

GRUNDFOS ALPHA Pro

Circulator pumps
50 Hz



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Circulator pumps

GRUNDFOS ALPHA Pro is a complete range of circulator pumps featuring:

- integrated differential-pressure control enabling adjustment of pump performance to the actual system requirements,
- optional automatic night-time duty,
- a display showing the actual power consumption (P1) in Watt and
- motor based on permanent-magnet technology.

GRUNDFOS ALPHA Pro is energy-optimised and labelled A.

The A energy label indicates the energy-saving level of the pump. The energy classification system has seven levels, i.e. from A to G. Level A is the best.

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

GRUNDFOS ALPHA Pro offers a host of advantages:

- Energy savings** Automatic control of the differential pressure.
- Flexibility** Suitable for installation in existing systems.
- Night-time duty** Optional automatic night-time duty.
- Comfort** Low-noise operation.
- Safety** Built-in electrical and thermal protection of the pump.
- Userfriendliness** Simple setting and operation.

Type key

Example	ALPHA Pro	25 - 40	(A)	(B)	180
Pump range					
Nominal diameter (DN) of suction and discharge ports [mm]					
Maximum head [dm]					
Pump housing with air separator					
Bronze pump housing					
Port-to-port length [mm]					

Performance range

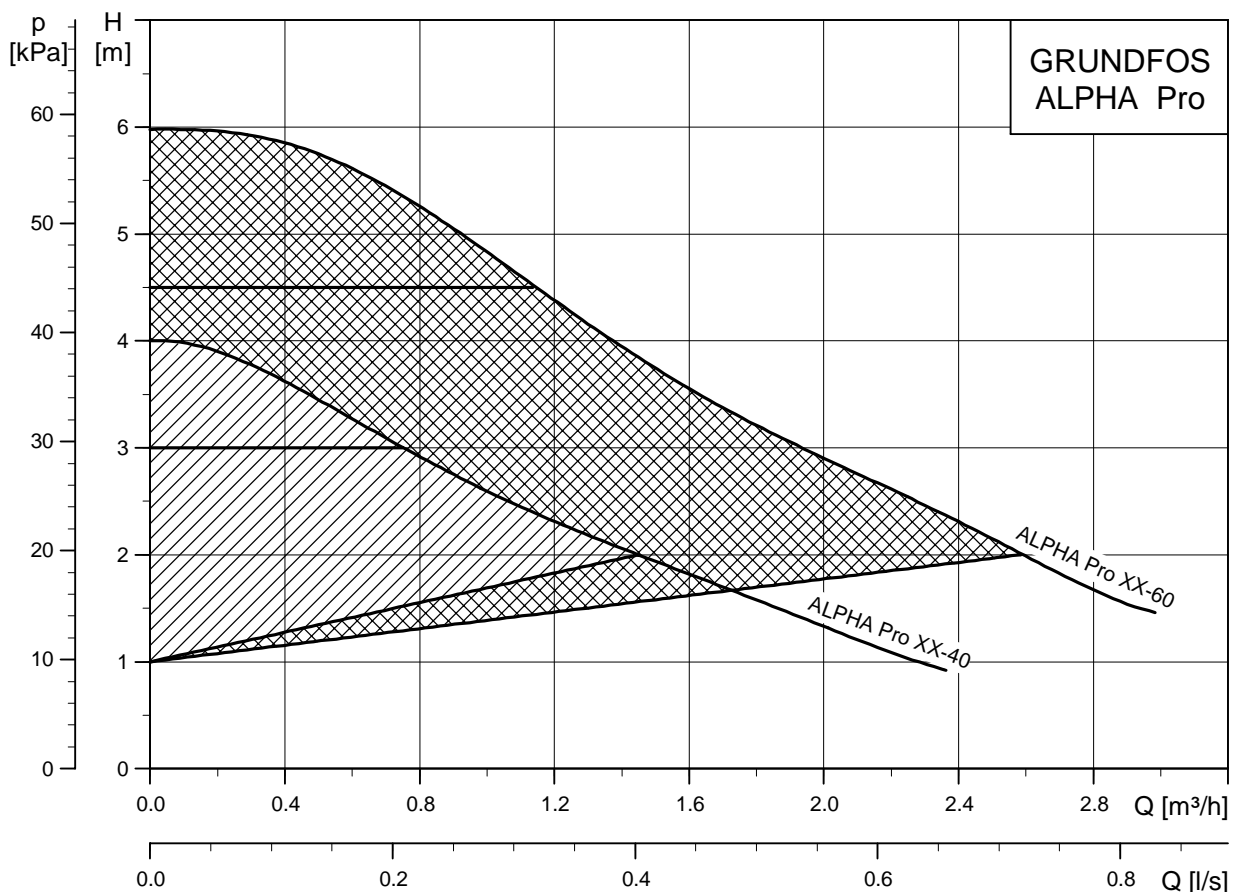


Fig. 1 Performance range, ALPHA Pro

TM03 1347 1805

Applications

GRUNDFOS ALPHA Pro is designed for circulating liquids in heating systems. Pumps with bronze pump housing can also be used in domestic hot-water systems.

