

Installation and Operating Instructions

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1.Important information

Please read before installing pump

- **BES Ltd will not be liable for damage if these instructions are not complied with in all respects**
- **When installing this pump it is the installer's responsibility to ensure compliance with local building regulations**
- **The pump must be installed by a competent person**
- **The installer must instruct the end user in the correct operation of the pump**
- **The electrical supply must be isolated prior to installation of the pump**
- **The pump must not be installed**
 - in a place subject to high humidity or near open sources of water
 - in poorly ventilated areas where condensation can occur as this may damage electrical components
 - outside or exposed to the elements
- **The pump must be installed with valves either side to facilitate isolation and/or replacement**
- **Failure to protect the system with the correct concentration of corrosion inhibitor will invalidate the warranty**
- **The pump should not be operated until full of water, any damage caused by dry running is not covered under the warranty.**
- **To avoid burns and scalding the central heating system must be switched off and allowed to cool prior to any servicing of the pump**
- **Where there is a risk of freezing the pump should be drained of water to avoid damage**
- **During long periods without use the pump should be electrically isolated and the isolation valves closed**
- **Damaged cables must be replaced by a competent person**
- **In the unlikely event of a pump malfunction contact a competent heating engineer**
- **In normal use the pump gets hot, so it should not be installed within the reach of small children**
- **This pump is not suitable for use with potable drinking water**

2. Overview

The CURA pump is designed to circulate hot water around a domestic heating system and is suitable for:

- Constant and variable flow
- Variable temperatures

The pump uses a permanent magnet motor and differential pressure controller that monitors and adjusts the pump performance to meet the system demands. The control panel allows the user to override the automatic settings to the desired performance levels **as required**.

The CURA pump offers:

- Easy installation and start up: the Auto setting allows the pump to be installed, bled and set to the desired performance level of the system without any adjustment by the installer
- Low power consumption: the pump complies with EC directive 641/2009
- Low noise
- **1 year warranty: see section 15**

3. Operating enviroment

The CURA pump is suitable for the following operating environment:

- Ambient temperature: 0°C to +40°C
- Maximum relative humidity: 95%
- Water temperature range: +2°C to +110°C
- Maximum pressure: 10 bar
- Protection rating: IP42

Use outside of these conditions may cause premature failure and will void the warranty

In order to prevent condensation forming within the control box the water temperature in the pump must always be higher than the ambient temperature in the vicinity of the pump, see page 17.

Minimum inlet pressures in relation to liquid temperature are listed below:

Water temp	<85°C	90°C	110°C
Inlet pressure	0.05 bar	0.3 bar	1 bar

The water within the system and the pump must be:

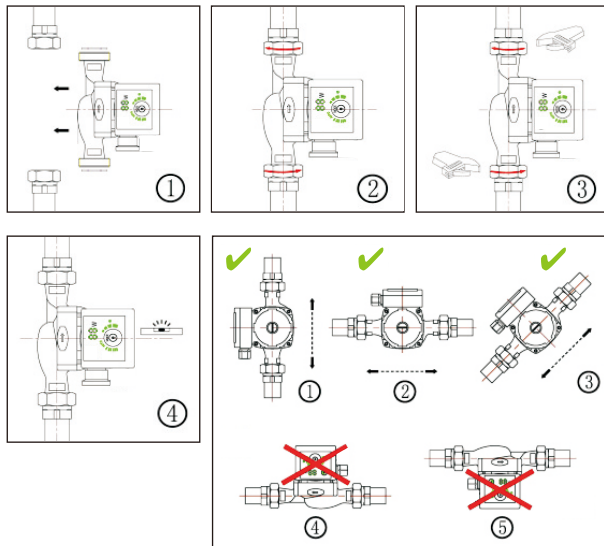
- Clean
- Non-corrosive
- Protected with a suitable corrosion inhibitor
- Non-viscous
- Free from solids and particles

The CURA pump is not suitable for use with flammable liquids such as oil and petrol. Use of this pump for viscous liquids will lead to high power consumption and reduced service life.

