ALPHA SOLAR

Circulator pumps

50/60 Hz

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Table of contents

1. ALPHA SOLAR **3**
Product description . . . 3
Features . . . 3
Benefits . . . 3
Technical data . . . 3
Pumped liquids . . . 3
Operating mode . . . 4
Alarm status . . . 4
Control box connections . . . 4
Power supply connection . . . 5
Control signal connection . . . 5
Digital signal converter . . . 5

2. Curve conditions **6**

3. Performance curves and technical data **7**
ALPHA SOLAR 15-75, 25-75 130/180 . . . 7
ALPHA SOLAR 25-145 180 . . . 8

4. Product numbers **9**
Replacement table . . . 9

5. Grundfos Product Center **10**

1. ALPHA SOLAR

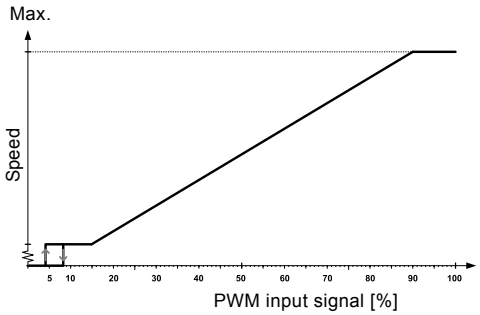
TM06 5816 0216

Product description

The ALPHA SOLAR is designed to be integrated in all kinds of thermal solar systems with either variable or constant flow rate. High-efficiency ECM (Electronically Commutated Motor) pumps, such as ALPHA SOLAR, must not be speed-controlled by an external speed controller varying or pulsing the supply voltage.

The speed can be controlled by a low-voltage PWM (Pulse Width Modulation) signal from a solar controller to optimise the solar harvesting and temperature of the system. As a result, the power consumption of the pump will be reduced considerably.

If no PWM signal is available, you can set ALPHA SOLAR to operate at constant speed / constant curve, only switched on and off by the controller.



TM05 1575 3211

Fig. 1 PWM input profile C (solar)

Features

- Four different constant speed settings
- PWM C profile. The PWM signal is a method for generating an analog signal using a digital source.

Benefits

- Low EEI (Energy Efficiency Index), EEI ≤ 0.20
- Maintenance-free
- Low noise level
- Very simple installation
- Compact
- Deblocking screw
- High ambient temperature (70 °C).

Technical data

System pressure	Maximum 1.0 MPa (10 bar)
Minimum inlet pressure	0.05 MPa (0.50 bar) at 95 °C liquid temperature
Maximum inlet pressure	1 MPa (10 bar)
Maximum liquid temperature	2-110 °C at 70 °C ambient temperature
	2-130 °C at 60 °C ambient temperature
Enclosure class	IPX4D(with drain holes)
Insulation class	F (EN 60335-1)
TF class	TF110 at 70 °C ambient temperature
Motor protection	No external protection needed
Approval and marking	CE
Water/propylene glycol mixture	Maximum water/propylene glycol mixture is 50 %. Note: The water/propylene glycol mixture reduces the performance due to higher viscosity.

Pumped liquids

ALPHA SOLAR is suitable for the following:

- Clean, thin, non-aggressive and non-explosive liquids, not containing solid particles or fibres.
- In heating systems, the water should meet the requirements of accepted standards on water quality in heating systems, for example the German standard VDI 2035.
- The pH should be between 8.2 and 9.5. The minimum value depends on the water hardness and should not be below 7.4 at 4 °dH (0.712 mmol/l).
- The electrical conductivity at 25 °C should be ≥ 10 microS/cm.
- Mixtures of water with antifreeze media such as glycol with a kinematic viscosity lower than 10 mm2/s (10 cSt). When selecting a pump, the viscosity of the pumped liquid must be taken into consideration. If the circulator pump is used for a liquid with a higher viscosity, the hydraulic performance of the pump is reduced.
- Solar media as used in typical solar thermal systems containing up to 50 Vol % of antifreeze media.