GRUNDFOS ALPHA Pro is suitable for

- systems with **constant or variable flows** where optimum setting of the pump duty point is required,
- systems with **variable flow-pipe temperature** and
- systems where night-time duty is desired.

GRUNDFOS ALPHA Pro is especially suitable for

- 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:

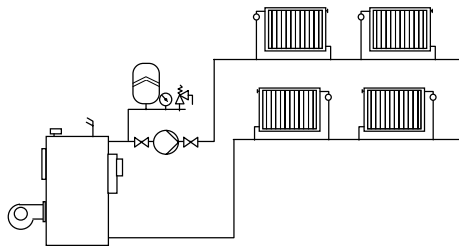


Fig. 2 One-pipe heating system

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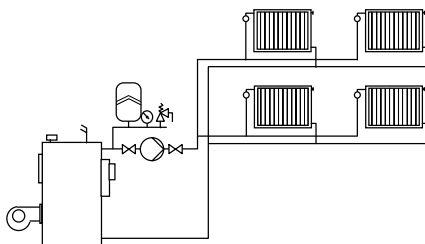


Fig. 3 Two-pipe heating system

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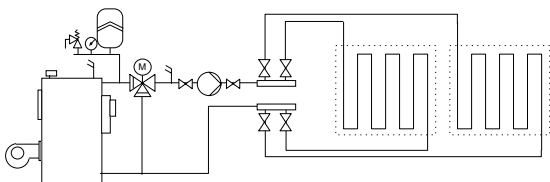


Fig. 4 Underfloor heating system

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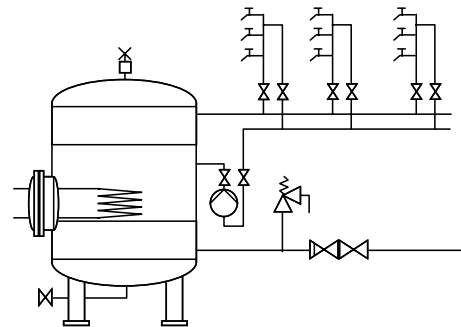


Fig. 5 Domestic hot-water system

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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. The consequences may be

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

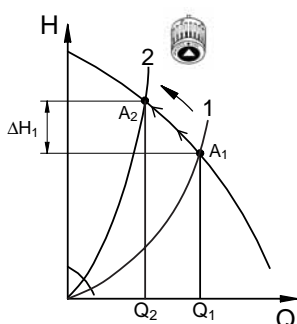
GRUNDFOS ALPHA Pro automatically controls the differential pressure by adjusting the pump performance to the actual heating demand, without the use of external components.

Advantages of pump control

The differential pressure is controlled by adjustment according to the flow (proportional- or constant-pressure control).

Contrary to an uncontrolled pump, the proportional-pressure controlled GRUNDFOS ALPHA Pro reduces the differential pressure as a result of falling heating demand.

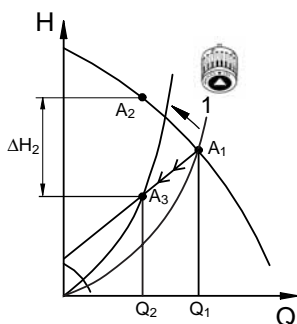
If the heating demand falls - for instance due to solar radiation - the radiator valves will close, and, for the uncontrolled pump, the flow resistance of the system will rise for instance from A_1 to A_2 .



TM01 9119 5002

Fig. 6 Uncontrolled pump

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



TM01 9120 5002

Fig. 7 Pump in proportional-pressure control mode

In a system with a GRUNDFOS ALPHA Pro pump, the pressure will be reduced by ΔH_2 compared to an uncontrolled pump.

When using an uncontrolled pump, a pressure rise will often cause flow-generated noise in the thermostatic valves. This noise will be reduced considerably with the GRUNDFOS ALPHA Pro.

Automatic night-time duty

GRUNDFOS ALPHA Pro is available in one standard version featuring optional automatic night-time duty.

Automatic night-time duty is activated by turning the selector switch on the control box to position .

Factory setting: Automatic night-time duty off.

Note: The night-time duty function is not active if the pump has been set to speed I, II or III.

Once automatic night-time duty has been activated, the pump changes automatically between normal duty and night-time duty. The changeover takes place as a result of the flow-pipe temperature measured by the integrated temperature sensor.

Electrical data

Supply voltage	1 x 230 V $\pm 10\%$, 50 Hz, PE.
Motor protection	The pump requires no external motor protection.
Enclosure class	IP 42.
Insulation class	F.
Relative air humidity	Max. 95%.
Ambient temperature	0°C to +40°C.
Temperature class	TF110 according to CEN 335-2-51.
EMC (electromagnetic compatibility)	EN 61 000-6-1. EN 61 000-6-3.
Sound pressure level	≤ 43 dB(A).

