

## Installation and Operating Instruction

**EPS Series Energy-saving Pipeline Canned Motor Pump**  
with speed control via PWM signal  
for heating and solar systems



[www.hst-industrie.at](http://www.hst-industrie.at)

**Heiz- und Sanitärtechnik GmbH**

Ziegeleistraße 1

5020 Salzburg / AUSTRIA

Inhaltsverzeichnis

- 1 NOTES: ..... 4**
  
- 2 SIGNS ..... 5**
  
- 3 GENERAL ..... 8**
  
- 3.1 HST EPS ... -11 SERIES CIRCULATION MOTOR PUMP IS MAINLY USED IN DOMESTIC HEATING, SOLAR AND HOT WATER SYSTEM. .... 8
- 3.2 ADVANTAGES..... 8
  
- OVERVIEW ..... 9**
  
- TECHNICAL DATA AND DIMENSIONS ..... 9**
  
- 4 OPERATING CONDITIONS ..... 10**
  
- 4.1 AMBIENT TEMPERATURE..... 10
- 4.2 RELATIVE HUMIDITY (RH) :..... 10
- 4.3 MEDIUM (LIQUID DELIVERY) TEMPERATURE ..... 10
- 4.4 SYSTEM PRESSURE..... 10
- 4.5 DEGREE OF PROTECTION ..... 10
- 4.6 INLET PRESSURE..... 10
- 4.7 PUMPING LIQUID ..... 10
  
- 5 INSTALLATION ..... 11**
  
- 5.1 INSTALLATION ..... 11
- 5.2 POSITION OF JUNCTION BOX ..... 12
- 5.3 CHANGING POSITION OF JUNCTION BOX ..... 12
- 5.4 THERMAL INSULATION OF MOTOR PUMP BODY ..... 13
  
- 6 ELECTRICAL CONNECTION ..... 14**
  
- 7 CONTROL PANEL..... 16**
  
- 7.1 CONTROLS ON CONTROL PANEL..... 16
- 7.2 TROUBLESHOOTING ..... 16
- 7.3 INDICATION LAMP AREA OF MOTOR PUMP SETTING..... 16
- 7.4 BUTTON FOR SELECTING MOTOR PUMP SETTINGS ..... 17
  
- 8 MOTOR PUMP SETTING ..... 17**
  
- 8.1 MOTOR PUMP SETTING BASED ON SYSTEM TYPE..... 17
- 8.2 CONTROL OF MOTOR PUMP ..... 18
  
- 9 PWM SIGNAL CONTROL MODE..... 19**

9.1	CONTROL AND SIGNAL.....	19
9.2	INTERFACE.....	19
9.3	PWM INPUT SIGNAL .....	20
9.4	PWM FEEDBACK SIGNAL .....	21
9.5	HOW TO USE THE SIGNALS .....	21
<b>10</b>	<b><u>BYPASS VALVE SYSTEM INSTALLED BETWEEN THE INLET PIPELINE AND RETURN PIPELINE ....</u></b>	<b>22</b>
10.1	PURPOSES OF BYPASS VALVE .....	22
10.2	MANUALLY-OPERATED BYPASS VALVE.....	23
10.3	AUTOMATIC BYPASS VALVE (TEMPERATURE-SENSING TYPE) .....	23
<b>11</b>	<b><u>START UP.....</u></b>	<b>23</b>
11.1	BEFORE START UP .....	23
11.2	EXHAUST THE MOTOR PUMP .....	23
11.3	VENT THE HEATING SYSTEM .....	24
<b>12</b>	<b><u>MOTOR PUMP SETTING AND PERFORMANCE .....</u></b>	<b>24</b>
12.1	RELATIONS BETWEEN MOTOR PUMP SETTING AND PERFORMANCE .....	24
<b>13</b>	<b><u>PERFORMANCE CURVE.....</u></b>	<b>25</b>
13.1	GUIDE ON PERFORMANCE CURVE.....	25
13.2	CURVE CONDITIONS .....	25
13.3	PERFORMANCE CURVE HST EPS...-11 SERIES .....	26
<b>14</b>	<b><u>FEATURES .....</u></b>	<b>28</b>
14.1	NAMEPLATE INSTRUCTIONS .....	28
14.2	MODEL INSTRUCTIONS .....	28
<b>15</b>	<b><u>TECHNICAL PARAMETERS AND INSTALLATION DIMENSIONS .....</u></b>	<b>29</b>
15.1	TECHNICAL PARAMETERS .....	29
15.2	INSTALLATION DIMENSIONS .....	30
<b>16</b>	<b><u>TROUBLE-SHOOTING SCHEDULE .....</u></b>	<b>31</b>

## 1 Notes:

01. Read the installation manual carefully before installation and use.
02. The manufacturer will not be liable for any personal injury, pump damage and other property damage due to failure to comply with contents specified in safety warning signs.
03. The installers and operators must comply with local safety regulations.
04. The user must confirm that only qualified personnel with professional certification and proficiency of this manual is allowed to install and maintain this product.
05. The pump must not be installed in a place that is damp or may be splashed by water.
06. For convenient access of maintenance, a shut-off valve shall be installed on each side of the pump the pump
07. The power supply of the pump shall be cut off before installation and maintenance.
08. Pump with copper or stainless steel body should be adopted to the domestic hot water Circulation.
09. Heat supply pipelines shall not be frequently filled with non-softened water so as to avoid increasing calcium in the circulating water inside the pipeline, which may thus block the impeller.
10. Do not start the pump without liquid.
11. Some models are not suitable for drinking water.
12. The liquid may be high-temperature and high-pressure; therefore, the liquid in the system must be completely drained or the shut-off valves on both sides must be closed before moving and dismantling the pump to prevent burning
13. If removing the exhaust bolt, high temperature and high-pressure liquid will be overflow. Therefore, it is necessary to insure that the outflow liquid will not cause personal injury or damage other parts.
14. Ventilation must be ensured in summer or high ambient temperature period to avoid condensation that may cause electrical malfunctions.
15. In winter, the pump system does not work or when the ambient temperature drops below 0°C liquid in the system shall be completely drained so as to avoid frost cracking of pump body.
16. If the pump is left unused for a long time, please close the pipe valve in the inlet and outlet of the pump and cut off the power supply.
17. If the flexible cord of cable is damaged, it must be replaced by a qualified person.
18. Please close the valve at the inlet of the pump and cut off power of the pump immediately if overheating and abnormality of motor of motor is detected, and contact your vendor or service center immediately.

19. If trouble cannot be addressed according to the manual, please close the valves the inlet and outlet of the pump immediately, cut off power supply and contact your vendor or service center immediately.
20. This product shall be put in a place out of reach of children. After installation, take an isolation measure to avoid access of children.
21. This product shall be stored in a dry, well ventilated and cool place under room temperature.
22. This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.



**Warning**

Before installation, you must carefully read the installation and operation manual. The installation and use of the equipment must comply with local regulation and applicable operation standards.



**Warning**

Those who have weak physical strength, react slowly or lack experience and knowledge (including children) can use this motor pump only under the monitoring and direction of his/her safety personnel.

**2 Signs**

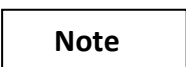


**Warning**

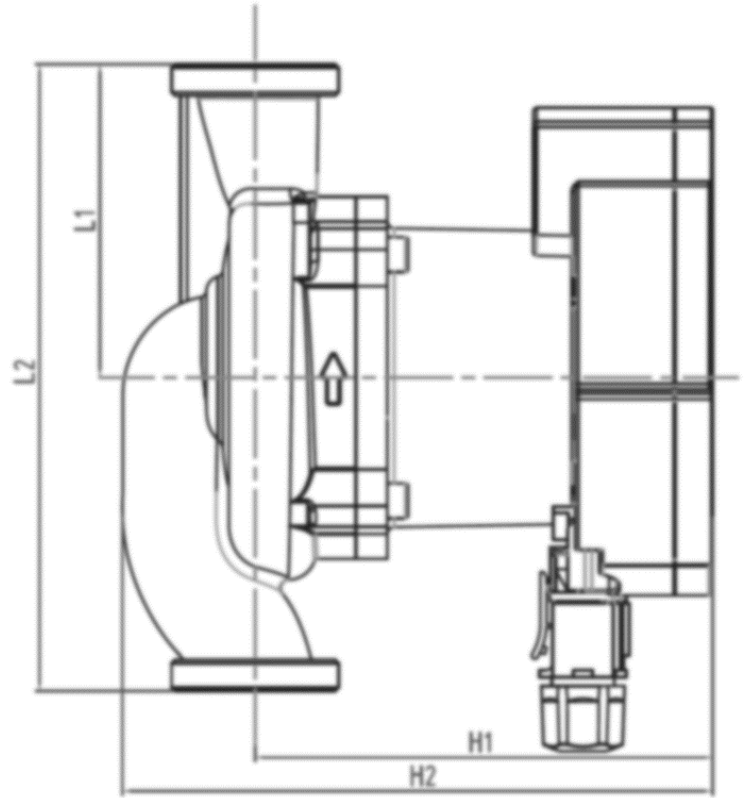
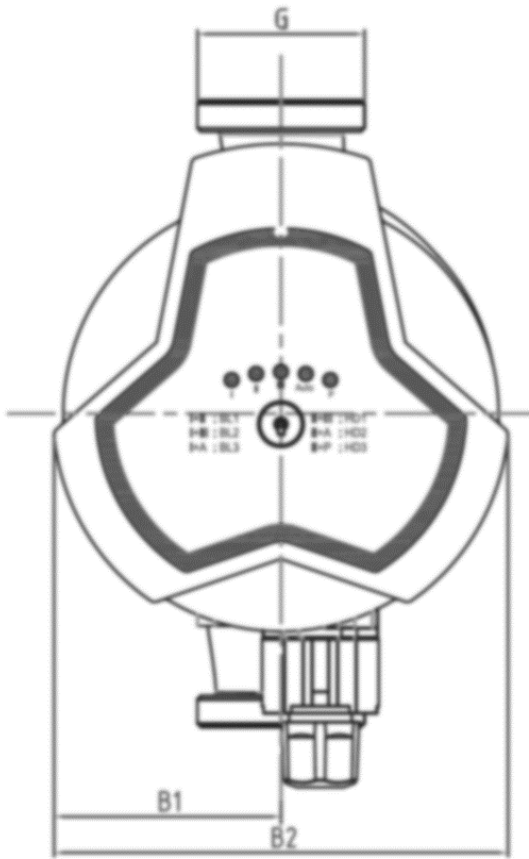
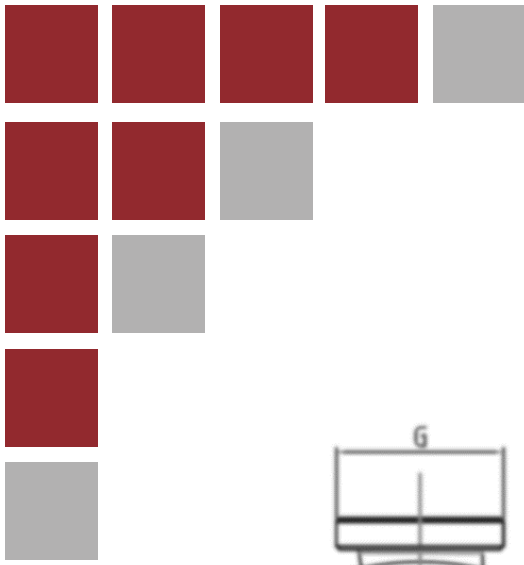
Failure to comply with this safety instruction may lead to personal injury!



