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Samsung Gen 6 R32 Typical Installation with Third Party controls

Installation and Setup

Monobloc system

Rev 1.4 14th July 23



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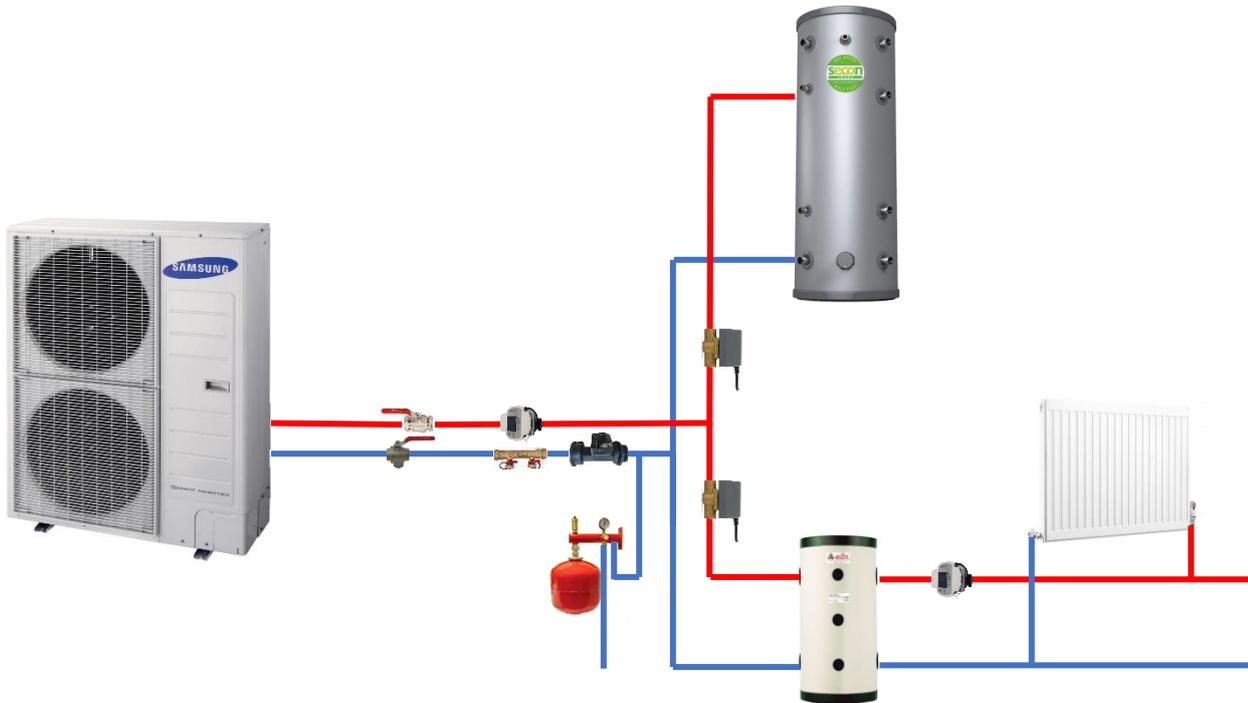
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This manual is designed to be a quick guide to the most common type of installation for the Samsung Gen 6 R32 Monobloc system.

This assumes heating via buffer, domestic hot water via a cylinder with sensor pocket and immersion heater, 1 Heating Circuits controlled via third party programmable temperature controller.



In the above system the monobloc unit functions are controlled by the units own external controller (MIM) and this is only used by the technician not the end user.

The end user controls the heating demand using a wired or wireless programable room thermostats and can use this to set the room temperature at different times of the day and time control.

The heat pump controls the domestic hot water temperature itself (including for an optional sterilization cycle) using the 2 port valve and this is assisted by the immersion heater.

The hot water control is managed through the Samsung controller (MIM). Hot water takes priority over heating above 0°C.

There is no electric heater inside the monobloc unit.

The flow sensor must be installed as per the information in this Guide

A pump must be installed on the flow and the return to the heat pump

A magnetic filter should be fitted in the return pipework and a pressure gauge in the flow.

Warranty

Please check the following before commencing start-up as they are important conditions of the Samsung warranty.

- A magnetic filter must be installed in the return pipe as close as possible to the system inlet. Do not switch the system on without this.
- Power must be supplied to the unit for at least 8 hours before operation in order to heat the compressor sufficiently for first use. Do not start the compressor up from cold or expensive failure may result.
- A buffer tank or low loss header should be used if required to ensure a minimum primary water volume of 30lt is obtained. If using a low loss header then a volumizing tank is probably required.
- The pipe diameter used must be no smaller than 28mm copper (larger if plastic). Contact Secon for advice if the pipe length exceeds 10 meters or you are using plastic pipe.
- Freeze protection solutions must use propylene glycol with a toxicity rating of Class 1 and pre mixed before introduction and of the correct strength for the system. This should be checked every year.
- The water quality should be tested against Samsung's Requirements

Part of the start-up process involves checking the water flow rate. In order for the unit to operate at all then an absolute minimum flow rates must be met, but for correct operation as designed then a water flow rate below must be observed below.

