2. Installation

2.1 Installation

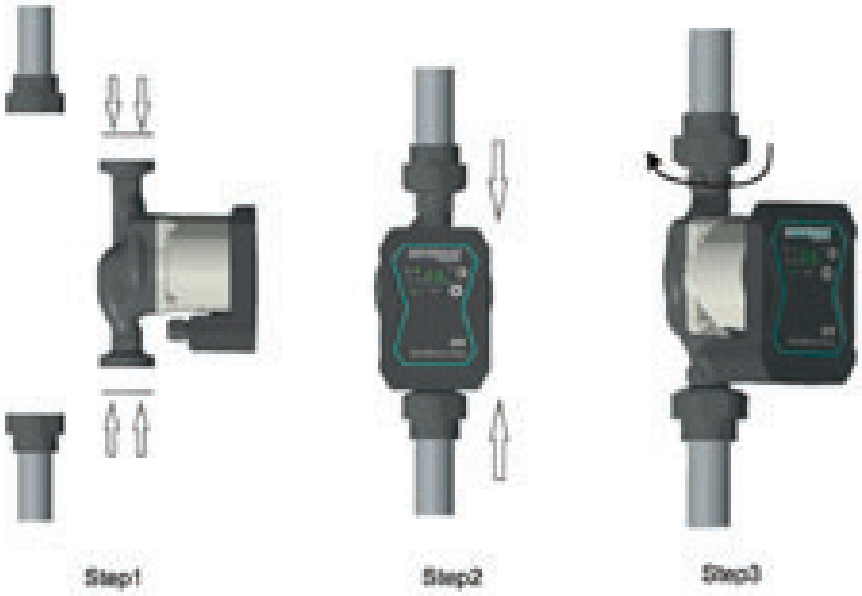


Figure 1

Correct installation location of motor

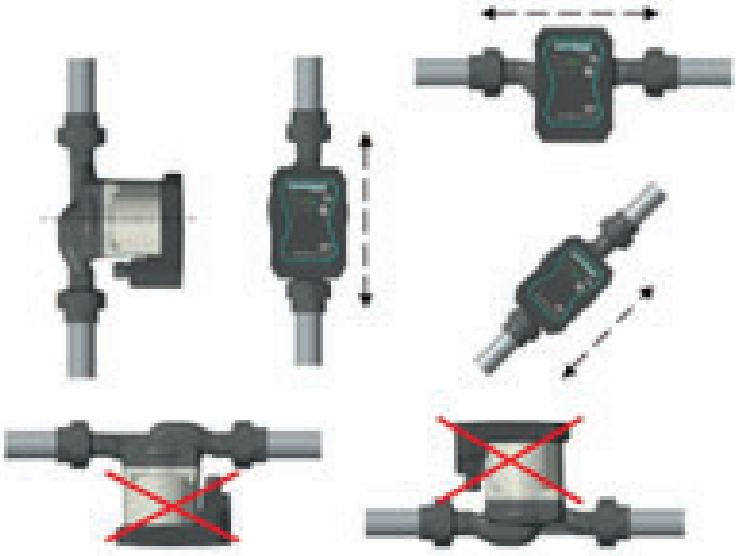


Figure 2

1. When installing the pump in the pipeline, it needs to install the two sealed gaskets provided.(as steps in Figure 1)
2. When installing, the motor shaft should be horizontal(as steps in Figure 2)

