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Shinhoo®

Circulation Pump

GPD	Mega
GPA	Instant hot water
LPA	Promo

MADE TO LAST FOR YEARS

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1. Circulator pumps overview

Application	Pump type					
						
	GPD	GPA	LPA	Mega	Instant hot water	Promo
Radiator systems	●	●	●	●		
Underfloor heating systems	●	●	●			
Domestic hot water circulation	●	●	●		●	
Solar-heating systems	●	●	●	●		
Air-condtioning and cooing system	●	●		●		
Boosting of hot or cold water supply	●	●		●	●	●

Conditions to measure performance

Instructions below are valid for performance curves given in this section below.

- Degassed water was used as pumped liquid when measuring performance.
- Performance of the pumps is measured with water temperature of +20 °C.
- All the values are approximate and do not guarantee that the pumps actually have the same performance. If it is necessary to calculate a minimum curve, an individual research is required.
- The given performance range is valid for kinematic viscosity of 1mm^2/s (1 cSt).
- Transformation of hydrostatic head H(m) into pressure p (kPa) is performed for water with density ρ = 1,000 kg/m^3. For pumped liquids with other densities, outlet pressure should be proportional to density.

How to select a pump: a brief instruction

Prior to selecting a pump, ensure that the following parameters comply with the operating conditions:

- quality and temperature of pumped liquid;
- environmental conditions;
- minimum inlet pressure;
- maximum operating pressure.

See section «Operating conditions»

Pump size

Pump sizes are selected according to the following parameters:

- required maximum flow in a hydraulic system (Q);
- maximum pressure losses in a hydraulic system (H).

In order to find a duty point, study the description of a certain pump size.

Put the required maximum flow (Q) on the X axis, maximum pressure losses (H) — on the Y axis. See Fig. 1.

Note: for more energy effective operation, selecting an excessive pump size is not recommended.

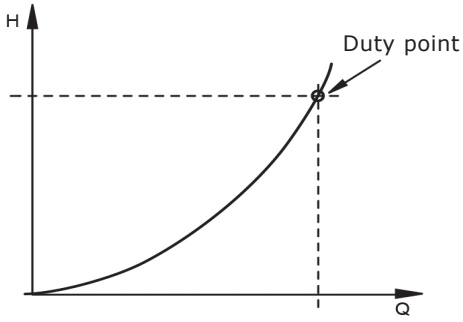


Fig. 1 System characteristic

GPD circulator pump

Fig. 3 GPD pump

Type key

GPD 15–6 SFC

Example	GPD 15–6 SFC
GPD series circulation pumps	
Nominal diameter of inlet and outlet ports(DN15)	
Maximum head(6m)	
Three-gear motor(single gear without letter)	
pump body is with flange structure	
Pump installed with check valve	

Application

Basic S pumps are used in different heating systems (one- or two-pipe heating systems, underfloor heating systems, mixing loops of large heating systems).

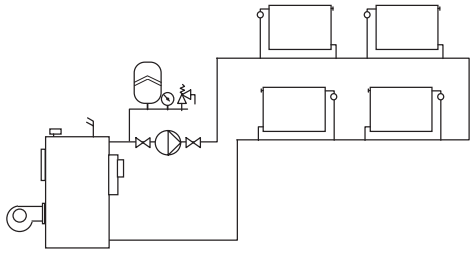


Fig. 4 One-pipe heating system

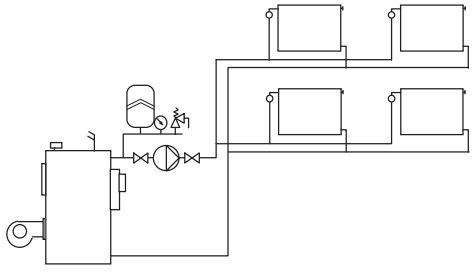


Fig. 5 Two-pipe heating system

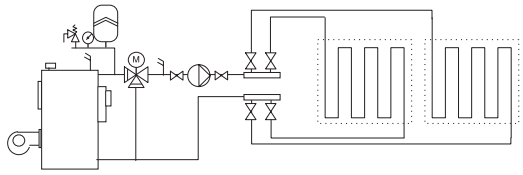


Fig. 6 Underfloor heating system

Operating conditions

Pumped liquids

Basic S circulator pumps are available in different configurations and work with the following liquid types:

• pure, non-viscous, non-corrosive, and non-explosive liquids without solids or fibers;
• cooling liquids without mineral oils;
• softened water.

Kinematic water viscosity u = 1 mm2/s (1 cSt) at 20 ° C. When a circulator pump is used to pump more viscous liquid, performance of the hydraulic system decreases. Exclude additives that can negatively effect pump operation.

The pump should be selected according to pumped liquid viscosity.

Liquid temperature

Allowable temperature of pumped liquid: from +2 to +110 °C.

Ambient temperature

Allowable ambient temperature: from 0 to +40 ° C. Temperature of pumped liquid should always be higher than ambient temperature. Otherwise, during operation there can be condensation water in stator and condensation water will bring pump out of operation.

Storage temperature

Storage temperature: from -30 to +55 °C.

Maximum system pressure

Pumps with unions (PN 10): 1.0 MPa (10 bar).

Inlet pressure

To avoid cavitation noise and pump bearings damage, the following minimal pressure should be set up for an inlet port:

Liquid temperature	85°C(bar)	90°C(bar)	110°C(bar)
Inlet pressure	0.6	0.75	1.5

Sound pressure

Sound pressure depends on the power consumed:
≤ 45 dB(A) for models with P1≤250 W

Construction

Basic S pumps are of the canned-rotor type, i.e. the pump and motor form a single unit without shaft seal that uses only two sealing gaskets. Bearings are lubricated with pumped liquid (see *Fig. 7*).

These pumps feature:

- ceramic radial bearings;
- carbon thrust bearing;
- stainless steel protective rotor can and bearing plate;
- impeller made of corrosion-resistant material;
- cast iron pump housing with cataphoretic coating.

Pumps are supplied with a three-speed motor.

Two- or four-pole asynchronous squirrel-cage motor.

A terminal box can be easily opened and is equipped with clips for cable connection. A cable inlet has a sealing and device to reduce mechanic stress in the cable.

The cable inlet can be protruded outside from the guide bush for easier installation.

Easy access to the terminal box with a cable tension compensator.

The motor complies with the Low Voltage Directive (LVD).

There are different configurations with different positions of terminal boxes to provide correct cable connection.

Insulation class: H.

Cable connection: Pg 11 for cables from 5.6 to 10 mm.

The motor does not require additional external protection and is equipped with built-in overtemperature protection depending on the pump model.

Material specification

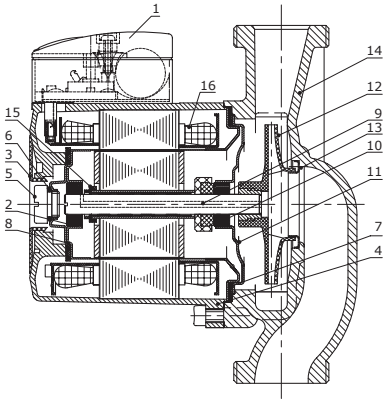


Fig. 7 Sectional drawing

No.	Name	Material
1	Terminal box	Composite PPE/PS
	Terminal box cover	Composite PPE/PS
	Electric unit	Composite PET
2	Radial bearing	Ceramics
3	Nameplate	Composite
4	Stator housing	Aluminum
	Stator winding cap	Composite PET
5	Air valve screw	Nickel-plated brass
6.7	Gaskets	Rubber EPDM
8	Rotor can	Stainless steel
9	External rotor can	Stainless steel
10	Thrust bearing	Carbon
	Thrust bearing retainer	Rubber EPDM
11	Bearing plate	Stainless steel
12	Impeller	Composite PES/PP
13	Neck ring	Stainless steel
14	Pump housing	Cast iron with cataphoretic coating
15	Stop ring	Composite PES
16	Intermediate ring	Stainless steel

Installation

Basic S circulator pumps should be securely fastened at the operation place so that there can be no risk of tipping over, falling or a sudden movement.

The pump should always be installed with the motor shaft in a horizontal position.

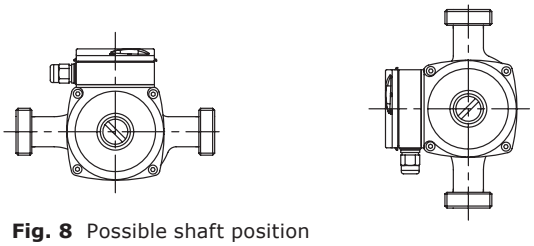


Fig. 8 Possible shaft position

The following position of the terminal box is possible:

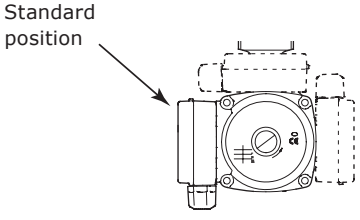


Fig. 9 The following position of the control box of the heating system

Product range

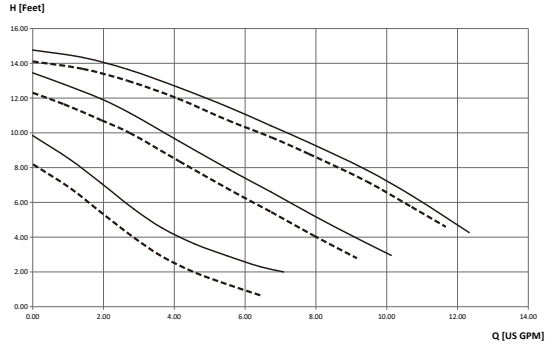
Basic S three-speed pumps

Housing material: cast iron with cataphoretic coating.

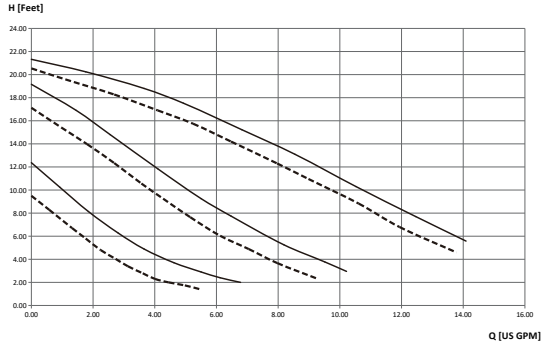
Pump model	Connection size	Port-to-port length, feet	Rated flow, (GPM)	Rated head, (feet)	Rated power, (W)	Rated current, (A)	Voltage
							110 V/60Hz
GPD15-4SFC	DN15	6 1/2	12.3	14.8	75/60/42	0.65/0.55/0.40	•
GPD15-4SFRC	DN15	6 1/2					•
GPD15-6SFC	DN15	6 1/2	14.1	21.3	100/85/57	0.95/0.78/0.55	•
GPD15-6SFRC	DN15	6 1/2					•
GPD25-7.5SFC	DN25	6 1/2	22.0	24.0	185/175/165	1.65/1.55/1.5	•
GPD25-10SFC	DN25	6 1/2	22.0	27.9	200/190/170	1.8/1.7/1.6	•
GPD25-12F	DN25	6 1/2	24.2	41.0	350	3.2	•
GPD25-12U	DN25	7 1/16	17.6	39.4	270	2.4	•
GPD40-4SFC	DN40	8 1/2	38.3	14.4	200/190/165	1.8/1.7/1.6	•
GPD40-7.5SF	DN40	8 1/2	35.2	19.7	230/220/165	2.0/1.9/1.6	•