Failure to comply with this safety instruction may lead to equipment malfunction or damage!



Note or instruction for easy and safe operations.



success has a name . . .

# HST

AUSTRIA

# **Installation- Manual & technical Overview**



## 3 General

3.1 HST EPS ... -11 series circulation motor pump is mainly used in domestic heating, solar and hot water system.

The Production is most applicable to the following systems:

- Stable and variable-flow heat supply system
- Variable-temperature pipeline heat supply system
- HVAC system
- Industrial circulation system
- Domestic heating and domestic water supply system

This pump is equipped with permanent-magnet motor and variable Speedcontroller, capable of automatically & continuously adjusting motor performance to meet the actual needs of the actual need of system.

This pump is equipped with control panel on the front for easy operation by users.

## 3.2 Advantages

Easy installation and start-up

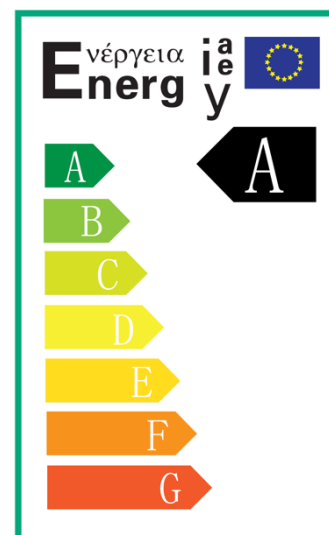
- Provided with self-adaptive mode AUTO (Initial setting). In most cases, the motor pump needs no adjustment and can be readily started to meet the actual needs of the systems

High-degree comfort

- Low operational noise of motor pump and whole system.

Low energy consumption

- Compared with traditional circulation motor pumps, it has lower energy consumption. HSTEPS25-11 series circulation motor pump is attached with Europe Energy Label Class A marking, and the minimum energy consumption can reach up to 16W.



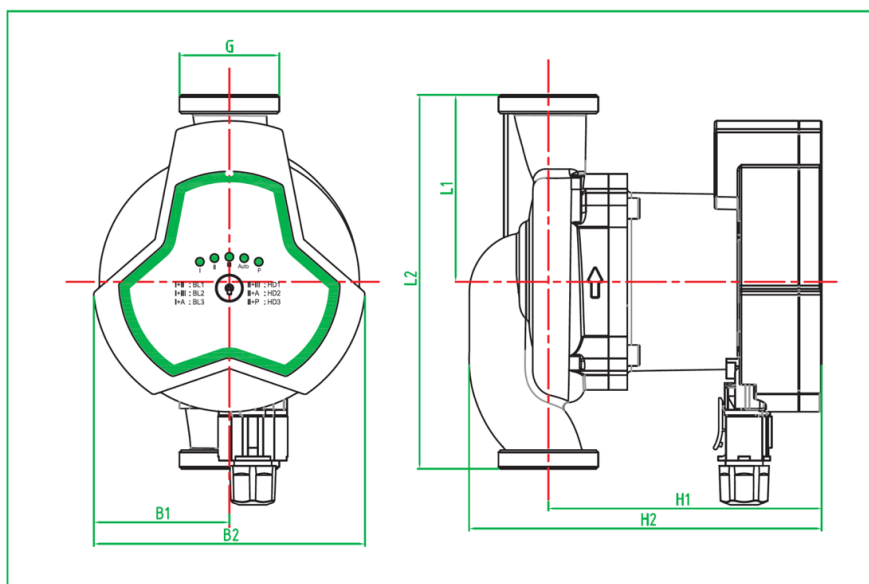


# OVERVIEW

## TECHNICAL DATA AND DIMENSIONS

more detailed information and graphics from page 23

### dimensions



Model	material			dimension						
	Cast iron	Stainless steel	Copper	L1	L2	B1	B2	H1	H2	G
EPS25-11	☑			90	180	66	132	132	170	1½"
EPS32-11	☑			90	180	66	132	132	170	2"

### technical data

	max. head	max. flow	power consumption (W)
HSTEPS 25-11 180	11m	5,5 m <sup>3</sup> /h	140 Watt
HSTEPS 32-11 180	11m	7,0 m <sup>3</sup> /h	140 Watt

	startwatt (W)	current (A)	voltage	mains frequency
HSTEPS 25-11 180	50	1.0	220~240V	50 Hz /60 Hz
HSTEPS 32-11 180				

more detailed information and graphics from page 23

## 4 Operating Conditions

### 4.1 Ambient Temperature

Ambient temperature: 0 °C~ +40 °C

### 4.2 Relative humidity (RH) :

Max. humidity: 95%

### 4.3 Medium (liquid delivery) temperature

Liquid delivery temperature: +2 °C~ +110 °C

To avoid condensation in control box and the stator, the temperature of liquid pumped by the motor pump must be always higher than ambient temperature.

### 4.4 System Pressure

Maximum pressure 1.0MPa (10bar).

### 4.5 Degree of Protection

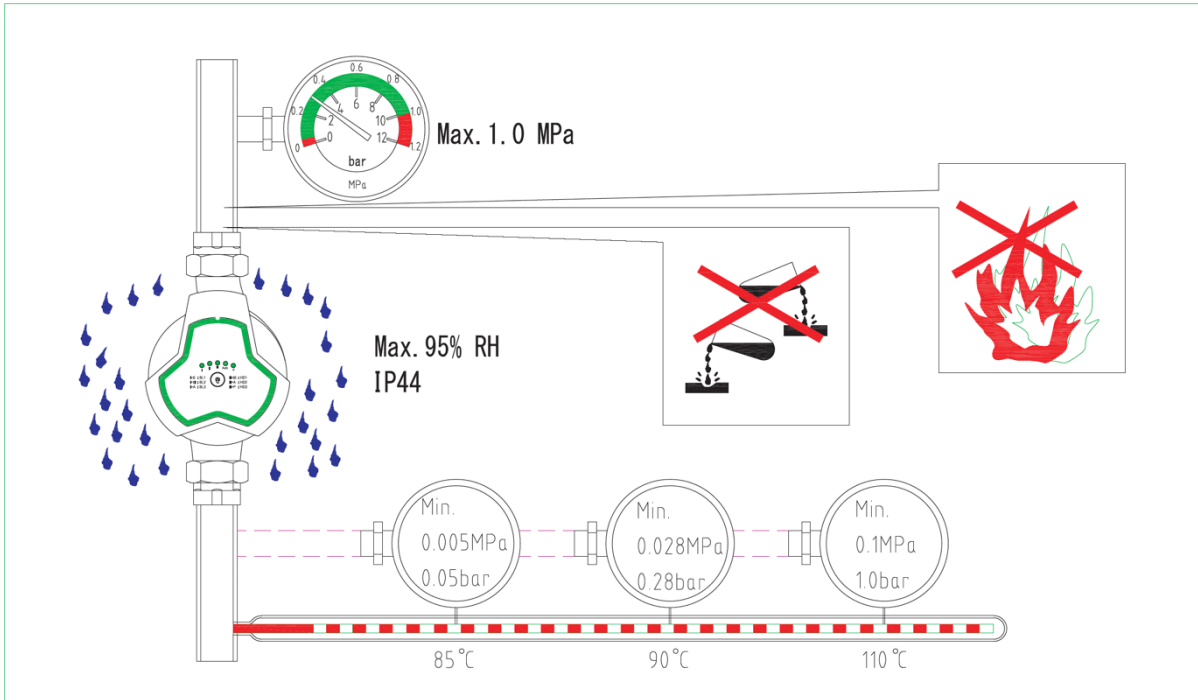
I P 44

### 4.6 Inlet Pressure

Liquid Temperature	<85°C	90°C	110°C
Inlet Pressure	0.05bar	0.28bar	1bar
	0.5m head	2.8 head	10m head

### 4.7 Pumping Liquid

The pumping liquid includes thin, clean, non-corrosive and non-explosive liquid which shall not contain any solid particles, fiber or mineral oil, and the pump must definitely not be used to pump inflammable liquid such as rapeseed oil and gasoline. If the pump is used in a place with relatively high viscosity, the pump has lower performance. So when choosing a pump, the viscosity of liquid must be taken into account.



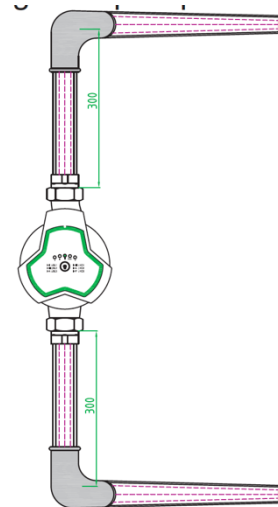
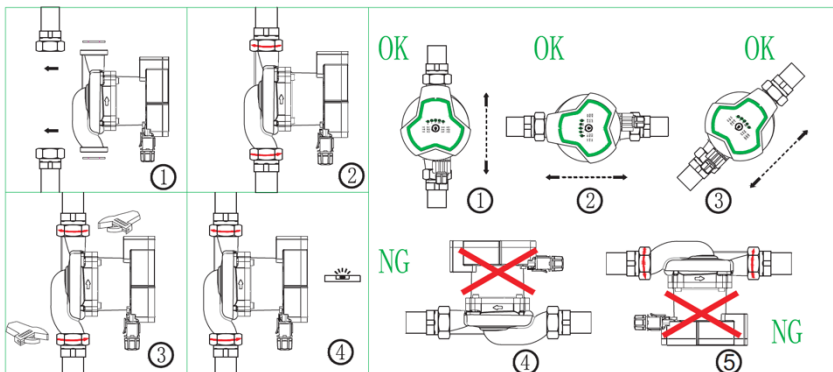
### Warning

When the pump is running, the surface temperature of the control panel is high. When switching gears, attention should be paid to preventing scald.