2.2 Location of Junction Box

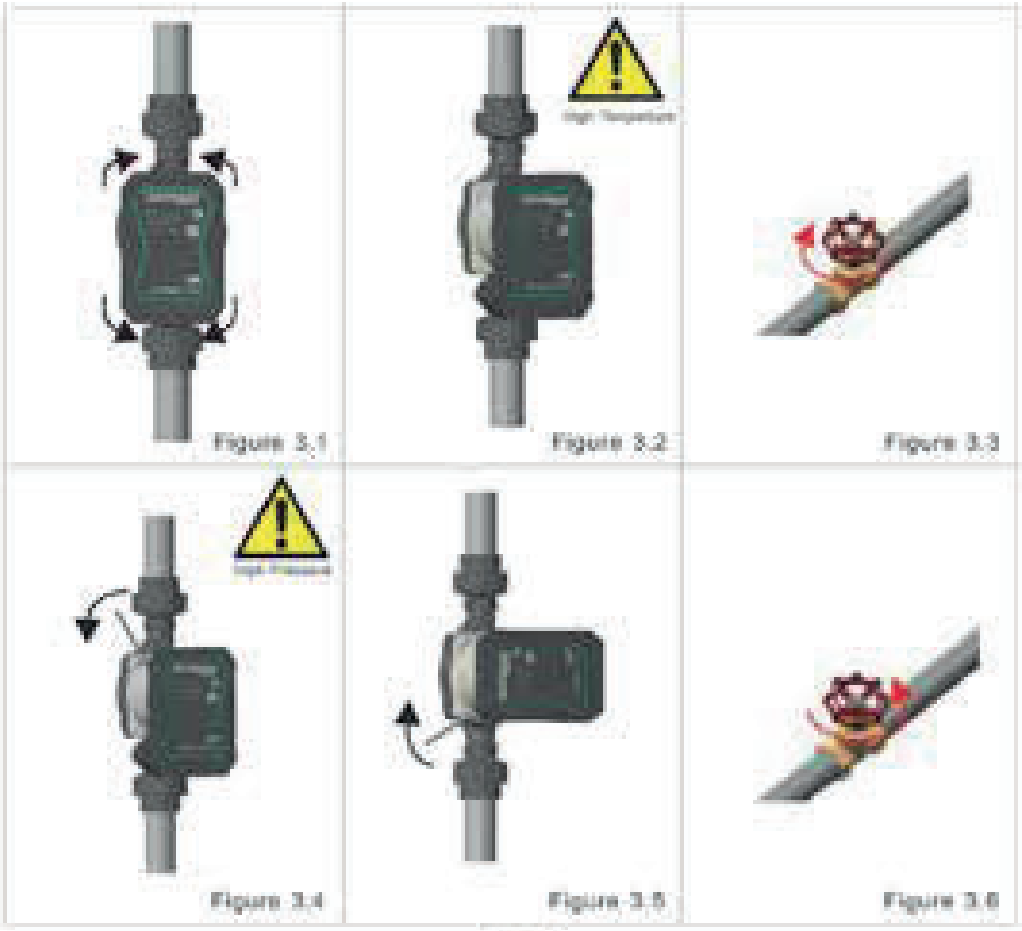


Figure 3

Warning

The pumping liquid might be high temperature and high pressure liquid. It needs to drank the system or close the stop valves at both sides of the pump before removing the inner hexagon bolt.

2.3 Change Location of Junction Box

If necessary,the junction box can be turned with 90° as gear like Figure 3.1

- Loosen it and take out four hex. Bolts that fixes the pump head . (Figure 3.4)
- Turn the pump head to the desired location. (Figure 3.5)
- Place back the four hex. bolts and tighten them in cross direction. (Figure 3.6)

After changing the location of the junction box, the pump can be started only after injecting pumping liquid to the system or opening the stop valve.

2.4 Pump Body and System Thermal Insulation

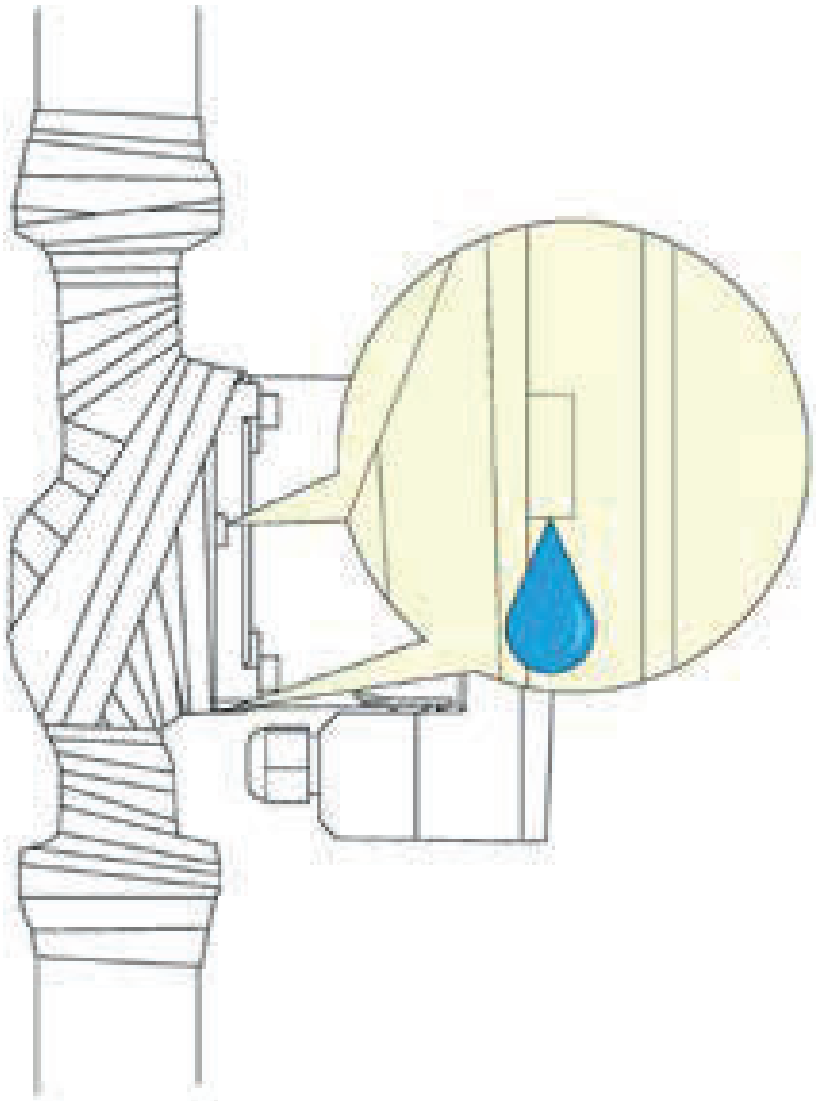


Figure 4 Heat insulation of the pump body

If the unit is fitted with thermal insulation, make sure the condensation drainage holes in the motor housing are not closed up or obstructed in any way.

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

2.5 Electrical connection

Figure 5 Electrical Connection

Warning

Pump must be connected to the ground wire ⏚

The pump must be connected to an external power switch and the minimum clearance between the electrodes should be 3mm.

- APM pump doesn't need external motor protection.
- Check whether the power supply voltage and frequency are consistent with values of the pump designation plate.
- When the indicator light on the control panel is on, it means it is powered on.
- Power connected with the pump needs 1A fuse.
- Wire end at cable 3 needs to be tinplated or fixed with wiring harness.
- If the supply cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.