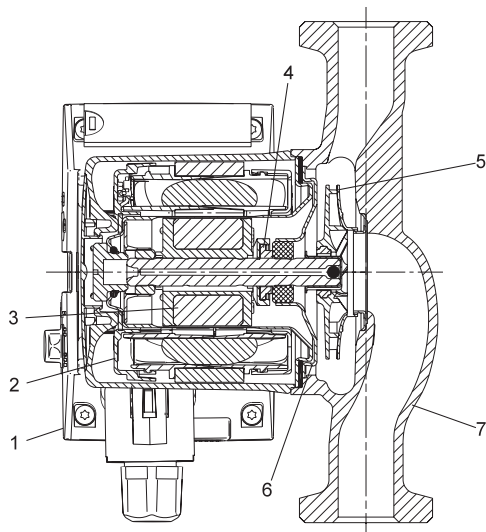
Construction

GRUNDFOS ALPHA Pro is 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 pump is characterised by:

- integrated proportional-pressure control
- integrated constant-pressure control
- three fixed speed curves
- frequency converter
- display showing the actual pump power consumption in Watt (in whole numbers)
- ceramic shaft and radial bearings
- carbon thrust bearing
- stainless-steel rotor can, bearing plate and rotor cladding
- composite impeller
- cast-iron or bronze pump housing.

Sectional drawing



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Fig. 8 Position numbers

Material specification

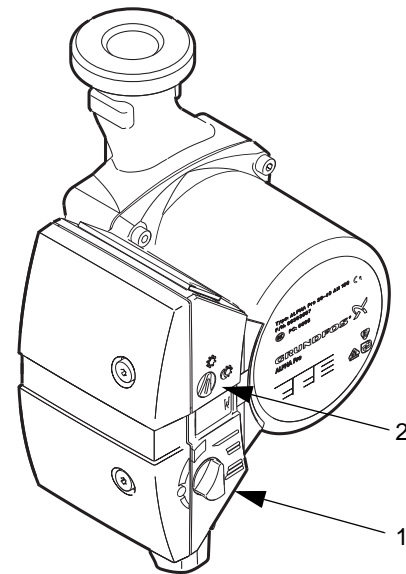
Pos.	Description	Material	EN / DIN W.-Nr.	AISI/ASTM
1	Controller complete			
2	Rotor can	Stainless steel	1.4301	304
	Radial bearing	Ceramic		
3	Shaft	Ceramic		
	Rotor cladding	Stainless steel	1.4301	304
	Stop ring	Composite, PES		
4	Thrust bearing	Carbon		
	Thrust bearing retainer	EPDM rubber		
5	Impeller	Composite, PES/PP		
6	Bearing plate	Stainless steel	1.4301	304
7	Pump housing	Cast iron	EN-JL 1020	A48-25 B
		EN-GJL-150 Bronze	2.1176.01	
	Gaskets	EPDM rubber		

Motor and control box

The motor is a 2-pole synchronous permanent-magnet motor.

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

The control box has two selector switches (see pos. 1 and 2) and a 2-digit 7-segment display.



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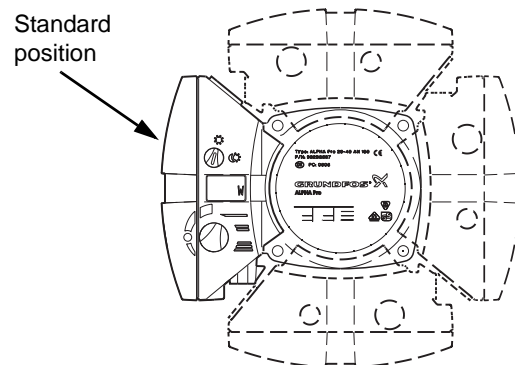
Fig. 9 Selector switch positions

- Selector switch (pos. 1) for selection of control curve.
- Selector switch (pos. 2) for activation or deactivation of automatic night-time duty.

The light in the display is on when the electricity supply has been switched on. During operation, the display shows the actual pump power consumption in Watt (in whole numbers). Accuracy: ± 1 W.

Faults preventing the pump from operating (e.g. blocking) are indicated in the display by "- -".

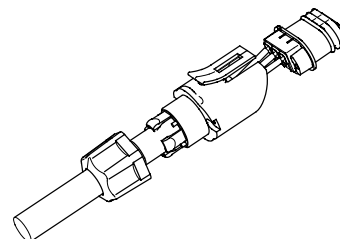
Possible control box positions:



TM03 0906 0705

Fig. 10 Control box positions

The cable entry incorporates cable relief.



TM01 9184 1400

Fig. 11 Cable entry with cable relief

Pump housing with air separator

The pump housing with air separator is installed in systems where the liquid contains so much air that a conventional circulator pump 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 suction 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.