Model	Min Flow Rate to Operate	Recommended Flow rate	Maximum Flow Rate	Minimum Water Content
HHSM-G00005-1	7 lpm*	14 lpm	48 lpm	50lt
HHSM-G00008-1	7 lpm*	26 lpm	48 lpm	50lt
HHSM-G00012-1	12 lpm*	35 lpm	58 lpm	50lt
HHSM-G00016-1	12 lpm*	46 lpm	58 lpm	50lt

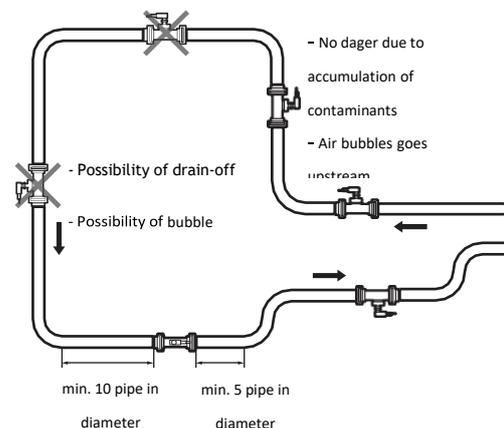
*If the Minimum Flow rate is only achieved the unit will not operate at full output

A commissioning sheet is available for download on the Secon renewable web site www.seconrenewables.com and this should be filled in and returned to Samsung within 28 days of commissioning. Also, the unit should be subject to an annual service by the installing contractor or another authorized service company to meet the warranty conditions.

A flow Sensor should be installed and can be mounted within 2m of the control unit.

The sensor should be mounted on straight length of pipe with 10x the pipe diameter up stream of the sensor and 5x the pipe diameter down stream.

The sensor plugs directly to the MIM into CSN 057



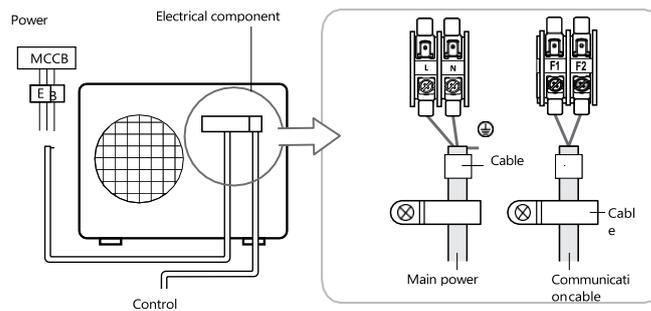
Power Supply

The MonoBlock units require a single power supply.

The power supplies are –

Model	MCB Size	Min Cable Size
HHSM-G600005-1	16a	4mm ² *
HHSM-G600008-1	22a	4mm ² *
HHSM-G600012-1	28a	6mm ² *
HHSM-G600016-1	32a	6mm ² *

*All Cable and Breaker sizes should be checked prior to Installation by a NICEIC accredited electrician.



*Communication Cable and Electrical supply should be kept separate (50mm or more)
The communication cable should be 0.75mm 2 core screened cable.