III. Operation Instructions

1. Operation Panel

1.1 Operation instructions for control panel

1. Display that shows the actual consumption power in watt
2. Indicate lighting areas in automatic night mode
3. Button to start the automatic night mode
4. Button to select pump settings
5. Automatically run and display light area
6. Indicate set function in the pump

Figure 6

1.2 Description of side plate

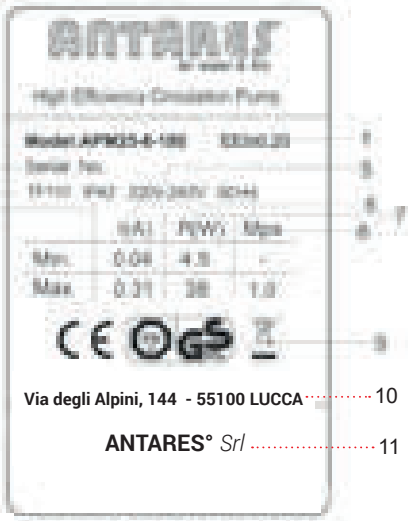


Figure 7 Name plate

Location	Description	Location	Description
1	Energy Efficiency Index	7	Imput power P1(Watt) Min. Mode Min. imput power P1(Watt) Max. Mode Max. imput power P1(Watt)
2	series n°	8	Max System pressure bearing(MPa)
3	Temperature grade	9	Mark and certification mark
4	Insulation grade	10	Company address
5	Voltage (V) Frequency (Hz)	11	Company name
6	Related current (A) Min. Mode Min. Current (A) Max. Mode Max. Current (A)		

2 Display description

2.1 After power on, displayer in location 1 works.

2.2 The exact pump consumption is shown on the display during operation

2.3 Failure that disables normal running of the pump (such as stagnation) will be displayed as E(X is 1o2)

2.4 If failure displays, it has to cut off the power supply to trouble shot. After trouble shooting, power on and start the pump.

3 Lighting area that shows pump settings.

The circulating pump has eight (ten) settings, which can be achieved through buttons. Pump setting is indicated by eight(ten) different lighting areas

For 8-12m Ten Lighting Areas **(Art. P.066 and P.076)**

Pressing times	Lighting area	Description	Displayer icon
0	A (Factory setting)	Autoadaptation	A
1	PP1	Min. proportional pressure curve	PP +
2	PP2	Medium proportional pressure curve	PP +
3	PP3	Max. proportional pressure curve	PP +
4	CP1	Min. Constant pressure curve	CP +
5	CP2	Medium Constant pressure curve	CP +
6	CP3	Max. Constant pressure curve	CP +
7	I	Constant speed curve, speed I	S +
8	II	Constant speed curve, speed II	S +
9	III	Constant speed curve, speed III	S +
10	A	Autoadaptation	A

4. Lighting area that indicates automatic night mode

If indicated by ☽ when it is on, it means it has enabled automatic night mode .

5. Button for enabling automatic night mode

- The button ☽ located in 3 will start /stop automatic night mode.
- Automatic night mode is only applicable to the heating system with the said function. (Refer to Section 8 of Chapter 4)
- When automatic night mode is started, the lighting area ☽ located in 3 is on.

If APM pump is set to be speed I mode, speed II mode or speed III mode, it cannot choose automatic night mode.

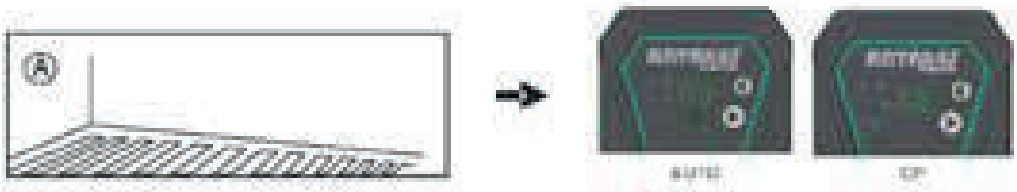
6. Button for selecting pump settings

Press button once, and it only changes one type of pump setting.
Pressing eight or ten time is a cycle

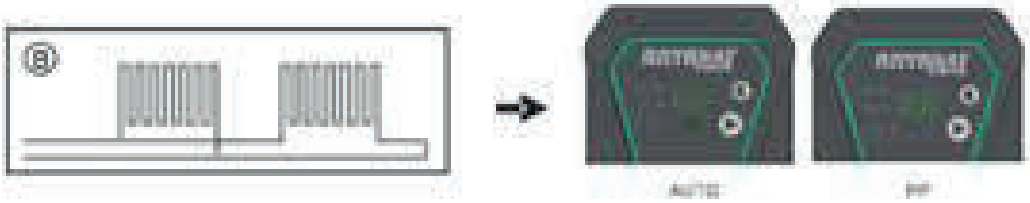
7. Pump setting

Pump setting as per system type

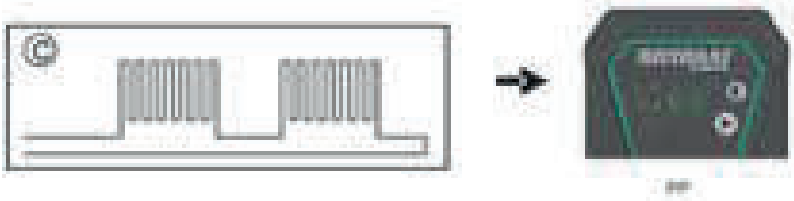
7.1 Pump setting as per system type



mounted in parallel mode



mounted in single pipe series



Factory setting = autoadaptation mode
The recommended and available pump settings should be referred to the previous Figure.