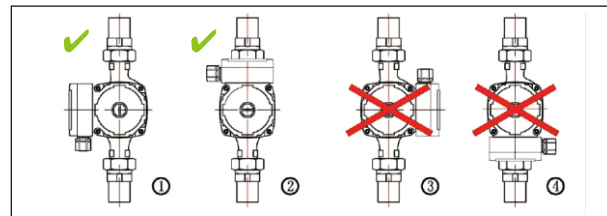
4. Installation

4.1 The pump shaft must be horizontal when installed as shown in the images below. Flow will be in the direction of the arrow shown on the pump body.

- Position the pump between 2 **isolation** valves and assemble with gaskets
- Hand tighten the union nuts ensuring that the pump is in the correct orientation for the shaft, control panel and direction of flow. Realign if required. The control panel can be adjusted as described in section 4.2
- Tighten the union nuts ensuring a watertight seal has been made with the gaskets provided
- Connect the electrical supply as described in section 5



4.2 The control panel can be oriented in 2 of the 4 positions shown below.



The panel can be adjusted to suit the requirement of the installation.

The control panel can be rotated through 90° as follows:

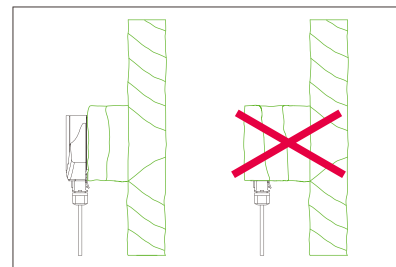
- If already installed:
 - Isolate the electrical supply and allow the pump and system to cool
 - **Close the pump isolation valves**
 - Disconnect the cable from the control panel

Then follow instructions below:

- Loosen and remove the 4 hexagonal screws attaching the pump body to its base.
- **WARNING- there will be some water leakage if the pump has been used**
- Rotate the motor and control panel to the required position
- Replace the 4 hexagonal screws and tighten

In order to reduce heat loss through the pump it can be insulated as shown in the diagram below.

WARNING- do not cover the control panel or electrical connection.



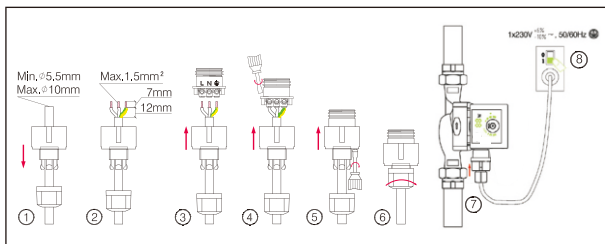
5. Electrical connection

WARNING:

The pump must be connected to earth

The pump must be connected to an external mains switch with a minimum contact gap of 3mm in all poles

- Electrical connection must be carried out only by a competent person and the pump must be fitted in compliance with current electrical regulations
- Supply voltage and frequency must match those shown on the face plate
- The pump must be connected to the electrical supply using the connector provided
- The control panel light will indicate when connected to the power supply

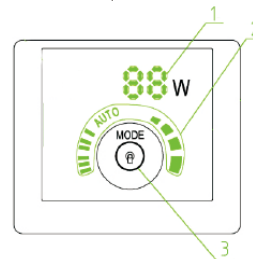


Connect the pump to the electrical supply in the **order shown above**

Note: Open the isolation valves to allow water into the pump before switching on the electrical supply. Failure to do so may damage the pump and invalidate the warranty

6. Control panel

The control panel and functions are as follows.



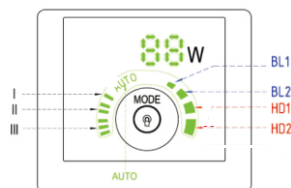
Label	Description
1	Power consumption (W)
2	Pump mode indicator
3	Pump mode button

1. Power consumption: When the pump is operating the power being consumed by the pump will be displayed. The power consumption will vary depending on the pump setting and the demand of the system. If the display shows "E" refer to the troubleshooting guide on page 18.