Performance curves and technical data

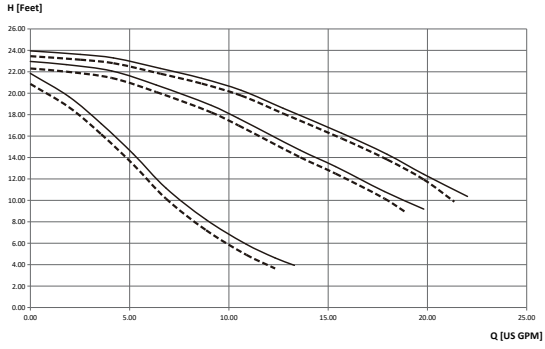
GPD15-4SF(R)C



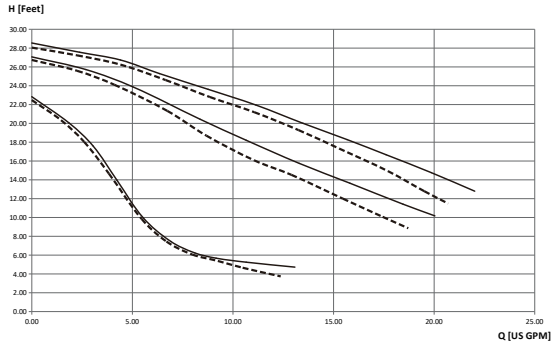
GPD15-6SF(R)C



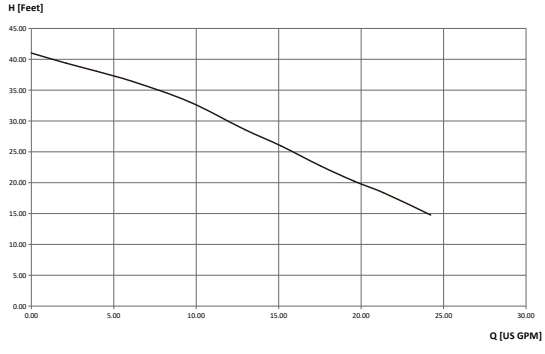
GPD25-7.5SFC



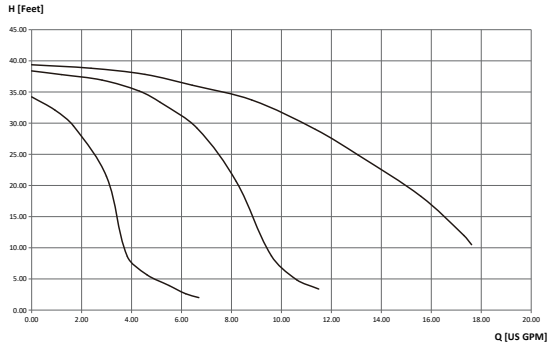
GPD25-10SFC



GPD25-12F

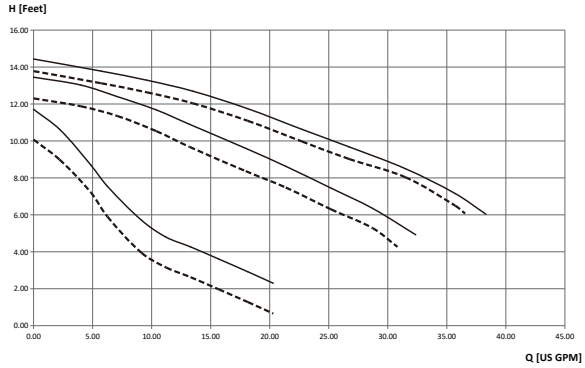


GPD15-12U

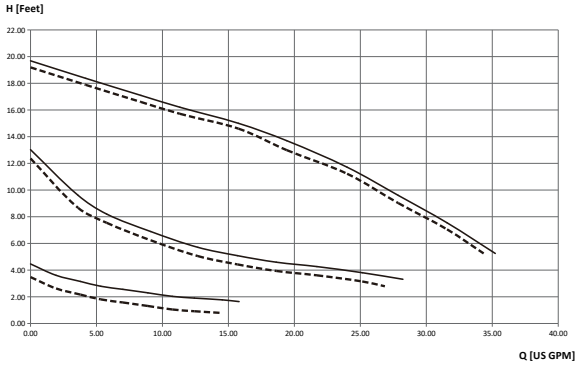


Performance curves and technical data

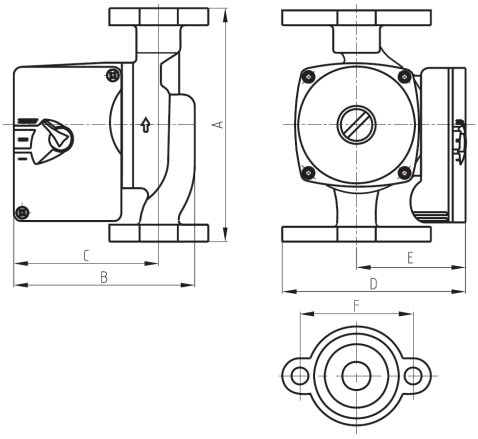
GPD40-4SFC



GPD40-7.5FC



Dimensions



Pump model	A	B	C	D	E	F
GPD15-4SFC	6 3/8	5 5/16	4 3/16	5 1/4	3 1/8	3 5/32
GPD15-4SFRC	6 3/8	5 1/4	4 3/16	4 7/16	3 1/8	3 5/32
GPD15-6SFC	6 3/8	5 5/16	4 3/16	5 1/4	3 1/8	3 5/32
GPD15-6SFRC	6 3/8	5 1/4	4 3/16	4 7/16	3 1/8	3 5/32
GPD25-7.5SFC	6 1/2	6 7/16	4 3/4	5 3/8	3 1/2	3 5/32
GPD25-10SFC	6 1/2	6 7/16	4 3/4	5 3/8	3 1/2	3 5/32
GPD25-12F	6 1/2	6 9/16	4 13/16	5 9/16	3 1/2	3 5/32
GPD25-12U	7 1/16	6	5 1/8	4 7/16	3 1/2	/
GPD40-4SFC	8 4/9	6 13/16	5 1/8	5 7/8	3 1/2	3 7/16
GPD40-7.5SF	8 4/9	6 13/16	5 1/8	5 7/8	3 1/2	3 7/16

GPA circulator pump

Fig. 1 GPA pump

Type key

GPA 15–6 F

Example	GPA 15–6 F
GPA series high efficiency pump	
Nominal diameter of inlet and outlet ports(DN15)	
Maximum head(6m)	
pump body is with flange structure	

Application

GPA pumps are designed for circulation of water or liquids with glycol in heating systems, underfloor heating systems, air conditioning and cooling systems. Cooling systems include systems in which the temperature of pumped liquid is lower than ambient temperature.

- systems with weather-dependent automatics in which it is recommended to optimize the position of the pump duty point;
- systems with temperature variables in a pressure pipe.

GPA pumps automatically adjust the pressure in the system according to an actual system requirement.
An automatic pump operating mode can be used in all the circuits of a heating system: one- or two- pipe radiator circuits, underfloor heating circuits and feed boiler circuits.

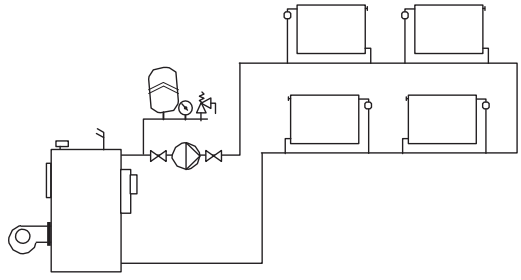


Fig. 2 One-pipe heating system

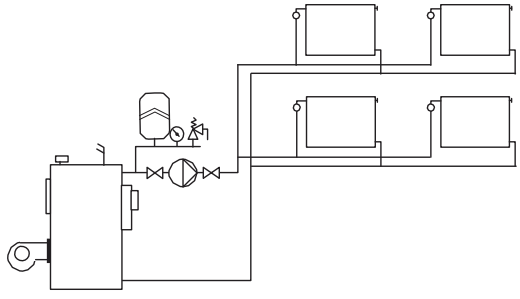


Fig. 3 Two-pipe heating system

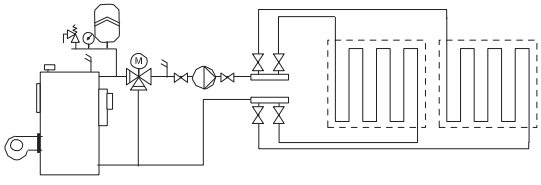


Fig. 4 Underfloor heating system

Below you can find the table with the data to select a pump for a certain heating system.

House area [m²]	Flow in the heating system at Δt = 15 °C [m³/h]	Flow in the underfloor heating system at Δt = 5 °C [m³/h]	Pump type
60-80	0.5	1.5	XX-4
80-120	0.7	2	XX-6
120-150	0.9	2.5	XX-7
180-200	1.1	3.2	XX-8

The recommendations are for information only.

Operating conditions

GPA circulator pumps can be used with the following liquid types:

- pure, non-viscous, non-corrosive, non- flammable, and non-explosive liquids without solids or fibers;
- cooling liquids without mineral oils;
- softened water.

Kinematic water viscosity = 1 mm2/s (1 cSt) at 20 °C.
When a circulator pump is used to pump a more viscous liquid, performance of the hydraulic system decreases.
Exclude additives that can negatively effect pump operation.
The pump should be selected according to pumped liquid viscosity.

Technical data

Supply voltage	230V +10% -15%,50Hz,PE
Motor protection	Additional external protection is not required
Protection against water and dust	IP44
Insulation class	H
Relative air humidity	Max. 95 %
Ambient temperature	From -30 to +70 °C
Sound pressure	≤ 42 dB(A)
Temperature class	TF110
System pressure	Maximum 1.0 MPa (10 bar)
Liquid temperature	-20 ... +110 °C

Inlet pressure

To avoid cavitation noise and pump bearings damage, the following minimal pressure should be set up for an inlet port:

Liquid temperature	≤75 °C	95 °C	110 °C
Inlet pressure	0.5 m	5 m	10.8 m
	0.05 bar	0.5 bar	1.08 bar

Construction

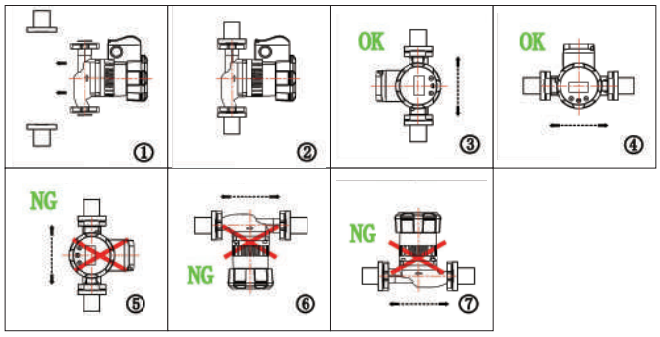
GPA pumps are of the canned-rotor type. In these pumps, the rotor of the motor is washed by pumped liquid.

Water in such pumps is used to:

1. Lubricate the bearings of an motor and remove wear debris.
2. Cooling of the stator winding.

Installation

- Mount pump shaft horizontally (±5° tolerance)
- Ensure air-free housing for normal operation



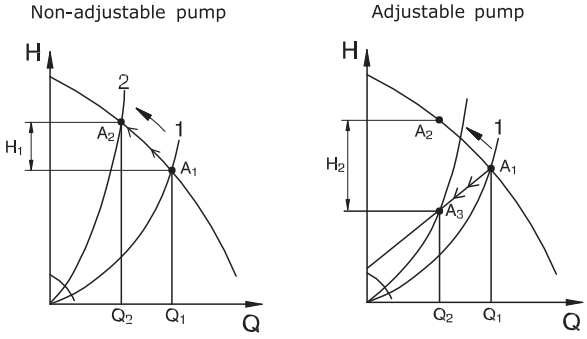
Electric control instructions

Necessity in the heating intensity of each room constantly changes and depends significantly on solar activity, time of the day, and individual features of the rooms heated.
These are the reasons why a non-adjustable pump can not adapt to changing conditions and works inefficiently.
Possible consequences when using non-adjustable pumps:

- excessive pressure in the system;
- noise in thermostatic heads;
- manual control of the heating system;
- excessive electricity consumption

Adjustable pumps equipped with a frequency converter and integrated software can process an actual system enquiry and automatically adjust to changing conditions·

Operation principles of non-adjustable and adjustable pumps are compared in the following graphs:



Changing of the duty point position of an adjustable and non-adjustable pump

If the system adopts a non-adjustable pump, then when thermostatic valve tap is closed, pressure difference on it increases due to the pump head rise in a low performance area. This increased pressure difference on the valve tap leads to local increase in water speed that, therefore, causes an unpleasant cavitation noise. If the system involves a GPA pump, the head before the valve tap will drop as the supply of the pump decreases. It means that the reason for noise appearance will be eliminated and the supply of heat transfer medium will comply with the real requirement of the system. Also, as the head decreases, a GPA pump decreases energy consumption.

Temperature Control Mode

Delta-T Mode
TEMP DIFF (AT): Set temperature difference
S-R (or R-S): Actual sensor temperature difference

Startup Cycle:

Activates only within first 3 minutes after power-on (timing counts in all modes).

Displays flashing START CYCLE on interface.

AT Mode:

START CYCLE disappears, displays actual power.

Operational Logic:

Power-on enters Startup Cycle:

① When S-R < ΔT:
Gradually increases from minimum to maximum speed.
Runs for 3 minutes (if S-R < ΔT maintained) → Exits to ΔT Mode.

② When S-R ≥ ΔT:
Immediately exits to ΔT Mode.

