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Simple Installation Guide of a Grant AEROMA 3 R32

Installation and Setup
Monobloc system

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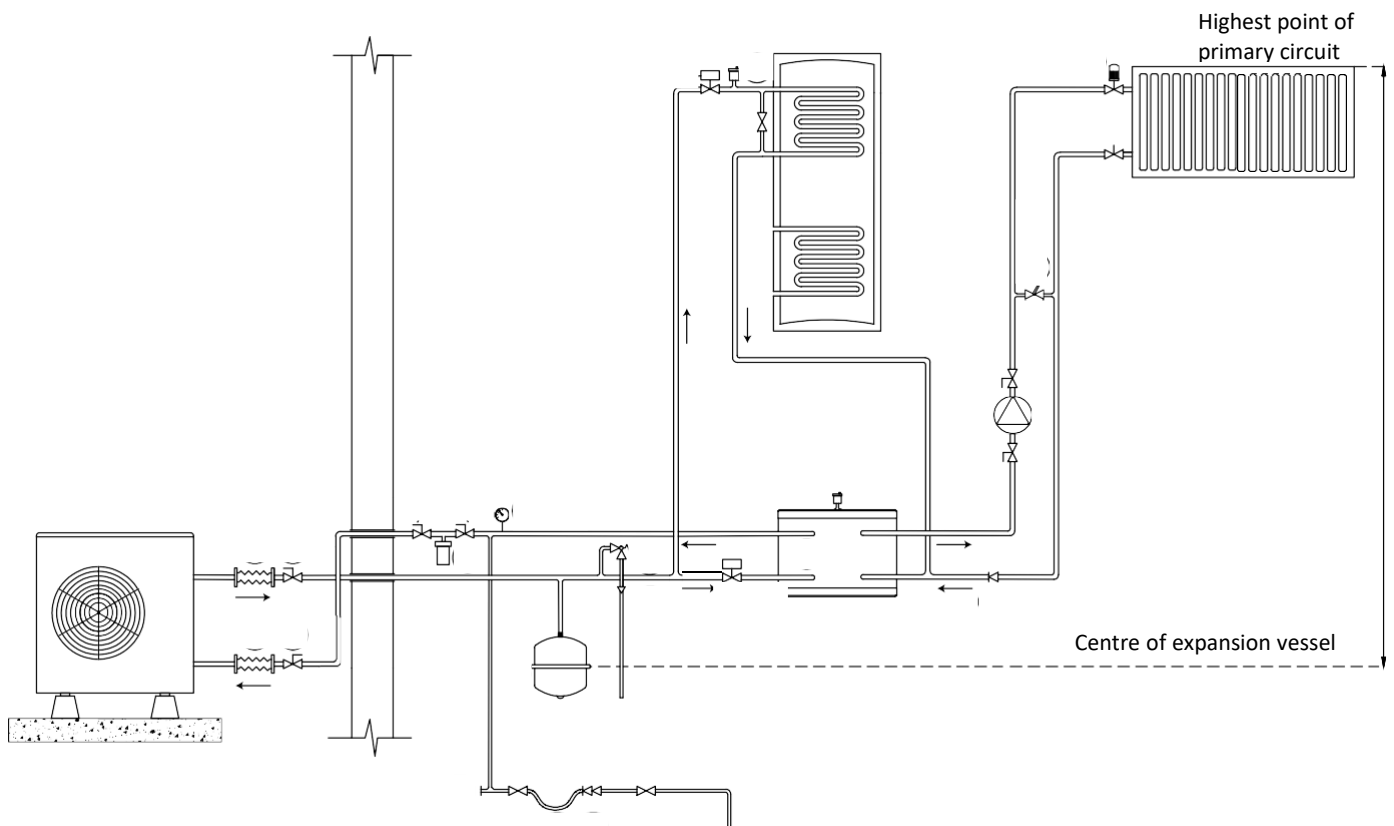
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This manual is designed to be a quick guide to the most common type of installation for a Grant AERONA 3 R32 Monobloc system.

This assumes heating via Buffer Tank, Grant also offer a option of a Lossloss Header/Volumiser (which has a volume of 11.5lt and includes a 3kw immersion heater to provide a supplementary heat), domestic hot water via a cylinder with sensor pocket and immersion heater, using 2 x 2port valves to control space heating and Hot water heating using the Grant Controller and third party controls for the end user.



In the above system the monobloc unit functions are controlled by the unit's own controller and this is for use by the technician. End user controls by Third Party.

The end user controls the heating demand and the hot water via the third-party controller.

The heat pump controls the domestic hot water temperature itself (including for an optional sterilization cycle) and is assisted by the immersion heater. 2 ports vales can be used as in a conventional S plan heating setup or using a drive open 3 port valve in a Y plan heating configuration.

The hot water temperature is control managed through the Grant controller. Hot water takes priority over heating. The EP001 Heat pump interface is used to take the wiring connections.

There is no electric heater inside the monobloc unit, however there is an additional booster heater available.

There is a flow sensor located within the unit.

A pump is installed within the Monobloc; however, a second pump will be required on downstream of the buffer to feed the heating circuits.

A strainer must be installed in the return pipework to the mono block. It is strongly recommended by Grant in addition to this, a Magnetic filter and Flow setter should also be installed. Grant recommends installation of one of their Mag one in line filters which also incorporates a gauss filter.