Location	System type	Pump setting	
		Optimum setting	Other available settings
A	Floor heating system	AUTO	CP
B	Double pipeline heating system	AUTO	PP2
C	Single pipeline heating system	PP1	PP2

AUTO (Autoadaptation mode) is installed in the heating system and double pipeline system under the floor. "AUTO autoadaption" mode adjusts pump performance automatically according to the actual heat demand of the system. Due to the fact that the performance is adjusted gradually, it is suggested to enable the pump to be in "AUTO autoadaption" mode at least one week before changing the pump settings.

If it chooses to change back to "AUTO autoadaption" mode, APMpump can memorize the set point of "AUTO autoadaption" mode last time and continues to adjust performance automatically. The pump setting changes from the optimum setting to other available setting. The heating system is "slow" system and cannot reach optimum running mode in several minutes or several hours. If the ideal heat distribution is not optimally defined, change the setting mode to another available.

7.2 Control of pump

During operation, exert control over the pump as per , Proportioinal pressure control " (PP) " or Constant pressure control " (CP) ".

Under the above mentioned two control modes, the pump performance and corresponding consumption power shall be adjusted according to the heat loss of the system.

- Proportional pressure control

Under this control mode, the pressure difference at both ends of the pump is controled by the flow. In Q/H diagram of proportional pressure curve, indicate with PP1andPP2.

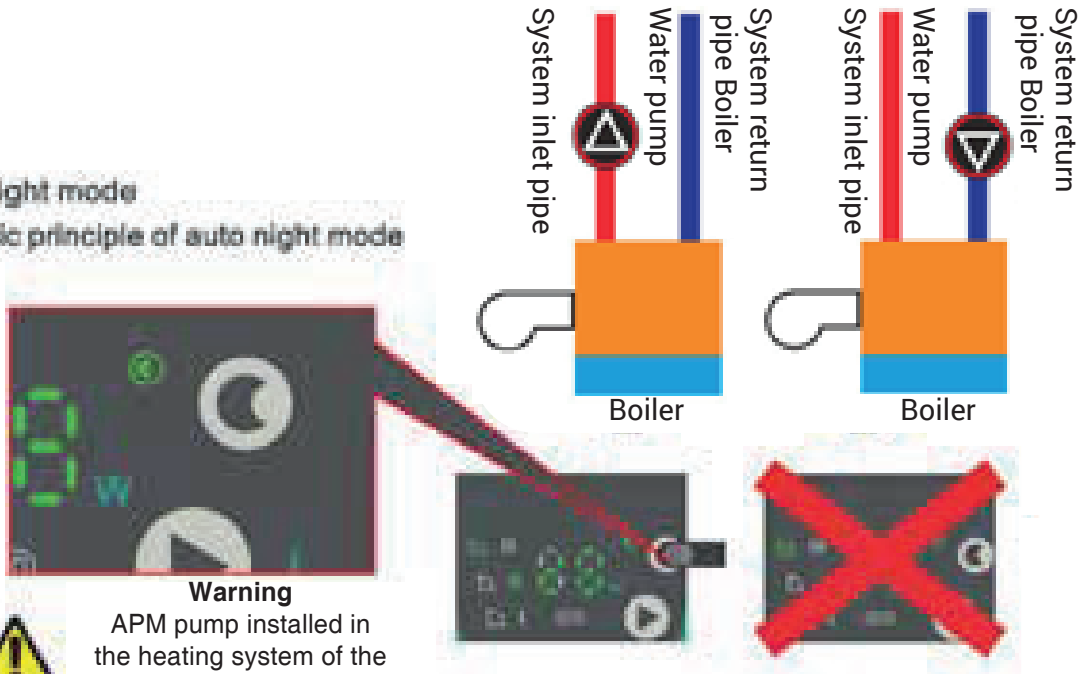
- Constant pressure control

Under this control mode, the pressure difference at both ends of the pump keeps stable and is irrelevant to the flow.

Constant pressure curve is indicated by CP1 and CP2. In Q/H, it is a horizontal performance curve.

7.3 Auto night mode

Basic principle of auto night mode



Warning

APM pump installed in the heating system of the air boiler with small water capacity cannot be set to auto

Figure 8 Auto night mode

Note: If speed I, speed II,or speed III are selected, auto night mode doesn't function.

If power supply is once cut off, it needs to restart the auto night mode.

If the heating system is providing "Insufficient heat" (lack of heat), it needs to check whether auto night mode has been enabled.
If so, disable auto night mode.

To ensure optimum status of auto night mode, the following conditions must be met:

- The pump must be installed in the inlet pipeline of the system and be close to the outlet of the boiler.
- If the pump is installed in the return water pipeline of the system, auto night mode doesn't function.
- The system (boiler) must have auto control over liquid temperautre.

Press ☽ button to start the auto night mode.
The indicator ☽ is on, which means that auto night mode has been enabled.