In ΔT Mode:

① When S-R < ΔT:
Gradually decreases to minimum speed.

② When S-R = ΔT:
Maintains current speed.

③ When S-R > ΔT:
Gradually increases to maximum speed.

Construction advantages of GPA pumps:

- An energy-efficient brand new permanent-magnet motor and increased starting torque.
- A ceramic shaft and bearings with the same temperature extension coefficient provide increased reliability of the equipment.
- A thrust bearing is made of carbon that extends the service life of the pump.
- A rotor can and thrust bearing are made of stainless steel to resist corrosion.
- The pump housing is made of cast iron with protective anti-rust coating.
- Simplified pump connection to power supply with a plug.

This design adopts a four-pole synchronous permanent-magnet motor and frequency converter. Easy access to the terminal box and cable tension compensator are included. The motor complies with the Low Voltage Directive (EN 60335-2-51). The motor is protected from short circuits.

The motor is protected by electronics of the control unit and does not require any external protection. The pump in connected to power supply via a plug supplied with it.

Material specification

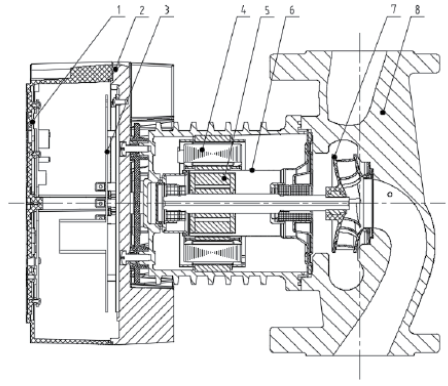
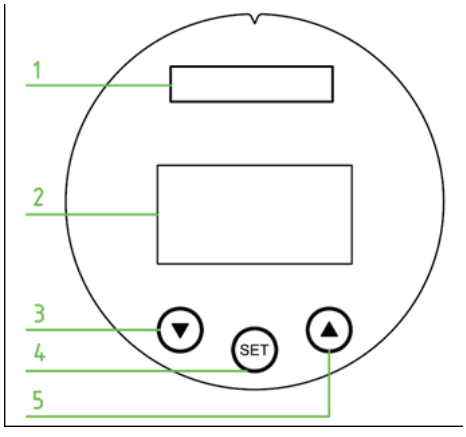


Fig. 6 Sectional drawing

No.	Name	Material
1	Pump Body Assembly	HT200
2	Impeller	Engineering plastics
3	Rotor	Assembly
4	Shield kit components	Stainless steel
5	Base	Aluminum alloy
6	Box seat	Engineering plastics
7	Lid	Engineering plastics

Product range

Pump model	Connection size	Port-to-port length, feet	Min power (W)	Min current (A)	Max power (W)	Max current (A)	Voltage
							110 V/60Hz
GPA15-6F	DN15	180	5	0.05	45	0.65	•

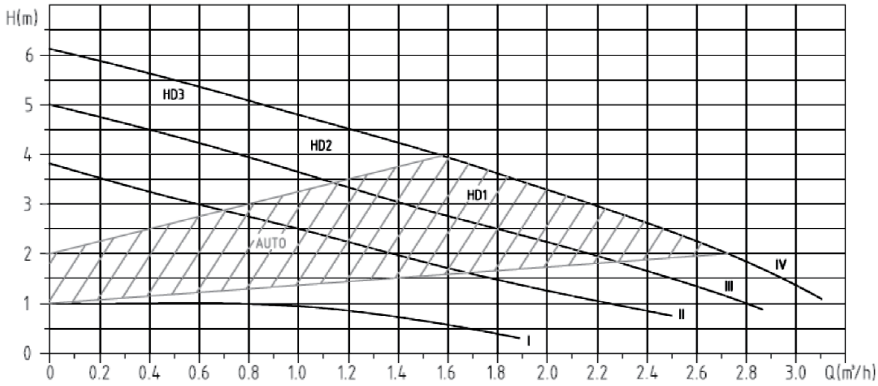


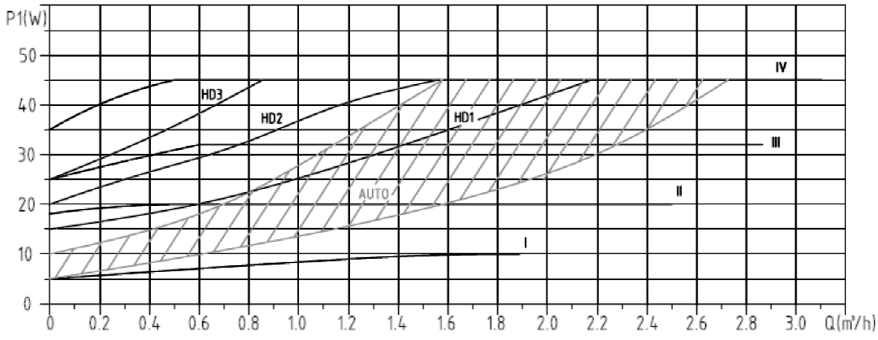
Position	Descriptions
1	displaying trademark
2	displaying area
3	down
4	setting
5	up

a.Press and hold the SET button for 3 seconds until the operating mode on the LCD begins to flash;
b.Use the UP or DOWN buttons to scroll through the 7 operating mode options, when the desired mode flashes on the LCD, press the SET button. The LCD will begin to flash either speed or setting options;
c.Use UP button to increase temperature or speed setting. Use DOWN button to decrease temperature or speed setting. When the desired setting flashes, press the SET button;
d.Programming is complete, and operating mode and setting will appear on the LCD screen.

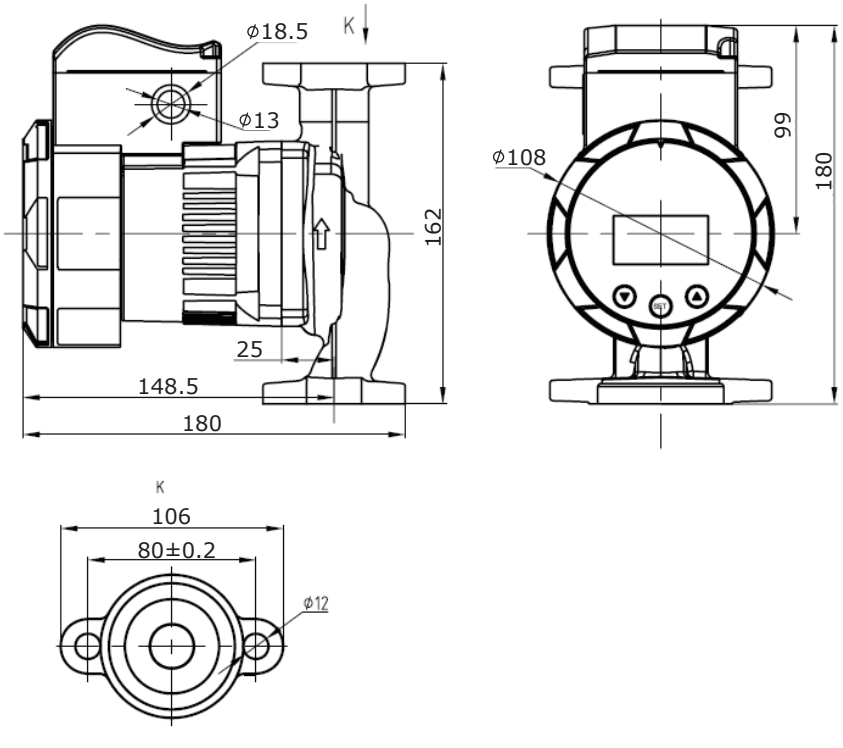
Performance curves and technical data

GPA 20/25/32-4 180





Dimensions



LPA circulator pump

Fig. 54 LPA 15-6F

Type key

Example	LPA	15	-6	F
LPA series high efficiency pump				
Nominal diameter of inlet and outlet ports (DN15)				
Maximum head(6m)				
pump body is with flange structure				

Application

LPA pumps are designed for circulation in heating systems, domestic hot water system.

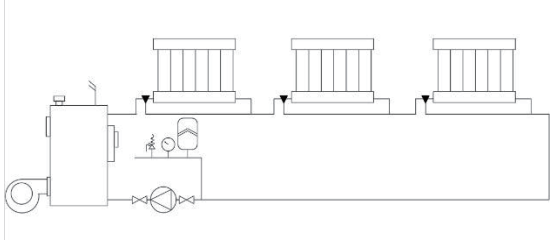


Fig. 2 One-pipe heating system

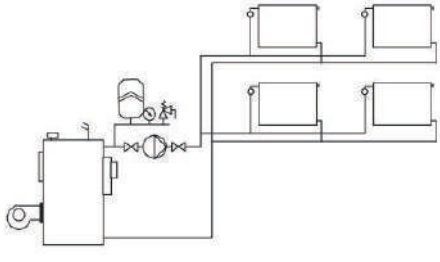


Fig. 3 Two-pipe heating system

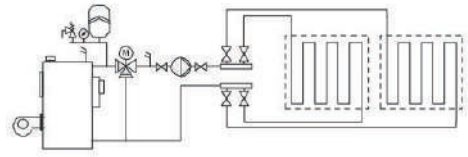


Fig. 4 Underfloor heating system

Operating conditions

LPA circulator pumps can be used with the following liquid types:

- pure,non-viscous,non-corrosive,non-flammableand, and non-explosive liquids without solids or fibers;
- cooling liquids without mineral oils;
- softened water.

Kinematic water viscosity=1mm2/s(1 cSt)at 20°C.
When a circulator pump is used to pump a more viscous liquid, performance of the hydraulic system decreases.
Exclude additives that can negatively effect pump operation.
The pump should be selected according to pumped liquid viscosity.

Technical data

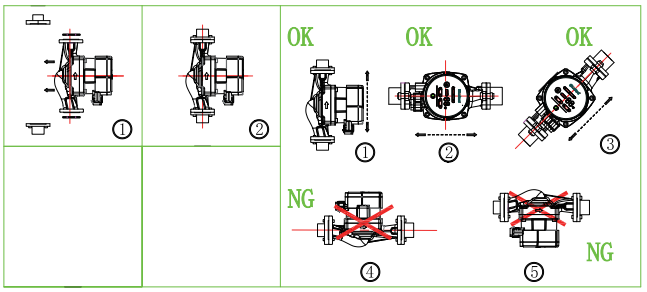
Voltage:115V AC	Frequency:50/60Hz	Insulation class:H
Design pressure:1.0MPa	Protection class:IP44	Temperature class:TF110
Sound pressure ≤ 42 dB(A)	Vibration:≤4.5mm/s	Standby power:≤3W
Steering: Clockwise from the impeller inlet		

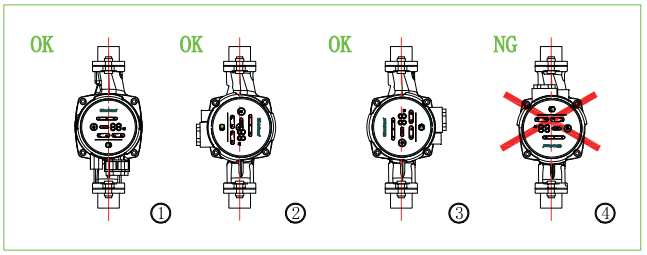
Construction

LPA pumps are of the canned-rotor type.
In thesepumps,the rotor of the motor is washed by pumpedliquid.
Water in such pumps is used to:
1. Lubricate the bearings of an motor and removewear debris.
2. Cooling of the stator winding.

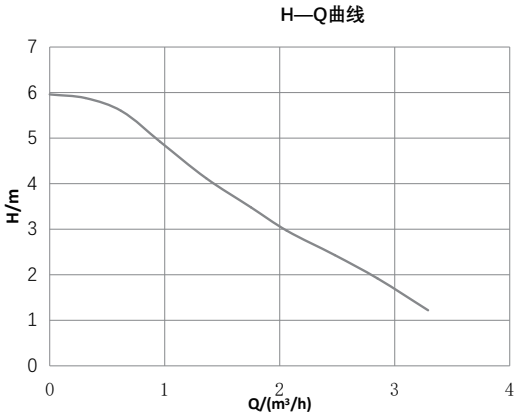
Installation

When the circulation pump is installed early, the circulation pump shaft must be in a horizontal position, and the allowable installation angle of the circulation pump shaft is ± 5 °. The installation method of the circulating pump in the system should ensure that there is no large amount of gas in the chamber of the circulating pump to avoid affecting the normal operation of the circulating pump.