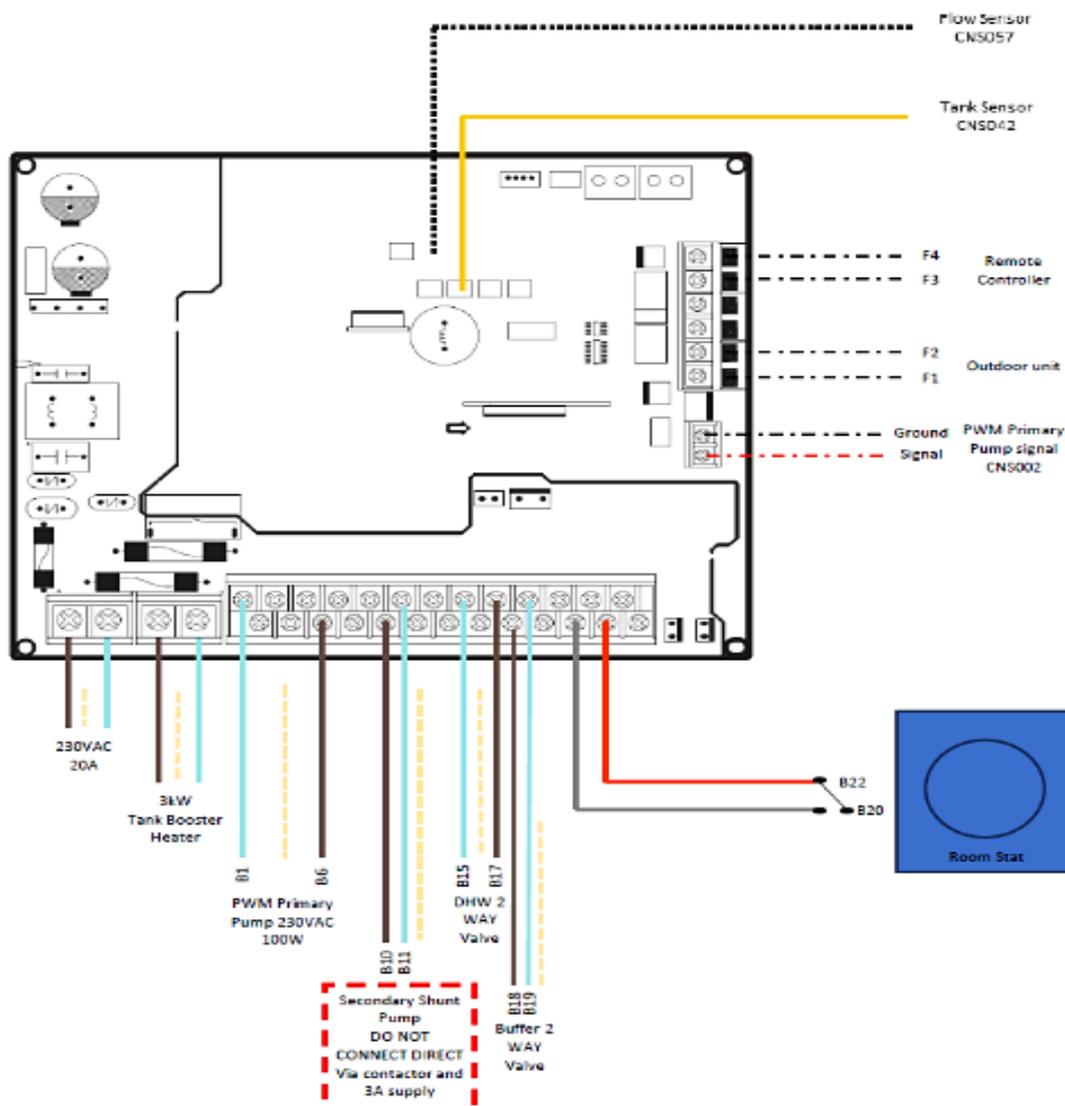
The Internal MIM unit Requires a 20Amp Supply and a suitably sized cable 4mm²*

*All Cable and Breaker sizes should be checked prior to Installation by a NICEIC

Control Wiring

This shows a basic Heating and Domestic hot water system as shown on the first page.

Connections are made into the terminal blocks on the internal MIM wiring center.



- Be sure to run the Communication cable separately to all of the other cables to avoid electrical interference with the control circuit. This Communication Cable should also be screened.
- We recommend taking the immersion heater and the heating pump wiring through local fused switches mounted next to each (Pump—3A and Heater 16A)
- The tank hot water sensor is a Samsung specific part and not a generic item.
- Please confirm all details with the relevant Samsung installation manuals.
- All electrical wiring must be carried out by a competent electrician in accordance with local and national regulations.
- Make sure the immersion heater thermostat is set to maximum

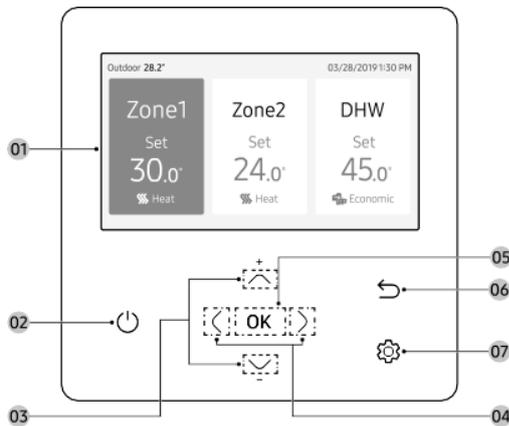
Pre-Start Checks

Please Check the following items before starting and powering up the unit.

- Ensure that both the internal and external units are plumbed up currently and wired correctly.
- The system should be fully flushed in both directions at 110% of the systems required flow rate.
- A suitable strainer must be fitted to protect the outside unit this should be check post flushing of the system, we also recommend a external magnetic filter.
- Power the unit up at least 8 hr before to allow the sufficient power to the compressor heater.
- Pre mixed glycol should be added to the system, DO NOT add neat glycol as this will cause circulation issues.
- Make sure the system is vented of air and all isolation valves are open.
- Make sure that a correctly sized expansion vessel and safety valve are installed to the system.

Starting the unit for first time

1. Turn on the power to internal MIM unit first, then turn on the power to the external unit.
2. The outdoor unit will start flashing and the internal controller will flash (scanning) while connecting the indoor unit to outdoor unit.
3. Once scanning disappears from the screen the system is ready to test.



