modulair

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Manufacturing Excellence

Joule Modul-AIR All-E, Modul-AIR All-E with Green Comfort Module & Modul-AIR Aqua Installation & Maintenance Manual

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UNITED KINGDOM / IRELAND

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benchmark
COLLECTIVE MARK
THE MARK OF QUALITY, COMPLIANCE AND BEST PRACTICE FOR THE INSTALLATION, COMMISSIONING, SERVICING AND MAINTENANCE OF DOMESTIC HEATING AND HOT WATER SOLUTIONS

hot water association
DEVELOPING HOT WATER

ENG-0026-07

Safety Information

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 a 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.

- Hot water may drip from the discharge pipe of the pressure-relief device, this discharge pipe must be left open to the atmosphere.
- The pressure-relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked.
- Drain valves are located on the hot water tank to allow draining of the water from the primary and secondary.
- This appliance is intended to be permanently connected to the water mains and not connected by a hose-set.
- A discharge pipe connected to the pressure relief device must be installed in a downwards direction and in a frost-free environment.
- The Appliance power cable is to be connected to a suitably sized isolator which disconnects all poles with a contact gap of at least 3mm.
- The maximum flow temperature achieveable by the Modul-Air Heat Pump is 65°C. The Heat Pump and Cylinder combination have been tested to EN 12897:2016+A1 2020 and the function of all Safety devices has been verified.
- WARNING, CAUTION, DANGER removing the front cover of the appliance will give access to live parts!

Preface

Dear installer,

You are about to install a Joule Modul-AIR exhaust air heat pump. This system shall only be commissioned by a qualified installer. You the installer must have been trained by Joule. Systems installed by untrained installers will have no warranty guarantee. Systems are to be commissioned using the Joule commissioning App.

Before you start installing the Joule Modul-AIR, please ensure that you have fully read and understood this installation manual. Use the table of contents on the next page to quickly find information.

Prior to the installation of the Modul-AIR system the dwelling must be visited and inspected by Joule to determine whether the Modul-AIR is suitable for your specific job. This inspection is also carried out to determine which configuration of Modul-AIR system is the most appropriate to install in your specific scenario.

To successfully install the Green Comfort, it must be installed in combination with the Joule Modul-AIR.

The warranty terms are 2 years parts and labour on the Modul-AIR heat pump, Green Comfort module and all heat pump system accessories supplied by Joule, with 25 years warranty on the Modul-AIR cylinder body. To maintain these warranty guarantees a once yearly service must be carried out by a competent engineer. For further details on the terms and conditions please consult the warranty section of this manual.

Based on the experience of the installers we want to further improve the Modul-AIR and Green Comfort. Your feedback on the product, installation and this manual is appreciated

The Modul-AIR and Green Comfort complies with European directives and additional national regulations which are indicated in a CE marking. The corresponding declaration of conformity can be requested from Joule.

The Modul-AIR and Green Comfort complies with protection class IPX2.

For more information, please contact:

Joule UK:

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WF8 4PS, UK
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f: 353 (1) 626 9337

Third Party Certification

Third Party Certification - Documents handover to the customer

Confirm availability of operation and maintenance document, handover document for client	Y	N
Incl. type of ventilation system	Y	N
Incl. type of controls	Y	N
Incl. design air volume flow rates	Y	N

Third Party Certification - Components check

Is the system safe to operate?	Y	N
Is there adequate access and free space to the system for the purposes of operation and maintenance?	Y	N
Has the system been left in reasonably clean condition?	Y	N
Are all components in good condition?	Y	N

Third Party Certification - Balance check

Is the overall supply air flow rate greater than but no greater than 15% of overall extract air flow rate?	Y	N

System Recording

Air Flow Measurements (Extract)

Room Reference	Design Air Flow High Rate (l/s)	Measured Air Flow High Rate (l/s)		Design Air Flow Low Rate (l/s)	Measured Air Flow Low Rate (l/s)	
		Installer	Third Party		Installer	Third Party
Kitchen						
Bathroom						
En-suite						
Utility						

Air Flow Measurements (Supply) – With Green Comfort

Room Reference	Design Air Flow High Rate (l/s)	Measured Air Flow High Rate (l/s)		Design Air Flow Low Rate (l/s)	Measured Air Flow Low Rate (l/s)	
		Installer	Third Party		Installer	Third Party
Living Room 1						
Dining Room						
Bedroom 1						
Bedroom 2						
Bedroom 3						
Bedroom 4						
Study						

Third Party Certification

Commissioning - MEV & MVHR

Has the system been installed in accordance with manufacturers requirements? Y N

Have controls been set up in accordance with manufacturer's instructions? Y N

Have all distribution grilles been locked to prevent unauthorised adjustment? Y N

Have Ductwork joints been properly made in accordance with the supplier's recommendations? Y N

Commissioning Equipment

Schedule of air flow measurement equipment used, (model and serial)		Date of last INAB calibration
Installer		
3rd Party		

Heating System

Test Pressure (Bar)	Fill Pressure (Bar)	Expansion Vessel (Bar)

Installation Checklist

General

Have the correct number and location of extract fans/terminals been installed?	
Is the installation complete with no obvious defects present?	
Has all protection/packaging been removed such that the system is fully functional?	
For ducted systems, has ductwork been installed in such a manner that air resistance and leakage is kept to a minimum?	
Is the ductwork fitted to the correct connections on the exhaust air heat pump?	
Has all the exhaust ductwork been insulated?	
Has the exhaust air heat pump and all its ductwork been effectively insulated where installed in unheated spaces?	
Is flow and return pipework connected correctly?	
Is primary flow + return insulated?	
Has system been completely flushed of air + charged to the correct pressure (1.5 BAR) ?	
Is heating expansion vessel correctly sized, secured and charged to the right pressure?	
Has the correct size electrical circuit breaker been installed?	
Has an electrical isolation switch been installed?	
Has the correct size power cable been used for exhaust air heat pump?	

See Page 52 for cable requirements

NO Pre-Paid Meters are to be installed on a Modul-AIR Exhaust Air Heat Pump System

Installation Checklist

Ventilation System

Total floor area of dwelling?	
Total installed equivalent area of background ventilators in dwelling?	
Does the total installed equivalent ventilator area meet the requirements given in Section 1.2 of TGD F?	
Have all background ventilators been left in the open position?	
Have the correct number and location of extract fans/terminals been installed that satisfy relevant Table of Tables 1, 2 and 3 of TGD F?	
Is the installation complete with no obvious defects present?	
Do all internal doors have sufficient undercut to allow air transfer between rooms (i.e. 10 mm over and above final floor finish)?	
Has all protection/packaging been removed (including background ventilators) such that system is fully functional?	
For ducted systems, has the ductwork installation been installed in such a manner that air resistance and leakage is kept to a minimum?	
Are the correct number and size of background ventilators provided that satisfy TGD F?	
Has the entire system been installed such that there is sufficient access for routine maintenance and repair/replacement of components?	
Have appropriate air terminal devices been installed to allow system balance?	
Has all ductwork been effectively insulated where installed in unheated spaces?	
Condensate connection is complete and drains to an appropriate location?	
Upon initial start-up, was any abnormal sound or vibration experienced, or unusual smells detected?	

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Introduction

General Product Description:

The Modul-AIR extracts heat from the stale indoor air that is to be exhausted outdoors. This heat, rather then being lost to the atmosphere as in traditional ventilation system, is rather returned to the central heating system allowing to fully electrically heat a hot water tank and, depending on the variant, this recaptured energy is also used for the space heating of the house.

All variants that provide space heating are available with or without balanced ventilation (Green Comfort Module).

This manual details two different variants of Modul-AIR:

- Modul-AIR Aqua: Heat Pump Water Heater & Joule hot water storage tank
- Modul-AIR All-E: All Electric Space Heating, water Heating & Joule hot water storage tank

Who is this manual for?

This manual is intended for the professional installer. The installer must be certified by Joule and have successfully completed the Modul-AIR training. The installer does not need to be in possession of a STEK or F-gas certification.

The purpose of the manual is to support you in installing the Modul-AIR with or without the Green Comfort unit safely and correctly.

Intended & unintended use

The Modul-AIR may only be used to use the heat from ventilation air to heat a home and optionally to heat tap water. The Modul-AIR should only be installed according to the instructions in this manual.