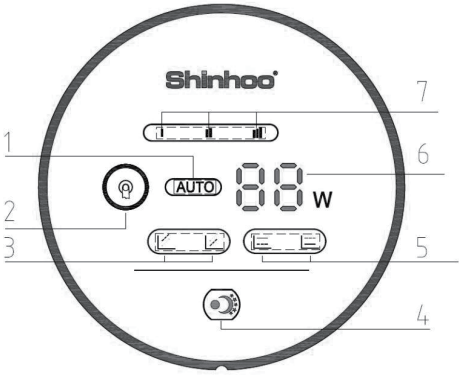


Performance curves and technical data



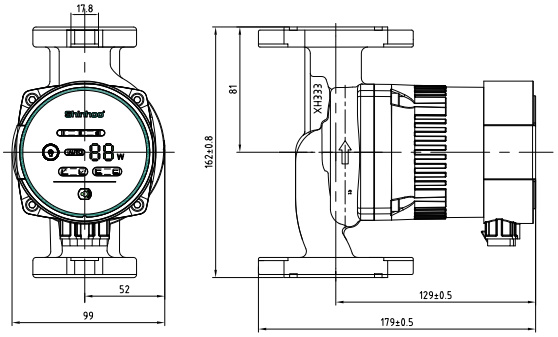
Product range

Type	Max flow (m3/h)	MAX head (m)	MAX Power (W)	Energy efficiency value	Rated voltage (V)	MAX current (A)
LPA15-6F	2.8	6	45	EEI≤0.20-Part2	115V/ 60Hz	0.38

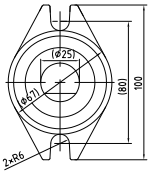


NO.	Description
1	Electric pump automatic display (AUTO)
2	Electric pump shift button
3	Electric pump ratio display (BLI/BL2)
4	Electric pump night mode button and display
5	Electric pump constant pressure profile display (HDI/HD2)
6	Electric pump power display
7	Electric pump constant speed display (HS1/HS2/HS3)

Dimensions



进出口尺寸



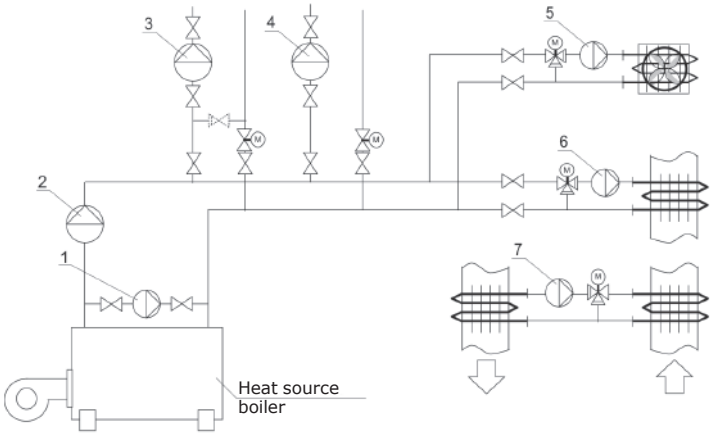
Mega circulator pump

Fig. 30 Mega pump

Type key

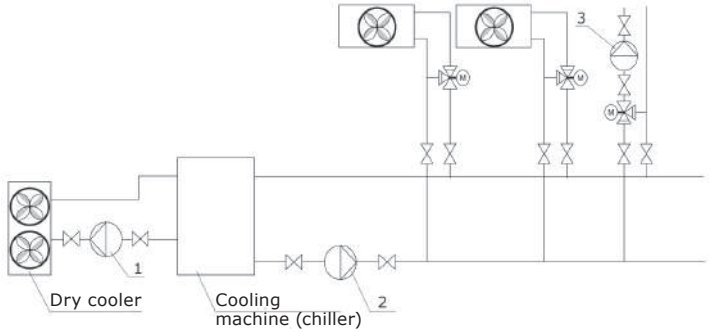
Example	Mega	40	-10	F	180
Type range					
Nominal diameter (DN) of inlet and outlet ports [mm]					
Maximum head [m]					
Flange configuration (if no marks, then threaded)					
Port-to-port length [mm]					

Application



1. Boiler circuit pump
2. Primary circuit pump
3. Pump in one- and two-pipe heating systems
4. Heating circuit pump in a domestic hot water circulation
5. Heat pump in air heating systems
6. Pump for underfloor heating systems
7. Heat regeneration and recovery systems

Fig. 31 Functional drawing of heating system



1. Condenser and dry cooler circuit pump
2. Consumer circuit pump (fan coils)
3. Pump of cold supply systems in central air conditioners

Fig. 32 Functional drawing of air conditioning system

Operating conditions

General instructions

Water in heating system	Water quality according to local standard
Water with glycol	Maximum viscosity = 10–50 cSt ~ solution of water 50 % / glycol 50 % at -10 °C

Operation range

Parameter	MEGA
Maximum flow, Q	10 m^3/h
Maximum head, H	10 meters

Liquid temperature

from 2 to +110°C.

Environmental conditions

Ambient temperature when operated	from 0 to +40 °C
Ambient temperature when stored or transported	from -30 to +70 °C
Relative air humidity	Max. 95 %

Maximum operating pressure

PN 10: 10 bar / 1.0 MPa.

Minimum inlet pressure

In order to avoid cavitation noise and bearings damage during pump operation, the following minimum relative pressure should be maintained at its inlet port.

	Liquid temperature	Inlet pressure of the pump
Inlet pressure	≤ + 85 °C	0.005 MPa
	≤ + 90 °C	0.028 MPa
	≤ +110 °C	0.100 MPa

Note: the sum of actual inlet pressure and pump pressure should always be lower than a maximum allowable operating pressure in the system when the valve is closed.

Relative minimum pressure is given for the pumps installed at 300 m above the sea level. For the pumps installed higher than 300 m above the sea level, the required relative inlet pressure should be increased by 0.01 bar or 0.001 MPa per each 100 m of height. MEGA pumps are allowed only at a height up to 2,000 m above the sea level.

Sound pressure

Sound pressure depends on the power consumed and does not exceed 42 dB (A).

Pumped liquids

The pump is designed to pump pure and non-corrosive liquids without solids or fibers that can have a mechanical or chemical impact on the pump.

Water used in heating systems should meet the quality requirements of system water for heating units.

The pumps must not be used for inflammable or explosive liquids such as diesel fuel or petrol.

The pumps must not be used for corrosive liquids such as acids or sea water.

If the pump is not operated during a cold season, take the necessary measures to avoid low temperature damages.

Using additives in a heat transfer medium with the density and/or kinetic viscosity higher than the water ones decreases the performance of the pump. Never use the additives that can negatively affect the pump operation.

In order to learn whether the pump can be used with a certain liquid, take into account several factors. The most important are lime content, pH, temperature, and the content of solvents and oils.

The pump can be used for glycol and water mixtures at the level up to 50 %.

Pumping of glycol mixtures decreases hydraulic performance of the pump.

Construction

Mega pumps are wet rotor pumps, i.e. the pump and the motor are a single-piece unit without shaft end seal. The bearings are lubricated with pumped liquid.

The pumps feature:

- controller built in a control unit;
- operating panel at the front of the pump;
- external protection of the motor is not required.

Motor and frequency converter

Mega pumps are equipped with permanent-magnet motor. This motor type is characterized by an increased efficiency in comparison with traditionally used asynchronous squirrel-cage motors.

Motor speed is set up by a built-in frequency converter.

Pump connections

Threaded pipe and flange connections.

Surface treatment

A pump housing and its head part have cataphoretic coating for better corrosion resistance.

Cataphoretic coating application includes the following steps:

- alkali cleaning;
- zinc phosphate pre-treatment;
- cathodic electrodeposition (cataphoresis);
- varnish-and-paint film drying at 200–250 °C.

Installation

Mega pumps are designed for indoor installation.

The shaft of the pump should be installed horizontally.

The pump can be installed both on horizontal and vertical pipelines.

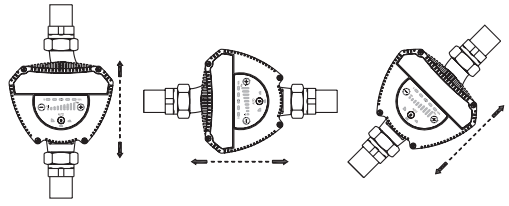


Fig. 33 Acceptable position of the pump shaft

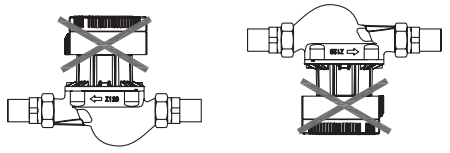


Fig. 34 Unacceptable position of the pump shaft

The arrow on the pump housing shows the direction of a liquid flow.

The control unit should be in a horizontal position.

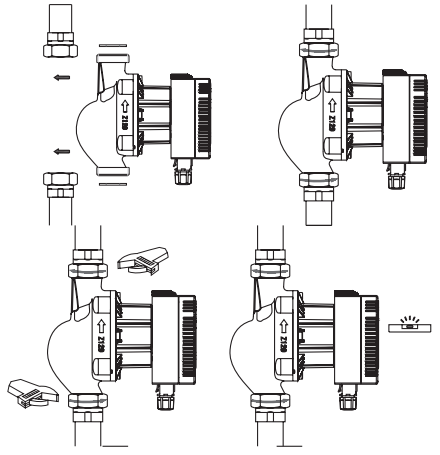


Fig. 35 Pump installation

In order to provide sufficient cooling of the motor and electronic equipment, fulfil the following requirements:

- Ambient temperature should not be higher than 40 °C.

Electrical data

Pump type	Mega
Protection class (IP class)	IP 42
Insulation class	H
Supply voltage	1 x 230 V+10%,-15%,50 Hz, PE
Digital input	PWM 0–10 V
Electromagnetic compatibility	EN61000-6-1 and EN61000-6-3

Electrical connection

Power supply connection should be performed in compliance with local regulations and rules.

- The pump should be connected to an external on/off switch.
- The pump should be appropriately earthed.
- External protection of the pump motor is not required.

Note: the pump should not be started and stopped more than four times within an hour when supply voltage is turned on and off.

The pump is connected to power supply according to Fig. *36*.

Cables

All the cables should be connected in accordance with the local regulations.

Additional protection

The earth leakage circuit breaker should be marked with the first or both symbols given below:

Marking	Description
	High-sensitivity ELCB, type A, according to IEC 60775
	High-sensitivity ELCB, type B, according to IEC 60775

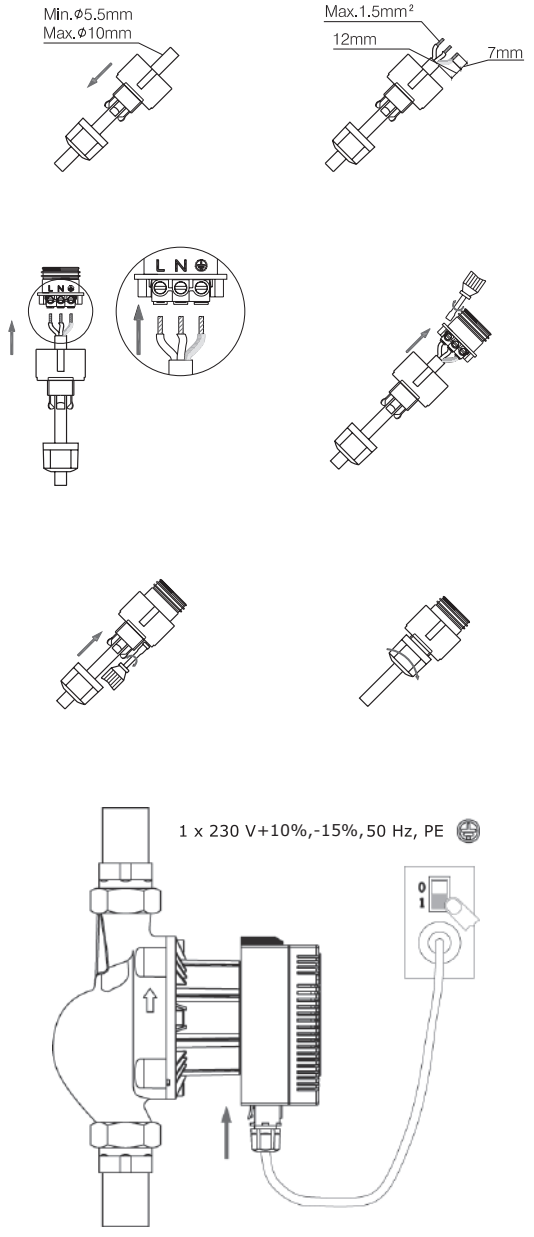


Fig. 36 Electrical connection

Electric control instructions

Control modes

The pump has 19 control modes with an automatically changed speed, nine modes with a constant speed and the mode controlled by an external controller with a PWM signal and 0-10v control. The description of the modes is given below.