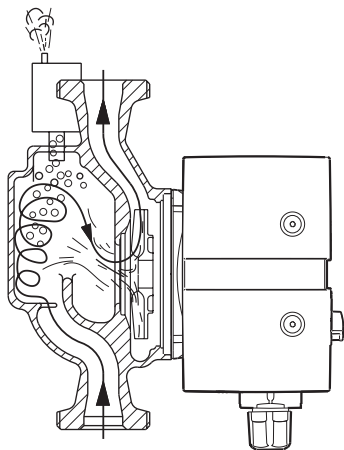


Fig. 12 Pump housing with air-separating chamber

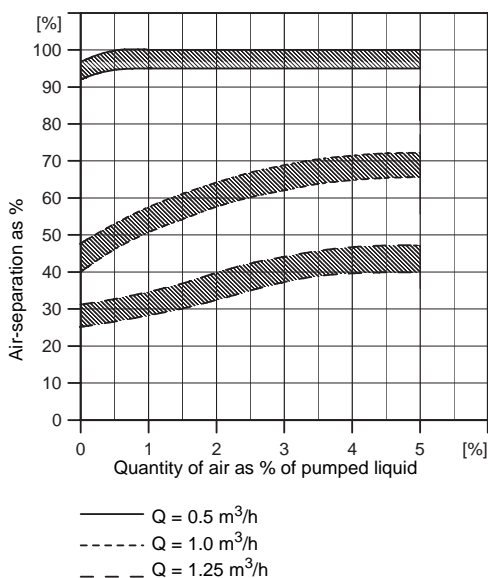


Fig. 13 Air separation

Installation

The pump must always be installed with horizontal motor shaft.

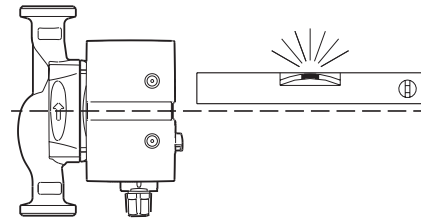


Fig. 14 Horizontal motor shaft

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.

As the pump is self-venting, the pump need not be vented in connection with start-up.

Pumped liquids

Thin, clean, non-aggressive and non-explosive liquids, not containing solid particles, fibres or mineral oil.

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

Liquid temperature

Cast-iron pumps: +2°C to +110°C.

Bronze pumps in domestic hot-water systems:
Continuously: +15°C to +60°C.

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

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

System pressure

PN 10: Max. 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 pump suction port.

Liquid temperature		
75°C	90°C	110°C
0.5 m head	2.8 m head	11.0 m head

Setting of pump head

With the selector switch on the control box, the electronically controlled pump can be set to

- two constant-pressure curves,
- two proportional-pressure curves and
- three fixed speed curves.







Factory setting

The selector switch on the pump control box is factory-set as shown in the table below.

This setting is suitable for 80-90% of all single-family houses.

Change of head setting

The head is changed by turning the control box selector switch as indicated in the table:

Setting	Result	System
 Factory setting	Pump performance according to the heating demand (in 80-90% of all single-family houses).	Variable-load one- or two-pipe heating system with normal resistance, with or without thermostatic valves.
 Pump head is reduced.		Variable-load heating system with low resistance, with or without thermostatic valves.
 Pump head is increased.		Variable-load heating system with high resistance, with or without thermostatic valves, or underfloor heating system. Also systems fitted with a bypass valve.
 Pump running at minimum performance.		Small constant-load heating system. Setting when adjusting a bypass valve.
 Pump running at medium performance.		Medium-sized constant-load heating system.
 Pump running at maximum performance.		Large constant-load heating system. Setting when venting the system.