## 5 Installation

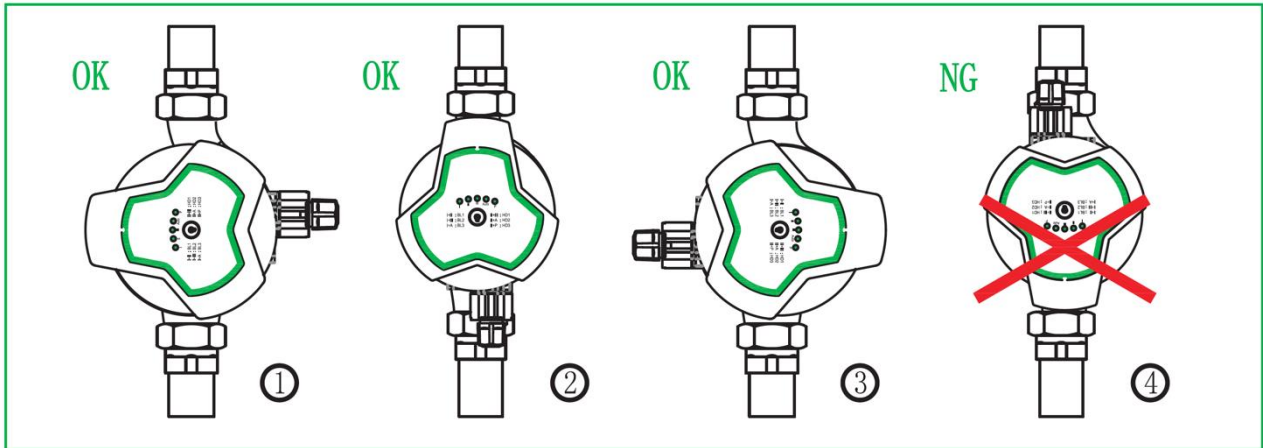
### 5.1 Installation

- When installing EPS ... -11 series circulating pump, the arrow on motor pump case indicates the flow direction of liquid through the pump.
- When installing the motor pump in the pipeline, two supplied gaskets must be installed at the inlet and outlet.
- During the installation, the shaft of motor pump must be horizontal.



The distance between bent part of pipe elbow and electric pump inlet and outlet shall not be less than

## 5.2 Position of Junction Box

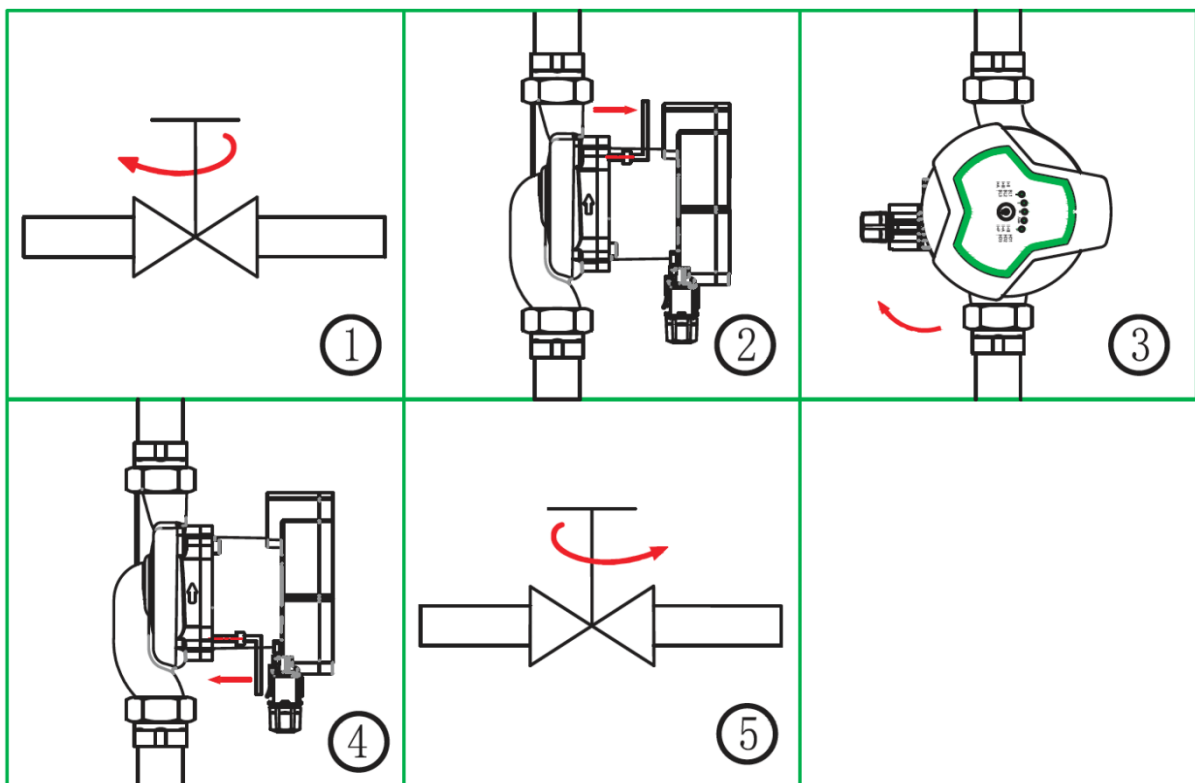


## 5.3 Changing Position of Junction Box

The junction box can be rotated in a step of 90°

The procedure for changing the position of junction box are as follows:

1. Close the valves at the inlet and outlet and release the pressure;
2. Unscrew and remove the four socket head screws that fasten the pump body;
3. Rotate the motor to the expected position and align the four screw holes;
4. Install the four socket head screws again and fasten them clockwise;
5. Open the valves at the inlet and outlet.





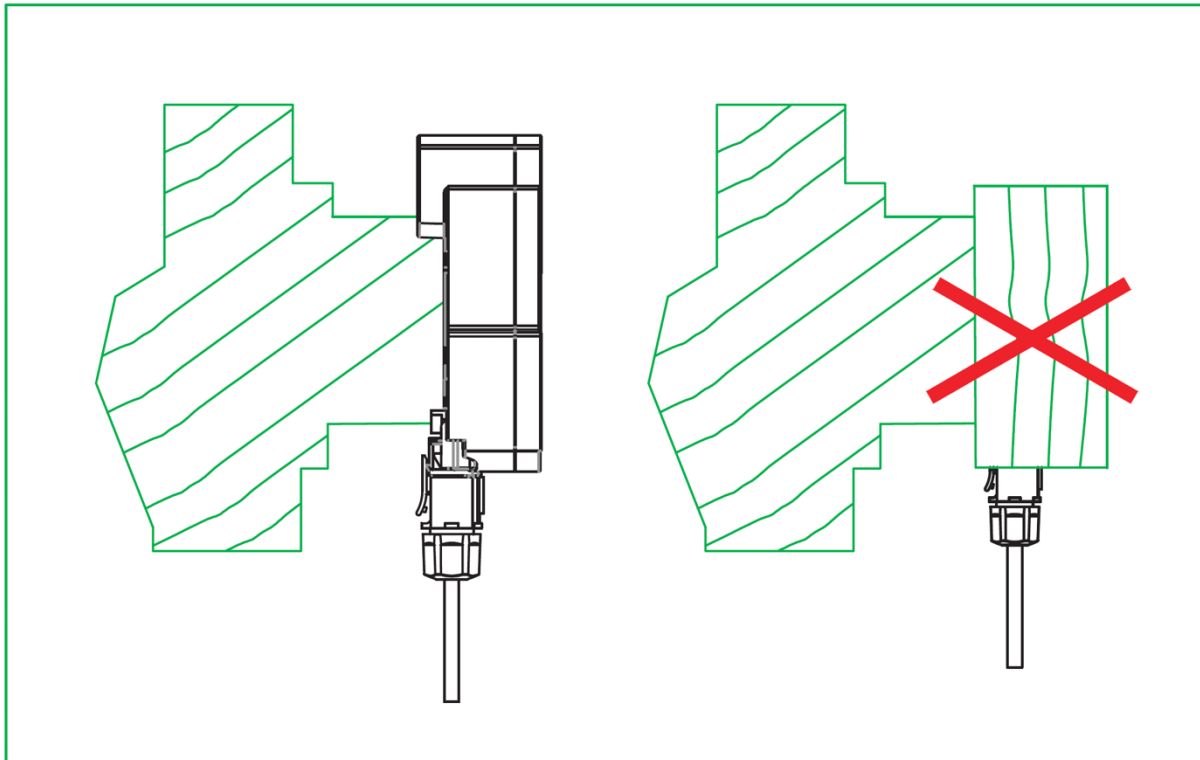
## Warning

Pumping liquid may be high-temperature high-pressure; therefore the liquid in the system must be completely drained or the valves on both sides of motor pump must be closed before removing the socket head screws

### Caution

When changing the position of junction box, the motor pump can be started only after the system is filled with pumping liquid or the valves on both sides of motor pump are opened.

## 5.4 Thermal Insulation of Motor Pump Body



### Note

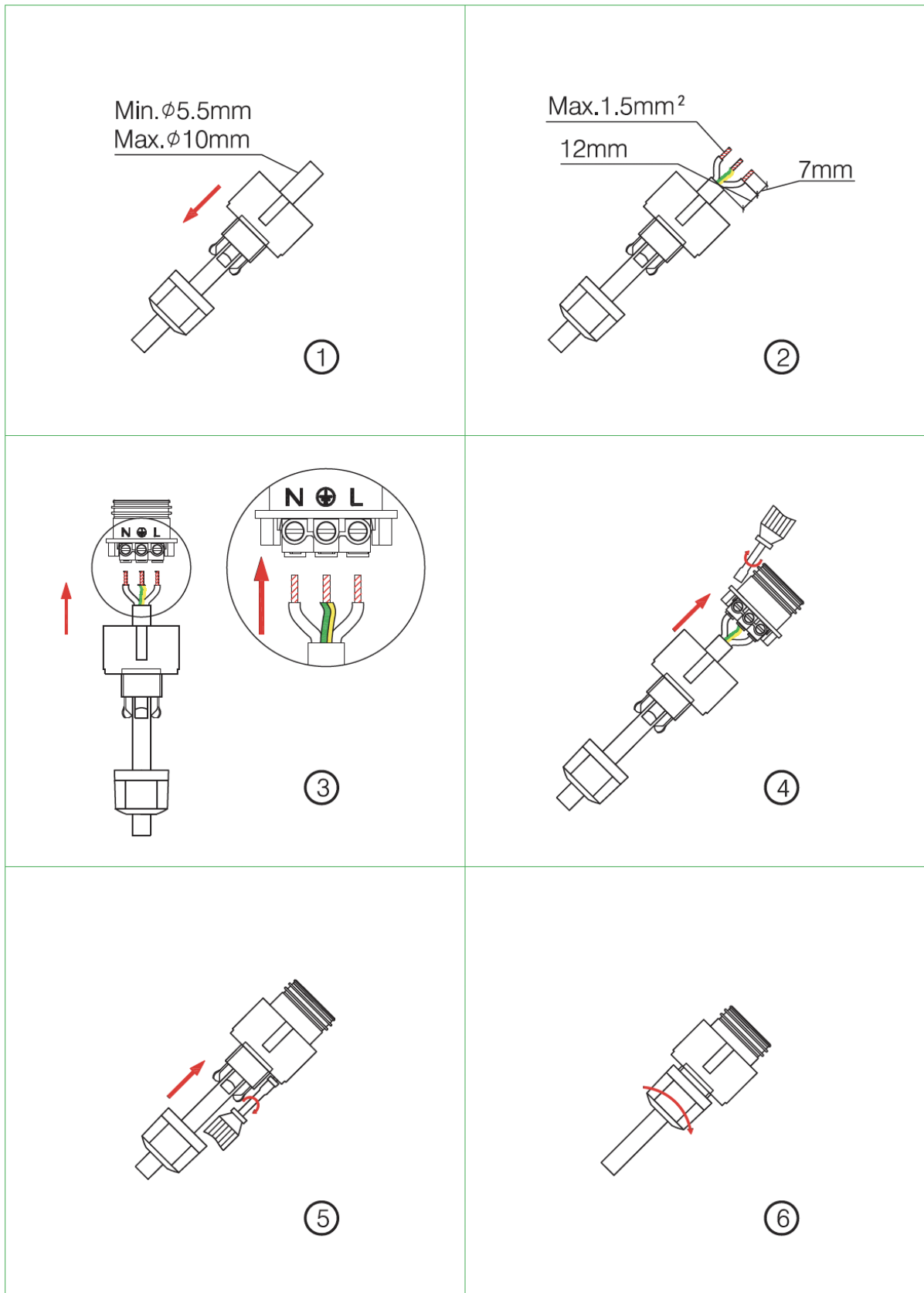
Limiting the heat loss of motor Pump body and pipeline.