Any other use is considered unintended use and may result in damage to the Modul-AIR and/or personal injury. Always follow the instructions in the accompanying manual(s) and if in doubt contact the manufacturer.

The Green Comfort is only used in combination with the Modul-AIR to provide a home with balanced ventilation. The Green Comfort may only be installed according to the instructions in this manual.

Any other use is considered unintended use and can lead to damage to the Green Comfort and/or personal injury. Always follow the instructions in the accompanying manual(s) and if in doubt, contact Joule

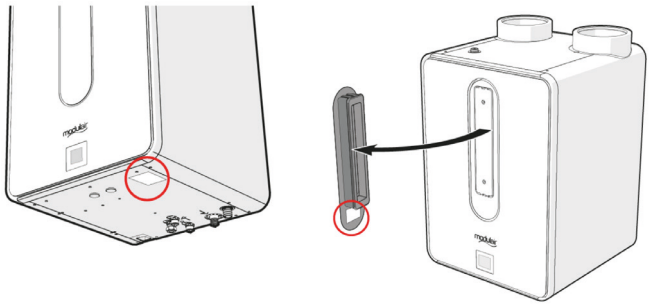
Nameplate and symbols on the product

Important information about your unit can be found on a rating plate as well as other symbols located on the product.

The Type Plate

The Type Plate provides information about the unit. The Type Plate is located in two places on and in the Modul-AIR and Green Comfort units as shown:

Modul-AIR Type Plate:



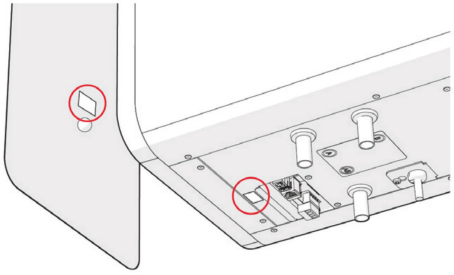
JOULE Modul-AIR ALL-E - HHH-AEHP-00001

Article no:	62070035
Serial no:	2147001
Manufacturer:	Joule Group Ltd, Unit 407 NW Business Park, Cappagh Road, Ballycoolin, Blanchardstown, Dublin 15, D11HD36

Current:	230 V ~50 Hz 32A
Cos phi compressor:	0.92
Max. power:	8095 W
Starting current:	10 A
Mains fuse:	16 A
Max. ch pressure:	300 kpa
Refrigerant / mass:	R134a / 580 g
GWP / CO2 equivalent:	1430 / 829 kg
IP-code:	X2
Weight:	55 kg

version: 001

Green Comfort Type Plate:



Joule GreenComfort - HHH-GCPH-00001

Article no:	62050005
Serial no:	2147001
Manufacturer:	Joule Group Ltd, Unit 407 NW Business Park, Cappagh Road, Ballycoolin, Blanchardstown, Dublin 15, D11HD36

Current:	230 V~ 50Hz
Max. power:	80 W
Mains fuse:	16 A
Max. ch pressure:	300 kPa
Heating power:	653 - 3166 W
IP-code:	X2

Article Number

Indicates the exact model version of that specific unit

Serial Number

This is a unique number specific to the unit that can be used to identify the Modul-AIR/Green Comfort during installation or maintenance.

QR Code

A QR code is placed on the inside of the Modul-AIR/Green Comfort. The digital warranty card can be filled in by scanning the QR code. This is then automatically sent to Joule and the installer.

Version

The design/manufacturing version

Symbols

The symbols on the Type Plate and on the Modul-AIR/Green Comfort mean the following:

CE MARKING
This is the CE logo with which Joule indicates that the product meets the legal requirements.

FOR INDOOR USE ONLY
This symbol indicates that the Modul-AIR may only be used indoors.

READ THE MANUAL
This symbol indicates to the user that the manual should be consulted.

OPERATORS MANUAL
To indicate that the operating instructions should be considered when operating the device.

SERVICE INDICATOR
To indicate that a machine or equipment requires service. To indicate that the technical manual shall be consulted.

WEEE MARKING
This symbol indicates that the product must not be disposed of with household waste. The product must be collected separately.

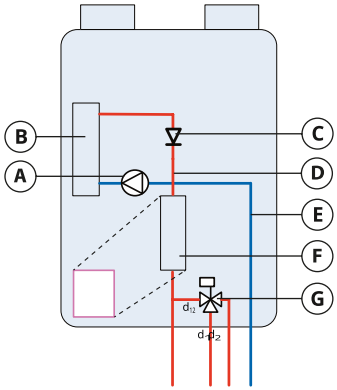
OPENTHERM®
This logo indicates that the product is OpenTherm certified and works with OpenTherm central heating boilers.

LOGO MATERIAL CODE PP
This logo is applied to the housing and indicates the use of polypropylene.

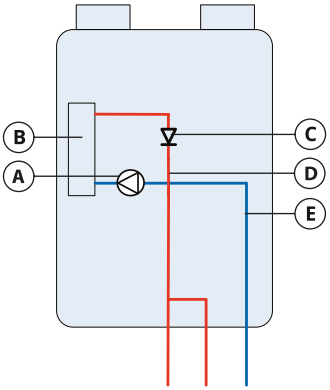
LOGO MATERIAL CODE ABS
This logo is applied to the housing and indicates the use of ABS.

Modul-AIR Variants

Depending on the situation the Modul-AIR can be used in five different variants. This manual is particular to 2 variants: the All-E and Aqua. Detailed Mechanical and Electrical schematics specific for these can be found in the Appendices of this installation manual.



Modul-AIR All-E



Modul-AIR Aqua / Solo

Modul-AIR variant internals		
A Circulation Pump	D Heating Flow	G Three-way Valve
B Condenser	E Heating Return	
C Check Valve	F Back Up Heater	

Modul-AIR All-E

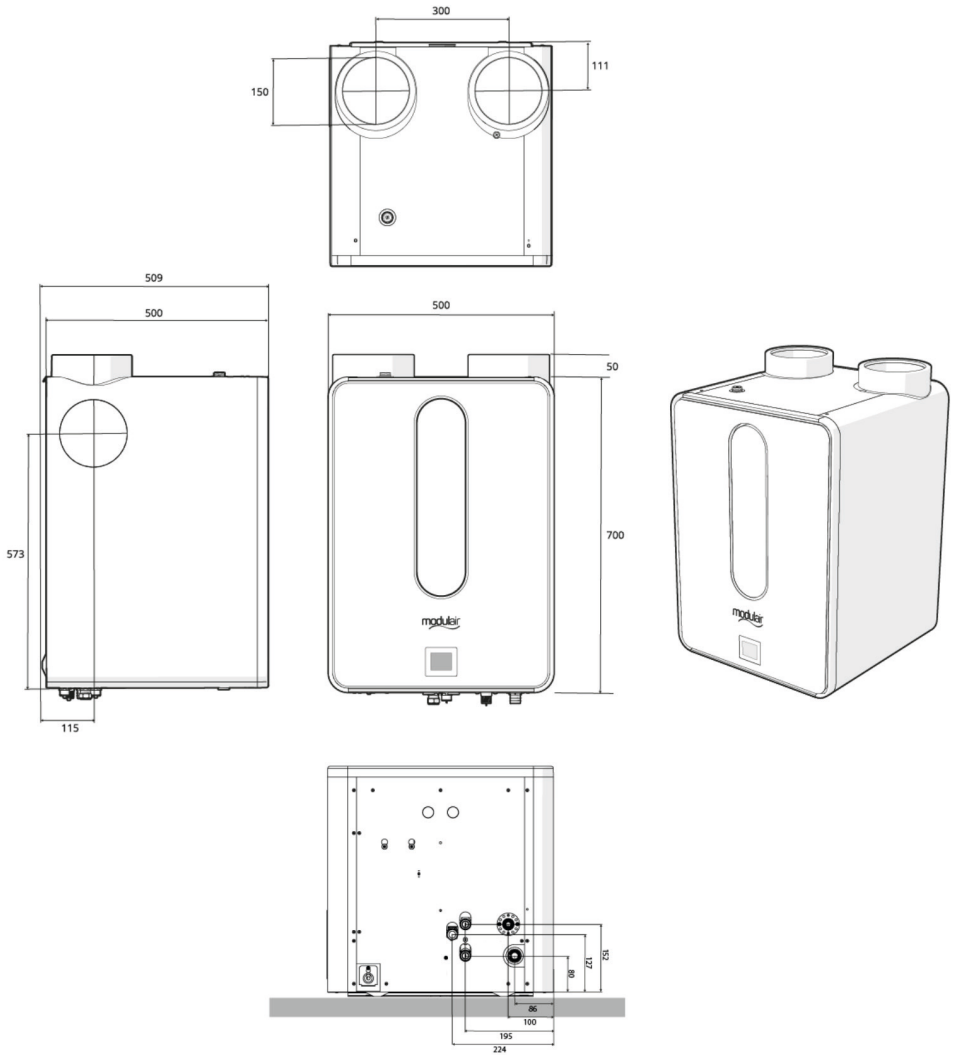
The Modul-AIR All-E can heat a house fully electrically and provide hot water via a Joule hot water storage tank. This variant contains both an integrated electric flow heater and a three-way valve.