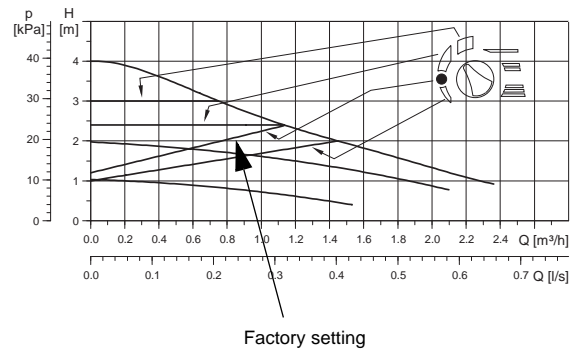


Fig. 15 Setting of pump head

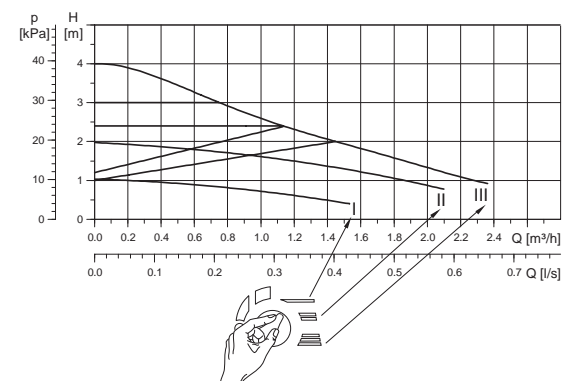


Fig. 16 Three constant-speed curves

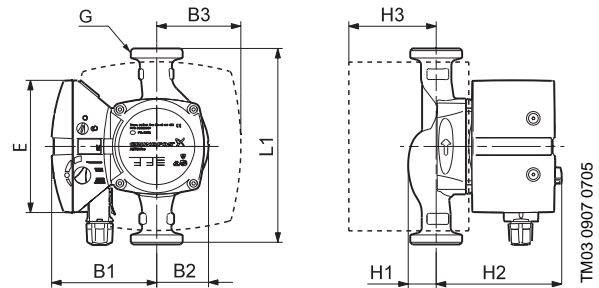
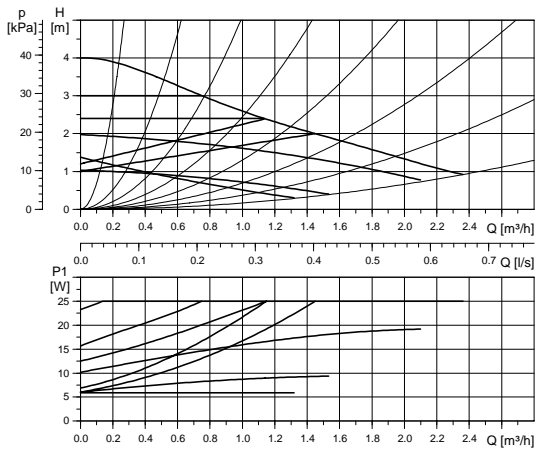
Curve conditions

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

- Test liquid: Airless water.
- The curves apply to a density of $\rho = 983.2 \text{ kg/m}^3$ 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 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, e.g. hot water, the discharge pressure is proportional to the density.

ALPHA Pro 15-40, 25-40, 32-40

1 x 230 V, 50 Hz



Speed	P ₁ [W]	I _n [A]
Min.	6	0.06
Max.	25	0.23
I	8	0.09
II	18	0.17
III	25	0.23

The pump incorporates overload protection.

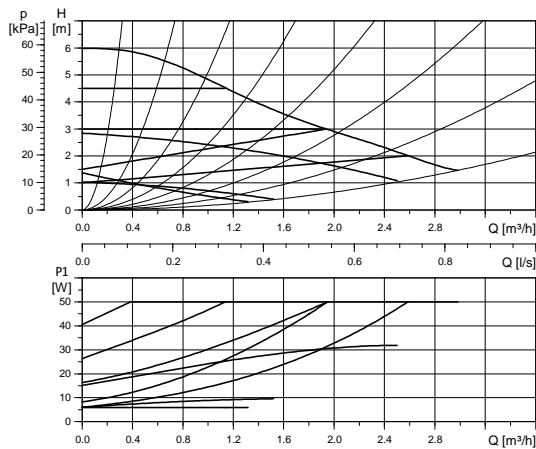
Connections: See "Union and valve kits" on page 12.
 System pressure: Max. 10 bar.
 Liquid temperature: +2°C to +110°C (TF 110).
 Also available with: Bronze pump housing, type B (only ALPHA Pro 25-40 B 180).

Pump type	Dimensions [mm]									Weights [kg]★		Ship. vol. [m ³]
	L1	H1	H2	H3	B1	B2	B3	E	G	Net	Gross	
ALPHA Pro 15-40	130	28	116	57	97	48	77	122	1	2.4	2.6	0.00509
ALPHA Pro 25-40	130	28	116	57	97	48	77	122	1½	2.4	2.6	0.00509
ALPHA Pro 25-40	180	28	116	57	97	48	77	122	1½	2.5	2.7	0.00509
ALPHA Pro 32-40	180	30	116	57	97	48	77	122	2	2.8	3.0	0.00509

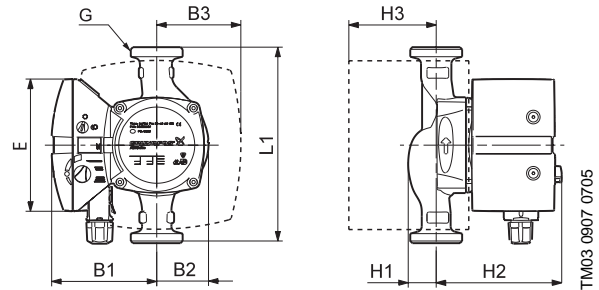
★ Weights of bronze versions are approx. 10% higher.

ALPHA Pro 15-60, 25-60, 32-60

1 x 230 V, 50 Hz



TM03 1295 1605



Speed	P ₁ [W]	I _n [A]
Min.	6	0.06
Max.	50	0.45
I	8	0.09
II	31	0.28
III	50	0.45

The pump incorporates overload protection.

Connections: See "Union and valve kits" on page 12.
 System pressure: Max. 10 bar.
 Liquid temperature: +2°C to +110°C (TF 110).
 Also available with: Bronze pump housing, type B (only ALPHA Pro 25-60 B 180).