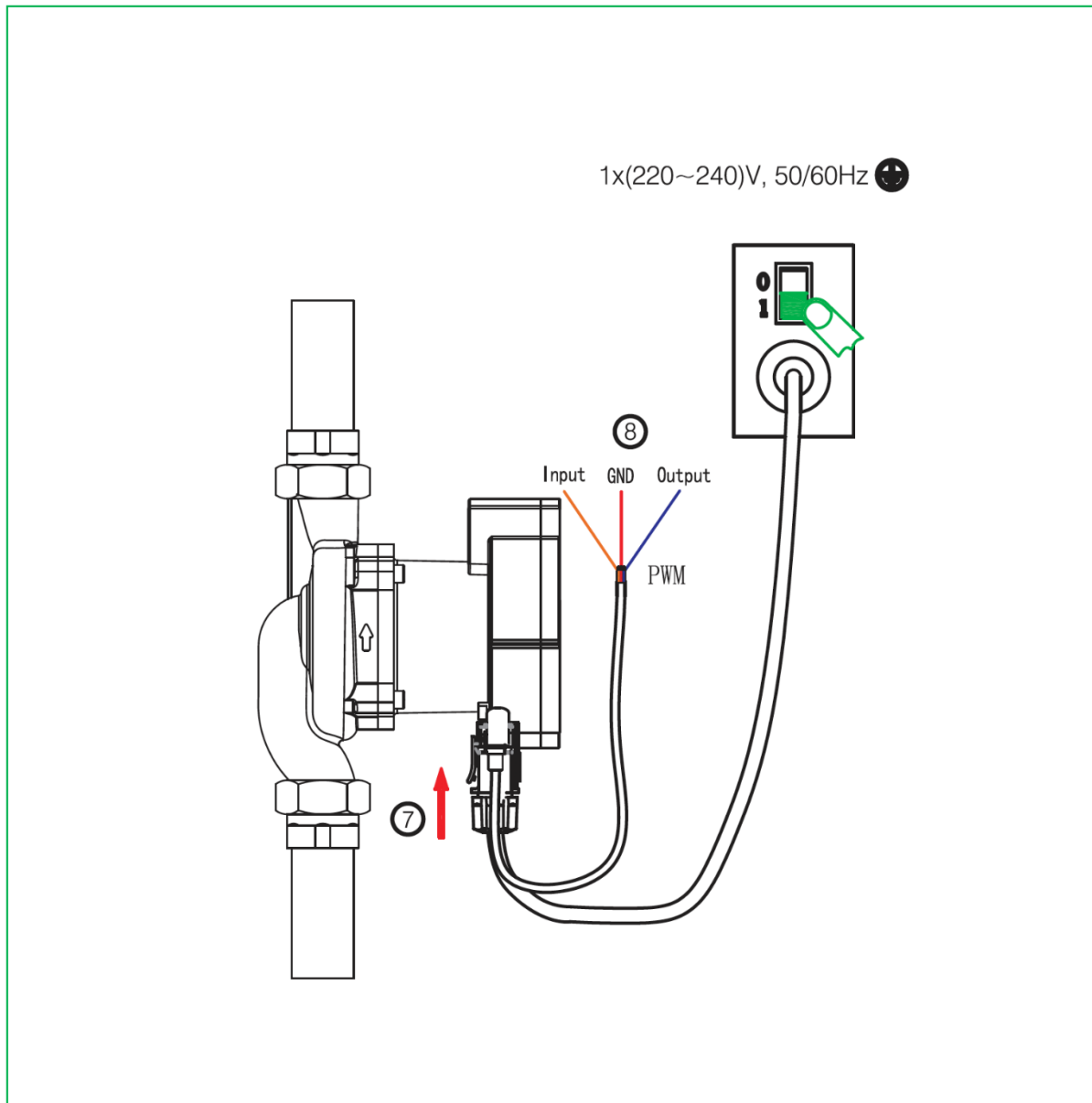
Motor pump body and pipeline should be thermally insulated to reduce their heat loss.

### Caution

Do not isolate or cover the junction box and control panel.

## 6 Electrical Connection





Electrical connection and protection shall comply with local codes and norms.



### Warning

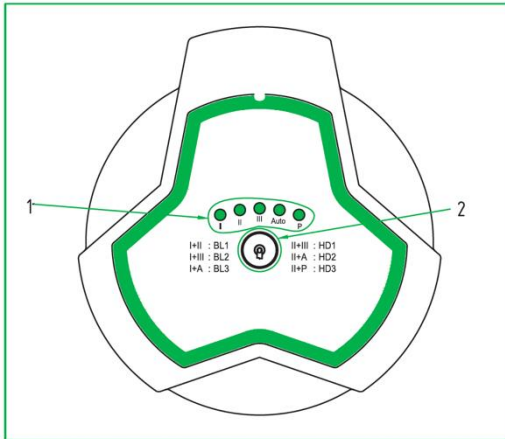
The motor pump must be earthed ⚡

The motor pump must be connected to an external power switch, and the minimum space between all the electrodes is 3mm

- EP... -11 series circulating motor pump needs no protection from external motor.
- Check if the supply voltage and frequency are the same as parameters indicated on the nameplate of the motor pump.
- Connect the motor pump and power supply with the plug supplied together with the pump.
- After the power is supplied, the indicator lamp on the control panel is ON.

## 7 Control Panel

### 7.1 Controls on Control Panel



Position	Descriptions
1	Lighting area display showing the rear
2	Setting button showing pump operating mode

### 7.2 Troubleshooting

With power on, position 1 lighting area indicating the situation: Operating, speed area displaying light are always lit; with flashing lights indicating the pump problem, corresponding fault are as follows:

If malfunction is detected, the power supply must be cut off before trouble-shooting. After the trouble is addressed, re-connect the power and start the motor pump.

Fault Code	Description
Speed 1 flashing	Over-voltage
Speed 2 flashing	Unter-voltage
Speed 3 flashing	Over-flow
Speed 4 flashing	Under-load
Speed 5 flashing	Open-phase
Speed 1 & 2 flashing	Impeller-locked
Speed 1 & 3 flashing	Under-power
Speed 1 & 5 flashing	Over-temperature

### 7.3 Indication Lamp Area of Motor Pump Setting

HST EPS ...-11 series circulation pumps have 11 kinds of settings, pressing the button to choose.

5 different light area indicating all the settings;

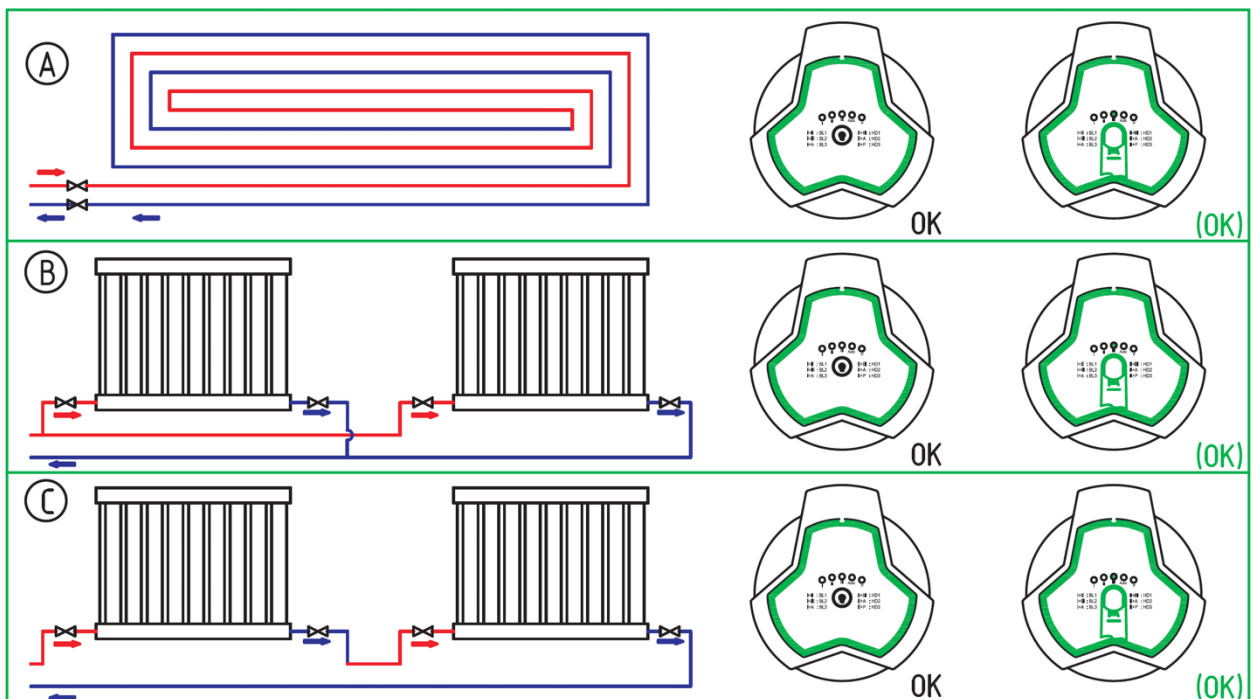


## 7.4 Button for selecting motor pump settings

Lighting area	Description	Graphical representation
AUTO(factory reset)	Autoadaptation	
HS1	Constantspeedlow speed	
HS2	Constantspeedmedium speed	
HS3	Constantspeedhigh speed	
BL1	Proportional pressure low speed	
BL2	Proportional pressure medium speed	
BL3	Proportional pressure high speed	
HD1	Constant pressure low speed	
HD2	Constant pressure medium speed	
HD3	Constant pressure high speed	
P	PWM control	

## 8 Motor Pump Setting

### 8.1 Motor Pump Setting Based on System Type



## Initial setting= AUTO (Self-adaptive mode)

Recommended and available motor pump setting

Position	System	Motor Pump Setting	
		Recommended	Options
A	Floor heating system	AUTO	HD (1-3)
B	Dual pipeline heating system	AUTO	BL (1-3)
C	Single pipeline heating system	BL1	BL (1-3)

- AUTO (Self Adaptive Mode) mode can adjust the performance of motor pump based on the actual heat demand of the system. As the performance is adjusted gradually, it is suggested, before changing motor pump setting, to maintain AUTO (Automatically Adaptive Mode) mode setting for at least one week.
- If you select to change back to AUTO (Self Adaptive Mode) mode, the HST EPS ...-11 series motor pump can memorize its last setting in AUTO mode and continue adjusting the performance automatically.
- It may take several minutes or even hours to reach the optimal operation mode after motor pump setting is changed from the optimal setting (the "Recommended abovemention") to other optional setting. If the optimal setting of motor pump fails to enable each room to obtain desired heat distribution, then you should change the motor pump setting to other settings
- Please refer to Section 12.1 for the relations between motor pump setting and performance curve.