Modul-AIR Aqua

The Modul-AIR Aqua is variant for domestic hot water generation in applications where central heating is already provided for by some other source, e.g electric radiators. The Modul-AIR supplied along with the immersion in the Joule hot water storage tank can provide fully electric heating to domestic hot water for your taps and showers.

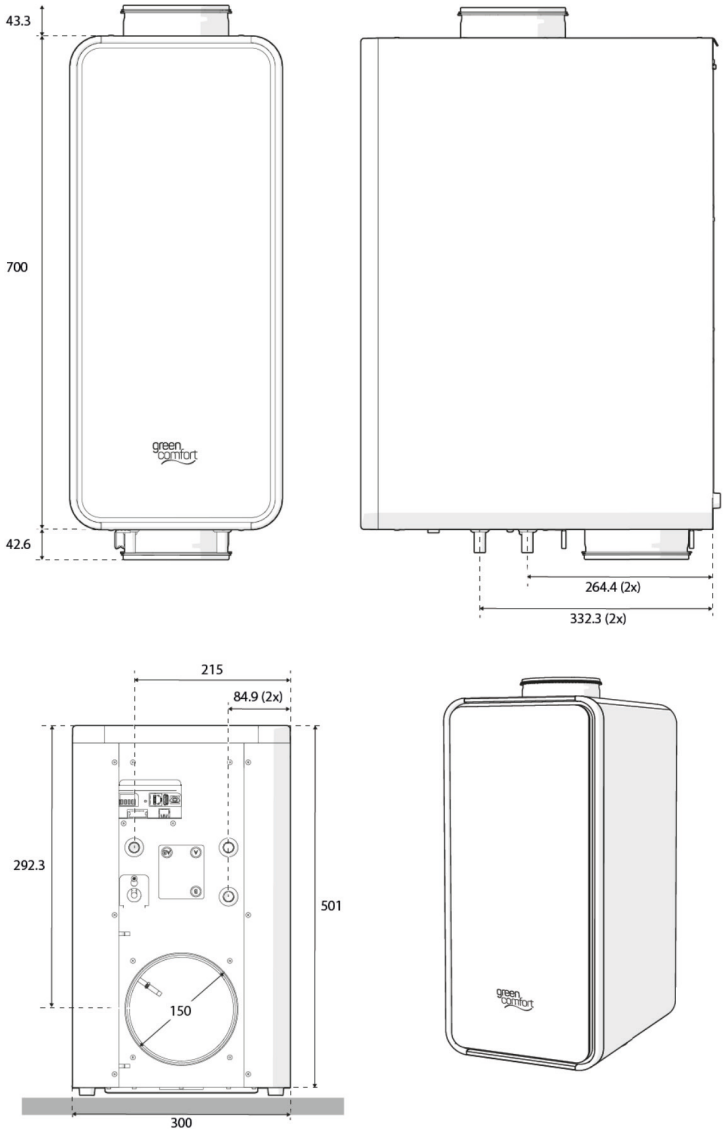
Modul-AIR Dimensions

The dimensions covering the full range of Modul-AIR configurations are shown below:



Green Comfort Dimensions

The dimensions covering the full range of Modul-AIR configurations are shown below:



Technical Specification

Modul-AIR & Green Comfort - Technical Specifications:

SPECIFICATIONS	UNIT	CONFIGURATION			
		SOLO	AQUA	ALL-E	Green Comfort
Mains connection		P+N230V ~50Hz ±6%"	P+N230V ~50Hz ±6%"	P+N230V ~50Hz ±6%"	P+N230V ~50Hz ±6%"
Fuse	A	25	16	25	16
Max. power consumption	W	620	620	5230	80
Max. power consumption heat pump	W	620	620	620	N/A
Max. power consumption Backup Heater	W	N/A	N/A	3180	N/A
Max. power consumption DHW Tank element	W	N/A	N/A	2120	N/A
Average electrical consumption power heat pump	W	300	300	300	N/A
IP Class		X2	X2	X2	X2
Max. working pressure	kPa	300	300	300	300
Cord type		3 core cable flex (1m)	3 core cable flex (1m)	3 core cable flex (1m)	3 core cable flex (1m)
PERFORMANCE					
Max. supply temperature	°C	60	60	60	60
Rated Heat Output (A20/W35, A20/W55)	kW	1.5, 1.3	N/A	1.5, 1.3	3.5
COP (A20/W35, A20/W55)		4.35, 3.02	N/A	4.35, 3.02	N/A
Reheater power	kW	N/A	N/A	max 4.5 kW + 6%	N/A
REFRIGERANT					
Refrigerant	Type	R134a	R134a	R134a	N/A
Refrigerant content	g	580	580	580	N/A
GWP Value		1430	1430	1430	N/A
C02 equivalent	kg	830	830	830	N/A
DIMENSIONS AND WEIGHT					
Height	mm	700	700	700	700
Width	mm	500	500	500	298
Depth	mm	500	500	500	493
Weight	kg	58	55	60	20