Auto night mode

- Once Auto night mode is enabled, APM pump can be switched between the Auto mode and Auto night mode.
- Switching between the Auto mode and Auto night mode by the APM pump is depending on temperature in inlet pipeline (non-return water pipeline) of the system.
- If the temperature drop in the inlet pipeline of the system is over 10-15°C within about two hours, APM pump will automatically switch to Auto night mode. Such temperature drop must at least reach 0.1°C/minute. When the flowing pipeline temperaure of the system rises by about 10°C, it will switch to the Auto mode (irrelevant to time)

8. pipeline and return water pipline

8.1 Function of the bypass valve

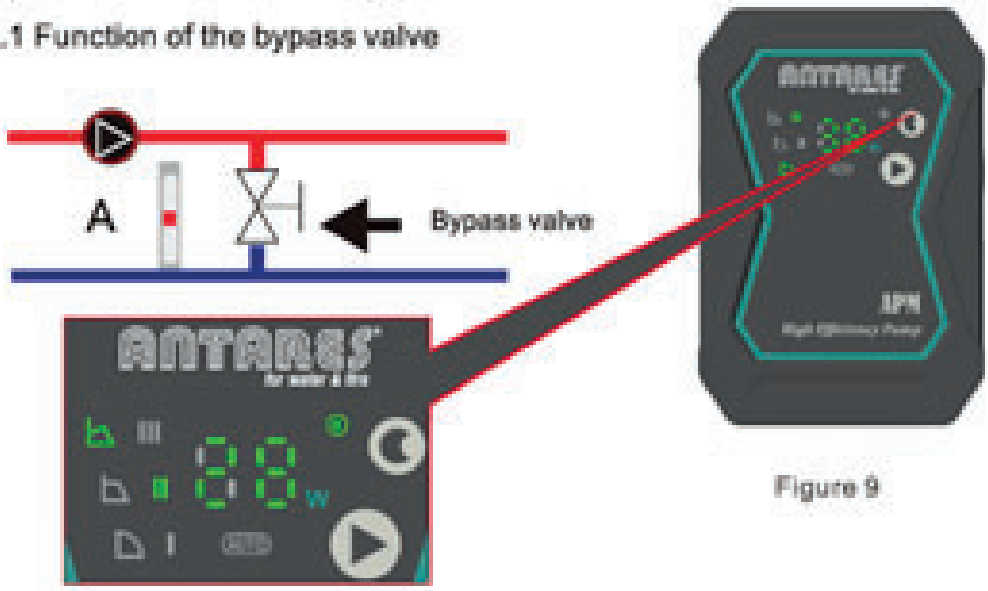


Figure 9

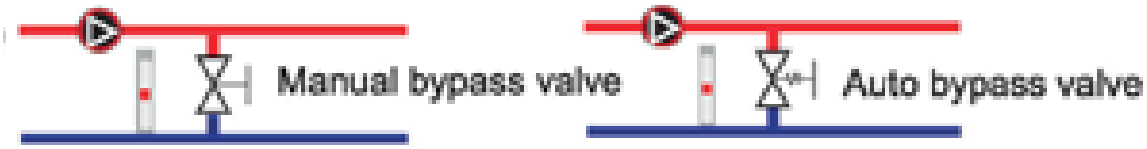


Figure 10 - System installed with bypass valve

8.2 Bypass valve

8.2.1 Function of bypass valve: When all valves in the floor heating circuit and /or the temperature control valve of the radiator are closed, the bypass valve can ensure distribution of heat from the boiler.

8.2.2 Components in the system.

Bypass-valve

A Flowmeter, located in A

When all valves are closed, it needs to guarantee the minimum flow.

Pump setting depends on the type of bypass valve equipped, namely manually -operated bypass valve or temperature-controlled bypass valve.(Figure 10)

8.3 Manually-operated bypass valve

Do as follows:

8.3.1 When adjusting the bypass valve, ensure that the pump is in setting I speed I mode. (Figure 9)

It has to keep the minimum flow （Qmin.） of the system always. Refer to the instructions of the bypass manufacturer.

8.3.2 When the bypass valve is adjusted, set the pump as per Chapter 7 of Pump Settings.

8.4 Auto bypass valve (temperature-controlled bypass valve)

Do as follows:

8.4.1 When adjusting the bypass valve, the pumpt should be setting I(speed I mode)

It has to keep the minimum flow （Qmin.） of the system always. Refer to the instructions of the bypass manufacturer.

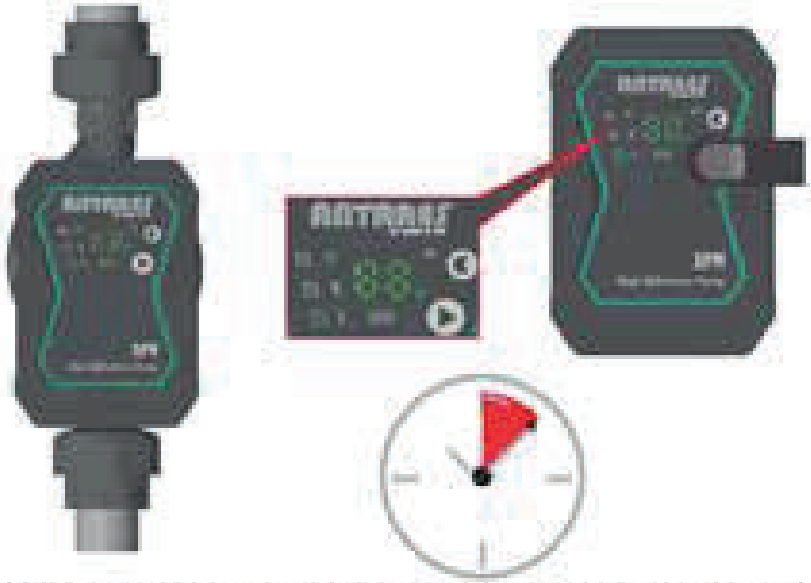
8.4.2 When the bypass valve is adjusted, set the pump to the min.or max.constant presure mode.

9. Start

9.1 Before starting

9.1.1 Before starting the pump, it must be sure that the system is filled with liquid and air is drained out. The pump inlet must reach the min.inlet pressure requried.