## 8.2 Control of Motor Pump

When the motor pump is working, the motor is controlled according to the principle of "Proportional Pressure Control (BL)" or "Constant Pressure Control (HD)". In these two modes, the motor pump performance and corresponding power consumption will be regulated according to the heat demand of the system.

### Proportional Pressure Control

In this control mode, the differential pressure of both ends the motor pump will be controlled by the flow rate. In the Q/H Figure, proportional pressure curve is represented with BL (1-3). Please refer to Section 13.3

### Constant Pressure Control

In this control mode, the differential pressure of both ends of the motor pump remains constant and is irrelevant to the flow rate. In the Q/H Figure, constant pressure curve is a horizontal performance curve represented with HD (1-3). Please refer to Section 13.3

## 9 PWM Signal Control Mode

### 9.1 Control and Signal

#### 1) Control Principle

HSTEPS...-11 series model pump is controlled by modulated LV PWM (Pulse Width Modulation) digital signal, which means that the variance of velocity depends on the external input signal. The variance of velocity is one of the functions of input control.

#### 2) Digital LV PWM (Pulse Width Modulation) Signal

Design frequency scope of square wave PWM signal: 100Hz~2000Hz; PWM input signal (PWM IN) is used to give velocity commands, and adjusts the velocity commands through adjusting PWM duty cycle. PWM output signal (PWM OUT) is the feedback signal of the pump, and the PWM frequency is fixed at 75Hz±5%

#### 3) Duty Cycle (d%)

$$d\% = t/T$$

For example :

$$T = 2 \text{ ms (500Hz)}$$

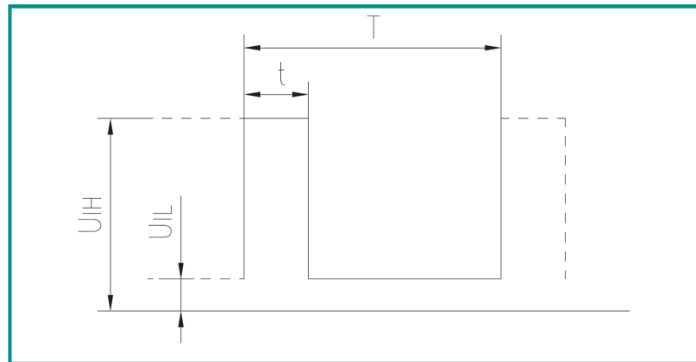
$$t = 0.6 \text{ ms}$$

$$d\% = 100 \times 0.6 / 2 = 30$$

$$U = 7 \sim 15 \text{V ich}$$

$$U \leq 1 \text{V iL}$$

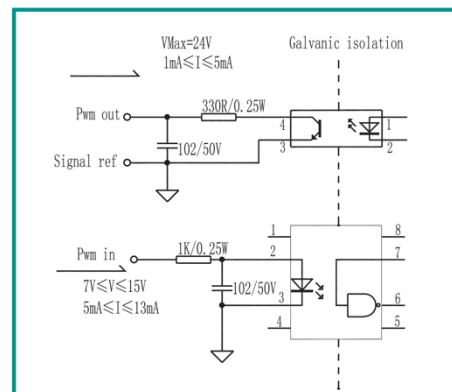
$$I \leq 10 \text{mA}$$



Code	Descriptions
T	Cycle
D	Duty Cycle
UiH	Input High Voltage
UiL	Input Low Voltage
IiH	Input Current

### 9.2 Interface

The pump is controlled by external electrical elements and components through interfaces. The interfaces convert external signals into signals that can be recognized by microprocessor in the pump. In addition, when the pump is supplied with 230V voltage, the interfaces can ensure that users will not be at risk of high voltage electric shock when contacting the signal cable.

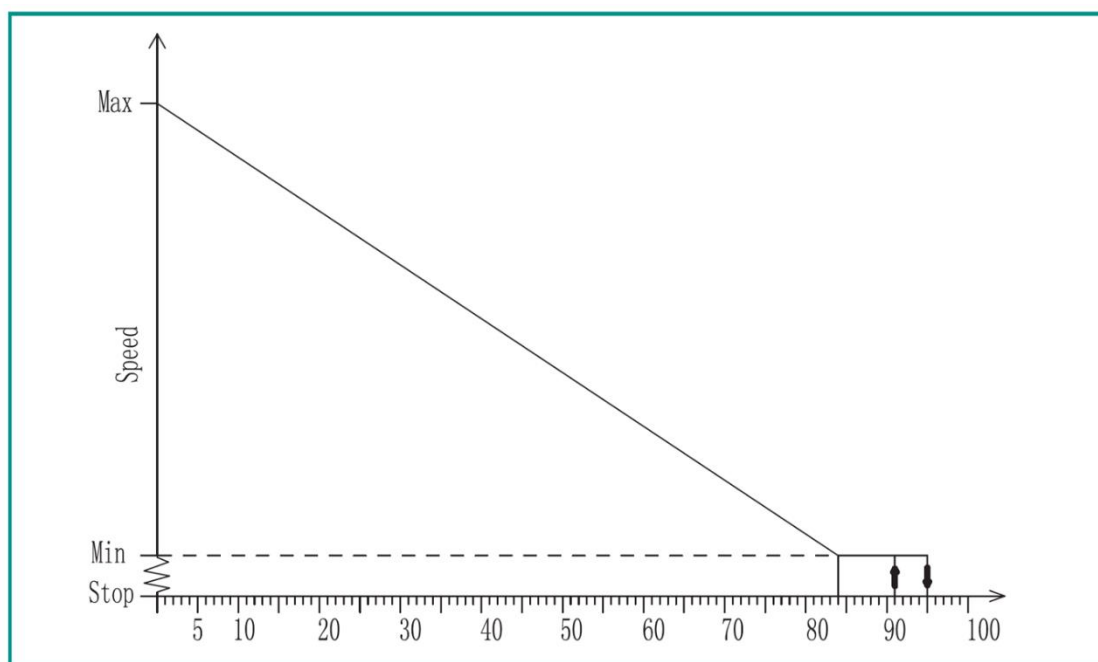


#### Note

“Signal Ref” is a reference earthing, and it is not connected to protective earthing

### 9.3 PWM Input Signal

- In area of high duty-cycle PWM signal, when the input signal fluctuates in the critical point, there will be a delay area to prevent frequent stop and start of the pump.
- In area of low duty-cycle PWM signal, the pump runs at high velocity for the sake of system safety. For instance, when the signal cable of gas boiler system is damaged, the pump will continue to run at the maximum rotational speed and transfer heat through main heat exchanger. This is also applicable to heat pump, ensuring continuous heat transfer in the case of signal cable of pump is damaged and system safety is guaranteed.
- When PWM input signal is 0% or 100%, the pump will switch to non-PWM mode (normal mode), and the default system will have no PWM signal input.



PWM Input Signal (%)	Pump Status
0	The pump switches to non-PWM mode (normal mode), and the default system will have no PWM signal input.
<10	The pump runs at the highest velocity
10~84	The pump curve will drop from the highest to the lowest
85~91	The pump runs at the lowest velocity
91~95	If the velocity variance point of input signal fluctuates, then it will block the start and stop of the pump according to the principle of magnetic hysteresis
96~99	Stand-by, the pump stops
100	The pump switches to non-PWM mode (normal mode) and the default system will have no PWM signal input.

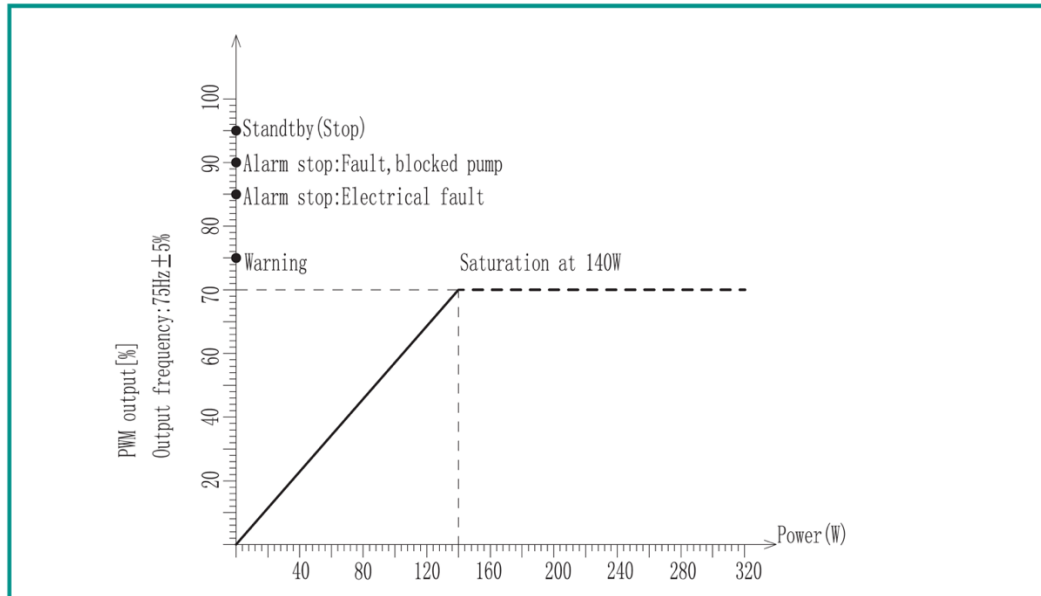
**Note**

This System is adaptive to the automatic switching of PWM and non-PWM mode. When there is PWM signal input, the system will enter PWM mode.

## 9.4 PWM Feedback Signal

PWM feedback signal can provide operation status of the pump, such as power loss or all kinds of alarm/warning modes.

PWM feedback signal will feed back exclusive alarming information. If the power voltage detects under voltage signal values, its output signal will be set to 75%. Provided sundries settlement exists in the hydraulic system and causes rotor being blocked, the duty cycle of output signal is set to 90%, the alarm will be given higher priority.