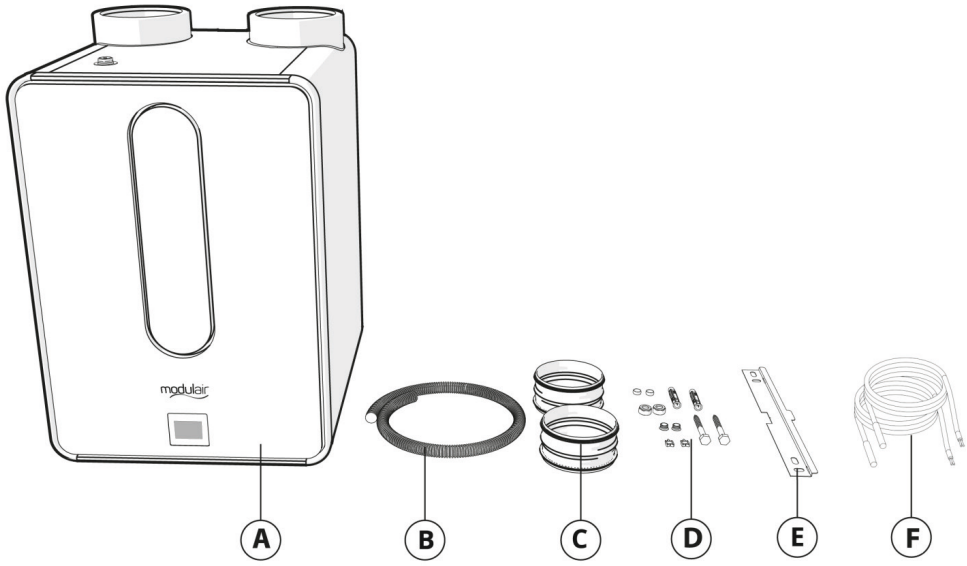
Water Quality Requirements

SPECIFICATIONS	UNIT	SOLO	AQUA	ALL-E	Green Comfort
Permissible acidity of central heating water	pH	6.5-8.0	6.5-8.0	6.5-8.0	6.5-8.0
Chloride	mg/l	< 50	< 50	< 50	< 150
Conductivity	µS/cm	150-350	150-350	150-350	150-350
Hardness	°dH C	2 - 4	2 - 4	2 - 4	2 - 4
Total hardness (CaCO3)	F	< 5	< 5	< 5	< 5
Iron	mg/l	< 50	< 50	< 50	< 50
Copper	mg/l	< 3	< 3	< 3	< 3
Aluminium	mg/l	< 3	< 3	< 3	< 3
Hydrogen Carbonate (HCO3)	mg/l	80 - 100	80 - 100	80 - 100	80 - 100
Langelier's index	mg/l	0 ±0.01	0 ±0.01	0 ±0.01	0 ±0.01
Additions	-	not allowed	not allowed	not allowed	not allowed
HARMFUL ADDITIVES					
Active Chlorine	mg/l	< 0.2	< 0.2	< 0.2	< 0.2
Fluorides	-	not allowed	not allowed	not allowed	not allowed
INSTALLATION ROOM					
Max. permissible air humidity installation room	rH	85%	85%	85%	85%
Max. allowed temperature	°C	35	35	35	35
Min. allowed temperature	°C	10	10	10	10
CONNECTIONS					
Air inlet (1x)	mm	150	150	150	150
Air outlet (1x)	mm	150	150	150	150
HP connections(2x)		15mm/ ½"	15mm/ ½"	15mm/ ½"	15mm/G ½"
DHW tank connection		15mm/ ½"	15mm/ ½"	15mm/ ½"	N/A
GC Module connection		15mm/ ½"	15mm/ ½"	15mm/ ½"	15mm/ ½"
Condensate drain	mm	32	32	32	N/A
VENTILATION					
HP Air Flow Rate	m3/h	100-250	100-250	100-250	50-350
(Depending on house floor area)					
High setting (set value)	m3/h	50-350	50-350	50-350	50-350
Low setting (set value)	m3/h	50-350	50-350	50-350	50-350
SOUND					
Sound power level Lw (A) EN 12102-2:2019	dB	43	43	43	41.5
EN 12102-2:2019					
CE		Yes	Yes	Yes	Yes
OpenTherm		Yes	Yes	Yes	Yes

Modul-AIR Box Contents

The scope of delivery differs per variant, please check that the following parts are included as per your specific model:

Item number	Name
HHH-AEHP-00002	Joule Modul-AIR Aqua / Solo
HHH-AEHP-00001	Joule Modul-AIR All-E



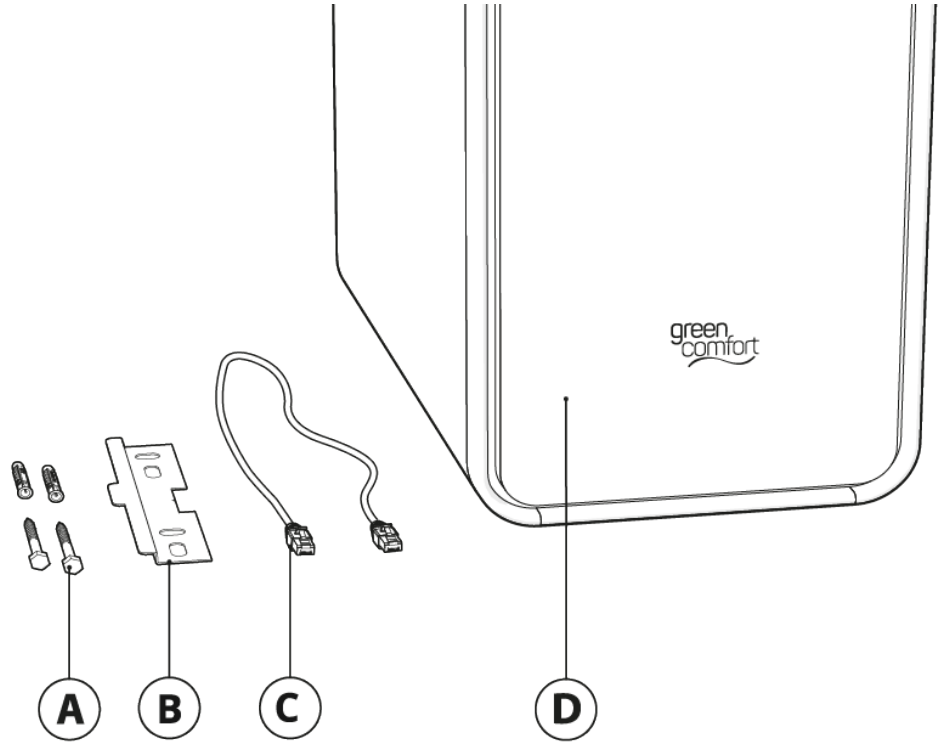
All necessary parts for installing the Modul-AIR	
A Modul-AIR Unit (x1)	D Support fix assembly [HZQ-V-S1051095] (1x)
B Condensate hose [HZQ-V-S1029010] (1x)	E Wall Mount [HZQ-V-00012708] (1x)
C Pipe socket 150 mm [HZQ-V-S1012811] (2x)	F Heat Pump tank sensor [HZQ-V-S1013151] (2x)

The isolation switch is not supplied as standard with the Modul-AIR.

Green Comfort Box Contents

The main components to install the Green Comfort, please ensure all are present before installation:

Item number	Name
HHH-GCPH-00001	Green Comfort Module



All necessary parts for installing the Green Comfort	
A Support fix assembly [HZQ-V-S1051095] (1x)	C UTP cable [HZQ-V-S1013480] (1x)
B Green Comfort Wall Mount [HZQ-V-S1013385] (1x)	E Green Comfort (1x)

Pre-Installation Notes

- Always store the Modul-AIR vertically
- Store the manual in a safe place in order to be able to use it as reference after installation. For maximum safety installers should always read the following warnings carefully.
- Store the provided manual in a safe location with the end user after installation and remember to hand it over to the new end user if the Heat Pump & Tank unit is sold or transferred.
- Only remove the device from the box at the installation site. Secure the device against falling.
- The Exhaust Air Heat Pump is compliant with the requirements of the Low Voltage Directive (2014/35/EU), the EMC Directive (2014/30/EU) and the pressure equipment directive (2014/68/EU).
- The manufacturers shall not be responsible for damage originating from unauthorised changes or the improper connection of electric and hydraulic lines.
- Do not use units if you see some damage on them and notice something untoward such as loud noise, smell or burning.
- In order to prevent electric shocks, fires or injuries, always stop the unit, disable the protection switch and contact Joule's technical support if the unit produces smoke, if the power cable is hot or damaged, or if the unit is very noisy.
- Handle electrical appliances with care. Never touch the device with wet hands, never touch the device when you are barefoot.
- Always remember to inspect the unit, electric connections, refrigerant tubes and protections regularly. These operations shall be performed by qualified personnel only.
- The unit contains moving parts and electrical parts which should always be kept out of the reach of children.
- Unauthorised personnel should not attempt to repair, move, alter or reinstall the unit. These operations may cause product damage, electric shock and fires.
- Do not place containers with liquids or other objects on the unit.
- Under no circumstances must the compressor block be opened or damaged.
- All the materials used for the manufacture and packaging of the Exhaust Air heat pump are recyclable. The packaging material and exhausted batteries of the remote controller (optional) must be disposed of in accordance with local regulations.
- The Modul-AIR Exhaust Air Heat Pump contains a refrigerant and must be disposed in an authorised centre or returned to the retailer as special waste.

- To avoid your hands being injured by the edge of the parts wear protective gloves to unpack, move, install, and service the unit. Do not touch the internal parts (water pipes, refrigerant pipes, heat exchangers, etc) while running the units. If you need to adjust and touch the units, allow sufficient time for the unit to cool and be sure to wear suitable personal protective equipment.
- In case of a refrigerant leakage, try to avoid contact with the refrigerant as this could result in serious injury.
- It is only permitted to install the Modul-AIR in a room that is free of frost.
- Only hang the Modul-AIR with the supplied fasteners.
- A non-return valve must always be installed in a hybrid combination. There is a high risk of damage to the Modul-AIR or the central heating boiler if not done so.
- Do not install the Modul-AIR higher than 2000 m above sea level.
- Always adhere to the specific regulations of the central heating boiler during installation (hybrid system only). If in doubt, contact the boiler supplier.