9.2 Exhaust the pump



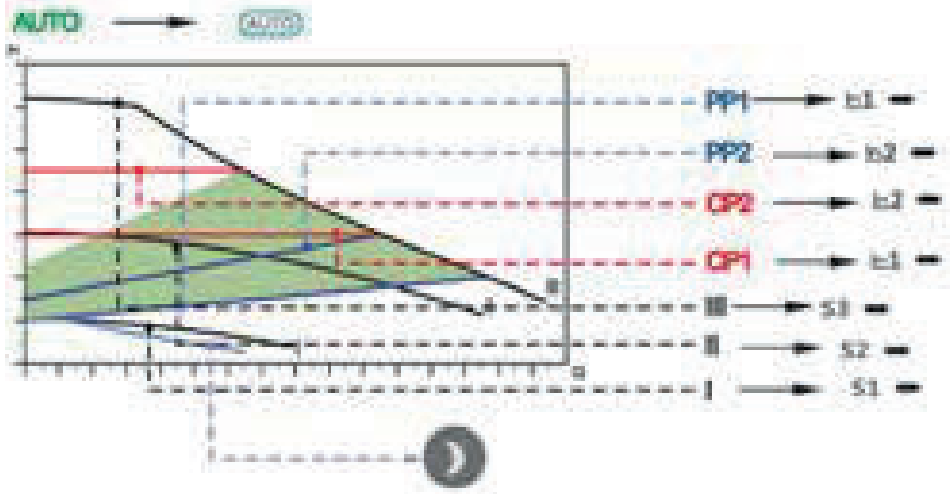
APM Pump boasts self-exhausting function. Before starting, exhausting is not required. The air in pump might cause noise, which will disappear after running for several minutes.

according to the system scale and structure, set the APM pump to be in speed III mode in short period so as to drain the air in the pump quickly. After that, the said noise disappears and set the pump as per the recommended instructions.

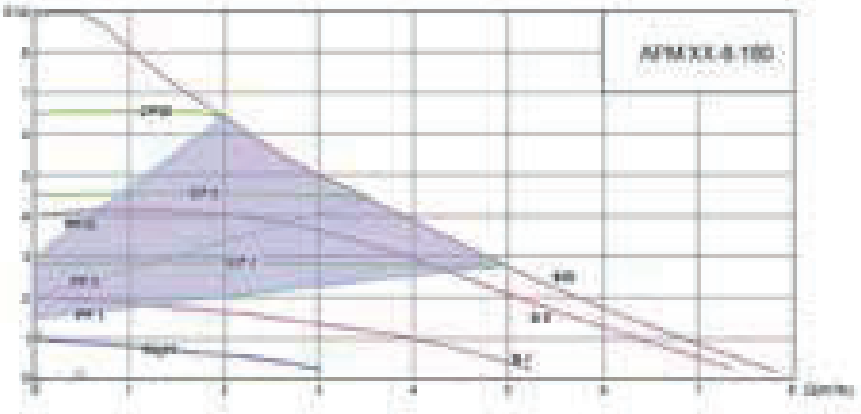
The pump cannot go idling without pumping liquid.
Do not start the pump for sytem exhausting.

10. Relation between pump setting and performance

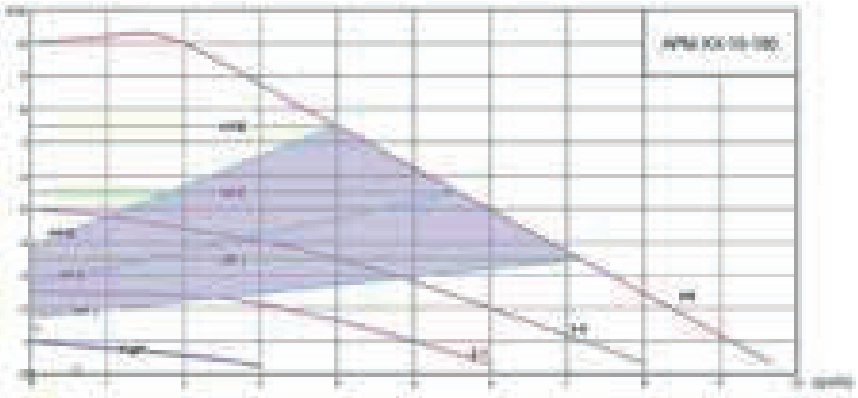
Relation between pump setting and performance is indicated with curve.



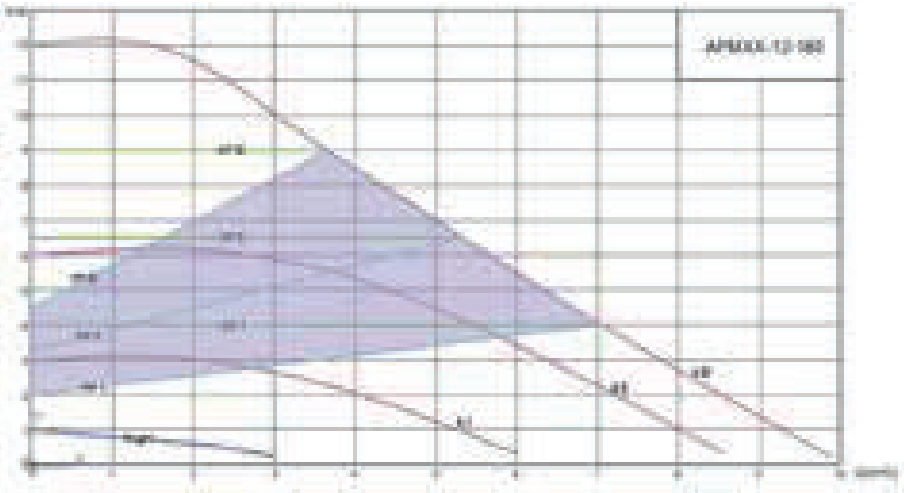
(APMXX - 8 - XX)