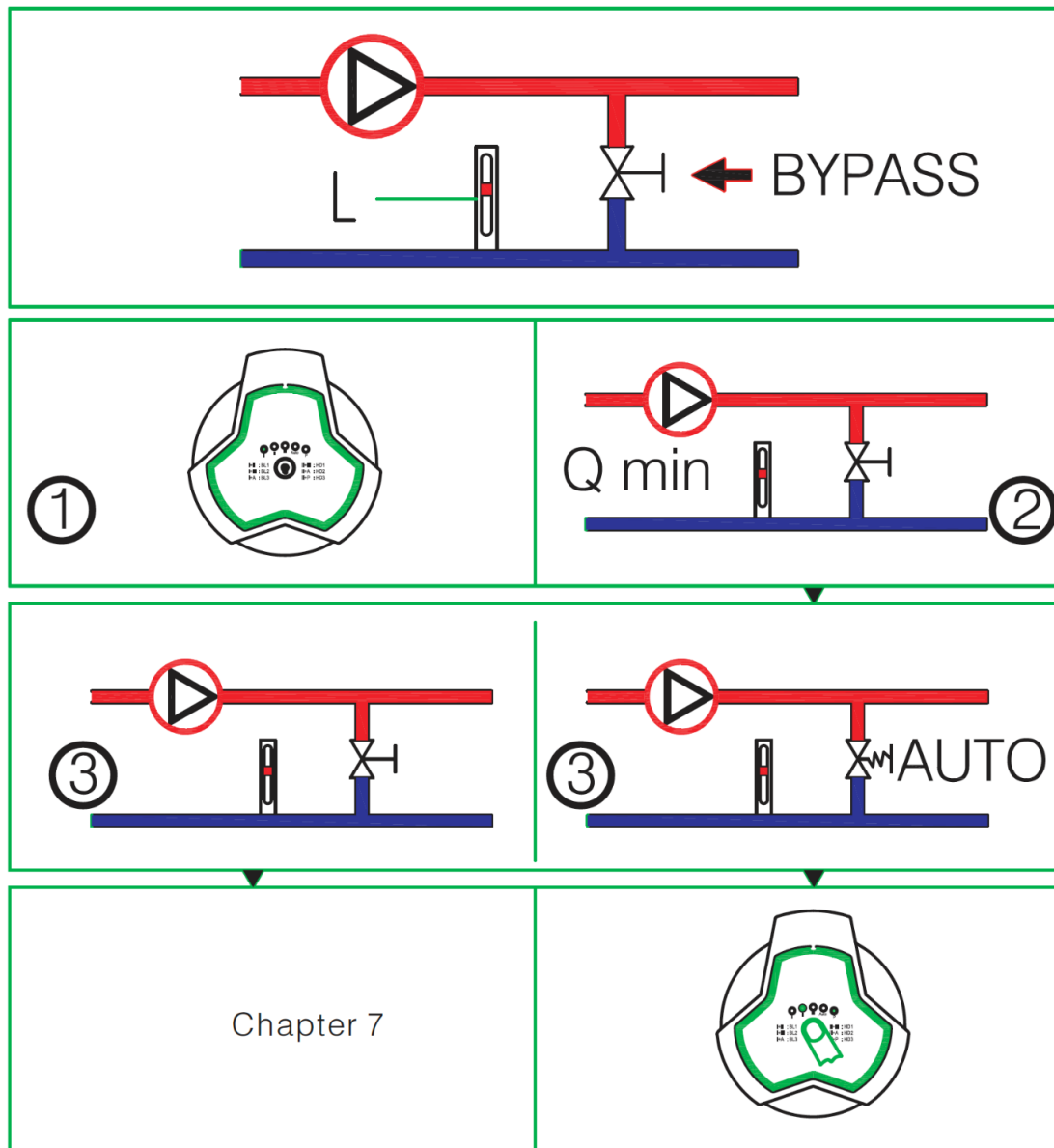
PWM Output Signal (%)		
95	Standby (stop)	The pump stops
90	Alarm stops, malfunctions (pump blocked)	The pump does not work and will restarts only after trouble is addressed
85	Alarm stops, electrical malfunction/trouble	The pump does not work and will restarts only after trouble is addressed
75	Warning	The pump runs, trouble has been detected under this situation but it is not critical, and the pump can still work.
0-70	0-140W (slope 2 W/% PWM)	

## 9.5 How to use the signals

The signal can be used to measure power consumption of the pump. The pump signal can be used to detect the actual operating point of the system rather than measuring by the current controlled by the system. The signal is also applicable to comparing velocity setting value and feedback.

## 10 Bypass valve system installed between the Inlet pipeline and return pipeline

### 10.1 Purposes of bypass valve



### Bypass valve

The purpose of bypass valve: when all the valves and/or temperaturesensing valves of heat from boiler can be distributed.

#### Elements in the system:

- Bypass valve
- Flow meter, position L.

When all valves are closed, the minimum flow rate must be guaranteed. The setting of pump position depends on the type of bypass valve, i.e. manual bypass valve or temperature-sensing bypass valve.

## 10.2 Manually-operated Bypass Valve

In accordance with the following procedures

1. Adjust the by-pass valve, pump should be set on HS1 (Constant speed I)  
The minimum flow rate ( $Q_{min}$ ) of the system shall be always guaranteed. Please refer to bypass valve manual provided by the manufacturer.
2. After the regulating of bypass valve completes, set the pump in accordance with Section 12.1 of Pump Setting.

## 10.3 Automatic Bypass Valve (temperature-sensing type)

Follow the following procedures:

1. Adjust the by-pass valve, pump should be set on HS1 (Constant speed I)  
The minimum flow rate ( $Q_{min}$ ) of the system shall be always guaranteed. Please refer to bypass valve manual provided by the manufacturer.
2. After the regulating of bypass valve completes, set the pump to lowest or highest constant pressure mode. For the relations between pump setting and performance curve, please refer to Section 13.1 of Pump Setting and Pump Performance.

# 11 Start up

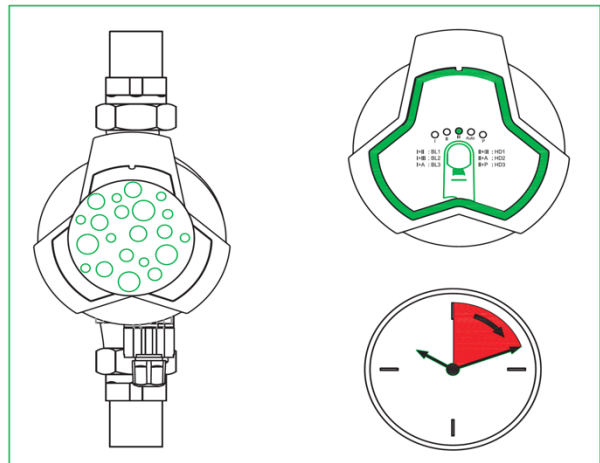
## 11.1 Before Start Up

Before starting the motor pump, ensure that the system is filled with liquid, air has been completely exhausted, and the inlet of motor pump must reach minimum inlet pressure. Please refer to Chapter 3.

## 11.2 Exhaust the Motor Pump

HSTEPS...-11 series motor pump is equipped with self - venting function. Before the start up, it is not necessary to vent the air. Air in the motor pump may cause noise. After the motor pump is put into operation for several minutes, the noise will disappear.

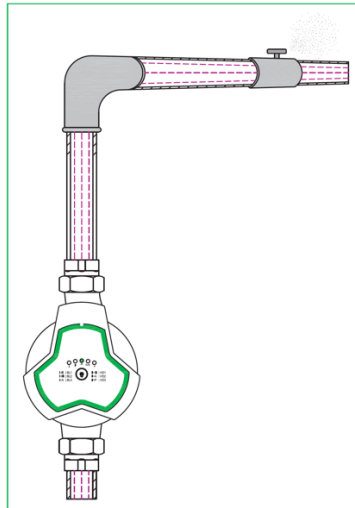
Based on the system scale and structure, set the HSTEPS25-11 series motor pump to HS3(Constant speed 3) for a short period of time and air in the pump can be quickly vented. After air is vented from the motor pump and noise disappear, set the motor pump in accordance with the manual. Please refer to Chapter 8.



### Caution

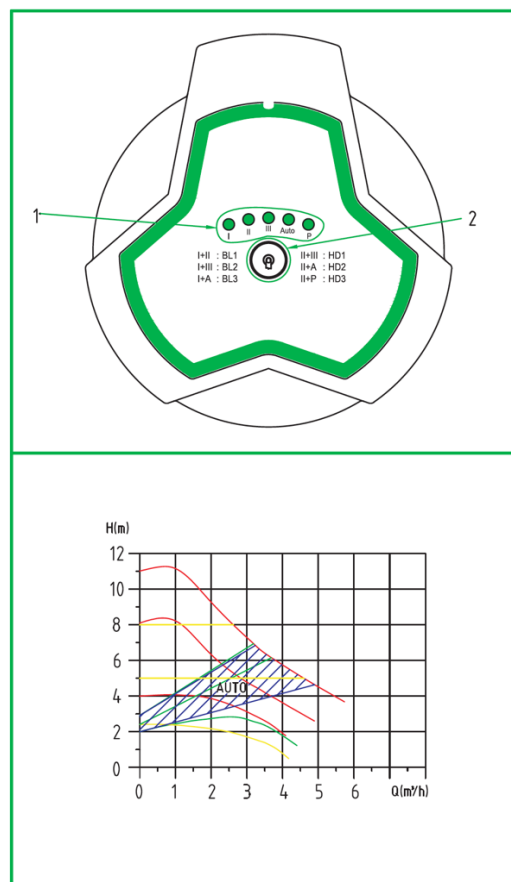
**Motor pump cannot run indle speed without pumping liquid**

## 11.3 Vent the heating system



## 12 Motor Pump Setting and Performance

### 12.1 Relations between Motor Pump Setting and Performance



Note: The red curve stands for constant speed gear (from 1 to 3), the shadow area of blue one is automatic gear, the green one is ratio gear (from 1 to 3), and the yellow one is constant pressure gear (from 1 to 3)



Settings	Pump Characteristics Curve	Functions
AUTO (Initial Setting)	Highest to Lowest Proportional Pressure Curve	AUTO function will automatically control the pump performance within the specified scope. adjust pump performance based on system scale; adjust pump performance based on load variance within a period of time; Under the AUTO mode, the pump will be set to proportional pressure control;
BL (1-3)	Proportional Pressure Curve	The operating point of the pump will move up and down on the lowest proportional pressure curve based on the demand of system flow rate. When flow demand decreases, the pressure supply of pump drops; when flow demand increases, the pressure supply of pump rises.
HD (1-3)	Constant Pressure Curve	The operation point of the pump will move around the constant pressure curve based on the demand of system flow rate. The head (pressure) is kept constant, regardless of the flow request.
HS (1-3)	Constant speed curve	It runs on the constant curve in a constant velocity. Under the Velocity HS (1-3) mode, the pump is set to work on the highest curve under all working conditions. Set under HS3 mode in a short time, fast venting can be arranged on the pump.

## 13 Performance Curve

### 13.1 Guide on Performance Curve

Every setting of the motor pump has corresponding performance curve (Q/H curve). However AUTO (Self Adaptive Mode) mode covers just one performance scope.