Warranty

Please check the following before commencing start-up of the unit, as these are important conditions of the Grant Warranty.

- A suitable filter arrangement has been installed. Grant recommends the use of their Mag one filter which also incorporates a 1200-micron filter.
- The system should be flushed, this is especially important if the system is an old gas or oil system. Flushing should be completed in accordance to BS7593.
- Grant recommends a suitable heat transfer is used to give a minimum frost protection of -9. In order to stop bacterial growth, it is also recommended to use a suitable Biocide if not included in the heat transfer solution.
- A 30lt volumiser or buffer is required for Grant Aerona 3 R32 heat pumps.
- The pipe work diameter should be no smaller than 28mm copper. If plastic pipe is used this should be bigger.
- The external mono bloc should be installed on a base suitable for withstanding the weight of the unit and should be level.
- There shall be a proper means of disposal of the condensate, this should be via a drain or soak away.
- The external mono bloc should be positioned so that there is good air flow around the unit. The minimum clearances are 100mm to the left, 600mm to the right, 300mm behind the unit and 600mm in front. We would recommend 2m in front.
- Antifreeze should be used in the system to give frost protection to minus 9 degrees and if it does not contain biocide, biocide should be added to protect against bacterial growth.

As part of the commissioning process, it is important that the correct flow rates are achieved for the output of the unit. Failure to do so, will result in poor performance and potential faults. The flow rates required are specified below.

Unit	Minimum Flow	Required flow rate @ 7A/Water 35	Required flow rate @ 7A/Water 55
HPD6R32	5lpm	20.22lpm	11.34lpm
HPID10R32	10lpm	32.16lpm	19.26lpm
HPID13R32	15lpm	40.68lpm	40.62lpm
HPID17R32	15lpm	50.88lpm	27.90lpm

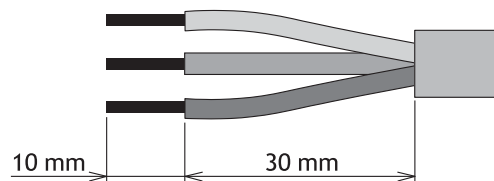
*The values above are taken from Grants Manual Sep 2020

Power Supply

The Mono block requires one Supply please find the details below:

Model	Power supply cable (mm ²)		Breaker capacity
	Maximum	Minimum	
HPID6R32	4.0	2.5	16A Class C
HPID10R32	4.0	2.5	20A Class C
HPID13R32	6.0	4.0	32A Class C
HPID17R32	6.0	4.0	32A Class C

***In the case of long cable runs, selection of correct cable must be done in accordance with BS 7671 (IET Wiring Regulations)**



In addition to the heat pump supply above 3 other additional supplies are required: One supply for the EP001 and another for the Immersion heater.

The EP001 requires a 5 amp supply.

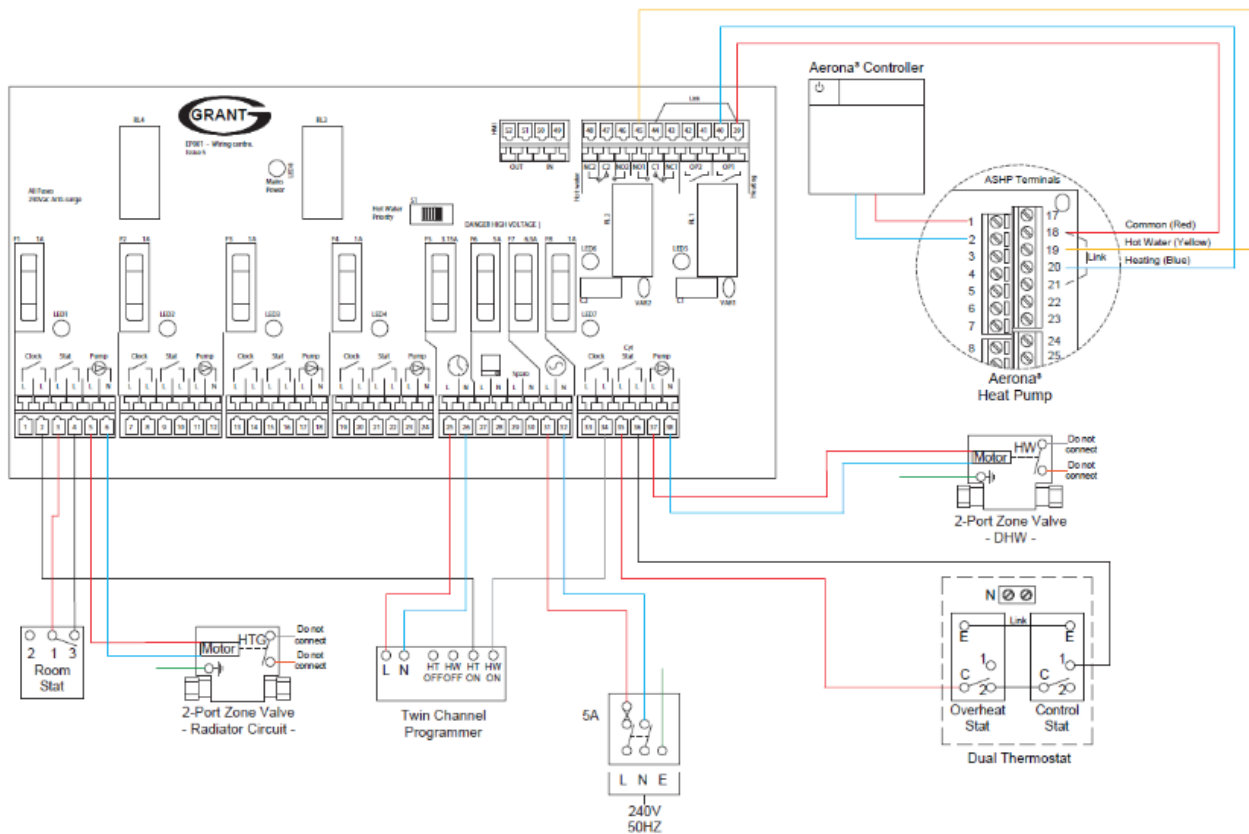
The Immersion heater requires a 13amp supply.