First Fix Notes

Primary Pipework from Heat Pump

- Minimum pipe size 22mm copper or 25mm Multilayer
- The primary pipework should be fully insulated and protected from water and moisture.
- The supplied flexible hose should be used for piping the condense outlet only, providing a suitable air gap to the drain connection.

Electrical Supply and Cable Requirements

- The heat pump is supplied with a 1 metre supply cord. Ensure the mains supply connection is made through a suitable isolator switch that can provide disconnection of all poles, with a minimum separation of 3mm.
- Power supply to heat pump to be terminated with a suitable isolator located next to the unit.
- Tank Immersion maximum allowed output of 2kW, connection of immersion with greater power draw will cause irreparable damage to Heat Pump controller board.
- External controls are to be Joule approved low voltage OpenTherm controllers only

Item No.	Heat Pump Unitw	Max Circuit Amps	Rec. RCBO Size
HHH-AEHP-00002	Joule Modul-AIR Aqua/Solo	16	16 Amp
HHH-AEHP-00001	Joule Modul-AIR All-E	25	25 Amp

No. of Cores	Location	Minimum Cable Size	Max Cable Length
2 Core + Earth	Heat Pump to Immersion Heater	2.5mm^2	10m
2 Core	OpenTherm Thermostat	0.50mm^2	30m
2 Core	Heat Pump to RF Receiver	0.50mm^2	30m

- When installing the Heat Pump take great care to install as per the detailed notes for installation locations. The Exhaust Air Heat Pump must have minimum clearance of 300mm at the top of the unit and 100mm at the bottom of the unit.
- The Exhaust Air Heat Pump must not be installed in a location without these clearances available.
- Condensation will form inside the Heat Pump during normal operation, this is normal. Ensure the correct pipework is used and that it has a continuous fall to the drain connection. An adequate air gap is also required to allow the water to drain correctly.
- The Exhaust Air Heat Pump must be installed vertically and be plumb and level.

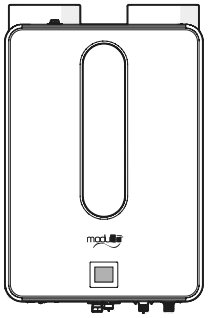
Tank Immersions connected to the Modul-AIR System must have a power input of 2kW or less

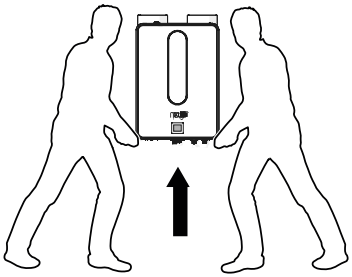
- Underfloor heating pipe centres to be equal to or less than 150mm.
- Radiators are to be sized according to standardized design methods. Eg. SR.50 or MCS.
- If Green Comfort unit is used a mechanical by-pass valve is to be installed on flow from the Modul-AIR unit to the Green Comfort unit
- The hot water control is managed through the touchscreen controller. Heating is prioritized over hot water production.
- Use of time clocks to turn off underfloor heating circuits is not recommended.
- Air is the most prevalent cause of restricted flow in the system. Make sure that all pipework can easily be purged of air and that all air is removed from the system prior to starting the unit.
- Site visits to solve a flow rate issue due to the presence of air are not covered under EUW and as such will incur a call-out charge.
- Air must be purged from the system using a suitable fill & flush pump via the fill & flush valve.
- The Heat Pump duct connections are Ø150mm. Flat Pack, Round or Semi Rigid duct is acceptable however, the cross sectional area must not be reduced and it must be maintained or increased to avoid noise in the duct system.

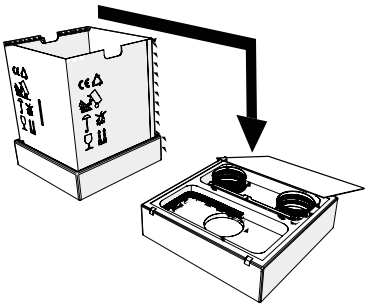
Transport & Handling

Handling Instructions

- Care must be taken when transporting, storing and installing the Heat Pump.
- The Modul-AIR unit is delivered securely packaged in a polystyrene sandwich. Care should be taken when transporting the Heat Pump ensuring that the unit is not damaged by impact
- The Heat Pump must remain in the upright position during transport.
- Do not remove the protective packaging until the Heat Pump unit has reached its final location. This will help protect the Heat Pump from damage.
- For transport, e.g. via a stairs, the Heat Pump may be tilted for a maximum of 15 minutes up to a maximum angle of 45 degrees.
- The Heat Pump can weigh up to 60kg. At least two people are required to lift the unit at all times .
- The Heat Pump must be stored in a dry area and always stored upright on a level base. The temperature in the storage room should be between 5°C and 50°C. The humidity may be a maximum of 85%, non-condensing
- The unit must never be dropped during storage or handling
- The installation area should be free from frost.
- The Modul-AIR unit must only be installed on a plumb level wall with the required load bearing capability.
- Installation, servicing, maintenance and repair must be carried out by a competent person.





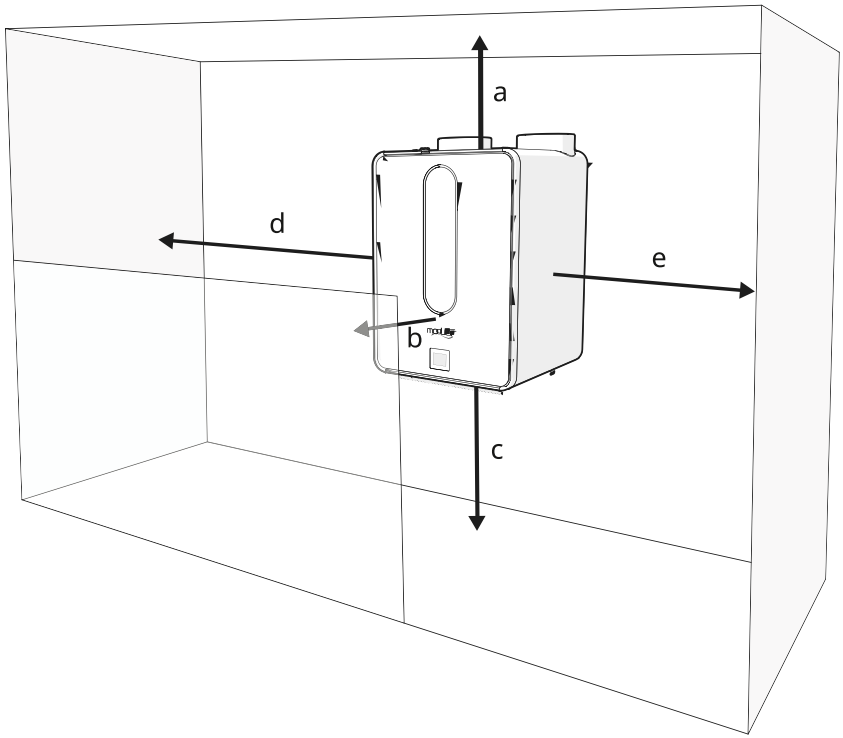


Use a lifting tool if moving the Modul-AIR upstairs.

Installation Location

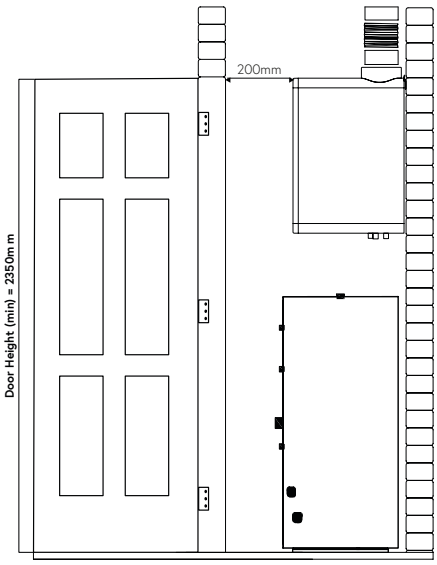
Restrictions around the Modul-AIR Heat Pump

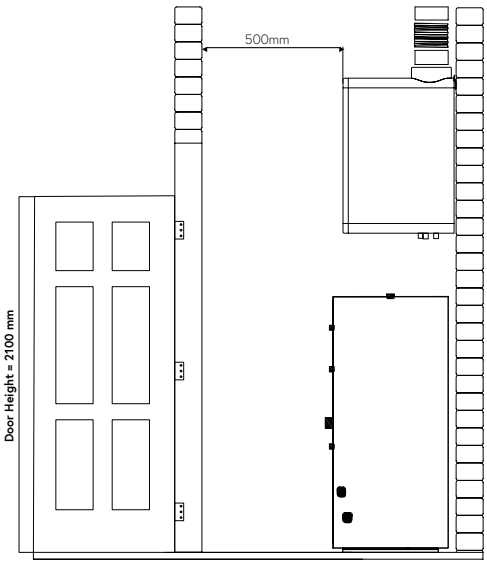
Certain clearance distances must be adhered to prior to citing an area for installing the unit. Clearance is required to provide sufficient space for installation and maintenance.