The input power curve (P1 curve) belongs to every Q/H curve. Power curve represents the power consumption of motor pump in given Q/H curve with Watt as the unit.

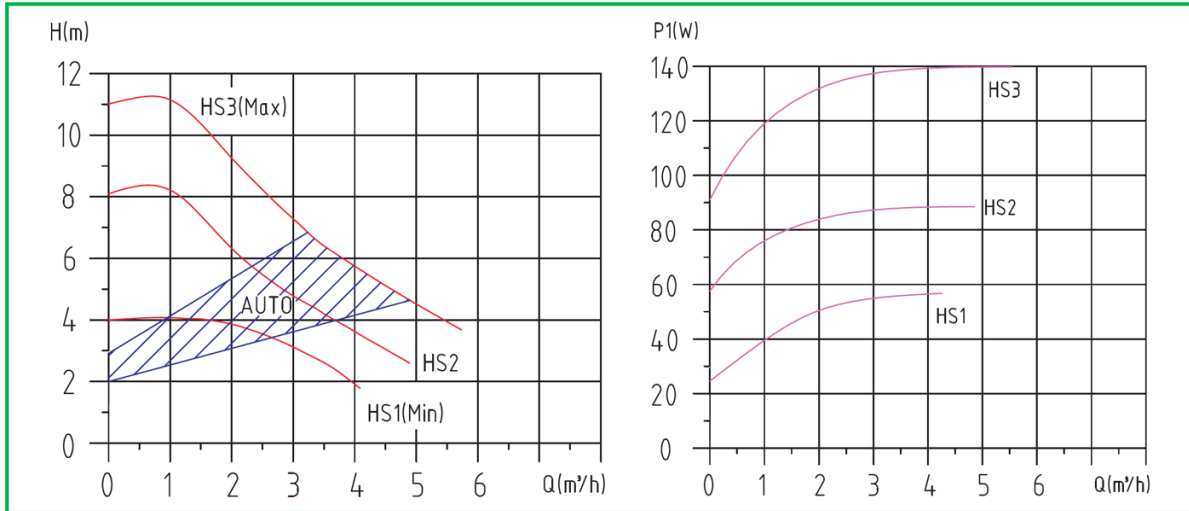
### 13.2 Curve conditions

The followings are applicable to the performance curve specified in the HST EPS ...-11 series manual:

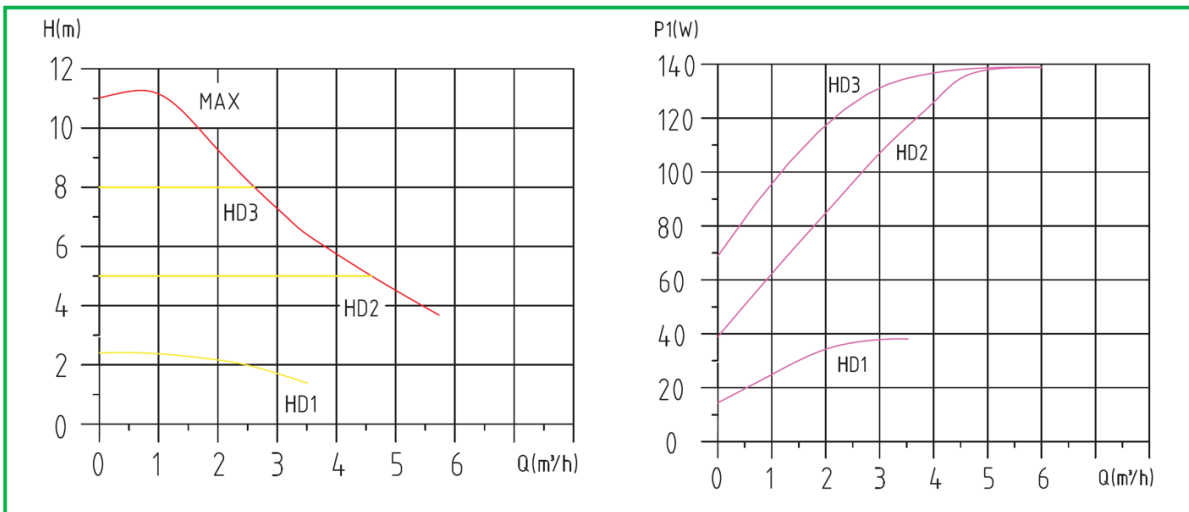
- Test liquid: air-free water.
- Applicable density of curve  $\rho=983.2 \text{ kg/m}^3$ , and liquid temperature  $+60^\circ\text{C}$ .
- All curves represent averaged value, and shall not be used as guarantee curve. If a specific performance is needed, then separate measuring shall be conducted.
- The applicable Kinetic viscosity of the curve  $\nu=0.474 \text{ mm}^2/\text{s}$  (0.474CcST)

### 13.3 Performance Curve HST EPS...-11 series

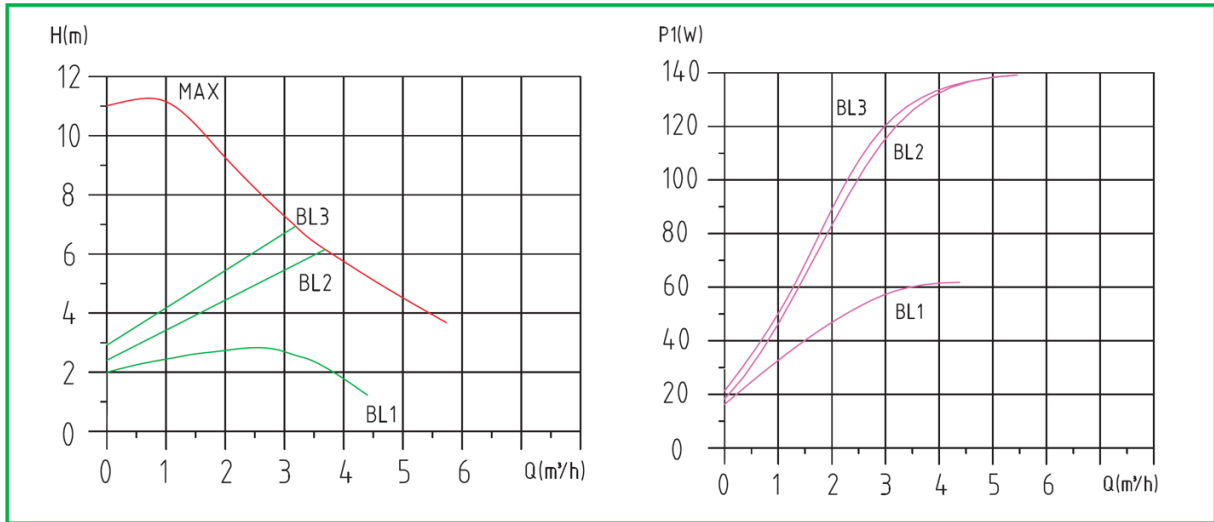
- Constant speed & AUTO mode performance curve  
HSTEPS...-11 series Performance Chart(Constant Speed+AUTO Mode)



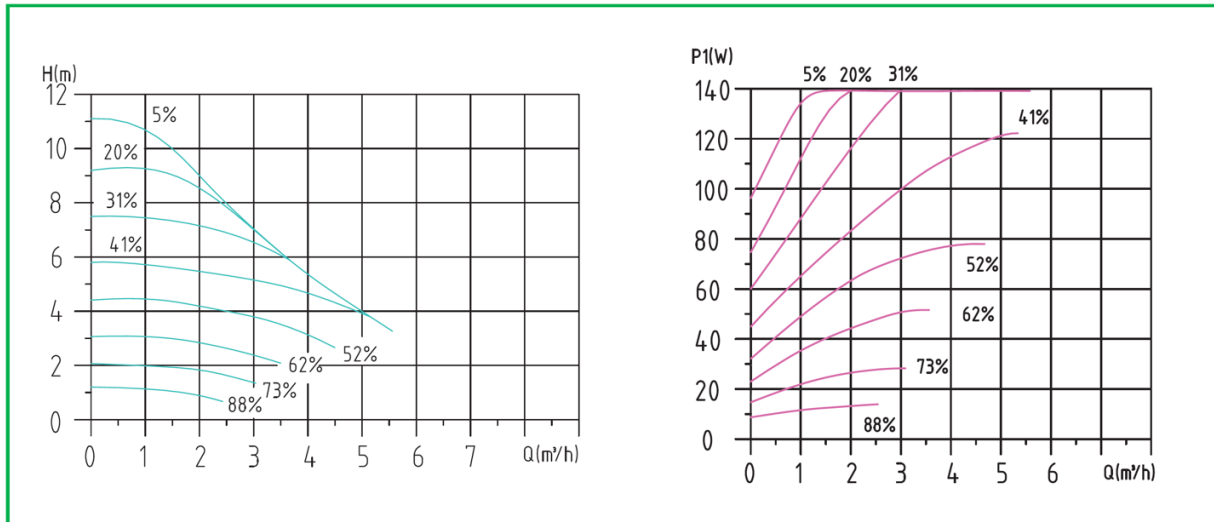
- Constant pressure mode performance curve  
HSTEPS...-11 series Performance Chart(Constant Pressure)



- Proportional pressure performance curve  
HSTEPS...-11 series Performance Chart (BL Mode)

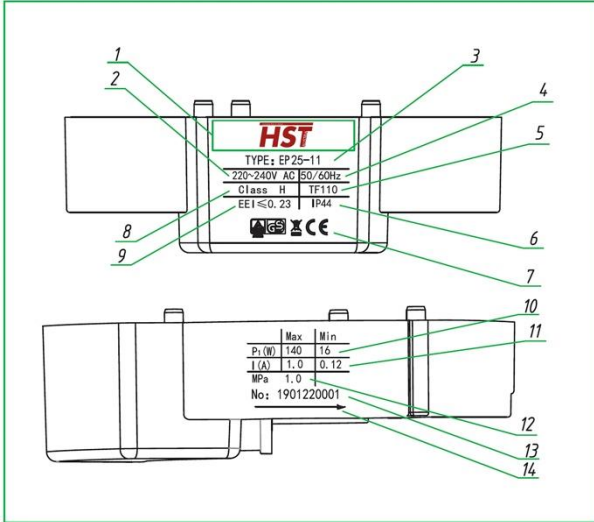


- PWM mode performance curve  
HSTEPS...-11 series Performance Chart (PWM)