Operating mode

This circulator pump is either for external PWM signal control with profile C or internal control with constant-curve mode. See fig. 2.

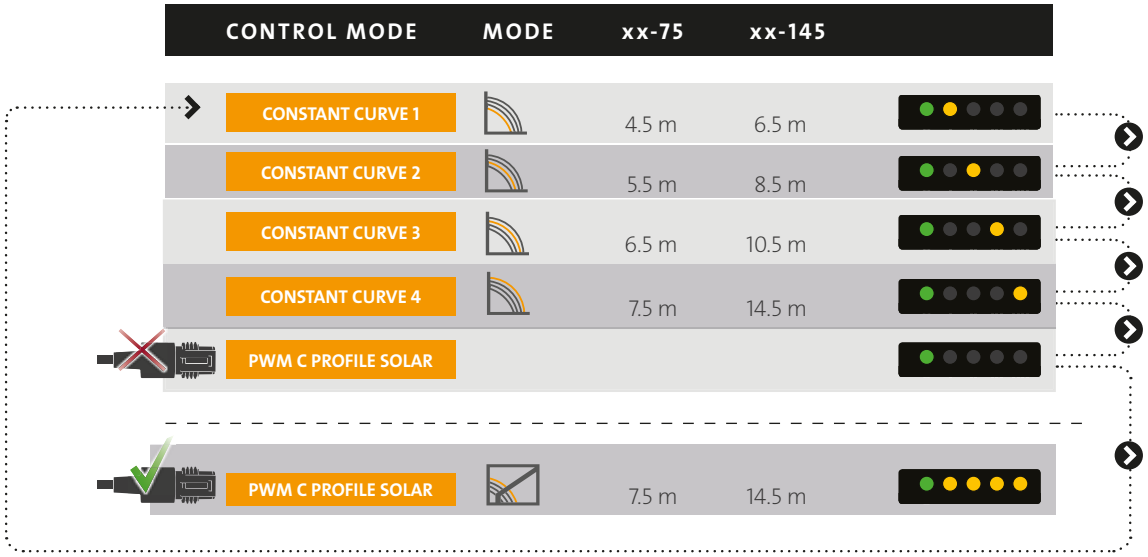


Fig. 2 Operating mode

Alarm status

Alarm status

If the circulator has detected one or more alarms, the first LED switches from green to red. When an alarm is active, the LEDs indicate the alarm type as defined in the table below. If multiple alarms are active at the same time, the LEDs only show the error with the highest priority. The priority is defined by the sequence of the table.

When there is no active alarm anymore, the control panel switches back to operating status.

Control panel	Description
	Blocked
	Supply voltage low
	Electrical error

Control box connections

The ALPHA SOLAR control box has two electrical connections on one side: the power supply and signal connection.

Signal connection

The PWM signal connection is covered by a blind plug from factory. See fig. 3.

Fig. 3 Control box connections

Power supply connection

The circulator pump must be connected to the power supply with the enclosed Superseal connector plug. Adapters are available for cables with Molex or Volex connectors.

Superseal power connector

TM06 5820 0216

Fig. 4 Superseal power connector

Reliability

- Temperature-proof and fireproof wire
- waterproof.

Control signal connection

The control signal cable connection has three leads: signal input, signal output and signal reference. Connect the cable to the control box by a Mini Superseal plug. An optional signal cable (1 meter) is delivered with the circulator as an accessory.

The cable length can be maximum 3 metres.

Mini Superseal

TM06 5821 0216

Fig. 5 Mini Superseal

PWM external control mode and signals

If you want to use PWM control of the pump, contact Grundfos for further information.

Digital signal converter

To replace UPS SOLAR with a new ALPHA SOLAR which fulfils the ErP requirements, we offer two solutions:

- Exchange the existing SOLAR controller to a controller suitable for high-efficiency pumps.
- Keep the old controller, and use the phase control. Use a signal converter, SIKON HE, which can convert the existing phase control to a PWM signal for the ALPHA SOLAR.