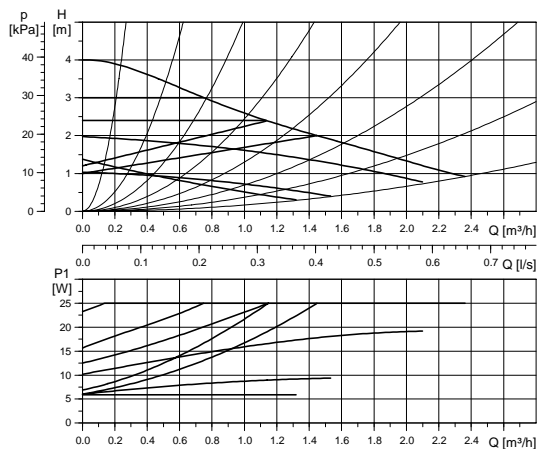
Pump type	Dimensions [mm]									Weights [kg]★		Ship. vol. [m ³]
	L1	H1	H2	H3	B1	B2	B3	E	G	Net	Gross	
ALPHA Pro 15-60	130	28	116	57	97	48	77	122	1	2.4	2.6	0.00509
ALPHA Pro 25-60	130	28	116	57	97	48	77	122	1½	2.4	2.6	0.00509
ALPHA Pro 25-60	180	28	116	57	97	48	77	122	1½	2.5	2.7	0.00509
ALPHA Pro 32-60	180	30	116	57	97	48	77	122	2	2.8	3.0	0.00509

★ Weights of bronze versions are approx. 10% higher.

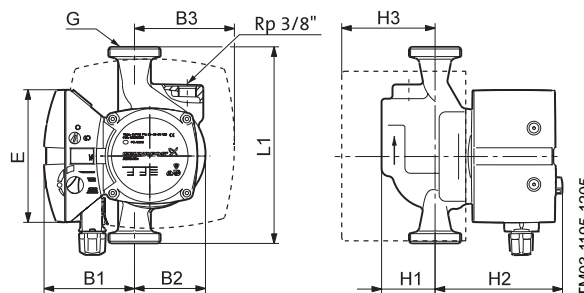
ALPHA Pro 25-40 A

180

1 x 230 V, 50 Hz



TM03 1296 1605



TM03 1195 1205

Speed	P ₁ [W]	I _n [A]
Min.	6	0.06
Max.	25	0.23
I	8	0.09
II	18	0.17
III	25	0.23

The pump incorporates overload protection.

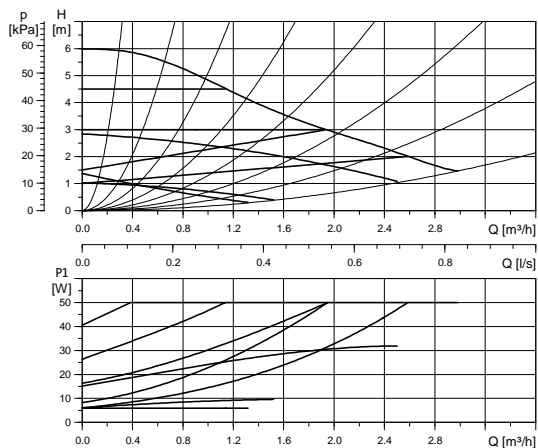
Connections: See "Union and valve kits" on page 12.
System pressure: Max. 10 bar.
Liquid temperature: +2°C to +110°C (TF 110).

Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m ³]
	L1	H1	H2	H3	B1	B2	B3	E	G	Net	Gross	
ALPHA Pro 25-40 A	180	50	126	71	83	65	92	122	1½	3.5	3.9	0.00667

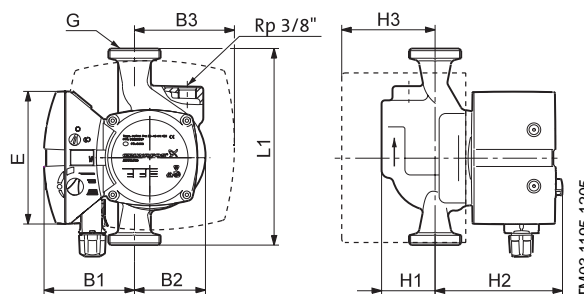
ALPHA Pro 25-60 A

180

1 x 230 V, 50 Hz



TM03 1295 1605



TM03 1195 1205

	P ₁ [W]	I _n [A]
Min.	6	0.06
Max.	50	0.45
I	8	0.09
II	31	0.28
III	50	0.45

The pump incorporates overload protection.

Connections: See "Union and valve kits" on page 12.
System pressure: Max. 10 bar.
Liquid temperature: +2°C to +110°C (TF 110).

Pump type	Dimensions [mm]									Weights [kg]		Ship. vol. [m ³]
	L1	H1	H2	H3	B1	B2	B3	E	G	Net	Gross	
ALPHA Pro 25-60 A	180	50	126	71	83	65	92	122	1½	3.5	3.9	0.00667

Union and valve kits

Pump type	Description	Material	Product number
ALPHA Pro 25-40, 25-40 A, 25-60, 25-60 A	¾" unions	Cast iron	529921
	1" unions	Cast iron	529922
	¾" valves	MS	519805
	1" valves	MS	519806
ALPHA Pro 25-40 B, 25-60 B	¾" unions	MS	529971
	1" unions	MS	529972
	¾" valves	MS	519805
	1" valves	MS	519806
ALPHA Pro 32-40, 32-60	1" unions	Cast iron	509921
	1¼" unions	Cast iron	509922

Insulation kits

GRUNDFOS ALPHA Pro can be fitted with two insulating shells.