Location	Function
1	Operation status display - Displays the operation/ function settings and statuses.
2	Operation On/Off button (LED display) - Turns the Airtro Water Heat Pump power On/Off
3	Up/Down button - Moves between items vertically or changes the set temperature.
4	Left/Right button - Moves between items horizontally or changes the item value.
5	OK button - Saves your new settings.
6	Save & Return button - Saves your new settings and returns to the previous step.
7	Option button - Selects the detailed setting function.

4. Access service mode by pushing and holding the up and down arrow for 10 seconds.
5. Enter password 0202
6. And push ok the unit is now in service mode.
7. Select Self-Test mode
8. Scroll down and select water pump ON, allow 15min for the system to circulate, bleeding the system at the same time whilst checking the pressure whilst doing so.

9. Return Back to the Service Menu
10. Select Field Setting Value
11. Using the Key Pad the Follow Values need to be set.

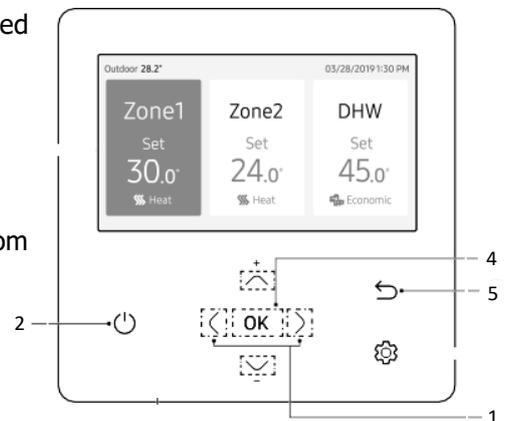
Field Setting	Set Value	Description
1051	50	Maximum DHW Tank Temperature
20-11	-3	High Ambient Temp Setting for Optimisation
20-12	+16	Low Ambient Temp Setting for Optimization
20-21	45	High flow temperature for heating circuit 1 at set value of 20-11. This should be set to the value to mirror the designed flow temp at the external design temp.
20-22	30	Low set Flow temp at 20-12 for zone 1
20-91	1	External run input for Zone 1 Heating (Third Party Controls)
30-11	1	This Tell the system there is a DHW cylinder connected
30-21	50	Heat Pump Maximum Flow Temp
30-25	200lt – 50min 300lt – 90min	Maximum cylinder Heating time from heat pump, before switching to heating
30-31	1	Use Hysteresis Thermo On/Off
30-32	200lt – 50min 300lt – 90min	Maximum cylinder heating time from heat pump, before switching on the immersion heater
30-41	1	Use Hysteresis Thermo On/Off
30-42	S (Sunday)	Legionella Function Day
30-43	1am	Legionella Function Active at this Time
30-44	60	Legionella Rises water temp to this
30-83	3kw	Booster Heater Capacity

12. Once FSV are set press the return key to return to the main menu (Front Screen).

Setting The Heating to On

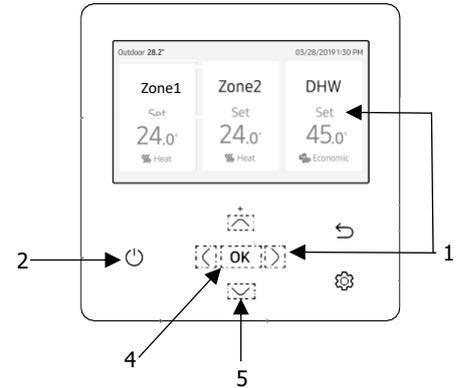
1. Using the Left and Right arrow highlight the zone required
2. Push the Power button to enable.
3. Screen Will display 0.0
4. Push ok and the Flow Temps can be seen
5. Use the return key to exit.

*0.0 must be on for the heat pump to detect a run signal from
From the System



Setting The DHW to On

1. Using the Left and Right arrow highlight the Domestic Hot Water.
2. Push the Power button to enable.
3. DHW is Displayed.
4. To Set the DHW temp push ok whilst DHW is highlighted.
5. Use the up and down to set the value.
6. Push the ok button to set mode, this should be Standard.
7. Use the up and down Keys select standard and push OK.
8. Use the return key to exit.