When you use SIKON HE, you can replace the conventional 230 V UPS SOLAR pumps with Grundfos ALPHA SOLAR pumps without having to change the controller. The function of the performance control of the pump is maintained.

TM06 5809 0216

Fig. 6 Digital signal converter (SIKON HE)

For further information about the controller, see www.prozeda.de.

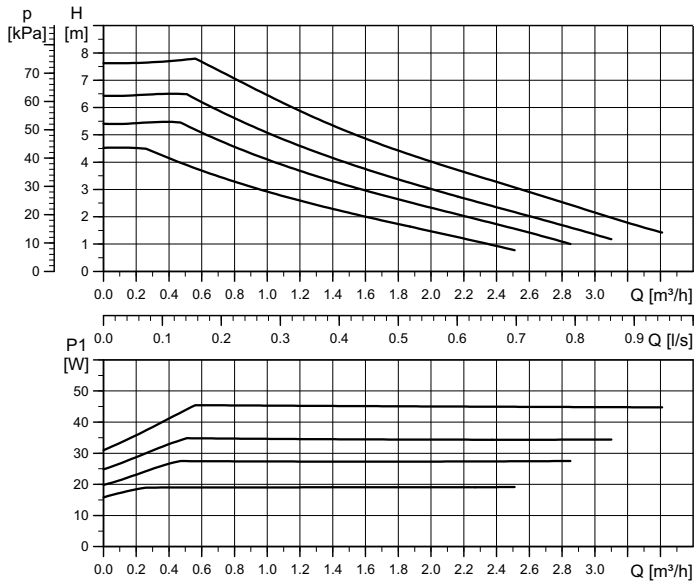
2. Curve conditions

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

- Test liquid: airless water.
- The curves apply to a density of 983.2 kg/m3 and a liquid temperature of +20 °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 0.474 mm2/s (0.474 cSt).
- The conversion between head H [m] and pressure p [kPa] has been made for water with a density of 1000 kg/m3. For liquids with other densities, e.g. hot water, the discharge pressure is proportional to the density.
- Curves obtained according to EN 16297.
- It is not obligatory to show PL,Avg but it gives an indication on the yearly expectable average power consumption.
- Maximum curves are limited by speed and power.

3. Performance curves and technical data

ALPHA SOLAR 15-75, 25-75 130/180



Setting	Max. head $_{nom}$
Curve 1	4.5 m
Curve 2	5.5 m
Curve 3	6.5 m
Curve 4	7.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	19 W
Curve 2	28 W
Curve 3	35 W
Curve 4	45 W

EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 20 W

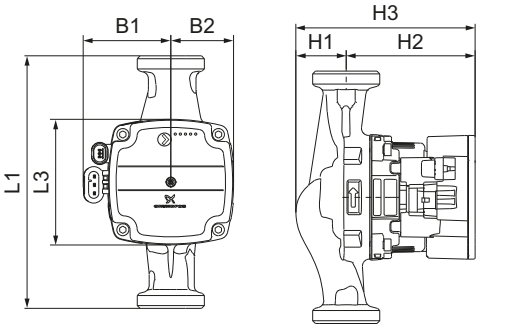
TM06 3658 0815

Note: PWM speed curves on request.

Electrical data, 1 x 230 V, +10/-15 %, 50/60 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2*	0.04
Max.	45	0.48

Settings			
PWM C	**PP**	**CP**	**CC**
1	-	-	4

* Only in PWM minimum speed operation.