The additional pump requires a 3 amp supply

All supplies should be via a double switched isolator and the cables should be sized in accordance with BS7671.

Control Wiring

Below is a basic schematic show the wiring of the controls using a EP001 wiring Centre.



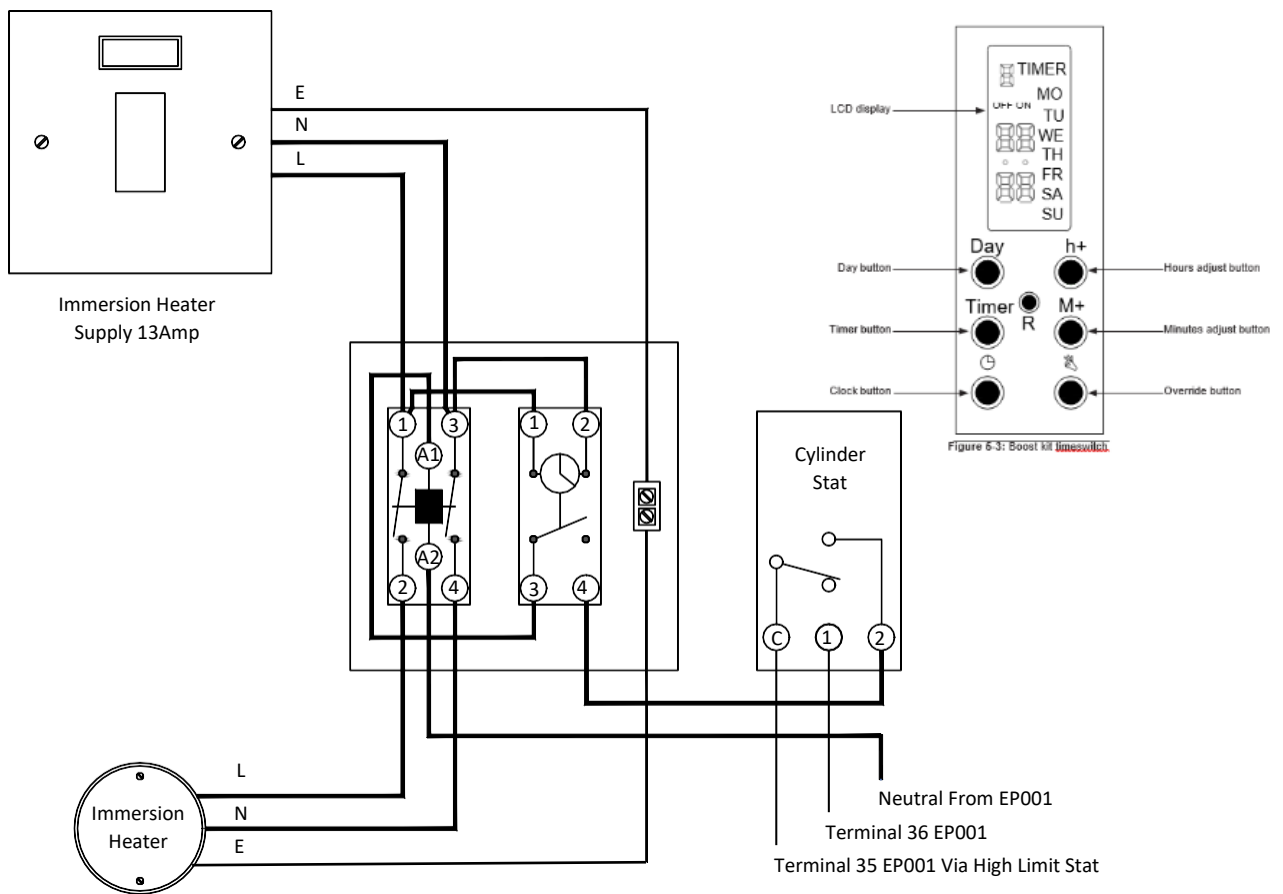
The EP001 requires its own 5A supply to provide power to the two 2 port valves and Third-party controls.

The Third-party controls connections to the heat pump are made via EP001 wiring centre on connections 3 and 4 for a room stat and 2 and 34 for a time clock, if a programable room stat with DHW control (NEST or HIVE) is used a link will be required between 3 and 4. The connections to the heat pump from the EP001 are via the volt free relays.