2. Pump mode: Press the mode button to advance the setting one step. Press eight times (with a 2 second gap) to cycle the pump through the range of settings.

3. Pump settings: There are 8 settings as described below which can be selected by sequentially pressing the pump mode button.

CURA GPA-II



Label	Description
III	Highest constant speed curve
II	Medium constant speed curve
I	Lowest constant speed curve
Auto	Fully automatic for optimum efficiency
BL1	Lowest proportional pressure curve
BL2	Highest proportional pressure curve
HD1	Lowest constant pressure curve
HD2	Highest constant pressure curve

7. Pump settings

The pump should be set according to the type of heating system.

System type	Pump settings	
	Recommended	Alternative
Underfloor	Auto	HD1 / HD2
Two pipe	Auto	BL2
Single pipe	BL1	BL2

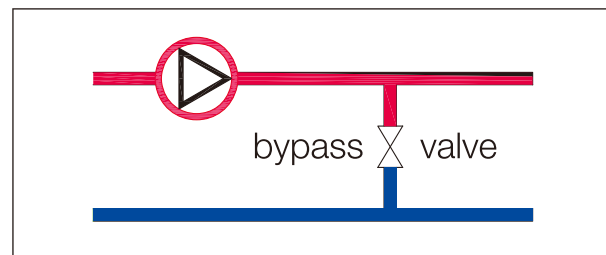
Auto mode adjusts the pump performance according to the heating system demand. It is recommended the pump is set to Auto when initially installed. If the desired performance is not achieved then manual adjustment to one of the other setting can be made

The power requirements will be adjusted in relation to the heat demand from the system

- **Proportional Pressure Control:** In this mode the pressure difference across the pump is determined by the flow and is indicated by curves BL1 and BL2 in the Q/H diagram shown in section 10
- **Constant Pressure Control:** In this mode the pressure difference across the pump is constant regardless of the flow conditions within the system and is indicated by HD1 and HD2 in the Q/H diagram shown in section 10

8. Use with a bypass valve

Installation and application: The pump should be installed according to the diagram below.



If all the thermostatic radiator valves in the system are closed, a bypass valve allows water to continually circulate eliminating unnecessary heat and pressure build up.

If the system has a manual bypass valve (non TRV radiator) select speed I and adjust the flow rate of the system to the minimum specified by the boiler manufacturer's specifications. Once the flow is adjusted set the pump to AUTO.

For systems with a temperature controlled bypass valve select and adjust the flow rate of the system to the minimum specified by the boiler manufacturer. Once the flow is adjusted, set the pump to BL1 or BL2 to suit the system demand.

9. Commissioning

The liquid in the heating system must be clean, it is recommended that a CURA magnetic filter be fitted to ensure that the system remains clear of potentially damaging contaminants and debris.

Before operating the pump:

- **Open both isolation valves and prime the system with water**
- Bleed the system (not the pump) to ensure no air is trapped
- Pressurise the system to its lowest recommended level

Bleeding the pump: The pump has an automatic venting function however manual bleeding can reduce the system commissioning time.

To auto vent the pump

- Connect the pump to the electrical supply and switch on
- The pump will now automatically vent any air within it. Whilst doing this the pump may appear as though it is not operating properly. However normal operation will begin once the air has been vented. This can take up to 30 minutes
- **To manually vent the pump set the pump speed to III and vent through the bleed screw on the front of the pump**
- Once the air has been removed the pump display will begin to show that power is being used and the pump should be set up as in section 7

NOTE: Do not run the pump without water in the system as this will lead to premature failure and invalidate the warranty.