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

The insulation kit, which is tailored to the individual pump type, encloses the entire pump housing. The two shells are easily fitted around the pump.

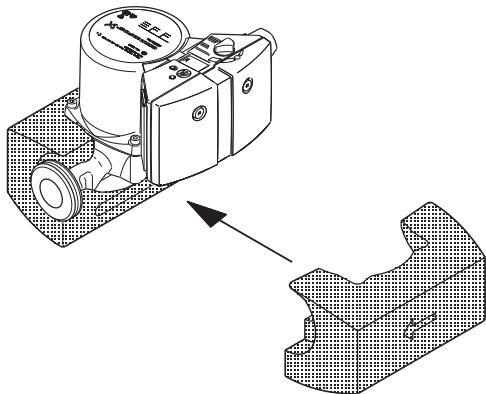


Fig. 17 Insulating shells

Pump type	Product number
ALPHA Pro 15-40, 25-40, 32-40, 25-60, 32-60	505821
ALPHA Pro 25-40 A, 25-60 A	505822

Service kit

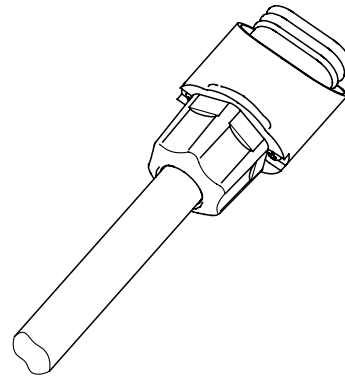


Fig. 18 Plug

TM01 9911 3400

Description	Product number
Plug	595562

Further product documentation

In addition to this printed data booklet, Grundfos offers the following sources of product documentation.

- WinCAPS
- WebCAPS.

WinCAPS

WinCAPS is a **Windows-based Computer Aided Product Selection** program containing information on more than 90,000 Grundfos products.

Available on CD-ROM in more than 15 languages, WinCAPS offers

- detailed technical information
- selection of the optimum pump solution
- dimensional drawings of each pump
- detailed service documentation
- installation and operating instructions
- wiring diagrams of each pump.



Fig. 19 WinCAPS CD-ROM

cd-wincaps

Click **Catalogue** and select a product from the extensive product catalogue.

Click **Sizing** and select the most suitable pump for your application.