An operating mode should be adjusted according to the system type (see *Fig. 37*). Initial settings — AUTO (self-adjusting mode). Recommended settings of the pump are given in the table below.

You can select the control mode by pushing the button on the operating panel. (*Fig. 41*). The selected control mode will be visible due to light fields.

A	Underfloor heating system	AUTO	PD (1-9)
B	Two-pipe heating systems	AUTO	PR (1-9)
C	One-pipe heating systems	PP1	PD (1-9)

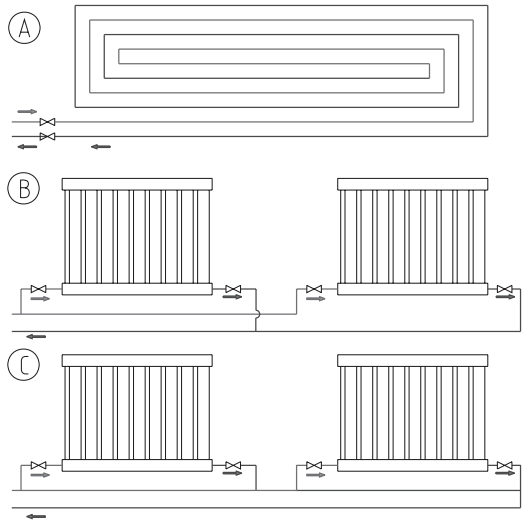


Fig. 37 Operating mode adjustment

Proportional pressure (PP1-9)

Proportional-pressure mode adjusts the pump performance to the actual heat demand in the system, but the pump performance follows the selected performance curve — PP1-9.

See *Fig. 38*.

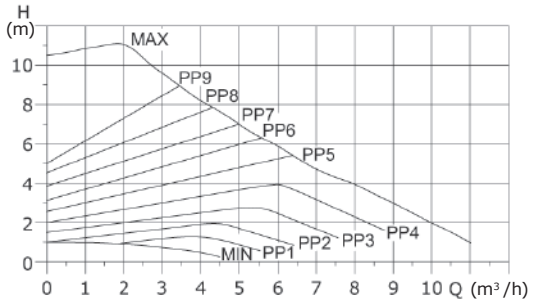


Fig. 38 Proportional-pressure curve settings

Depending on the pump sizes, there are 1–9 curves of the control mode of proportional pressure available.

The selection of the proportional pressure mode depends on the system parameters and required flow.

Constant pressure (CP1-9)

Constant pressure mode adjusts the pump performance with regard to the required flow in the system but within the selected performance curve — CP1-9. See *Fig. 39* with CP1-9 modes.

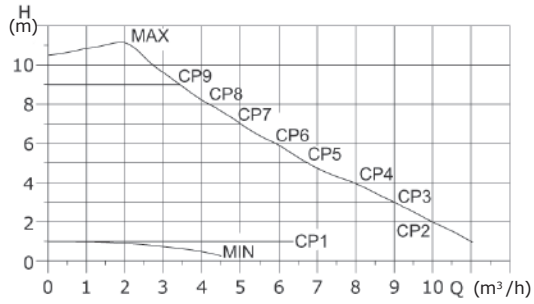


Fig. 39 Constant-pressure curve settings

Depending on the pump sizes, there are 1–9 constant pressure mode curves available.

The selection of the constant pressure mode depends on the system parameters and required flow.

Constant curve (CS1-9)

At constant curve, the pump runs at a constant curve independently of the actual flow demand in the system. The pump performance follows the selected performance curve — CS1-9. See *Fig. 40*

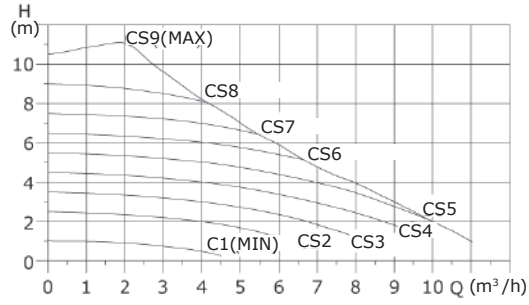


Fig. 40 Constant-curve settings

Depending on the pump sizes, there are 1–9 fixed speeds available.

The selection of a suitable operating mode at a constant curve mode depends on the system parameters and required flow.

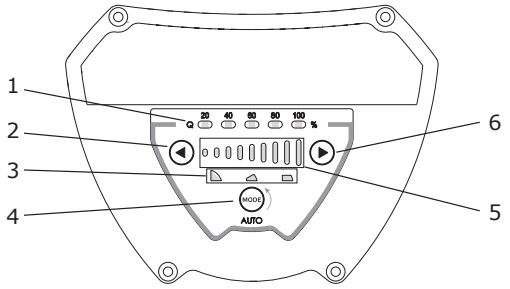


Fig. 41 Operating panel

No.	Description
1	Current flow, % of Max.
2	Speed decrease button
3	Operating mode indicators
4	Mode selection button
5	Current operation speed indicator
6	Speed increase button

PWM signal control mode

In order to transfer a PWM signal, use the supplied signal cable with a plug. The plug is connected to an appropriate connector of a control unit (see *Fig. 42*).

Procedure:

1. Disconnect the pump from the power supply.
2. Place the plug of a signal cable into a connector.
3. Connect the signal cable to an external controller.

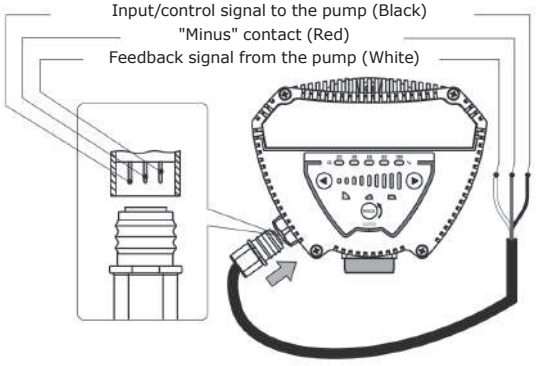


Fig. 42 Drawing of PWM signal connection

Brief description of control modes

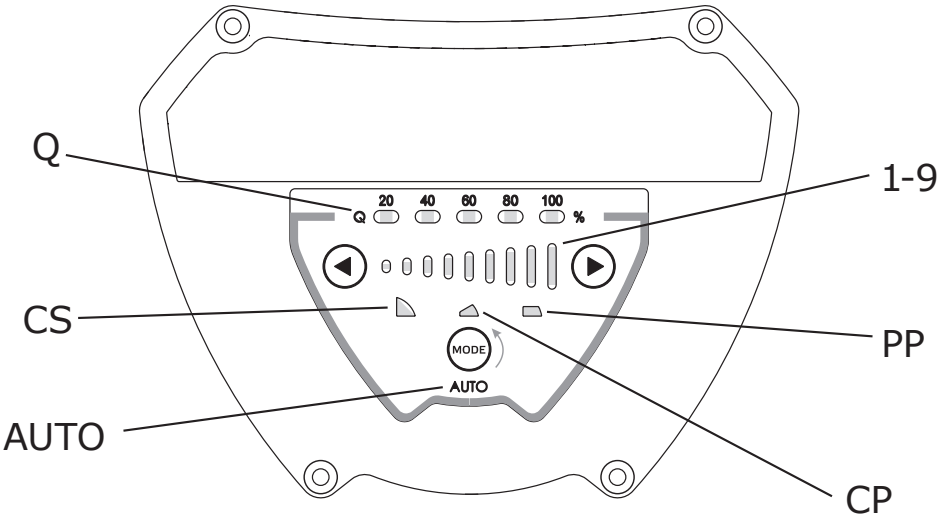


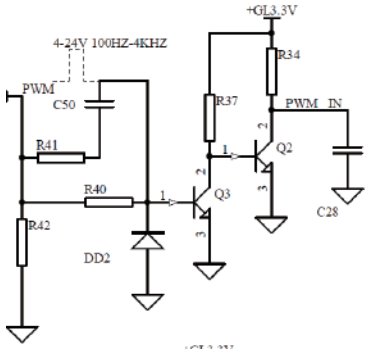
Fig. 43 Pump control modes

Setting	Pump performance curve	Description
PP1-5 for xx-6 model	Proportional pressure curves	The pump duty point will be shifted up or down along one of the five propotional pressure curves depending on the required system flow. The head (pressure) drops when the required flow in the system is reduced and rises when it is increased.
PP 1-7 for xx-8 model	Proportional pressure curves	The pump duty point will be shifted up or down along one of the seven propotional pressure curves depending on the required system flow. The head (pressure) drops when the required flow in the system is reduced and rises when it is increased.
PP 1-9 for xx-10 model	Proportional pressure curves	The pump duty point will be shifted up or down along one of the nine propotional pressure curves depending on the required system flow. The head (pressure) drops when the required flow in the system is reduced and rises when it is increased.
CP 1-5 for xx-6 model	Constant-pressure curves	The pump duty point will be shifted farther or closer along one of the five constant-pressure control mode curves depending on the required system flow. The head (pressure) remains constant regardless of the required flow in the system.
CP1-7 for xx-8 models	Constant-pressure curves	The pump duty point will be shifted farther or closer along one of the seven constant-pressure control mode curves depending on the required system flow. The head (pressure) remains constant regardless of the required flow in the system.
CP 1-9 for xx-10 models	Constant-pressure curves	The pump duty point will be shifted farther or closer along one of the nine constant-pressure control mode curves depending on the required system flow. The head (pressure) remains constant regardless of the required flow in the system.
CS1-5 for xx-6 models	Constant curves	The pump runs according to one of the five constant performance curves, i.e. with constant speed.
CS1-7 for xx-8 models	Constant curves	The pump runs according to one of the seven constant performance curves, i.e. with constant speed.
CS1-9 for xx-10 models	Constant curves	The pump runs according to one of the nine constant performance curves, i.e. with constant speed.
Auto mode	Auto performance range	The pump duty point will be shifted up or down along one of the selected automatic curves depending on the required system flow. The head (pressure) drops when the required flow in the system is reduced and rises when it is increased. The pump automatics selects the curve independently; manual adjustment is not required.

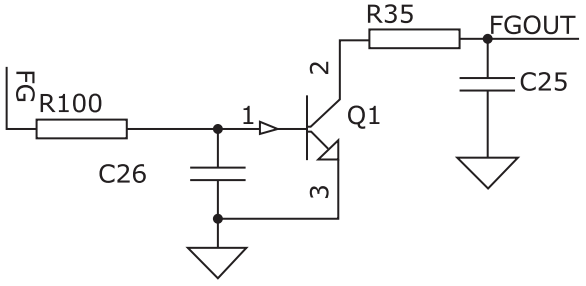
Signal connection

PWM input(white), Fault feedback (red), 0~10V (green), ground cable (black)
PWM output signal:pump feedback signal, PWM frequency is 75Hz±5%。

Interface circuit of PWM input signal



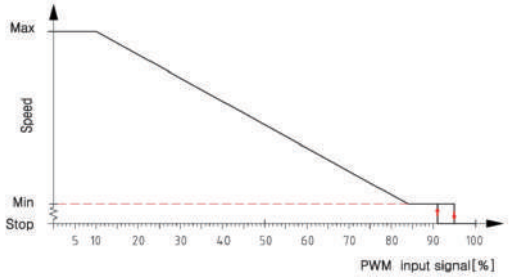
PWM output interface circuit



Electric control instructions

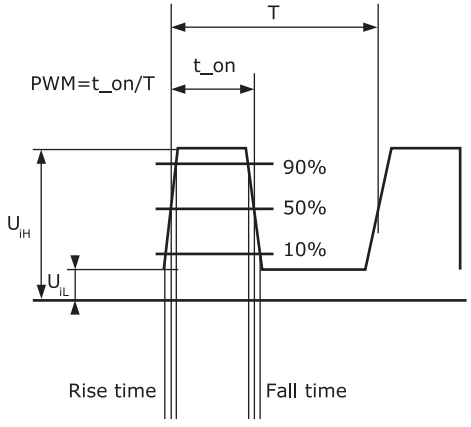
PWM signal input

Under fixed frequency, different duty cycles correspond to different motor given speed signals.Inverse proportional control mode is adopted. The specific control logic is as follows:



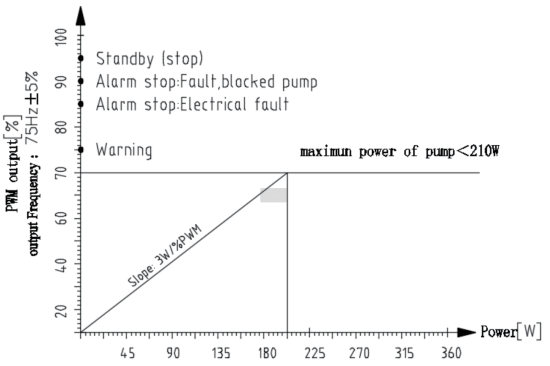
PWM input	Water pump status
0	Gear display: The factory default is AUTO When the water pump is switched to non PWM mode (maximum speed operation), the system has no PWM signal by default
≤10	The water pump operates at maximum speed
＞10～≤84	Pump linearity from highest to lowest
＞84～≤91	The water pump operates at the lowest speed
＞91～≤95	If the input signal fluctuates near the speed change point, the starting of the water pump will be prevented according to the hysteresis principle
＞95～＜100	Standby, the water pump stops running
100	Gear display: The factory default is AUTO When the water pump is switched to non PWM mode (maximum speed operation), the system has no PWM signal by default
Accuracy: ±1 (Example: When the PWM input signal is 20%, the actual duty cycle is in the range of 19% ～21%)	

PWM input signal	parameter
Current isolation in pump	YES
Frequency input	100 – 4000 Hz
Input voltage high level	4.0 – 24 V
Input voltage low level	≤ 0.7V
Input current high level	Max3.5mA@4700Ohms Max10 mA@100Ohms
Input PWM duty cycle	0 – 100 %
Signal polarity	Fixed changeless
Rise time	≤ T/1000



PWM feedback

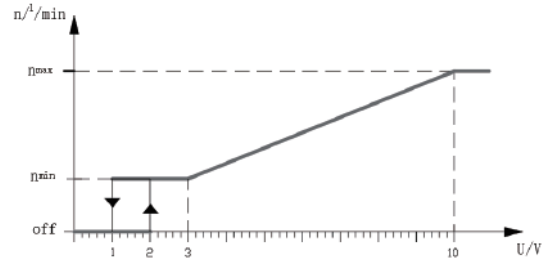
Frequency range: 75±5%Hz.
Corresponding relationship between output signal and circulating pump and operating status.



PWM Output signal (%)	Pump condition	Description
0-70	Pump operation	Power feedback: 0-185w (Slope: 3w/%PWM)
75	Alarm stop	The pump stops when the pump is in the stateof overpressure or underpressure protection
85	Alarm stop	The pump is in the protection state of phased eficiency,over-current, over-temperature,etc., and the pump stops
90	Alarm stop	The pump stops when the pump is in the lock protection state
95	Bide one's time	/

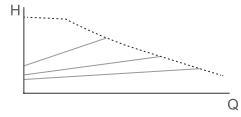
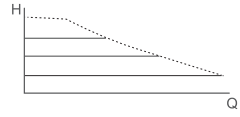
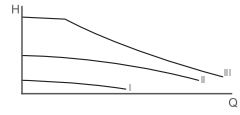
0-10V Control logic

0-10V analog control signal description: The water pump starts to power on in conventional mode (constant speed mode or constant pressure mode or proportional mode or AUTO mode), and the factory default constant speed mode. Once there is 0 ~ 10V analog voltage input, the pump enters 0 ~ 10V analog control mode, in this mode, the input of different analog voltages, the pump is in different operating states, if the cable line is broken in this mode, the pump runs at the lowest speed (0 ~ 10V analog control mode, the lowest speed). Once the pump enters the 0-10V analog control mode, it cannot switch to the normal mode. If you want to enter the normal mode again, you must power on the pump again to enter the normal mode.



Input signal (V)	Pump condition
U<1V	Pump shutdown
1V<U<3V	The pump runs at the lowest speed (when the analog voltage signal changes from large to small, when the voltage value is < 1V, the pump stops; > 1V, the pump runs at the lowest speed. When the voltage signal changes from small to large, when the voltage < 2V, the pump stops; > 2V, run at the lowest speed.)
3V<U<10V	Pump at minimum and maximum speed (linear)
Remark	Once an analog voltage signal (0-10V voltage signal) comes ,press the button to active the external controll mode.At this time ,if the signal line is broken (including the signal line is not connect-ed), the pump runs at the lowest speed, and the LED blinks.

Recommendations on the control mode selection

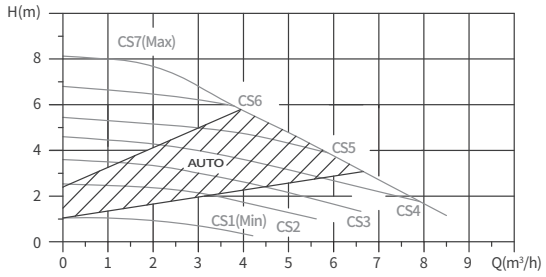
Application in hydraulic systems	Control method:
In systems with relatively large pressure losses in the distribution pipes and in air conditioning and cooling systems. • Two-pipe heating systems with thermostatic valves and: – with very long distribution pipes; – with strongly throttled pipe balancing valves; – with differential-pressure regulators; – with large pressure losses in those parts of the system through which the total quantity of water flows (for example, boiler, heat exchanger and distribution pipe up to the primary circuit). • Primary circuit pumps in systems with large pressure losses in the primary circuit. • Air conditioning systems – with heat exchangers (fan coils); – with cooling ceilings; – with cooling surfaces.	Proportional pressure 
In systems with relatively small pressure losses in the distribution pipes. • Two-pipe heating systems with thermostatic valves: – dimensioned for natural circulation; – with small pressure losses in those parts of the system through which the total quantity of water flows (for example, boiler, heat exchanger and distribution pipe up to the primary circuit); – with high differential temperature between flow pipe and return pipe (for example, central heating). • Underfloor heating systems with thermostatic valves. • One-pipe heating systems with thermostatic valves or pipe balancing valves. • Primary circuit pumps in systems with small pressure losses in the primary circuit.	Constant pressure 
The pump can also be set to operate according to the maximum or minimum curve, i.e. to the mode similar to the operation of a non-adjustable pump: • The maximum curve mode can be used in periods in which a maximum flow is required. • The minimum curve mode can be used in periods in which a minimum flow is required.	Constant speed 

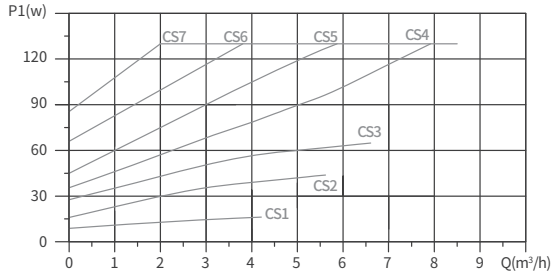
Product range

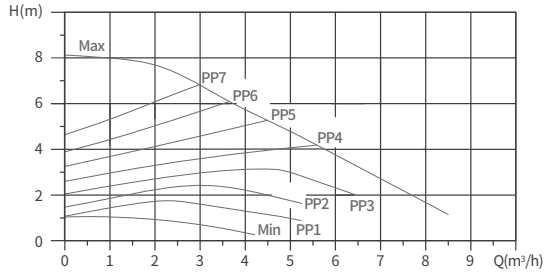
Pump model	Connection size	Port-to-port length, mm	Rated power min/ max, (W)	Rated current min/ max, (A)	Voltage
					230 V
Mega 25-8	G 1 1/2"	180	10–130	0.09/0.9	•
Mega 25-10		180	10–185	0.09/1.25	•
Mega 32-8	G 2”	180	10–130	0.09/0.9	•
Mega 32-10		180	10–185	0.09/1.25	•
Mega 40-8F	DN40	220	10–130	0.09/0.9	•
Mega 40-10F	DN40	220	10–185	0.09/1.25	•

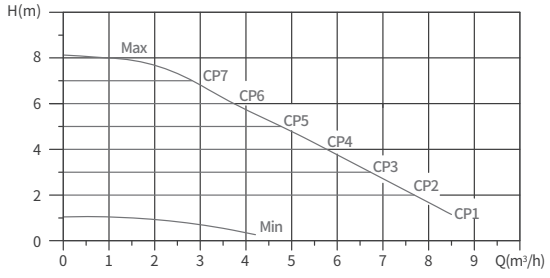
Performance curves and technical data

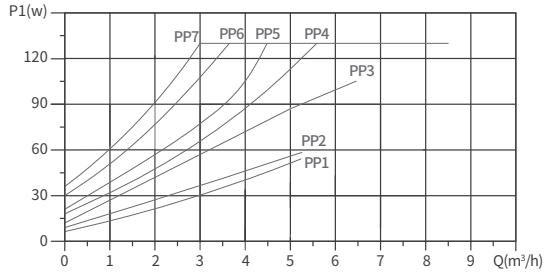
Mega XX-8

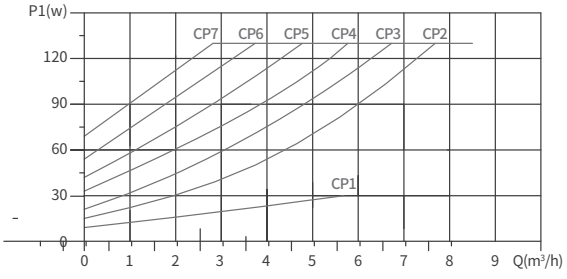




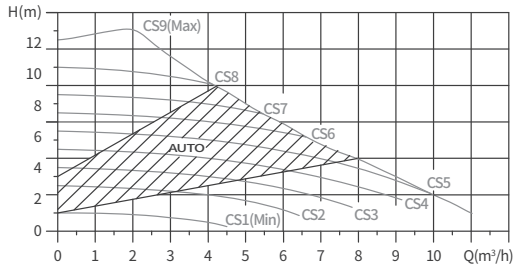


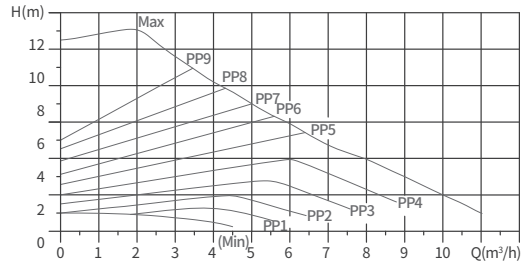


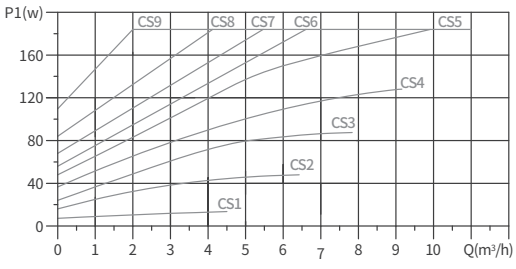


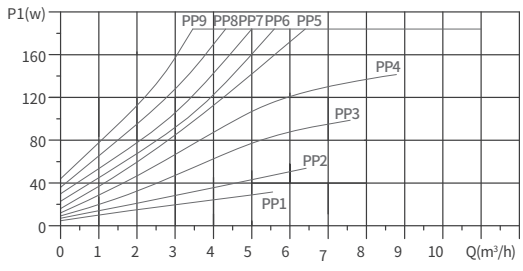


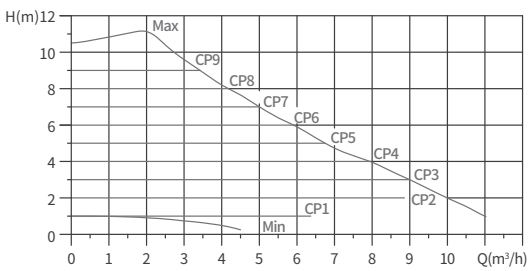
Mega XX-10

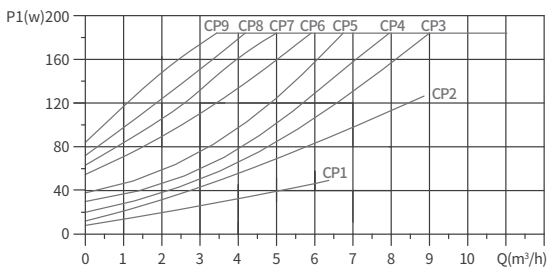

H(m)
CS9(Max)
CS8
CS7
CS6
AUTO
CS5
CS4
CS3
CS2
CS1(Min)
Q(m³/h)


H(m)
Max
PP9
PP8
PP7
PP6
PP5
PP4
PP3
PP2
PP1
(Min)
Q(m³/h)