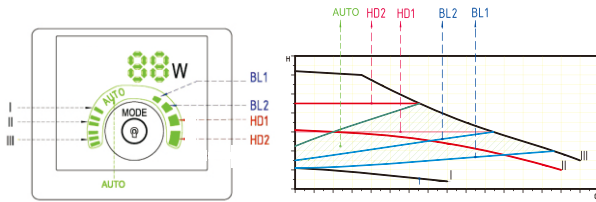
NOTE: Do not rely on the pump to vent air from the system once commissioned. It is recommended that an automatic air vent is installed to maintain an air free system.

10. Settings and pump performance

The table below describes each of the pump settings and its function.

Setting	Performance curve	Function
Auto	Maximum rate to minimum rate	Adjusts the pump performance across the standard range to maintain the optimum setting for the system demand
BL1	Lowest proportional pressure curve	The power of the pump will move up or down on the lowest proportional-pressure curve, depending on the heat demand in the system The head(pressure) is reduced at falling heat demand and increased at rising heat demand
BL2	Highest proportional pressure curve	The power of the pump will move up or down on the highest proportional-pressure curve, depending on the heat demand in the system The head(pressure) is reduced at falling heat demand and increased at rising heat demand
HD1	Minimum constant pressure curve	The power of the pump will move out or in on the lowest proportional-pressure curve, depending on the heat demand in the system The head(pressure) is kept constant, irrespective of the heat demand
HD2	Maximum constant pressure curve	The power of the pump will move out or in on the highest proportional-pressure curve, depending on the heat demand in the system The head(pressure) is kept constant, irrespective of the heat demand
III	Speed III	The pump will operate on the maximum curve in all conditions.
II	Speed II	The pump will operate on the medium curve in all conditions.
I	Speed I	The pump will operate on the minimum curve in all conditions.

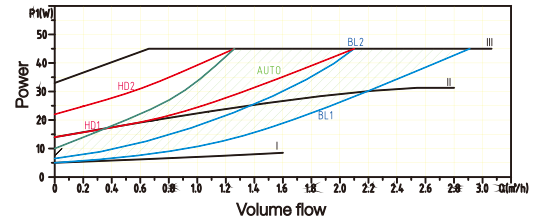
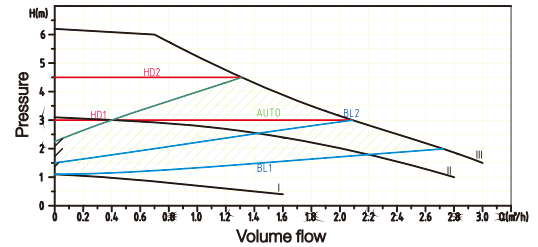
For each setting the pump has its own performance (Q/H) curve, but in Auto mode the pump can adjust to anywhere in its operating range within these curves. Input power curve P1 covers every Q/H curve, this is the power consumption in any given condition within the curves. Power consumption is measured in Watts (W) and will be displayed on the pump control panel.



The pump curves relate to the following characteristics:

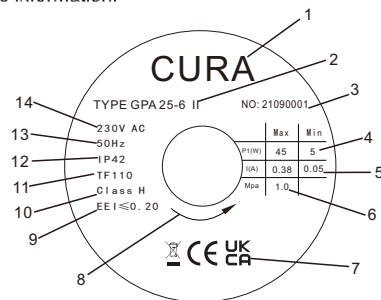
- Water with air fully vented from system
- Adaptive density (ρ) is 983.2 kg/m^3 with a liquid temperature of $+60^\circ\text{C}$
- All curves show average values and variation between pumps may exist. Tests should be conducted on individual pumps if a specific curve is required
- Adaptive kinematic viscosity is $0.474 \text{ mm}^2/\text{s}$ (0.474 cSt)

Performance curve for CURA GPA-II Pump



11. Features

Name plate information.

