPS is divided into six sections:

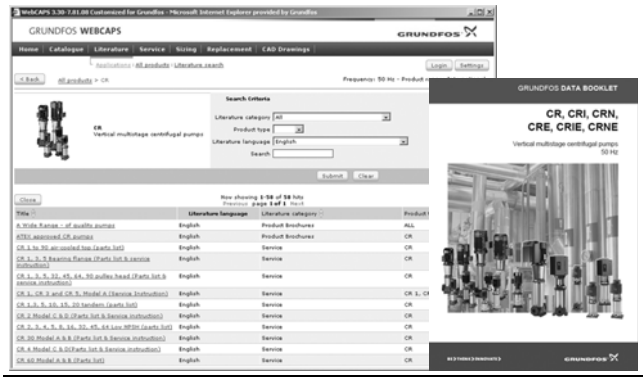
- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalogue

Based on fields of application and pump types, this section contains the following:

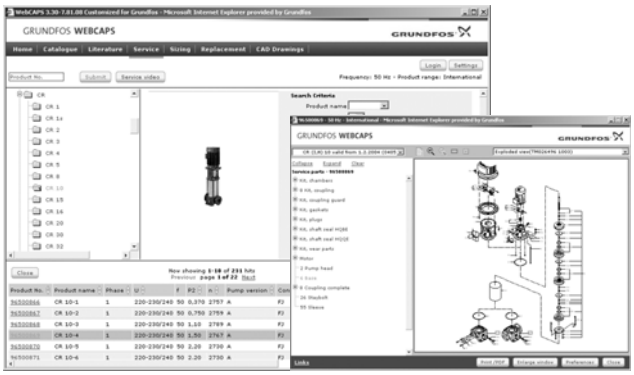
- technical data
- curves (QH, Eta, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

This section contains all the latest documents of a given pump, such as

- data booklets
- installation and operating instructions
- service documentation, such as Service kit catalogue and Service kit instructions
- quick guides
- product brochures.



Service

This section contains an easy-to-use interactive service catalogue. Here you can find and identify service parts of both existing and discontinued Grundfos pumps.
Furthermore, the section contains service videos showing you how to replace service parts.

Sizing

This section is based on different fields of application and installation examples and gives easy step-by-step instructions in how to size a product:

- Select the most suitable and efficient pump for your installation.
- Carry out advanced calculations based on energy, consumption, payback periods, load profiles, life cycle costs, etc.
- Analyse your selected pump via the built-in life cycle cost tool.
- Determine the flow velocity in wastewater applications, etc.

Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump.
The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.

CAD drawings

In this section, it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

2-dimensional drawings:

- .dxf, wireframe drawings
- .dwg, wireframe drawings.

3-dimensional drawings:

- .dwg, wireframe drawings (without surfaces)
- .stp, solid drawings (with surfaces)
- .eprt, E-drawings.

WinCAPS

Fig. 15 WinCAPS DVD

WinCAPS is a **Win**dows-based **C**omputer **A**ided **P**roduct **S**election program containing detailed information on more than 220,000 Grundfos products in more than 30 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no internet connection is available.

WinCAPS is available on DVD and updated once a year.

GO CAPS

Mobile solution for professionals on the GO!

CAPS functionality on the mobile workplace.

Available on the App Store

be think innovate

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