TroubleShooting

Error Code	Meaning	Troubleshooting
E177	Emergency stop	Indoor unit (\$POUSPM kit) orders emergency stop. Check the indoor unit (\$POUSPM kit)
E201	Control kit quantity is mismatched.	Control kit quantity must be matched with outdoor unit 1 by 1. Check the \$POUSPM kit quantity. It must be 1EA.
E403	Detection of outdoor freezing when compressor stops.	Outdoor unit (condenser) froze. Check condenser.
E404	Protection of outdoor overload when compressor stops.	Compressor is overloaded. Please check same as E461 and check compressor when it starts.
E416	Discharge temperature of a compressor in an outdoor unit is overheated.	Discharge temperature is overheated.
E440	Heating operation is not available since the outdoor air temperature is over 35 degrees.	Check the outdoor temperature.
E441	Cooling operation is not available since the outdoor air temperature is lower than -15 degrees.	Check the outdoor temperature.
E465	Compressor overload error	Compressor is overloaded. Please check same as E461 and check compressor when it starts.
E468	Current sensor error	Exchange INVERTER PBA.
E471	Outdoor EEPROM error	EEPROM data is wrong. Exchange EEPROM or MAIN PBA. (This error doesn't occur in EMF 150-AM)
E474	IPM (IGBT Module) or PFCM temperature sensor error	Exchange INVERTER PBA.
E484	PFC overload error	Check reactor located in control plate. If reactor is normal, exchange INVERTER PEA.
E500	IPM is over heated	Check INVERTER PBA's temperature. Power off and cool down INVERTER PBA, and then restart the outdoor unit.
E556	Capacity mismatching between indoor and outdoor	EEPROM data is wrong. Exchange EEPROM or MAIN PBA
E557	Option code miss matching among the indoors (only for DPM)	EEPROM data is wrong. (This error doesn't occur in EMF 150-AM)
E911	Emergency stop	Ensure flow switch is fitted onto pipework and connected to Samsung PCB. Ensure flow rate is above 16 litres per minute. Ensure all air is removed from system. Check circulation pumps speed setting. Check zone valves are not sticking closed. Check direction of flow switch on pipework. Check direction of pump on pipework. Check direction of Flow Meter on pipework.
E912	Emergency stop	Check circulation pumps are not operating. check flow switch is installed on horizontal pipework. Ensure 150mm of horizontal pipework each side of flow switch.

Fault codes

Error Code	Contents	Measure	Product op. in error condition	Error Type
			Outdoor unit / Comp. / Ind. unit	
101	Indoor unit communication error	Check the communication cable of indoor unit. Check the DC output voltage at the communication terminal.	Operation off	Communication error
102	Indoor unit/outdoor unit communication time-out error: errors in more than 6 packets	Check the outdoor communication cable connection. Check DC output voltage and the communication terminal.	Operation off	Communication error
121	Indoor temperature sensor (open/short error)	Check indoor unit room temperature sensor. Check indoor unit PCB connector CN41 (White)	Operation off	Indoor sensor error
122	Indoor unit Eva in sensor (Open/Short)	Check indoor unit pipe sensor. Check indoor PCB connector CN41 (White)	Operation off	Indoor sensor error
128	Indoor unit Eva in sensor disconnection	Check the disconnection of indoor unit pipe sensor.	Operation off	Indoor sensor error
153	Indoor floating switch secondary detection	Check indoor unit float sensor. Check indoor PCB connector CN5 (black)	Operation off	Self diagnostic error
202	Indoor/outdoor communication error (1 min)	Check the communication connection between indoor and outdoor units. Check the power line and communication cable connection status.	Operation off	Communication error
203	Communication error between indoor/outdoor INVIMAIN <-> MICOM (1 min)	Check MAIN MICOM Check INVERTER MICOM	Operation off	Communication error
221	Outdoor temperature sensor error	Check sensor connection status Check sensor location Check sensor resistance	Operation off	Outdoor sensor error
237	COND temperature sensor error	Check sensor connection status Check sensor location Check sensor resistance	Operation off	Outdoor sensor error
251	[Inverter] Emission temperature sensor error	Check sensor connection status Check sensor location Check sensor resistance	Operation off	Outdoor sensor error

Error Code	Contents	Measure	Product op. in error condition	Error Type
			Outdoor unit / Comp. / Ind. unit	
440	Heating operation blocked	Check the operation setting state Check temperature sensor	Operation off	Self diagnostic error
458	Outdoor fan 1 error	Check input power connection status Check the connection status between the motor and outdoor unit of PCB Check indoor/outdoor fuse	Operation off	Self diagnostic error
461	[Inverter] Compressor startup error	Check the compressor connection status Check the resistance between different phases of the compressor	Operation off	Outdoor unit protection control error
462	[Inverter] Total current error / PFC over current error	Check the input power Check the coolant charging status Check the normal operation of outdoor fan	Operation off	Outdoor unit protection control error
464	[Inverter] IPM over current error	Check coolant charging Check the compressor connection status and normal operation Check the obstacles around the indoor and outdoor units Check whether the outdoor unit service valve is open Check whether the indoor/outdoor installation pipe/wiring are correct	Operation off	Outdoor unit protection control error
465	Compressor V limit error	Check the compressor connection status Check the resistance between different phases of the compressor	Operation off	Outdoor unit protection control error
466	DC LINK over/low voltage	Check input power Check AC power connection	Restart in 3 minutes	Outdoor unit protection control error
467	[Inverter] Compressor rotation error	Check the compressor connection status Check the resistance between different phases of the compressor	Operation off	Outdoor unit protection control error
468	[Inverter] Current sensor error	Check EEPROM DATA Check the normal operation of PCB	Operation off	Outdoor unit protection control error
469	[Inverter] DC LINK voltage sensor error	Check the input power connection Check the status of RY2-1 and R200 in the INVERTER PCB	Operation off	Outdoor unit protection control error
471	[Inverter] OTP error	Check EEPROM DATA Check the normal operation of PCB	Operation off	Outdoor unit protection control error