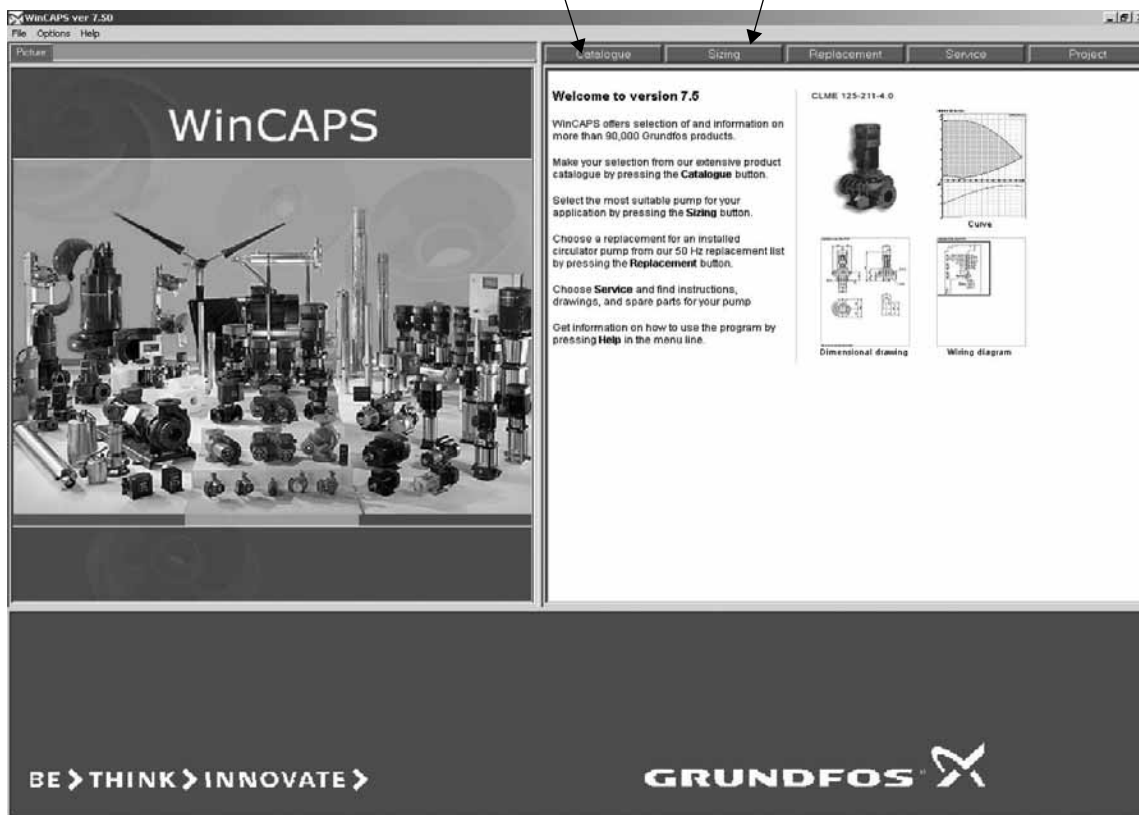


Fig. 20 WinCAPS

WinCAPS

Further product documentation

WebCAPS

WebCAPS is a **Web**-based **Compute Aided Product Selection** program and a web-version of WinCAPS.

WebCAPS is accessible on Grundfos' homepage, www.grundfos.com, and offers

- detailed technical information
- dimensional drawings of each pump
- wiring diagrams of each pump.

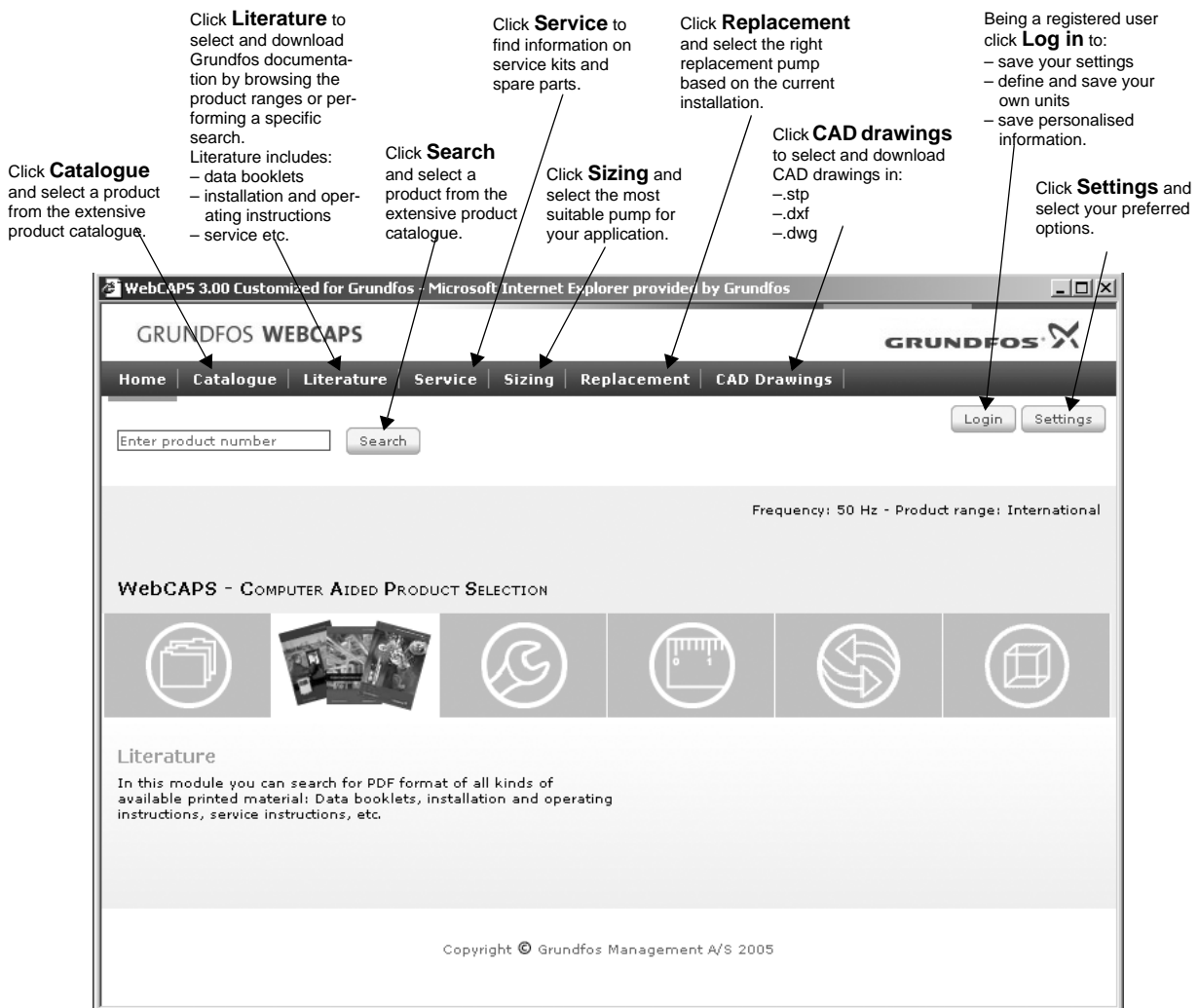


Fig. 21 WebCAPS

WebCAPS_English

96581062 0505	GB

Subject to alterations.