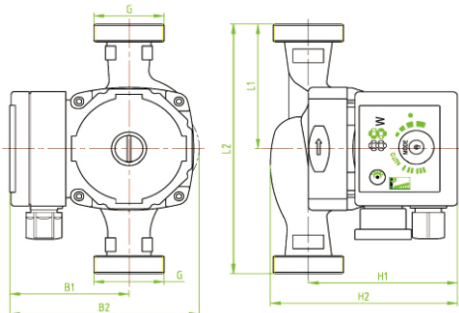


No.	Description	No.	Description
1	Product name	8	Direction of rotation
2	Pump model	9	Energy efficiency index
3	Serial number	10	Insulation class
4	Power (Watts) Minimum / Maximum	11	Maximum temperature
5	Current(Amps)	12	Protection rating
6	Maximum system pressure (MPa)	13	Power supply frequency
7	Certifications	14	Power supply voltage

12. Technical specifications

Voltage	240V +6% / -10%, 50Hz, PE	
Protection	No external protection	
Protection rating	IP42	
Insulation class	H	
Air humidity	Max 95%	
System pressure	1.0 Mpa	
Inlet pressure	Liquid temp	Min pressure at Inlet
	Up to 85°C	0.005 MPa
	Up to 90°C	0.028 MPa
	Up to 110°C	0.100 MPa
EMC standard	EN61000-6-1 and EN61000-6-3	
Acoustic level	<43dB (A)	
Ambient temperature	0°C to 40°C	
Temperature rating	TF110	
Surface temperature	<125°C	
Liquid temperature	2°C to 110°C	
In order to prevent condensation inside the control box and stator it is recommended the water being pumped is always at a higher temperature than the ambient temperature.		
Ambient temperature (°C)	Minimum pumped temp (°C)	Maximum pumped temp (°C)
0	2	110
10	10	110
20	20	110
30	30	110
35	35	90
40	40	70

13. Dimensions (in millimetres)



Model	L1	L2	B1	B2	H1	H2	G
GPA25-6 II	65	130	82	130	103	130	1.1/2"

14. Troubleshooting

Ensure the electrical power is isolated before carrying out any repairs.

Problem	Control panel	Possible reason	Actions
not running	indicator is not lit	Blown fuse	Replace fuse
		Circuit breaker has been tripped	Reset circuit breaker
		Faulty pump	Replace pump
	Display shows "E"	Low voltage	Check supply voltage
Excessive noise in the system	Normal	Impeller is blocked	Clear impeller
		Air in the system	Bleed system
		Excessive flow rate	Lower inlet pressure
Noisy pump	Normal	Air in the pump	Bleed air from pump
		Low inlet pressure	Increase inlet pressure
Insufficient heat from the system	Normal	Pump setting is too low	Adjust pump setting

Error codes – appearing in place of power consumption output.

E0	over-voltage protection
E1	under-voltage protection
E2	over-current protection
E3	under-loading protection
E4	default phase protection
E5	blocked protection
E6	failed to start the pump

15. Warranty

The CURA pump is sold with a 1 year warranty effective from the date of purchase

This warranty covers failure due to manufacturing defects within its warranty period.

The warranty is valid on the assumption that:

- the product has been installed and used as specified in the **Installation and operation instructions**
- the installation complies with all local building regulations
- the installation was carried out by a competent and qualified person

The warranty is invalid if the pump:

- has not been installed by a competent person
- has been used other than for the purpose for which it was designed
- has not been used in accordance with the **Installation and operation instructions**
- has not been installed correctly in accordance with the **Installation, and operation instructions**
- has not been removed from the heating system in a workmanlike fashion
- has been damaged by outside interference e.g. physical damage or inappropriate dismantling
- has failed outside the warranty period specified

BES Ltd does not accept any liability for damage caused by a third party, nor will BES LTD be responsible for malfunction caused by inappropriate operating conditions or force majeure

BES Ltd reserves the right to reject any warranty claims not covered in this statement.