Error Code	Contents	Measure	Product op. in error condition	Error Type
			Outdoor unit / Comp. / Ind. unit	
475	Outdoor fan 2 error	Check the input power connection status Check the connection status of the motor and the outdoor unit PCB Check the indoor/outdoor unit fuse	Operation off	Self diagnostic error
554	Gas leak error	Check the coolant charging status Check the indoor EVA sensor Check if the outdoor unit service valve is open Check that the indoor/outdoor installation pipe/wiring are correct	Operation off	Self diagnostic error
556	Capacities not matched	Check the option code of the indoor unit	Operation off	Outdoor unit protection control error
601	Communication error between the indoor unit and wired remote controller	Check the connection wire between the indoor unit and the wired remote controller	Operation off	Wired remote controller error
602	Communication error between the Master and Slave wired remote controllers	Check the option switch for defining the master and slave (only one master and one slave can exist)	Normal operation	Wired remote controller error
606	COM1/COM2 cross installation error	Check that wired remote controller is connected to the COM2 terminal of the indoor unit	Normal operation	Wired remote controller error
607	Communication error between the Master and Slave wired remote controllers.	Check the option switch for defining the master and slave (only one master and one slave can exist)	Normal operation	Wired remote controller error



Joule Kodiak

Supplementary Guide

Rev 1.2 06th June 2022

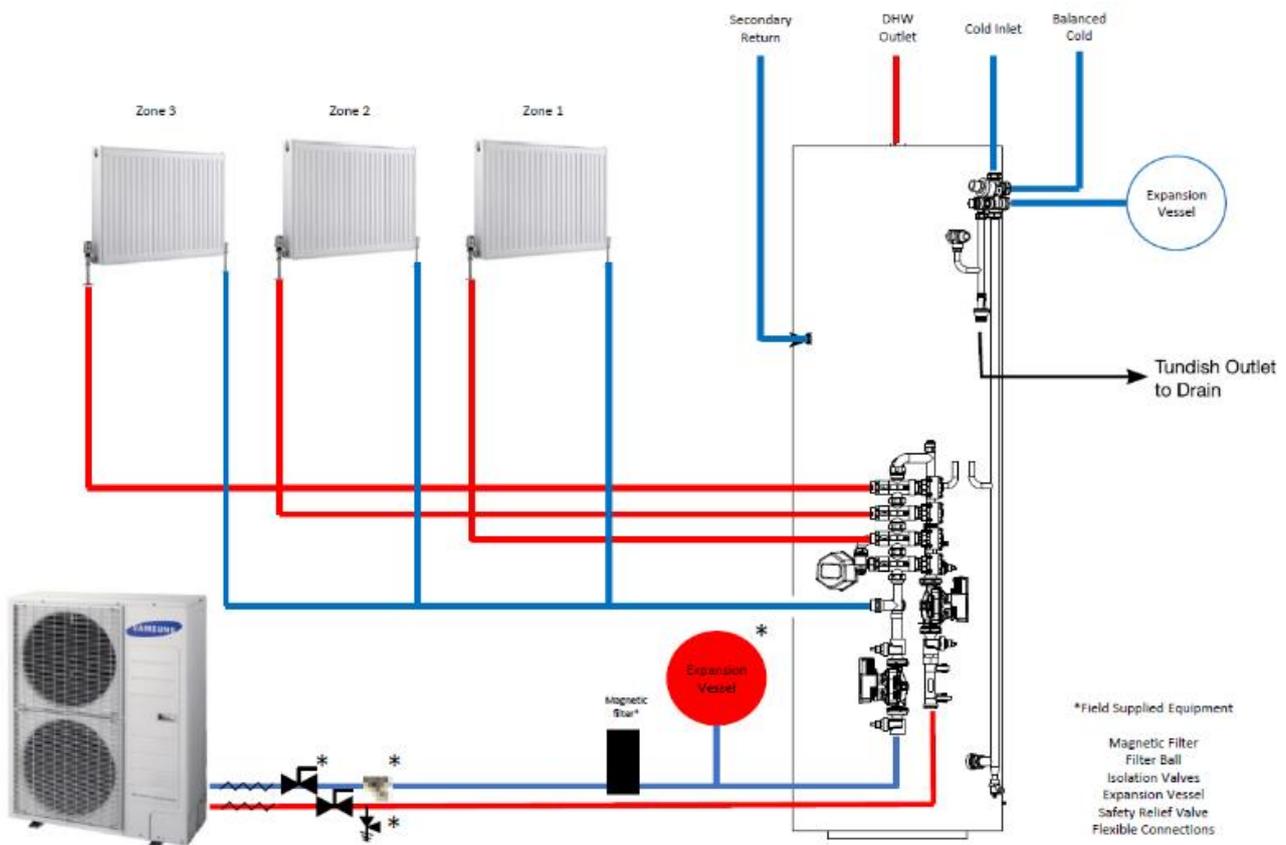
The Joule Kodiak Cylinder is an innovative design which is designed to be time saving and also compact allowing greater flexibility for installation.