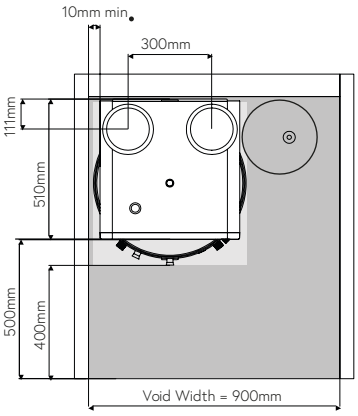


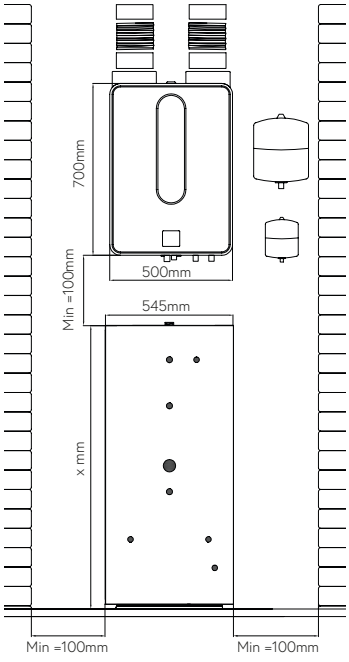
Minimum Required space around the Modul-AIR Unit	
a	min. 300mm
b	min. 500mm
c	min. 100mm
d	min. 10mm (when using the top connection for incoming ventilation air). min. 500mm (when using the side connection for incoming ventilation air).
e	min. 10mm

Mounting Modul-AIR and Hot Water Tank





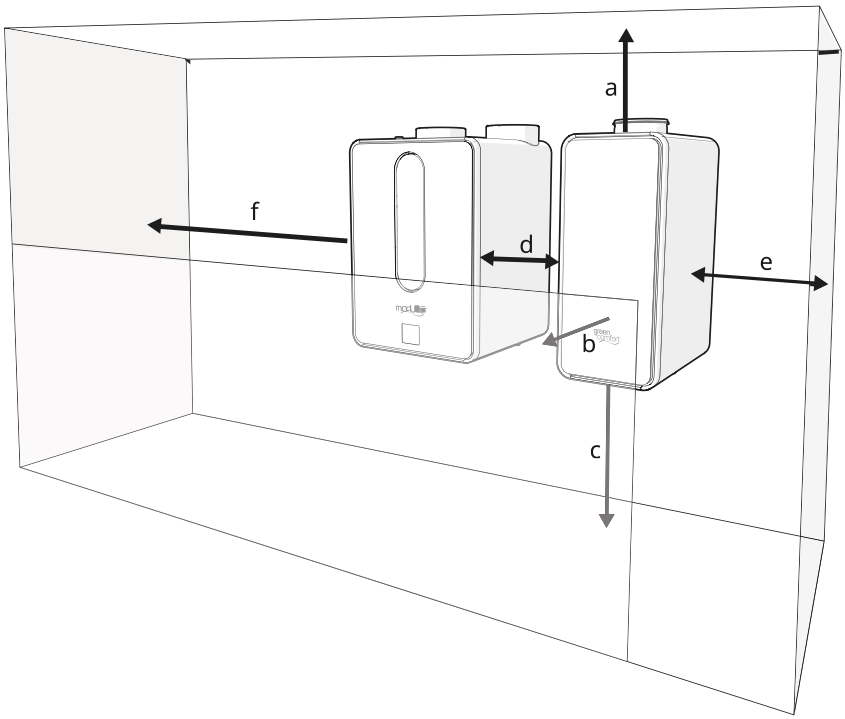




Tank Heights		
x	TUMA-00150-LFC	1102mm
	TUMA-00180-LFC	1293mm
	TUMA-00210-LFC	1478mm

Restrictions around the Modul-AIR Unit and Green Comfort Module

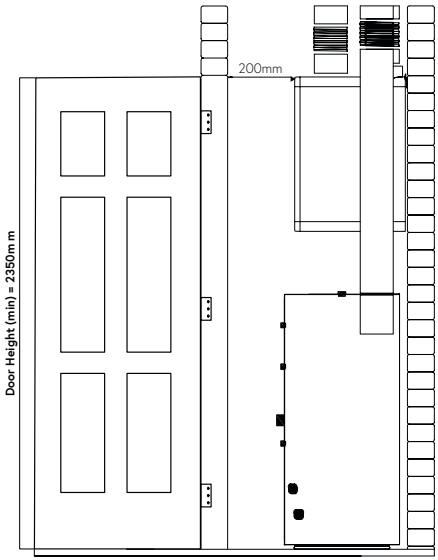
Certain clearance distances must be adhered to prior to citing an area for installing the unit. Clearance is required to provide sufficient space for installation and maintenance.

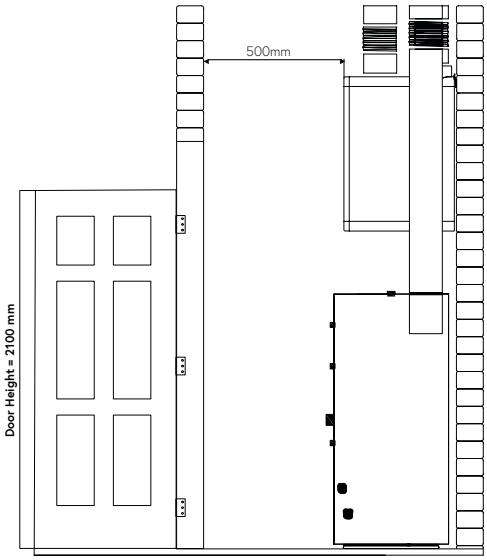


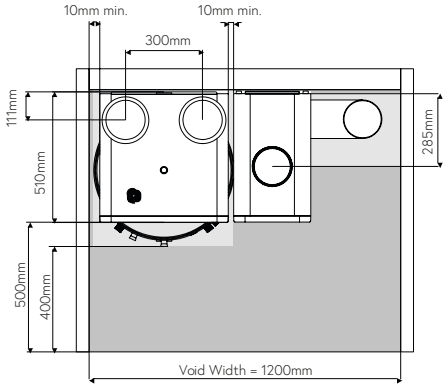
Minimum Required space around the Modul-AIR Unit	
a min. 300mm	d maximum 2.5m
b min. 500mm	e min. 350mm
c min. 300mm	
f min. 10mm (when using the top connection for incoming ventilation air).	min. 500mm (when using the side connection for incoming ventilation air).

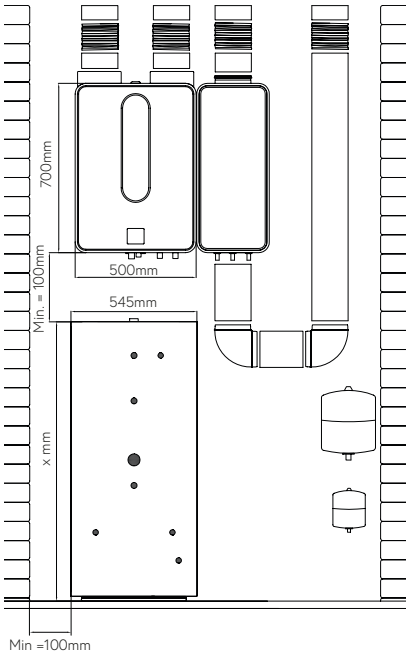
If installing the Green Comfort and Modul-AIR as a retrofit project, ensure that you place the ventilation air supply and exhaust of the appliance as close as possible to the existing ventilation supply and exhaust ducts in the home, so to minimise the pressure drop across the entire duct system.