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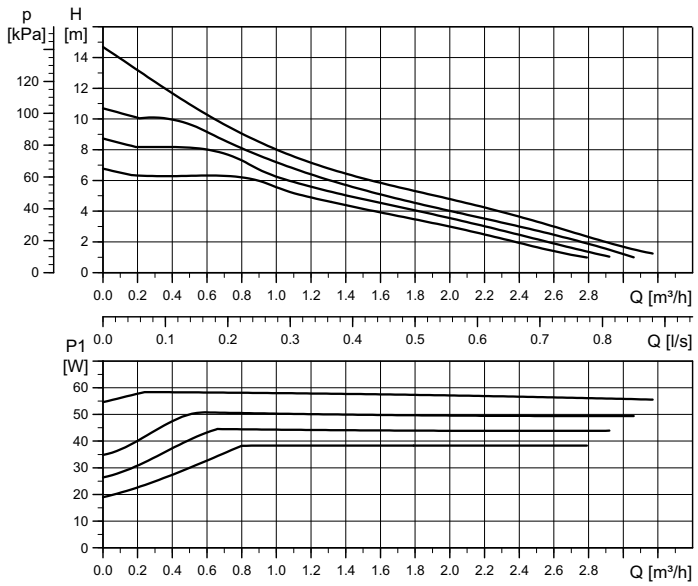
TM06 5636 5115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
ALPHA SOLAR 15-75 130	130	90	72	45	36	92	128	G 1	1.8
ALPHA SOLAR 25-75 130	130	90	72	45	36	92	128	G 1 1/2	1.9
ALPHA SOLAR 25-75 180	180	90	72	45	36	92	128	G 1 1/2	2.0

ALPHA SOLAR 25-145 180



Setting	Max. head $_{nom}$
Curve 1	6.5 m
Curve 2	8.5 m
Curve 3	10.5 m
Curve 4	14.5 m

Setting	Max. $P_{1\ nom}$
Curve 1	39 W
Curve 2	45 W
Curve 3	52 W
Curve 4	60 W

EEI ≤ 0.20 Part 3
$P_{L,avg}$ ≤ 25 W

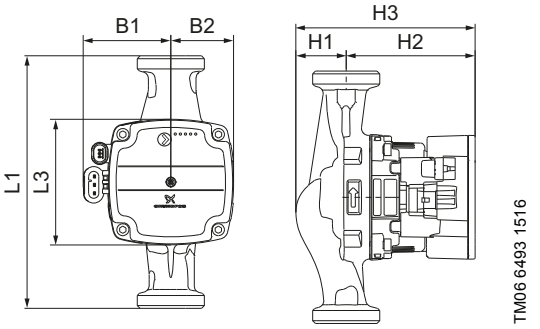
TM06 3652 0815

Note: PWM speed curves on request.

Electrical data, 1 x 230 V, +10/-15 %, 50/60 Hz		
Speed	**P_1 [W]**	**$I_{1/1}$ [A]**
Min.	2*	0.04
Max.	60	0.58

Settings			
PWM C	**PP**	**CP**	**CC**
1	-	-	4

* Only in PWM minimum speed operation.



TM06 6493 1516

TM06 5636 5115

Pump type	Dimensions [mm]							Connections	Weight [kg]
	L1	L3	B1	B2	H1	H2	H3		
ALPHA SOLAR 25-145 180	180	90	72	45	25	103	128	G 1 1/2	2.0

4. Product numbers

Pump type	Port-to-port length [mm]	Connection	Product number	Data sheet Page
ALPHA SOLAR 15-75	130	G 1	98989298	7
ALPHA2 SOLAR 25-75	130	G 1 1/2	98989299	7
ALPHA2 SOLAR 25-75	180	G 1 1/2	98989300	7
ALPHA2 SOLAR 25-145	180	G 1 1/2	98989297	8