The Kodiak design feature some innovative design features as standard including:

- 3 zone heating control as standard through the Kodiak board
 - Flow setter and filling/flushing points as standard
 - Automatic Bypass cartridge as standard
 - 2 wilo 25/60 A rated Pumps as standard
 - Flow sensor pre fitted standard
- Actuators all installed and Pre wired as standard through the Kodiak board.
 - Samsung MIM controller installed and prewired to Kodiak as standard.
 - Manual Air Vent

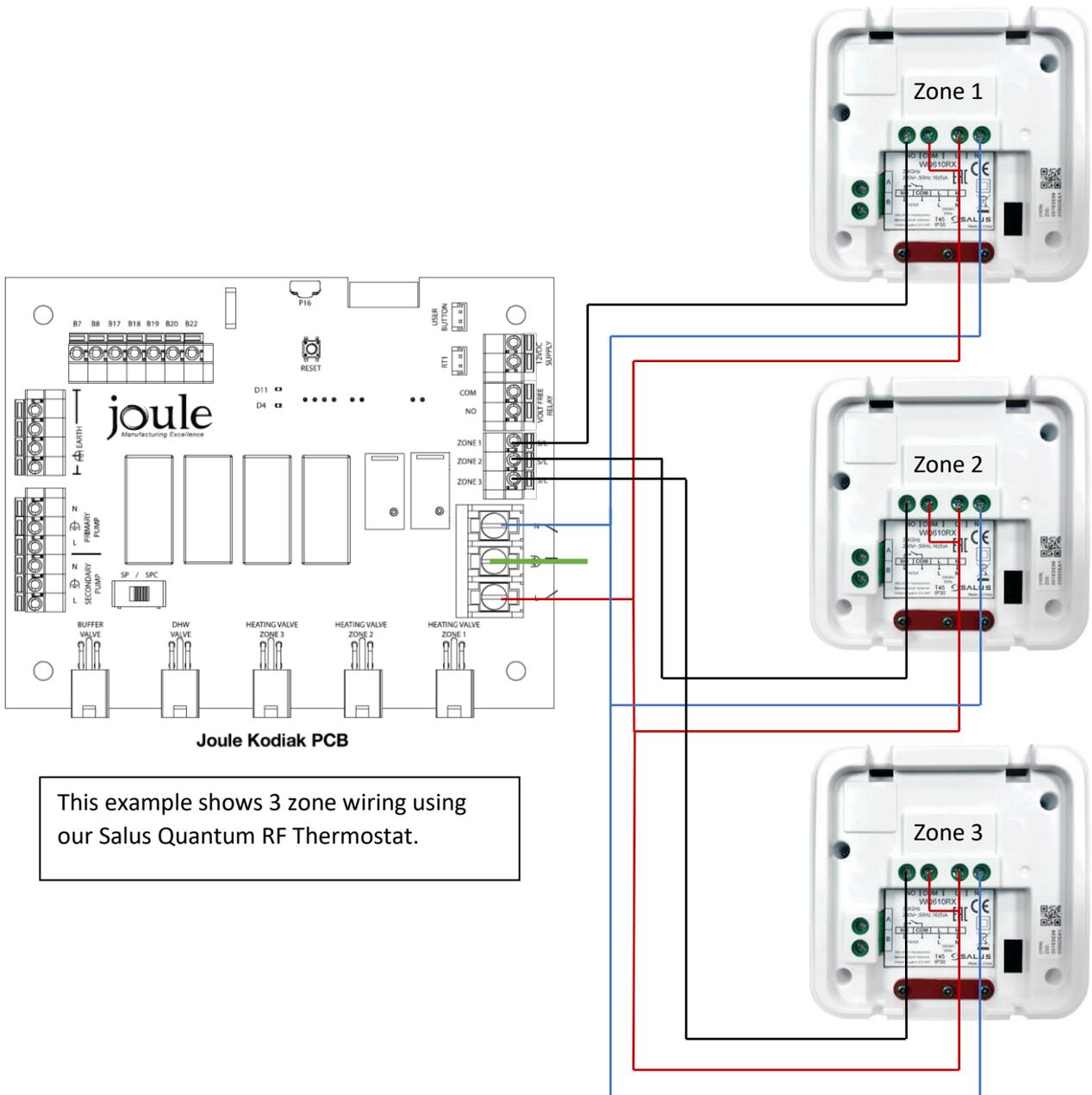
The Kodiak is designed to receive ON/OFF Heating control via 3rd Party Controls.