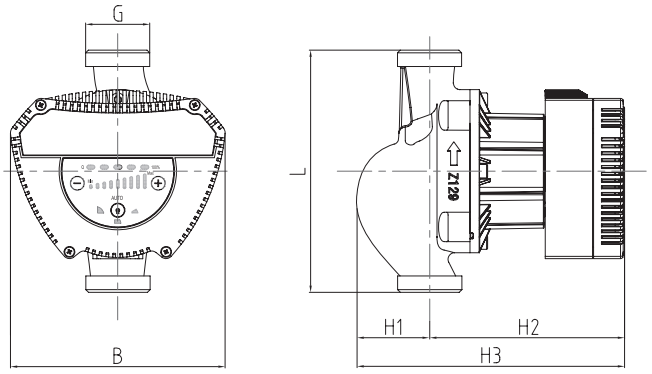

P1(w)
CS9
CS8
CS7
CS6
CS5
CS4
CS3
CS2
CS1
Q(m³/h)


P1(w)
PP9
PP8
PP7
PP6
PP5
PP4
PP3
PP2
PP1
Q(m³/h)

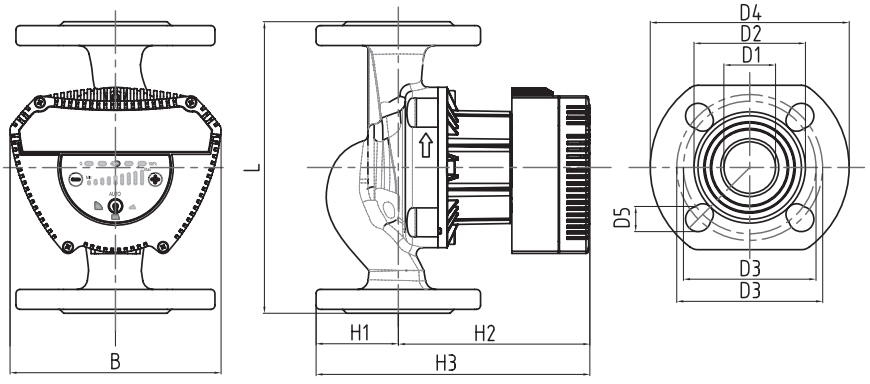

H(m)
Max
CP9
CP8
CP7
CP6
CP5
CP4
CP3
CP2
CP1
Min
Q(m³/h)


P1(w)
CP9
CP8
CP7
CP6
CP5
CP4
CP3
CP2
CP1
Q(m³/h)

Dimensions



Pump model	Size [mm]					
	L	B	H1	H2	H3	G [inch]
Mega 25-8	180	160	55	144	199	G 1 1/2
Mega 25-10						
Mega 32-8						G 2
Mega 32-10						

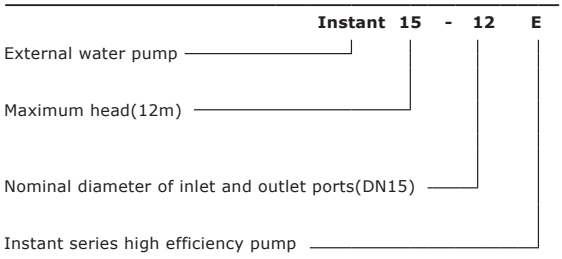


Pump model	Pump dimensions [mm]						Flange dimensions [mm]				
	L	B	H1	H2	H3	G [inch]/DN	D1	D2	D3	D4	D5
Mega 40-8F	220	160	62	144	206	DN40	40	84	100/110	150	19
Mega 40-10F	220	160	62	144	206	DN40	40	84	100/110	150	19

Instant circulator pump

Fig. 1 Instant 15-12E

Type key



Application

Instant hot water circulator pump is mainly used for water circulation or pressurization in domestic hot water systems. The front of the product has an operation panel for easy operation.

Application Scenarios

Usage Scenario 1 (There is no water return pipe in water-ways, no power supply at the farthest water point, and the pump has circulation and pressurization functions)

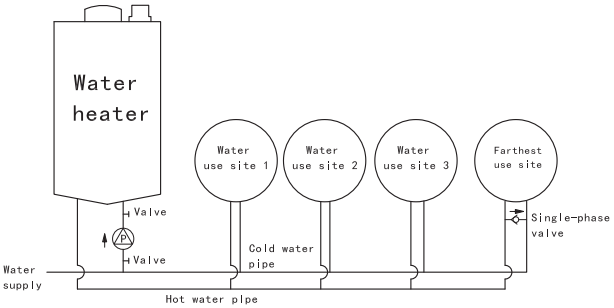


Fig.2 Usage Scenario 1

Note: Valves should be installed on both sides of the pump for convenient maintenance

Usage Scenario 2 (There is no water return pipe in water-ways, the furthest water point has power supply. The pump has circulation function)

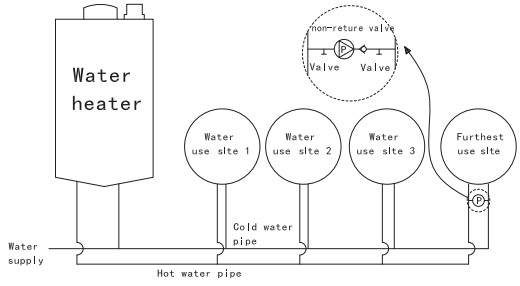


Fig.3 Usage Scenario 2

Note: Valves should be installed on both sides of the pump for convenient maintenance

Usage Scenario 3 (Water channel with return pipeline, pump with circulation and pressurization function)

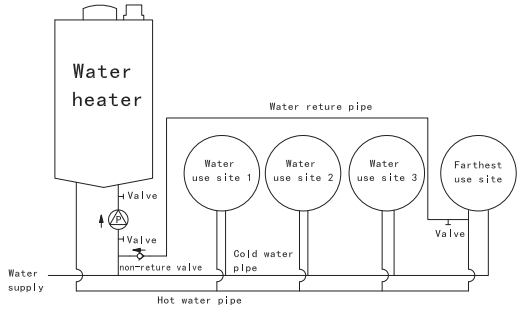


Fig.4 Usage Scenario 3

Usage Scenario 4 (Water channels have return pipeline and the pump has the function of circulation.)

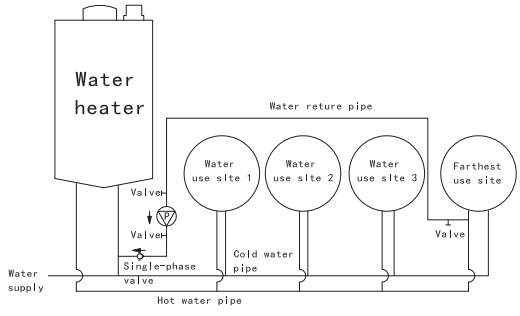


Fig.5 Usage Scenario 4

Note: Valves should be installed on both sides of the pump for convenient maintenance

Operating conditions

Conditions of use(keep the shaft horizontal)

Medium: clear water	Medium temperature: 4℃~80℃
Ambient temperature: 0℃～+40℃。	0.1bar(Liquid temperature≤+60℃) 0.28 bar(Liquid temperature≤+80℃)
Medium hardness: 25°dH	Relative humidity of the air: 95%(MAX)

Conditions of storage

Humidity of storage environment 30%~95% Stacking height: less than 6 layers	Storage ambient temperature: -20℃~60℃ (there is no freezing in the pipeline and water pump)

Construction

Instant hot water pump is of the canned-rotor type. In these pumps, the rotor of the motor is washed by pumped liquid.
Water in such pumps is used to:
1.Lubricate the bearings of an motor and remove wear debris.
2.Cooling of the stator winding.

Construction advantages of Instant hot water pump:

•An energy-efficient brand new permanent- magnet motor and increased starting torque.
•A ceramic shaft and bearings with the same temperature extension coefficient provide increased reliability of the equipment.
•A thrust bearing is made of ceramic that extends the service life of the pump.
•A rotor can and thrust bearing are made of stainless steel to resist corrosion.
•Simplified pump connection to power supply with a plug.

Material specification

No.	Name	Material
1	Base	Composite material
2	Pump housing	Composite material
3	Assembled rotor	Assembly
4	Shielding sleeve assembly	Stainless steel
5	Box base	Composite material
6	Terminal box base	Composite material
7	Terminal box cover	ABS

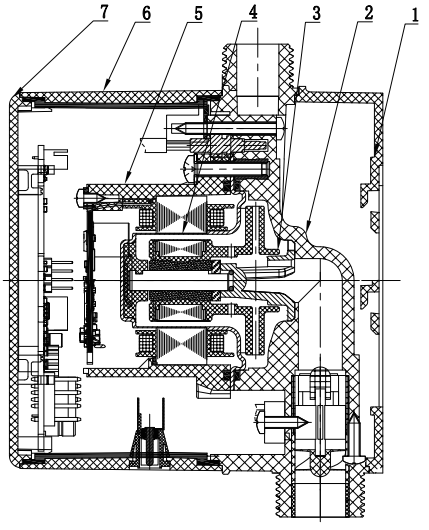


Fig. 7 Sectional drawing

Electric control instructions

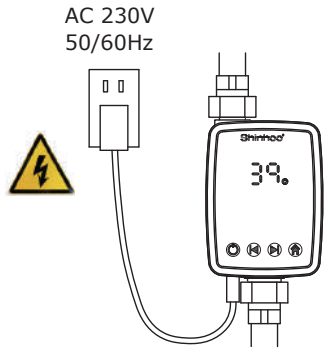


Fig.6 Wiring Diagram

Check that the supply voltage and frequency are consistent with the parameters indicated on the pump nameplate.
Use the adapter that comes with the pump to connect to the power supply.
The light on the control panel indicates that the power is on.

Display interface and Function Description during pump operation

● **One-click start function:** After the user touches the "Start" button, the pump starts to run. When the water temperature reaches the set temperature upper limit or there is no flow in the pipeline, the pump stops running. After starting, click the "Start" button again to shut down the pump.

● **Timing function:** The current time is within the set period, if the water temperature reaches than the lower limit, the pump starts to run. When the water temperature reaches the upper limit or there is no flow in the pipe, the pump stops running.

● **All-day mode function:** If the water temperature is reaches the set lower limit, the pump starts to run. When the water temperature reaches the set upper limit or there is no flow in the pipeline, the pump stops running.

● **Faucet start function:** Lift the faucet for about 1s, the pump starts to run, and stops running when the water temperature reaches the set temperature upper limit or there is no flow in the pipeline.

● **Pressurization function:** When there is fluid flow in the pump, the pump starts and is in pressurization mode; When the liquid does not flow, the pump stops. This mode does not have temperature control.

Pump parameter setting

● **"One-click start" parameter setting:** After the screen is lit up, hold down the "HOME" button for 2s, then the corresponding mode on the screen starts to blink, tap the "HOME" button, select the "one-button start" mode to blink, tap the "Forward" button to select the parameter to be set, the corresponding parameter blinks after selection, tap the "Back" button parameter value increases in cycles. After the parameters are set as required, Hold down the "HOME" button" for 2s to exit the parameter setting screen, or tap the HOME button to enter the next mode setting.

● **"Timing mode" parameter setting:** After the screen is lit up, hold down the "HOME" button for 2s, then the corresponding mode on the screen starts to blink. Tap the "HOME" button and select the "Timing mode" mode to blink. Tap the "Forward" button to select the parameter to be set, the corresponding parameter blinks after selection, tap the "Back" button parameter value increases in cycles. Tap the "Start" button to select Early, Middle, or Late. After the parameters are set as required, hold down the HOME button for 2s to exit the parameter setting screen, or tap the HOME button to enter the next setting mode.

● **"All-day mode" parameter setting:** After the screen is lit up, hold down the "HOME" button for 2s, then the corresponding mode on the screen starts to blink. Tap the "HOME" button and select "All-Day Mode" to blink. Tap the "Forward" button to select the parameter that you want to set, the corresponding parameter blinks after selection, tap the "Back" button parameter value increases in cycles. After the parameters are set as required, hold down the HOME button for 2s to exit the parameter setting screen, or tap the HOME button to enter the next mode setting.

● **Time calibration (time alignment):** After the screen is lit up, hold down the "HOME" button for 2s, then the corresponding mode on the screen starts to blink. Tap the "HOME" button and select "Time Settings" to blink. Tap "Forward" to select a parameter to be set, the corresponding parameter blinks after selection, tap the "Back" button parameter value increases in cycles. After the timing is complete, hold down the "HOME" button for 2s to exit the parameter setting screen, or tap the "HOME" button to enter the next mode setting.