Boost DHW Function

The Automatic Booster Kit is an Accessory, which is available to boost the Hot water when the Heat pump has Satisfied the DHW to 50-55 Degrees, the booster then provides a boost to Satisfy the bacteria prevention cycle via the immersion stat via a simple time clock. This requires its own 13amp supply to the immersion heater.

Please find the wiring diagram below for integration with the EP001 wiring centre.

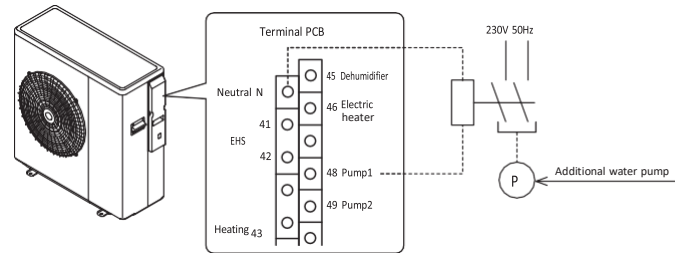


Conection of a Additional Down Stream Buffer Pump

When a additional water pump is connect down stream of the buffer this can be controlled by the heat pump via the terminal PCB connection Plug 48.

This must be done by via a relay and by a localised power supply. The board output is only rated at 1amp.

Please find the details below:



In order for the Above to work Parameters: 51 48, 42 20 must be set further details can be found below.

- We recommend all comunication cables are screened and power cables are kept separate.
- All supplies must go through local isolation switches.
- All senors used must be Grant Genuine Accessories.
- The immersion heater must be set higher than the heat pump we recommend 60-65 degrees
- The Booster Timer must be set to Maintain 60-65degrees for 1-2hr once a week, Beaware of scalding, we recommend this is performed outside of normal bathing times.
- All details should be confirmed via the Grant manuals
- All electrical works should be completed by a competent electrician.

Glycol Levels

Grant Recommend the use of a suitable glycol to protect against frost. They recommend a protection level of a minimum of -9 Degrees.

Please find below a chart for Calculating the Amount of Glycol required for the volume of the system.

	% Monoethylene glycol inhibitor	10%	20%	30%	40%
	Freezing temperature*	-4°C	-9°C	-15°C	-23°C
Correction factor	Capacity	0,996	0,991	0,983	0,974
	Power absorbed	0,990	0,978	0,964	1,008
	Pressure drop	1,003	1,010	1,020	1,033

* The temperature values are indicative. Always refer to the temperatures given for the specified product used.

If Ethylene Glycol is used in the system, the Anti-freeze function is not required and the Dip Switch (please see next section DIP switches) setting need to be altered and some parameters also should be modified.

This is done Via the Service Level Setting.

Please find below details on altering the parameters.

First Access the installer level:

1. Press and hold the menu (sun) and the - and + buttons together for 3 seconds to enter Installer Level.
2. “InSt” parameter number “00 00” and the parameter value “_ _” will be shown on the display. The first two digits of the parameter number will be blinking.

You now require to access Service Level:

1. Use the up and the down buttons to change the first two digits to 99 and then press the + button
2. The second two digits will then blink. Use the up and down buttons to change these two digits to 99 and then press the set button (tick to confirm)
3. The parameter value on the display will now be “0”
4. Use the up and the down button to change the parameter value to “738” and then press the Set (tick) button to confirm.

The controller is now in Service level. SErv will be displayed.

The parameter below should now be set to 0 value.

Level	Parameter		Function description	Display and input value				Remarks
	Group	Code		Default	Min.	Max.	Unit	
S	43	00	Frost protection on room temperature 0=disable <u>1=enable</u>	1	0	1	-	
S	43	10	Frost protection by outside temperature 0=disable <u>1=enable</u>	1	0	1	-	
S	43	20	Frost protection based on outgoing water temperature 0=disable <u>1=enable</u>	1	0	1	-	
S	43	30	DHW storage frost protection 0=disable <u>1=enable</u>	1	0	1	-	