Modul-AIR, Green Comfort Module and Hot Water Tank









Tank Heights		
x	TUMA-00150-LFC	1102mm
	TUMA-00180-LFC	1293mm
	TUMA-00210-LFC	1478mm

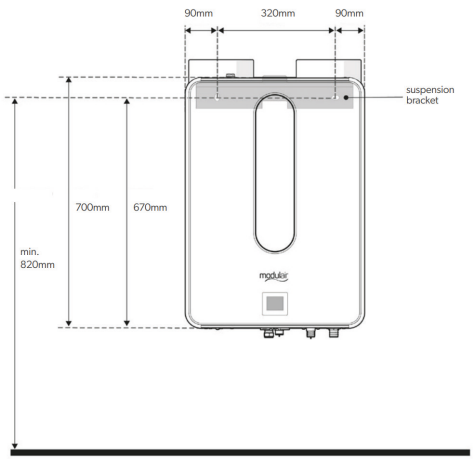
Mounting the Modul-AIR

The required method for mounting the Modul-AIR unit is to directly hang the unit on a wall. If the wall is not capable of holding the weight of the unit, details of how to build the wall up appropriately are shown in the Wall Build Up section below.

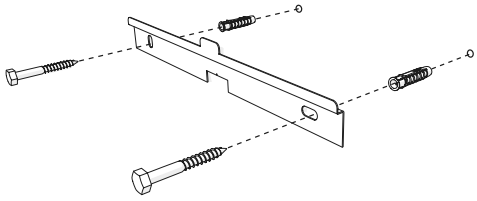
There are no other mounting options that will comply with Joules manufacturing and supply warranty, any possible attempt to do so would void Joules statutory responsibilities.

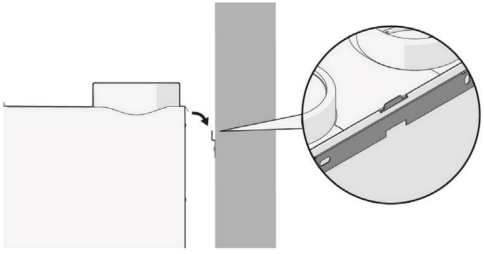
Wall Mounting

The Modul-AIR can only be hung on a smooth flat wall capable of holding a mass of 200kg/m^2. If the wall mass is lower than this, ensure the recommended wall build-up is adhered to. The Modul-AIR should always be hung level however there is a permitted tolerance of 2°. If there are any concerns relating to the correct wall build-up, please contact joule directly before installation.



1. Measure and mark positions for pilot holes based on the dimensions displayed here.
2. Mount the wall bracket using the supplied screws and plugs or suitable alternatives.
3. Hang the Modul-AIR on the wall bracket. Ensure the tab protrudes from the top of the unit, this is evidence the unit has engaged the bracket fully.
4. The use of vibration dampening pads is recommended to adjust the unit mounting if the wall is not completely flat.





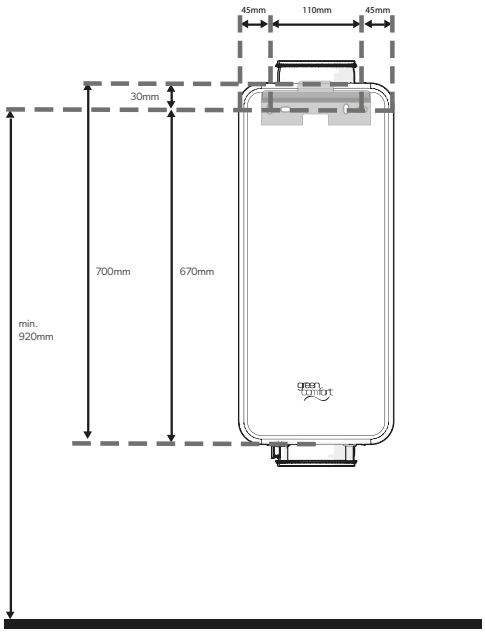
Mounting the Green Comfort

The mounting method for the Green Comfort Module is very similar to that of the Modul-AIR. The recommended and preferred method for mounting the Green Comfort unit would be directly hung on a wall using the wall bracket supplied. If the wall is not capable of holding the weight of both the Modul-AIR and Green Comfort units, details of how to build the wall up appropriately are shown in the next Wall Build Up section below.

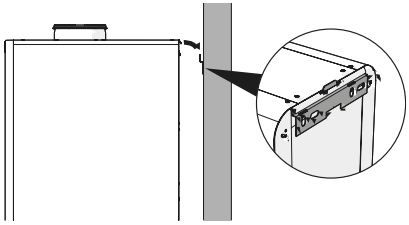
There are no other mounting options that will comply with Joules manufacturing and supply warranty, any possible attempt to do so would void Joules statutory responsibilities.

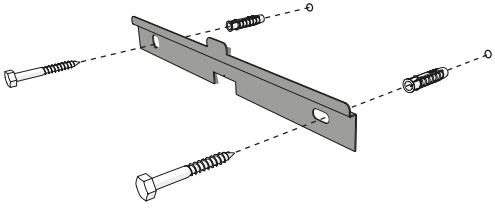
Wall Mounting

Increase weight for the wall to be capable of holding to 225kg/m^2 for Modul-AIR and GC. If the wall mass is lower than this, ensure the recommended wall build-up is adhered to. The Green Comfort should always be hung level however there is a permitted tolerance of 2°. If there are any concerns relating to the correct wall build-up, please contact joule directly before installation.



1. Measure and mark positions for pilot holes based on the dimensions displayed here.
2. Mount the wall bracket using the supplied screws and plugs or suitable alternatives.
3. Hang the Green Comfort on the wall bracket. Ensure the tab protrudes from the top of the unit, this is evidence the unit has engaged the bracket fully.



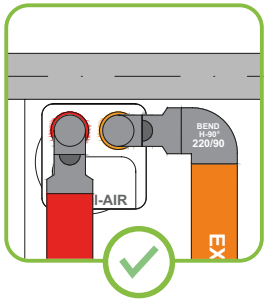


Wall Build Up Detail

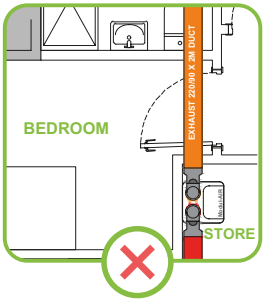
Modul-AIR Concrete/Block Wall Build-up

Item	Description	Qty.
1	Block Wall	1
2	Concrete Floor Slab	1
3	Standard Wall Finish	1
4	Wallplugs	2
5	Modul-AIR	1
6	Modul-AIR Wall Bracket	1
7	Metal Stud Wall	1
8	Heavy Hex Flange Screw, M8 X 80	2