(APMXX -10- XX)



(APMXX -12- XX)



IV. Technical Data and Installation Dimensions

1. Technical Data

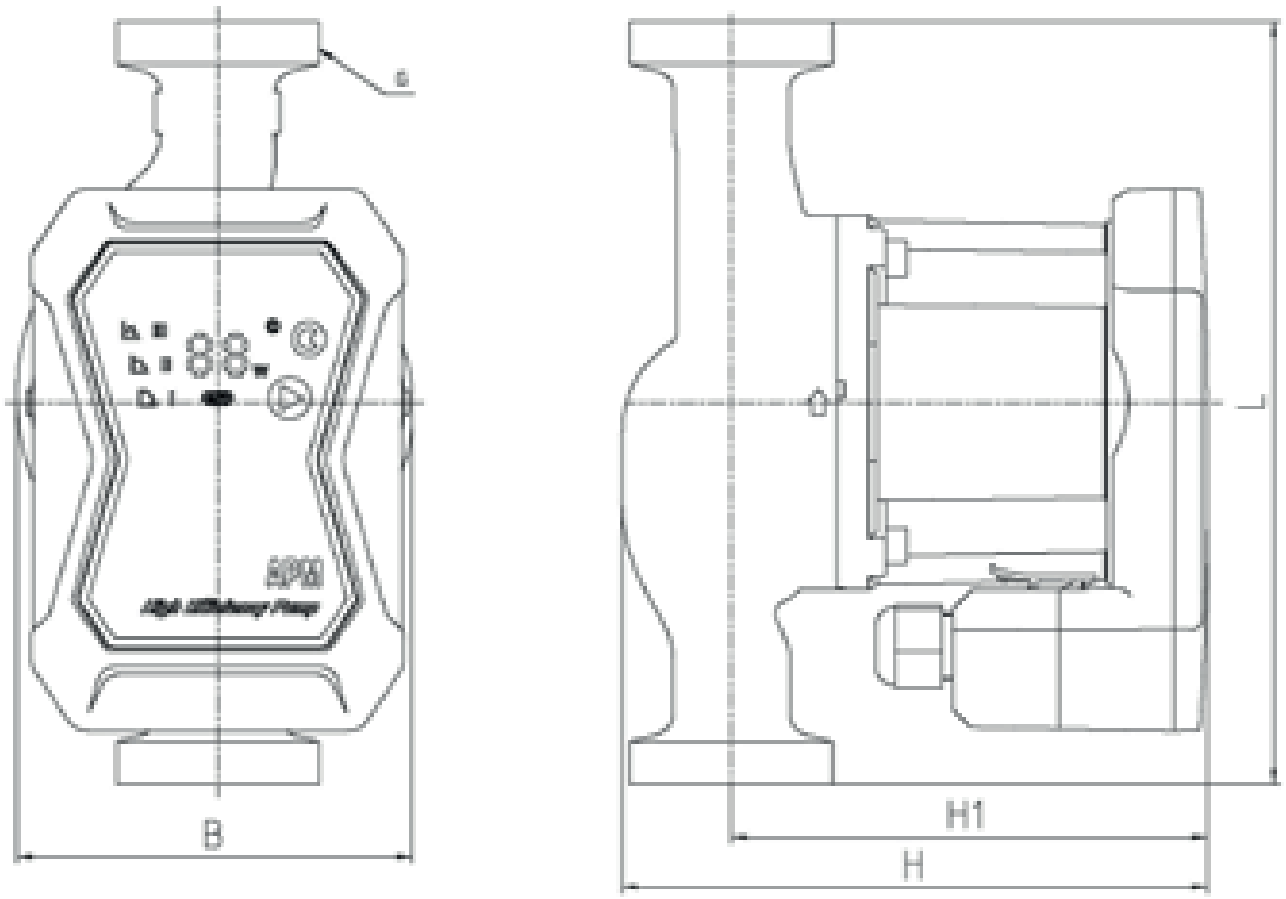
Supply voltage	230V, -10 %/+ 6 %, 50Hz, PE	
Motor protection	APM/circulating pump doesn't need external motor protection	
Protection grade	IP 42	
Isulation grade	F	
Relative ambient humidity	Max. 95%	
System pressure bearing	Max. 1.0 MPa, 10 bar, 100m water column	
Suction inlet pressure	Liquid temperature	Min. inlet pressure
	≤+75 ℃	0.05 bar, 0.005 MPa, 0.5m water column
	+90℃	0.28 bar, 0.028 MPa, 2.8m water column
	+110℃	1.08 bar, 0.108 MPa, 10.8m water column
EMC Standard	GB4343.2 GB/T17626.4 IEC61000-4-4	
Sound pressure level	The sound pressure level of the pump is less than 43 Decibel	
Ambient temperature	0℃ to +40℃	
Temperature grade	TF110	
Surface temperature	Max. Temperature is below +125℃	
temperature	+2℃ to +110 ℃	
Declared EEI	≤0.20 (4-6m)	
	≤0.23 (8-12m)	

To prevent condensate water in the control box and the stator, the temperature of the pumping liquid in the pump must be higher than the ambient temperature.