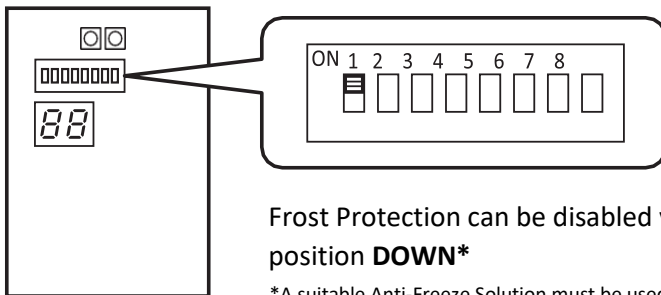
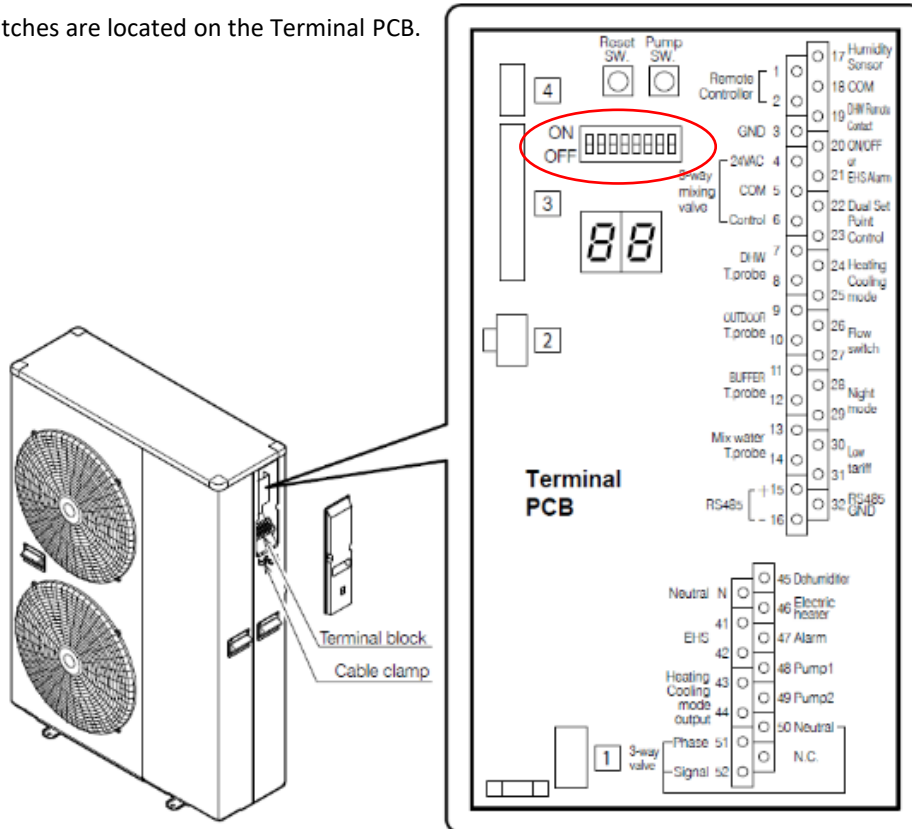
*Please note this should only be done when Frost protection is done via Glycol.

Dip Switch Setting

There are some Dip switched located in the external unit. These may require altering to enable and disable certain funtions on unit.

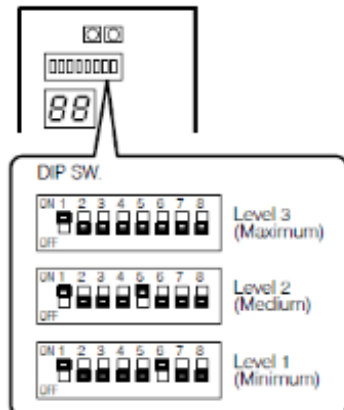
Modifications to the Dip switch setting should only be completed with the power off to the unit.

The DIP switches are located on the Terminal PCB.



Frost Protection can be disabled via setting DIP SW1 to the **OFF** position **DOWN***

*A suitable Anti-Freeze Solution must be used



The Output of the unit Circulation pump can be set Via DIP SW5-6

The Should be set to provide the correct flow rate through the unit:

- HPID6R32 – 11.34lpm*
- HPID10R32- 19.26lpm*
- HPID13R32 – 40.62lpm*
- HPID17R32 – 27.90lpm*

*Failure to achieve these figures may result in poor performance or reduced output

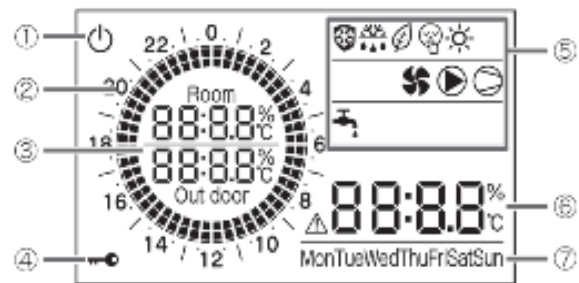
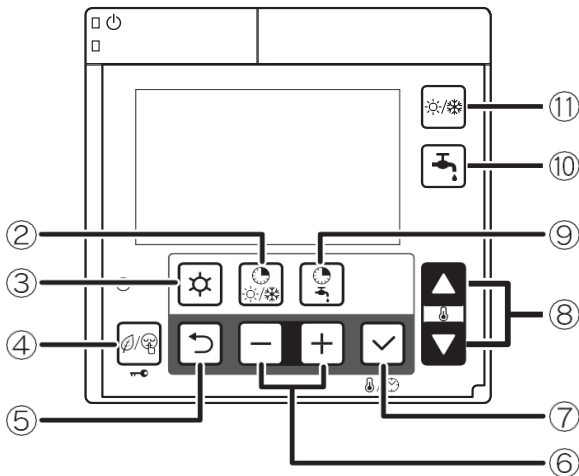
Prestart Checks

Please Check all the following before start the unit:

- The system has been connect hydralicly as per the schematic
- The system has been wired in accordance with the manufactures instructions.
- Check that a adquately sized Expansion vessel is fitted to the system and Safety relief valve.
- Make sure a Filtration system has been fitted, that meets Grants requirementt.
- Make sure the system has been flushed correctly.
- The system has been filled and vented and the correct Antifreeze protection level achieved.