Pump operation and fault self-check

After the power is turned on, the corresponding mode light will be on in the mode area, and the water temperature and running indicator will be on in the operation display area.
The failure of the electric pump is displayed as follows on the display interface:

Fault type	Fault code	Protection mode
Over-voltage protection	E0	Test under full load conditions: Detects the input voltage above 29V±5%, after 2 seconds the pump enters overvoltage protection. The pump will work normally if the voltage returns to the normal state.
Under-voltage protection	E1	Test under full load conditions: the detection input voltage is lower than 19V±5%, after 2S it enters the under-voltage protection. After The pump will work normally if the voltage returns to the normal state.
Over-current protection	E2	The water pump will stop working immediately if the current is too high. And it will be restarted after 8s. The water pump will be completely protected and will not be restarted unless the power is re-energized if the protection accumulates to 5 times.
Light load protection	E3	The pump is not loaded or the load is low, or the flow sensor is not working properly.
Phase loss protection	E4	Power on to detect phase loss, the water pump will stop working immediately when the phase-loss fault is detected. The water pump will be restarted after 8s. The water pump will be completely protected and will not be restarted unless the power is re-energized if the protection accumulates to 5 times.
Stalled rotor protection	E5	The water pump will stop working after the rotor locked 3s, Pump will stop working, and restart after 8s. The water pump will be completely protected and will not be restarted unless the power is re-energized if the protection accumulates to 5 times.
The temperature parameter is invalid	F0	The lower limit of temperature is higher than the upper limit of temperature.
Timing parameter setting is invalid (early)	F1	The start time of the timing is earlier than the end time.
Timing Parameter Settings are invalid (Medium)	F2	The start time of the timing is earlier than the end time.
Timing Parameter Settings are invalid (late)	F3	The start time of the timing is earlier than the end time.
Battery low voltage	F4	Check the battery voltage when the battery is powered on. If the battery voltage is low, a fault message is displayed 3s after the battery is powered on, indicating that the battery needs to be replaced. (Battery failure will affect the system time in timing mode.)
Temperature sensor anomaly	FF	The temperature sensor is not connected properly or is abnormal.

If a fault is displayed, the power supply must be disconnected for troubleshooting.
After troubleshooting, reconnect the power supply and start the pump.

Startup and mode selection

Before starting the electric pump, ensure that the system is filled with liquid and the power supply is in good contact.

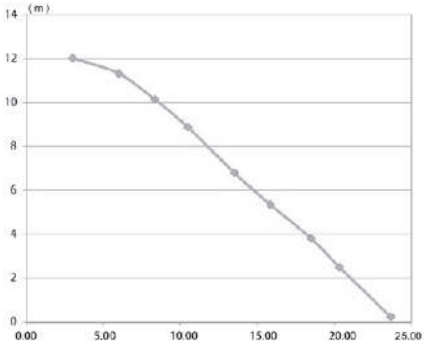
Setting	Setting instructions
One-click start	After touching the "Start" button, the pump will start to run. When the water temperature reaches the set temperature upper limit or there is no flow in the pipeline or the set temperature upper limit cannot be reached after continuous running for 3m, the pump will stop running. Suitable for use without long periods of hot water or out of the range of other modes.
Timing mode	When the water temperature in the pump is lower than the set temperature lower limit, the pump starts to operate, and when the water temperature in the pump reaches the set temperature upper limit or there is no flow in the pipeline, the pump stops running. This mode is suitable for water use time stabilization.
All-day mode	The pump runs 24 hours. Suitable for all day long pressurization or cycling.
Faucet start	Lift the faucet for about 1s, the pump starts to run, turn off the tap, and stops running when the water temperature reaches the set temperature upper limit or there is no flow in the pipeline. Suitable for bathing and other occasions.
Pressurization mode	Set the temperature range to 00-00, pump in pressurized mode, when there is fluid flow in the pump, the pump starts; When the liquid does not flow, the pump stops. Suitable for home water pressure is low, do not need temperature control function occasions.
Time set up	Set the time before the product is used, so that the pump time is consistent with the current time, and avoid the timing mode inconsistent with the expected setting time.
Temperature setting	The minimum temperature should be set higher than the current water temperature and the current ambient temperature to avoid the pump can not start after the pipeline water temperature is reduced; The set maximum temperature should be less than the current heat source temperature 2-3 ° C, to avoid the long-term circulation pipe temperature can not reach the set temperature, the pump can not stop. Avoid the pump inlet temperature is less than the current heat source temperature, resulting in frequent pump start.
Time setting	A maximum of 3 time periods can be set, which is 24h system. When 3 time periods are not required, the unnecessary time can be set as 0000-0000

Performance curve and technical data

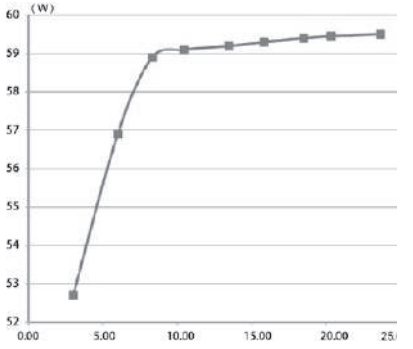
Performance curve

Maximum flow	> 20 L/min
Maximum head	12 m
Maximum power	60W
Rated flow	10 L/min
Rated head	8m

Head



Power



Technical data

Power voltage	230V，50/60Hz	
Protection class	IP44	
Insulation class	H	
Ambient relative air humidity（RH）	≤95%	
System pressure level	10bar	
Inlet pressure	Liquid temperature	Inlet pressure (Min)
	≤+60℃	0.1 bar
	≤+80℃	0.28 bar
Noise level	＜42dB（A）	
Ambient temperature	0～+40℃	
Temperature rating	TF80	
Surface temperature	≤+80℃	
Liquid temperature	4℃～+80℃	

Dimensions

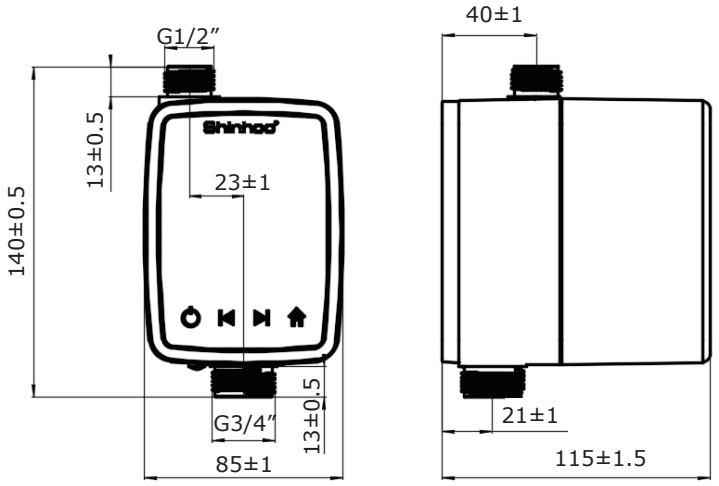


Fig.8 Installation dimension

Promo booster pump

Fig. 54 Promo

Type key

Example	Promo	15	-9	A
Type range				
Nominal diameter of inlet and and outlet ports (DN), [mm]				
Maximum head [dm]				
Automatic start/stop with flow relay				

Application

PROMO pumps are designed to increase the pressure in the currently used water supply systems of private houses. First of all, they are used to generate head before heaters (gas-fired water heaters and direct-flow water heaters), washing machines and dishwashers. PROMO can also be used to increase water pressure in the shower or other points of water distribution.

PROMO pumps are used in open systems and can be directly connected with the water supply system. PROMO pumps are equipped with a built-in flow relay that is used for automatic turning on/off the pump when the tap is open in the water distribution point.

The pumps are available with cast iron housing with a cataphoretic coating, impeller is made of composite material.

Operating conditions

Minimum inlet port pressure — 0.2 bar.

The pump should be placed in a non-aggressive and non-explosive environment.

Relative air humidity — not more than 95 %.

Technical data

Operation range	up to 2.8 m³/h
Head	up to 12 m
Supply voltage	1 x 230 V
Liquid temperature	2 to +60 °C
Ambient temperature	2 to +40 °C
Max. operating pressure	6 bar
Connection of PROMO 15-9A	G 3/4"
Connection of PROMO 15-12A	G 3/4"

Pumped liquids

- clean water,
- chlorinated tap water.

The pump should not be used for pumping explosive liquids such as diesel fuel, petrol and other similar liquids.

Construction

These pumps are of the canned-rotor type, that is pump and motor form an integral unit without shaft seal. Only two gaskets are required for sealing. The bearings are lubricated by the pumped liquid. Thus, PROMO motor is cooled with pumped liquid and is not equipped with air fan, which allows it working silently. Due to a unique system of ceramic bearings, PROMO pumps are exclusively durable and reliable.

The pump is supplied with a cable with a Schuko plug. PROMO 15-9A motor is equipped with short circuit and full resistance protection. A motor of PROMO 15-12A is equipped with thermal overloading protection. In both cases, it is not necessary to have an additional external protection of the motor.

Protection class: IP43.

Insulation class: H.

Operating modes

I Off

II Automatic

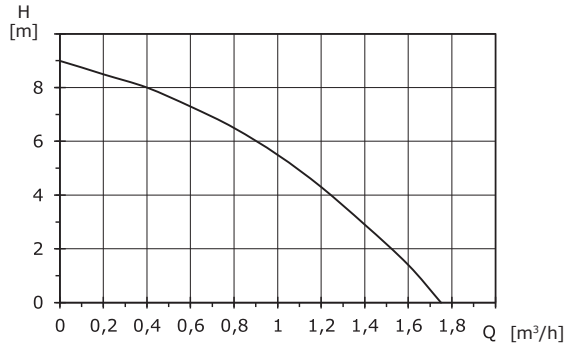
The pump is automatically turned on via the flow relay when the flow is 2.5 l/min. If the flow is below these values, the pump automatically stops. It is important that the pump stops in this mode automatically if the water is not fed. Thus, it is protected from dry running.

III Manual

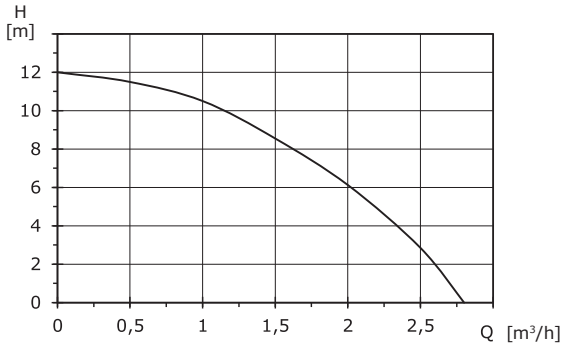
The pump works constantly with no regard to the flow relay.

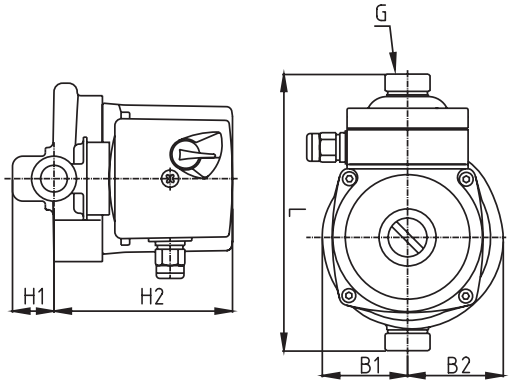
Performance curves and technical data

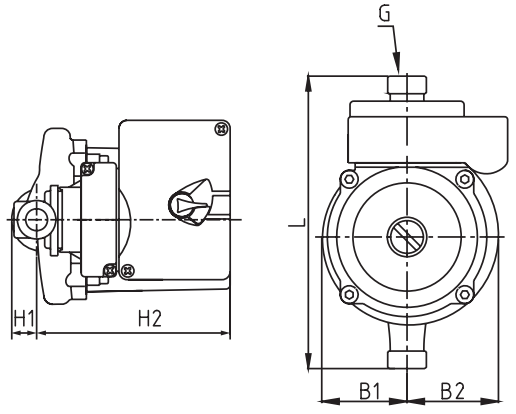
PROMO 15-9A



PROMO 15-12A







Dimensions

Product type	Size [mm]						Weight [kg]	
	L	H1	H2	B1	B2	G	Net weight	Gross weight
PROMO 15-9A	160	23	103	50	54	3/4"	2.5	2.7
PROMO 15-12A	200	18	132	63	69	3/4"	2.5	2.7

Electrical and technical parameters

Product type	$P1_{max.}$ [W]	$I_{1/1}$ [A]
PROMO 15-9A	120	0.5
PROMO 15-12A	270	1.2