Ambient temperature[℃]	Liquid temperature	
	Min. [℃]	Max.[℃]
0	2	110
10	10	110
20	20	110
30	30	110
35	35	90
40	40	70

2. Installation dimensions

Dimensional sketch and dimensions table



Type of pump	Dimension					
	H(mm)	H1(mm)	L(mm)	B(mm)	G(")	Weight (excluding cable) kg
APM25-8-180	185	133	180	99	1½"	4.80
APM25-10/12-180	185	133	180	99	1½"	5. 00
APM32-8-180	185	133	180	99	2"	4.85
APM32-10/12-180	185	133	180	99	2"	5. 05

V. External control modes and signals

1. Control principle

The APM 8/10/12 meter circulating pump is controlled by a digital low voltage pulse width modulation (PWM) signal whose speed depends on the input signal.Which are controlled internally or externally and can be set to internal or external control. The configuration curve of the pump prefabrication determines the rate of change of the pump speed.

1. 1. control signal

1.1.1. Digital low voltage PWM signal

Optocoupler isolation	YES
PWM input frequency	1000—1500Hz
Input voltage high level U_{iH}	4.0—24.5V
Input voltage low level U_{iL}	<0.7V
PWM adjustable range	0—100%
Signalpolarity	Fixed
Signallinelength	<3m
Risingandfallingedgetime	<T/1000

1.1.2. Duty cycle

d%=10

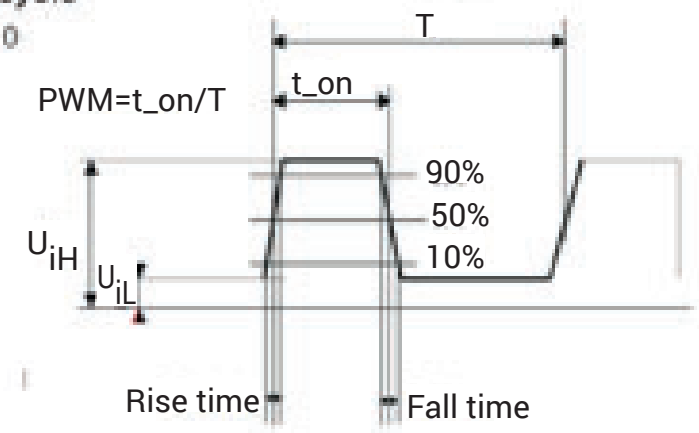


Figure 11 PWM waveform

1. 2 Alarm

The PWM feedback signal is made into a 5V rectangular wave pulse width form, which is isolated by optocoupler. The duty cycle of the circulating pump fixed at 75Hz frequency is tentatively defined as follows:

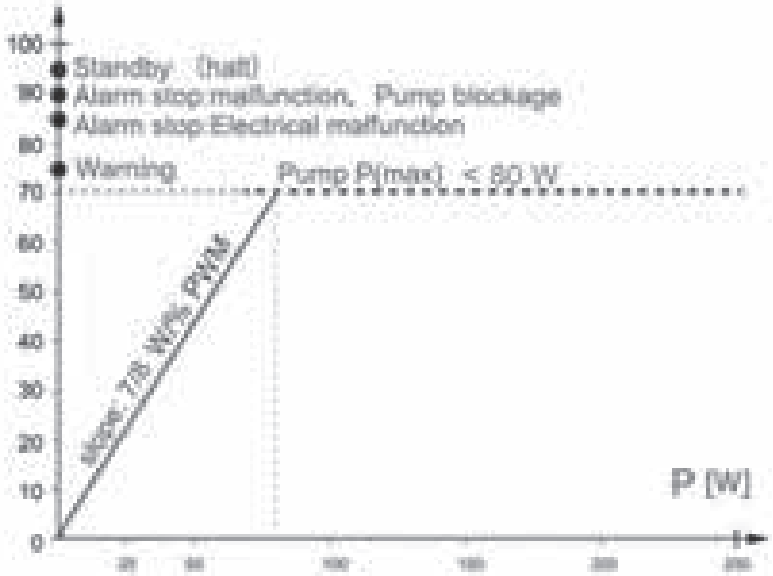


Figure 15

PWM output signal(%)	QT (s)	Pump information	DT(s)	priority
95	0	PWMsignalstandby(stop)	0	1
90	30	Alarm/stop/blockingerror	12	2
85	0-30	Alarm/shutdown/electricalerror(phaseloss, overcurrent)	1-12	3
75	0	Warning(overvoltage,undervoltage)	0	5
0-70	/	0—80W(Slope7/8 %PWM/W) 0—120W(Slope7/12 %PWM/W) 0—180W(Slope7/18 %PWM/W)	/	6
Outputfrequency	75Hz+/-5%			

NOTE: QT=Identification time
DT=Cancel identification time

VI. Trouble Shooting

Warning
Ensure that the power supply is cut off and will not be accidentally switched on before preparing any maintenance and repair of the pump.

Control panel	Causes	Troubleshooting method
Indicator lights off	a) One fuse is burned.	Replace the fuse.
	b)Breaker is off.	Put the breaker on.
	c) Pump doesn't work.	Replace the pump.
	d) Overvoltage or undervoltage	Check whether the power supply is within the specified range.
E1	Pump is blocked	Remove impurities
E2	Lacking phase	Replace the pump
E3	Overvoltage or undervoltage	Replace the pump
E4	Short circuit	Replace the pump

Note: When the pump is running, the display panel will go out after 10s no operating, and then press any button to display again.

Correct Disposal of this product

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

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