Controls

Please find below an illustration of the Grant Aerona 3 controller:

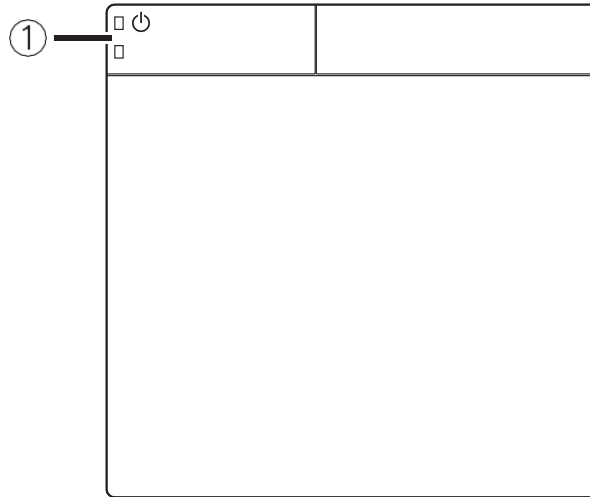


No.	Button name	Description
1	ON/OFF	Push and hold the button for 3 seconds to turn ON and turn OFF the heat pump. The green LED on the ON/OFF button is lit when the heat pump is ON. The red LED on the ON/OFF button blinks when an error alarm on the heat pump occurs.
2	N/A	This button is reserved for future products - pressing this button will result in an audible 'beep' indicating no function.
3	Menu	Programming: dedicated button for accessing the menu/parameters. Push and hold the Menu button for 3 seconds to access the user level.
4	Timer for low tariff/night mode (Key lock)	Refer to Sections 8.7 and 8.8 for details of low tariff/night mode operation. Push the Low tariff/Night button for 3 seconds to lock the button. When Key Lock is active, push 3 seconds to unlock. For low tariff/night mode function, an external timer must be connected.
5	Return	Return button in parameter programming mode. Push the Return button for 3 seconds to return to the normal display mode.
6	-, +	For parameter setting, select or return to the parameter group or code. Push the Menu- + button together for 3 seconds to access the installer level. During error code display, push - and + button together for 3 seconds to reset display.
7	Set (confirm)	Push the Set button -During the programming to save the setting. -Change display: Clock → Room set temperature Time setting can be set by remote controller only Push the Set button for 3 seconds to set the current time (day, hour, minutes). Refer to Section 9 (Commissioning)
8	Up, down	For parameter setting, change the parameter group and code numbers. Please note: this is not to be used for setting the room temperature control.
9	N/A	This button is reserved for future products - pressing this button will result in an audible 'beep' indicating no function.
10	N/A	This button is reserved for future products - pressing this button will result in an audible 'beep' indicating no function.
11	N/A	This button is reserved for future products - pressing this button will result in an audible 'beep' indicating no function.

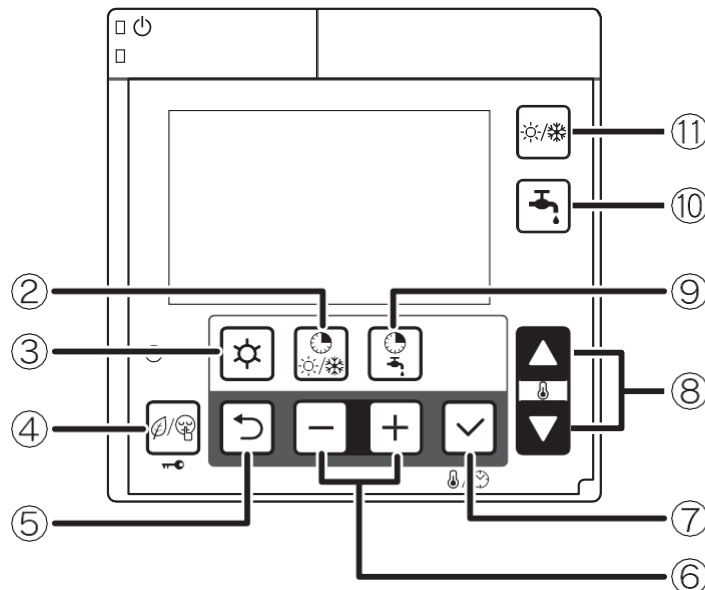
No.	Icons	Description
1		Power is ON, but ON/OFF switch is OFF (the heat pump is stopped)
2		Indicates current time of day.
3		Room air temperature, Outdoor temperature
4		Key lock is active
5		Frost protection is active
		Defrost cycle is active
		Low tariff mode is enabled For low tariff mode, an external timer must be connected. Refer to Section 6.
		Night mode is enabled For night mode, an external timer must be connected. Refer to Section 6.
		When this symbol is lit, heating mode is enabled. When this symbol is flashing, the heat pump is in heating mode, however the heating is stopped for the production of DHW which has priority
		Heat pump fan is active
5		System pump is active
		Compressor active Flashing: compressor delay
		Indicates DHW demand demand
6		Display alarm icon, and indicate error code Clock, Parameters value
7		Day of the Week

Commissioning

1. Press the On/Off Button Top Left Corner for 3 seconds (1)



2. The Green Led Will Light to indicate the system is ON.



3. The Time and Day can now be set by hold the Set button (7) on the controller for 3 seconds.
4. The Day will be blinking use the + and - buttons to select the day and confirm with Set button (7) the day will stop blinking and the time will start
5. Use the + and - button to select the correct time and confirm once again with the set button (7)

Parameter Setting

The controller Parameters must be programmed in order for the heat pump to operate correctly. Below you will find the details for programming the parameters for the system schematic on page 1.