# 14 Features

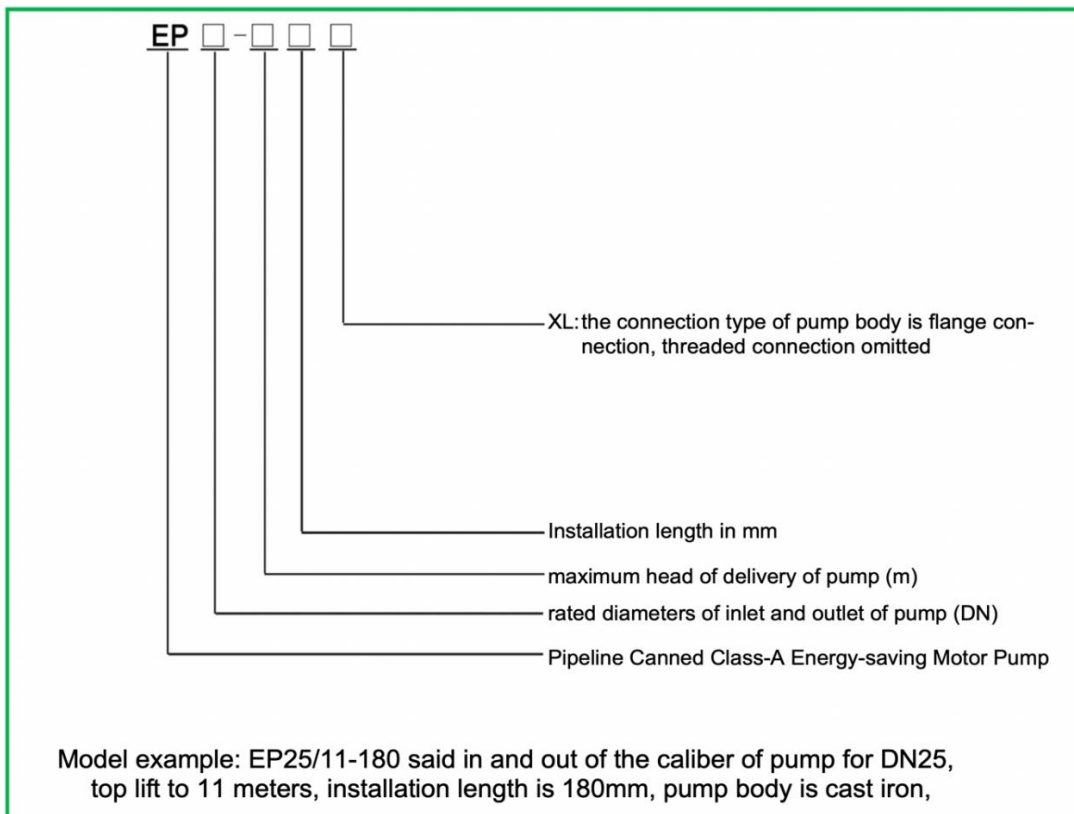
## 14.1 Nameplate Instructions



No.	Descriptions	
1	Manufacturer Name	
2	Voltage (V)	
3	Product Model	
4	Frequency (Hz)	
	Temperature class	
6	Degree of protection	
7	Authentication mark	
8	Insulation class	
9	Energy Index	
10	Power Watt	Minimum. mode minimum input power P1
		Maximum mode maximum input power P2
11	Current	Min. mode min. current
		Max. mode max. current
12	Maximum system load bearing (MPa)	
13	Date	Digit to digit 6 indicates manufacturing date
	No.	Digit 7 to digit 10 indicates serial number
14	Direction of rotation	

## 14.2 Model Instructions

The model of motor pump is composed of capitalized Latin letters and Arabic numbers, which means:

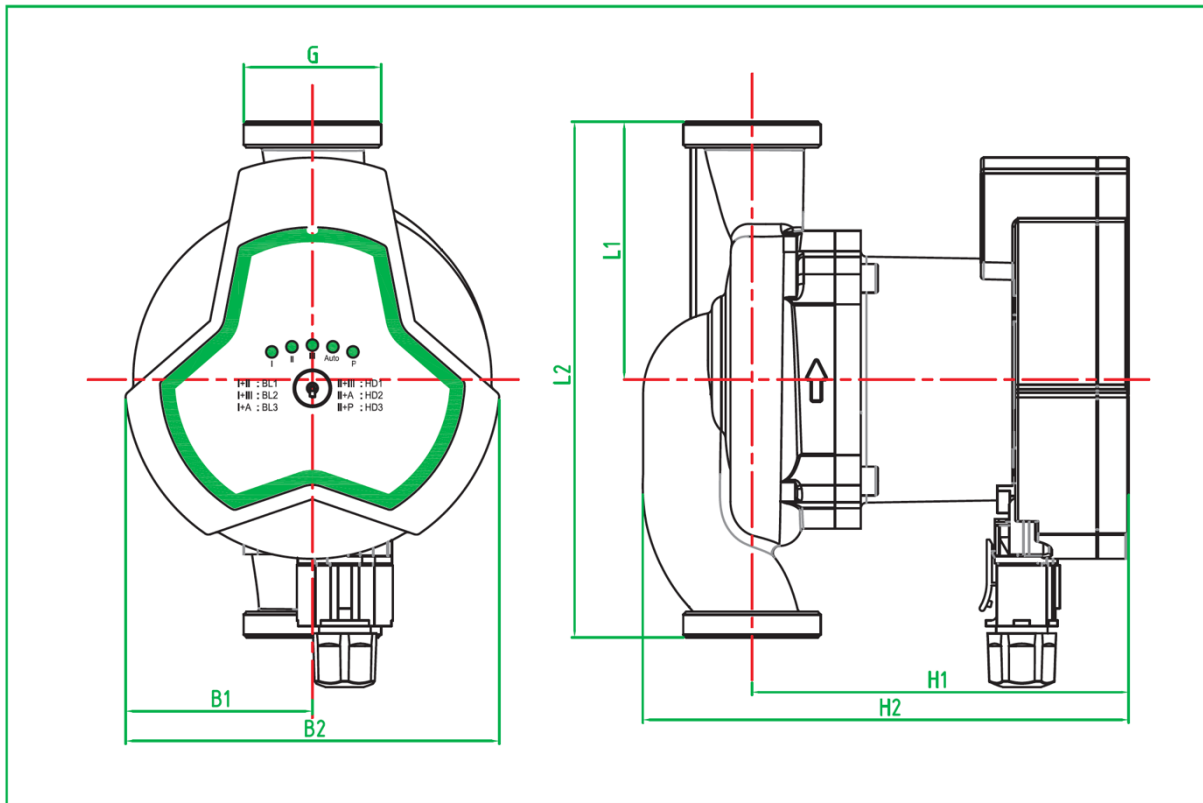


## 15 Technical Parameters and Installation Dimensions

### 15.1 Technical Parameters

Power Supply Voltage	1x(220~240V) V,50/60Hz	
Energy-efficiency-index	EEI≤0.23	
Motor Protection	The pump needs no external protection	
Degree of Protection	IP44	
Insulation Class	H	
Relative Humidity	Max 95%	
System Load Bearing	1.0 MPa	
Suction Port Pressure	Liquid Temperature	Minimum Inlet Pressure
	≤+85°C	0.005 Mpa
	≤+90°C	0.028 Mpa
	≤+110°C	0.100 MPa
EMC Standard	EN55014-1:2006+A1+A2, EN55014-2:2015, EN61000-3-2:2014 and EN61000-3-3:2013	
Sound Pressure Class	The sound pressure level of pump is lower than 42dB (A)	
Ambient Temperature	0~+40°C	
Temperature Grade	TF110	
Surface Temperature	The maximum surface temperature is not higher than +125°C:	
Liquid Temperature	+2~+110°C	
To prevent condensation in the junction box and rotor, the temperature of pumping liquid of the motor pump must be always higher than ambient temperature.		
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
For domestic hot water, it is suggested that water temperature should remains below 65°C to reduce scaling.		

## 15.2 Installation Dimensions



Power (W)	Model	Material			Dimension						
		Cast iron	Stainless steel	Copper	L1	L2	B1	B2	H1	H2	G
140	EPS25-11	☐			90	180	66	132	132	170	11/2"
140	EPS32-11	☐			90	180	66	132	132	170	2"

Startwatt (W) (at start)	Power input (W)	Model	Voltage (V)	Current (A)
50	140	EPS 25-11	<b>220~240V 50/60Hz</b>	<b>1.0</b>
50	140	EPS 32-11	<b>220~240V 50/60Hz</b>	<b>1.0</b>

## 16 Trouble-Shooting Schedule



### Warning

Before conducting any maintenance and repair of the motor pump, ensure that power supply has been cut off and will not be connected accidentally.

Symptom	Control Panel	Cause	Corrective Action
Motor pump cannot be started	Indication lamp "Off"	Equipment fuse burned	Replace the fuse
		The circuit breaker of current control or voltage control opens	Connect the circuit breaker
		Failure of motor pump	Return to factory maintenance
	Speed 1 flashing	High voltage	Check whether power supply is in specified range
	Speed 2 flashing	Under voltage	Check whether power supply is in specified range
	Speed 3 flashing	PCB component failure or motor failure	Return to factory maintenance
	Speed 4 flashing	Missing phase protection	Return to factory maintenance
	Speed 5 flashing	Rotor blocked	Remove the pump housing and clean the rotor
	Speed 6 flashing	No water in the pump	Open the valve and supply water to the pump
Speed 7 flashing	Motor resistance parameters do not match	Return to factory Maintenance	
Noise in the system	Indicating one value	Air exists in the system	Vent the system
		Excessively high flow rate	Lower inlet pressure of the motor pump
Noise in the motor pump	Indicating one value	Air exists in the motor pump	Vent the system
		Excessively low inlet pressure	Increase inlet pressure
Insufficient heat	Indicating one value	Poor performance of motor pump	Increase inlet pressure of motor pump



Meaning of crossed –out wheeled dustbin:

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

Contact your local government for information regarding the collection systems available.

If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposals at least free of charge.

## **Product warranty book of HST**

HST Heiz- und Sanitärtechnik GmbH provides 12 months' quality assurance for the products since the sales date, and shall be responsible for the product failure or damage caused by manufacturing and material defects. The warranty is on condition that the installation of product should be in line with *HST Installation and Use Manual* and recognized good operation specification.

This warranty does not apply to the product failure or damage caused by ① use the product other than for the usage recommended by HST; ② misuse of the product that does not conform to *HST Installation and Use Manual*; ③ improper maintenance and handling of product; ④ disassemble products and replace parts by oneself.

Any product provided rather than manufactured by HST Heiz- und Sanitärtechnik GmbH should comply with the quality assurance provisions of the manufacturer.

Within warranty period, the product repair is guaranteed by purchase invoice and warranty bill. Please send or return the product in need of repair to the local dealer of HST Heiz- und Sanitärtechnik GmbH. or designated maintenance point for repair. HST Heiz- und Sanitärtechnik. may determine whether home maintenance service shall be provided for free in accordance with its maintenance policies in the local.

HST Heiz- und Sanitärtechnik GmbH. will not accept claims to damage which should be borne by a third party or caused by product failure of any other company.

HST Heiz- und Sanitärtechnik GmbH shall not be responsible for the product failure or damage due to abnormal operating conditions, war, riot, wind (rain) storm, disaster or other force majeure.

HST Heiz- und Sanitärtechnik GmbH reserves the power of interpretation on the unaccomplished matter in the product warranty book.

HST HEIZ- UND SANITÄRTECHNIK GMBH  
Ziegeleistraße 1, 5020 Salzburg, AUSTRIA