Below Is a Standard Pipe Schematic for a 3 Zone Kodiak Installation



Please Note any unused Zones should be Capped

Below Is a Standard Electrical Wiring Schematic for a 3 Zone Kodiak Installation*



*The above Wiring schematic only shows the wiring of the Kodiak Board, For wiring details relating to MIM please refer back to earlier Control Wiring section and reference, Controller wiring (F3,F4), Heat Pump connection (F1,F2) and Incoming Supply via ECB.

Kodiak Starting for First Time

The Kodiak system should be fully filled and flush before powering up the unit.

There is a small manual air vent located on the Kodiak manifold this should be used during filling and flushing of the unit.

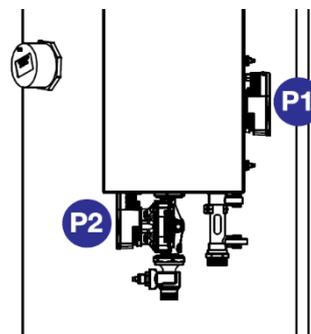
All FSV setting should be set in accordance with the cylinder size as per the previous Starting for the first time section in our Samsung Gen 6 Guide.

All Kodiak installation should be set for Single Zone control in the FSV in the Samsung controller, the management of Zone 2/3 is controlled Via the Joule Kodiak Board.

Setting the primary flow rate on the Kodiak should be set slightly different to a normal installation, due to the 2 pumps design.

Below are the Details on how this process is completed.

1. Enter the FSV as detailed in the earlier section.
2. Select Self-test mode.
3. Select Water pump and set to ON.
4. Observe the Flow rate using the flow Setter valve on the Kodiak
5. P1 should be set speed setting 3
6. P2 should then be adjusted using the speed setting in order to achieve the Recommended flow rate in the Warranty Section
7. The flow rate should be checked with flow to the CH Zones as this will be the higher resistance.

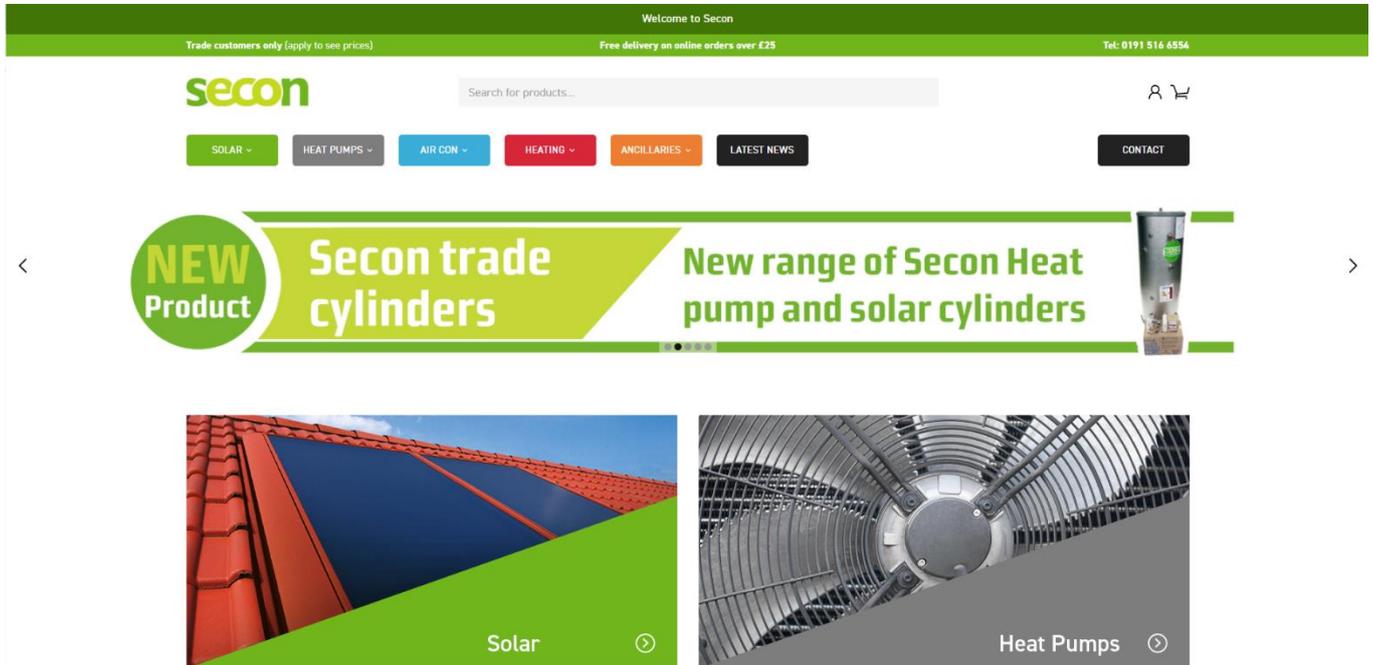


Below is the minimum recommend flow rates for the Kodiak Installation, please be aware that only achieving these flow rates may, result in reduced performance of the Heat Pump.

5 kW	8 kW	12 kW	16 kW
12- 16 L/min	16 - 20 L/min	20 L/min plus	20 L/min plus

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