Enter the Install level

1. With the controller powered on Press and Hold the menu (sun) and the - and + buttons together for 3 seconds to enter Installer Level.
2. “InSt” will be displayed and the parameter number “00 00” and the parameter value “_ _” will be shown on the display. The first two digits of the parameter number will be blinking
3. Use the up and down keys to select the correct group ie 21 00, then press the plus button.
4. Use the up and down keys again to select to correct code ie 21 04, then press set button (tick) and the Parameter value will blink in the bottom right.
5. Use the up and down to alter the Parameter value and confirm by press the set button (tick)

We recommend the following Values are set in the parameters for the system detailed below.

DHW + Heating Via Buffer Tank, pump Down stream of buffer controlled via heat pump.

Level	Parameter		Function Discription	Default	Recommend
	Group	Code			
I	21	02	Maximum outgoing water temp in Heating mode	45	55 Rads 45 UFH
I	21	04	Minimum outside temp Corresponding to Max Water Out temp	-4	-3
I	42	20	Type of operation of additional water pump	0	2
I	51	84	Terminal 48	0	1

*If the system contains Glycol please follow the Previous instructions on Disabling the frost protection in the Service menus

The Parameters Can all be reset by completing a Factory Reset.

1. Enter the install level as above.
2. Hold the Low Tariff/night mode buttons for 10 seconds all parameters have now been set to their default values.
3. Press and hold the menu, + and - button simultaneously for 3 seconds of wait 10 min, to return to normal operation

Errors

Error codes can be Reset two ways:

Pressing the SW Reset button of the terminal PCB or Pressing – and + on the Controller for 3 sec together.

Below is a List of error codes for the Aerona 3 ASHP

Error code	Error	Method of check	Troubleshooting	Error reset	
-	-	Power supply	Check the power supply	Confirm the power supply	-
		Fuse CF1 HPID6R32: 250V 15A HPID10R32: 250V 25A HPID17R32: 250V 30A	Check the electric continuity of Fuse CF1 by tester	If CF1 is blown, Main PCB should be replaced	
		Fuse CF3 (250V 3A)	Check the electric continuity of Fuse CF3 by tester	If CF3 is blown, Main PCB should be replaced	
		Fuse CF4 HPID6R32: 250V3A HPID10R32: 250V 3A	Check the electric continuity of Fuse CF4 by tester	If CF4 is blown, Main PCB should be replaced	
		Main PCB	Other than described above	Main PCB should be replaced	
A0	DC voltage error	Fan motor	Operate without lead wire for Fan motor Check the electric continuity of Fuse by tester	If the same error code appears again, Main PCB or Pump should be replaced If other error codes appear, Fan motor should be replaced	Power OFF
		Fuse CF6 HPID17R32: 250V 3A		If CF6 is blown, it should be replaced	
		Fuse CF7 HPID10R32: 250V 3A HPID17R32: 250V 3A		If CF7 is blown, it should be replaced	
		Pump	Operate without lead wire for Pump	If the same error code appears again, Main PCB or Fan motor should be replaced If other error codes appear, Pump should be replaced	
		Reactor	Check the resistance by tester (0.1Ω at 20°C)	If the reactor is faulty, it should be replaced.	
		Main PCB	Check the voltage of Fan motor by tester Check the voltage of Pump by tester	If the voltage is abnormal, PCB (Main) should be replaced	
		Power supply	Check the power supply	Confirm the power supply	
A1	Discharge temperature error	Sensor, Temp. Discharge	Check the resistance by tester	If the sensor is faulty, it should be replaced	Auto
		Gas leakage	Check the service valve and refrigerant circuit (pipe)	Collect refrigerant once, then recharge with prescribed mass	
A2	Protective action against excess	Unreasonable operation under/ overload	Check the place of installation (blockage of air inlet & outlet) Check the excess gas	Ensure the installation position to avoid blockage of air inlet & outlet If excess gas is observed, collect all refrigerant once, then recharge with prescribed mass	Manual
		Drop of power voltage	Check the power voltage (230V)	Confirm the power supply voltage (230V)	
	Current DC current detection	Main PCB	Operate without the junction connector of Compressor lead wire	If the same error code appears again, Main PCB should be replaced	
		Momentary stop of power (In case of lightning)	-	Restart operation	
		Compressor	Other than described above	Compressor should be replaced	
A3	CT disconnection	Main PCB	-	Main PCB should be replaced	
				Ensure the installation position to avoid blockage of air inlet & outlet	

A4	Protective action against excess	Unreasonable operation under/ overload	Check the place of installation (blockage of air inlet & outlet) Check the excess gas	If excess gas is observed, collect all refrigerant once, then recharge with prescribed mass	Manual
	Current AC current detection	Drop of power voltage	Check the power voltage (230V)	Confirm the power supply voltage (230V)	
		Momentary stop of power (In case of lightning)	-	-	