Replacement table

Old existing products		Replaced by	
96817710	SOLAR 15-45 130	98989298	ALPHA SOLAR 15-75 130
96705819	SOLAR 15-60 130	98989298	ALPHA SOLAR 15-75 130
96817649	SOLAR 15-65 130	98989298	ALPHA SOLAR 15-75 130
59508500	SOLAR 15-80 130	98989298	ALPHA SOLAR 15-75 130
59544183	SOLAR 25-40 180	98989300	ALPHA SOLAR 25-75 180
96817722	SOLAR 25-45 130	98989299	ALPHA SOLAR 25-75 130
96817725	SOLAR 25-45 180	98989300	ALPHA SOLAR 25-75 180
59546639	SOLAR 25-60 180	98989300	ALPHA SOLAR 25-75 180
96817652	SOLAR 25-65 130	98989299	ALPHA SOLAR 25-75 130
96817707	SOLAR 25-65 180	98989300	ALPHA SOLAR 25-75 180
52588352	SOLAR 25-120 180	98989297	ALPHA SOLAR 25-145 180

5. Grundfos Product Center

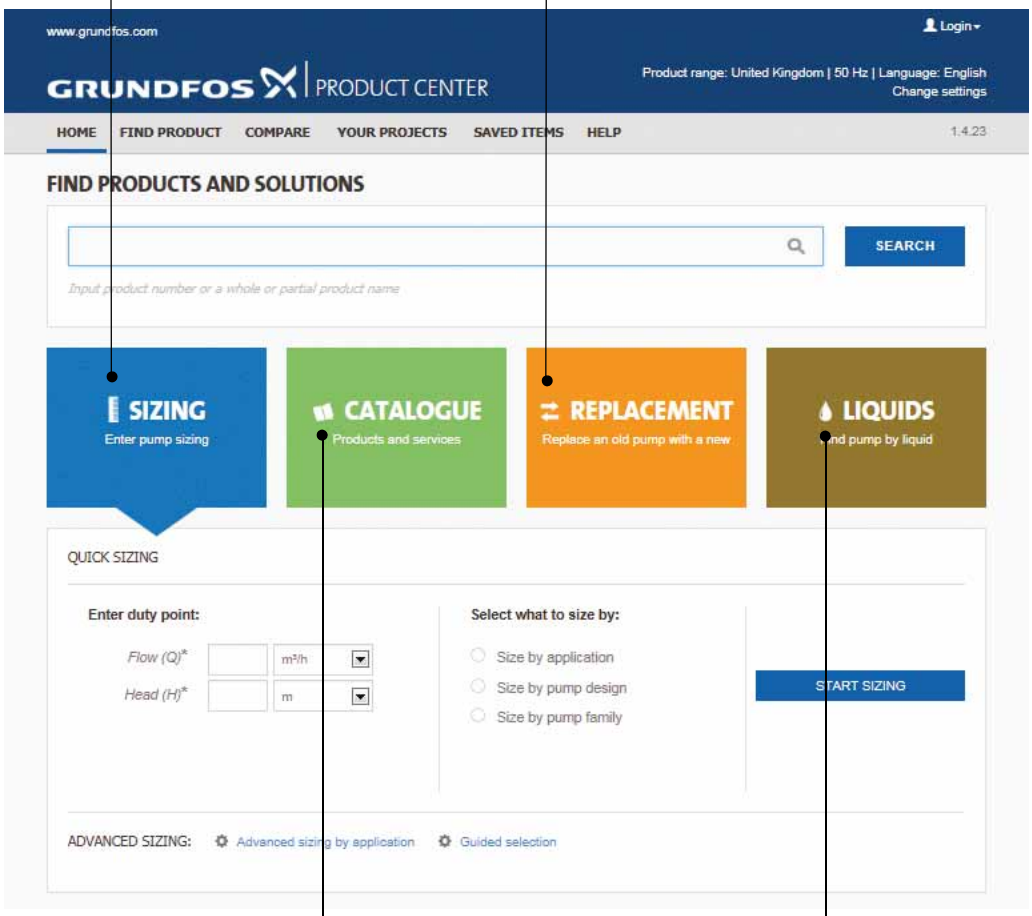
Online search and sizing tool to help you make the right choice.

http://product-selection.grundfos.com

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

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

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



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

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

All the information you need in one place

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

Downloads

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

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