Error code	Error	Method of check	Troubleshooting	Error reset	
C8	Main PCB error	Main PCB	Turn off the power supply, wait for about 3 minutes, then power up again	If the same error code appears, Main PCB should be replaced	Power OFF
			Check loose cable connections and contacts of reactor		
E4	Outgoing water temp. sensor error	Sensor, Temp. Outgoing water	Check the resistance by tester	If the sensor is faulty, it should be replaced	Auto
E5	Return water temp. sensor error	Sensor, Temp. Return water	Check the resistance by tester	If the sensor is faulty, it should be replaced	
FU	High pressure switch is operating	Outside air recirculation	Check temperature difference of Outgoing/Return water (see Monitor display function) Large difference means flow rate is too low	Make sure the position doesn't block the air inlet and outlet	Manual
		Clogged water circuit		Remove the blockage, then restart operation	
P1	Pump error	Pump (*2)	Check the voltage of Pump	If the voltage is normal, Pump should be replaced	Manual
		Main PCB		If the voltage is abnormal, Main PCB should be replaced	
		Clogged the water Pump and/or water circuit	Check the pump and water circuit	Remove the blockage, then restart operation	
P3	High pressure switch error (HPID17R32)	High pressure switch	Check loose cable connections and contacts	If the same error code appears, high pressure switch should be replaced	Power OFF
U1	Compressor overheat protection relay operation (HPID17R32)	Compressor overheat protection relay	Check the resistance by tester	If the compressor overheat protection relay is blown, it should be replaced	Manual
		Gas leakage	Check the service valve and refrigerant circuit (pipe)	Correct refrigerant once, then recharge with prescribed mass	
Water not getting warm		Fuse CF2 0639U : 250V T3.15A 1039U : 250V T3.15A 1639U : 250V T5A	Check the electric continuity of Fuse CF1 by tester	If CF2 is blown, it should be replaced and check the resistance of 4way valve and the resistance of Defrost heater by tester	-
		4way valve	Check the resistance of 4way valve by tester	If 4way valve is blown, it should be replaced	
		Defrost heater	Check the resistance of Defrost heater by tester	If Defrost heater is blown, it should be replaced	
		Short cycle (insufficient air circulation)	Check the blockage of air inlet & outlet	Ensure the installation position to avoid blockage of air inlet & outlet	
		Sensor, Temp. Outgoing water and Return water	Check the resistance by tester	If any of these sensors is faulty, it should be replaced	
		Gas leakage	Check the service valve and refrigerant circuit (pipe)	After fixing the leakage point, collect the refrigerant once, then recharge with prescribed mass	
		Clogged water circuit	Check temperature difference of Outgoing/Return water (see Monitor display function) Large difference means flow rate is too low	Remove the blockage, then restart operation	

Error code	Error		Method of check	Troubleshooting	Error reset
L0	EEPROM error	PCB(Controller) and PCB(EEPROM)	-	PCB(Controller) and PCB(EEPROM) should be replaced	Power OFF
L1	DHW temperature sensor error	Sensor, temperature DHW tank	Check the resistance by tester	If the sensor is faulty, it should be replaced	Auto
L2	Outdoor temperature sensor error	Sensor, temperature outdoor	Check the resistance by tester	If the sensor is faulty, it should be replaced	
L3	Thermal store temperature sensor error	Sensor, temperature thermal store	Check the resistance by tester	If the sensor is faulty, it should be replaced	
L4	Mix water temperature sensor error	Sensor, temperature Mix water	Check the resistance by tester	If the sensor is faulty, it should be replaced	
L5	Humidity sensor error	Sensor, Humidity	Check the resistance by tester	If the sensor is faulty, it should be replaced	
740	Remote controller communication error	Incorrect remote controller wiring or DIP SW setting	Check loose cable connections and contacts Check DIP SW setting	After having corrected the wiring and DIP SW setting, restart operation	
		Loose interface connection cable or contacts	Rear side of remote controller		
		Remote controller	Other than described above	Remote controller should be replaced	
		Controller PCB	Other than described above	Controller PCB should be replaced	
E8	Remote controller communication error	Incorrect remote controller wiring Loose interface connection cable or contacts	Check loose cable connections and contacts	After having corrected the wiring, restart operation	
		Controller PCB	Other than described above	Controller PCB should be replaced	
F5	Main PCB communication error	Incorrect main PCB wiring Loose interface connection cable or contacts	Check loose cable connections and contacts	After having corrected the wiring, restart operation	
		Main PCB	Other than described above	Main PCB should be replaced	
		Controller PCB	Other than described above	Controller PCB should be replaced	
Terminal PCB cannot be operated Terminal PCB does not display anything		Lead wire of Terminal PCB	Check lead wires are connected to the connectors properly	Connect the connectors to both TerminalPCB and Controller PCB steadily	
			Ensure that there is no disconnection for the lead wires	Lead wires should be replaced	
		Terminal PCB	Other than described above	Terminal PCB should be replaced	
		Controller PCB	Other than described above	Controller PCB should be replaced	

MCS Certified Product

Grant Aeron3 HPID6 R32 - BBA 0009/15
 Grant Aeron3 HPID10 R32 - BBA 0009/16
 Grant Aeron3 HPID13 R32 - BBA 0009/18
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