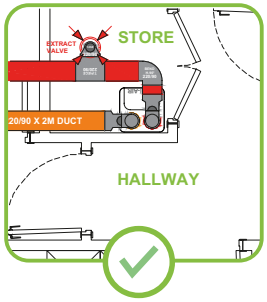
Solid External Party Wall



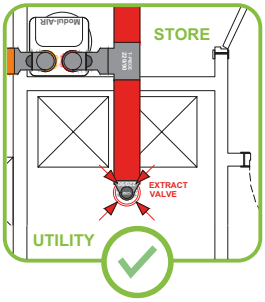
Internal Wall Adjoining Bedroom



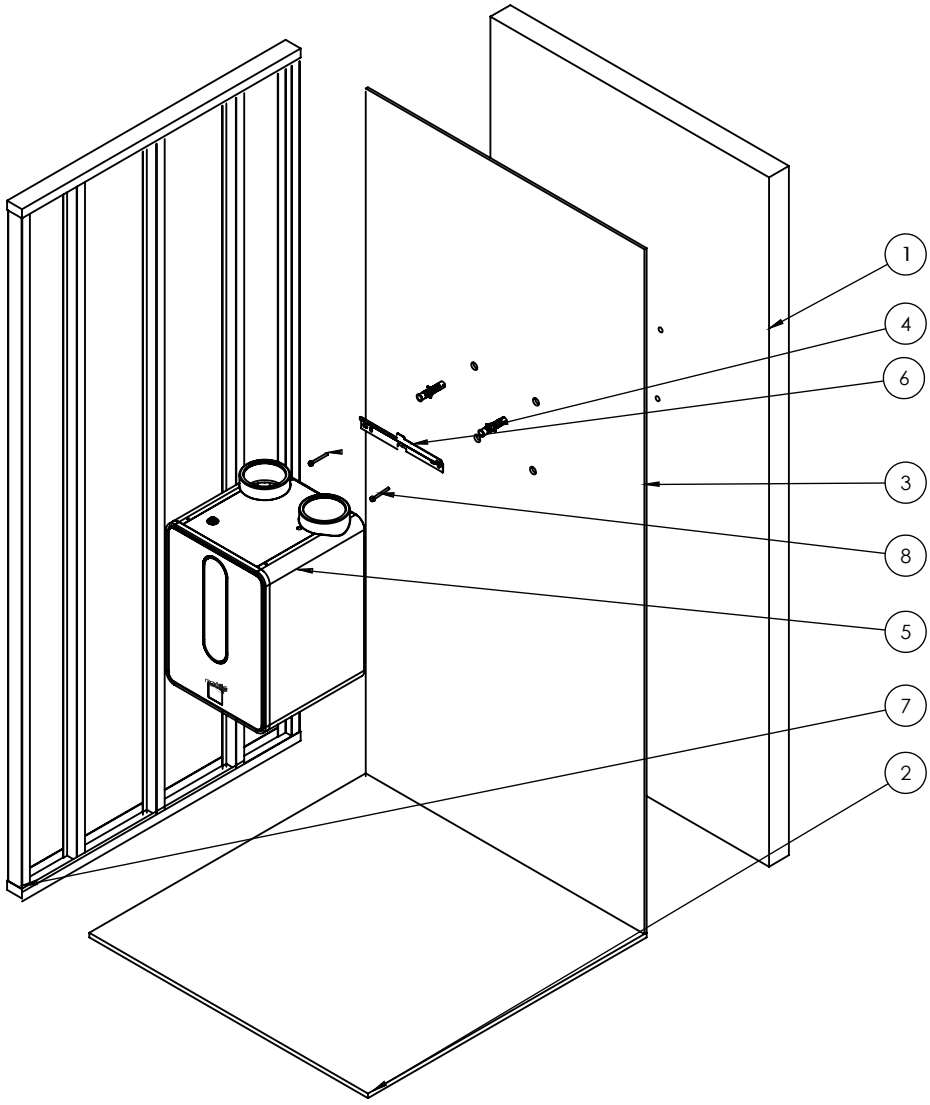
Internal Wall Adjoining Hallway



Internal Wall Adjoining Utility



Modul-AIR Concrete/Block Wall Build-up

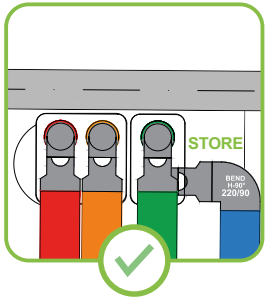


Modul-AIR and Green Comfort Concrete/Block Wall Build-up

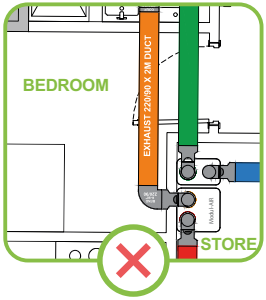
The exploded view on the following page details the required wall build-up to adequately support the Modul-AIR and Green Comfort if the dwelling has Concrete or Block walls- this is the recommended wall type as it can naturally carry the weight of the Modul-AIR and Green Comfort without reinforcement. Use the supplied Wallplugs and Fixings to secure the Modul-AIR and Green Comfort brackets to the wall.

Item	Description	Qty.
1	Block Wall	1
2	Concrete Floor Slab	1
3	Standard Wall Finish	1
4	Wallplugs	4
5	Modul-AIR	1
6	Green Comfort	1
7	Modul-AIR Wall Bracket	1
8	Green Comfort Bracket	1
9	Metal Stud Wall	1
10	Heavy Hex Flange Screw, M8 X 80	4

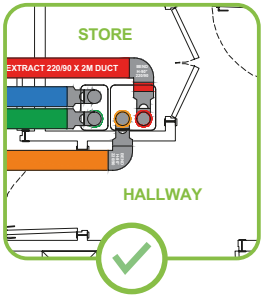
Solid External Party Wall



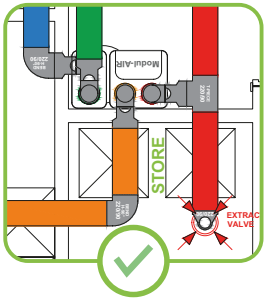
Internal Wall Adjoining Bedroom



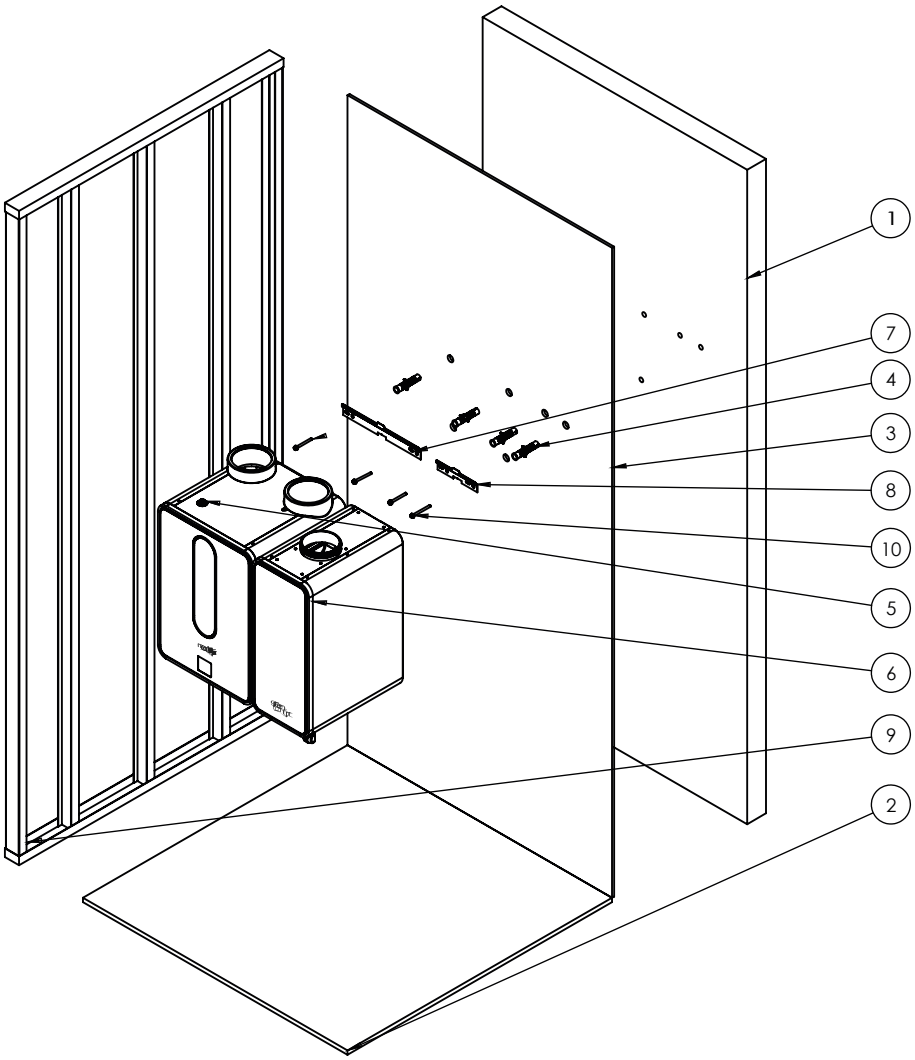
Internal Wall Adjoining Hallway



Internal Wall Adjoining Utility



Modul-AIR and Green Comfort Concrete/Block Wall Build-up



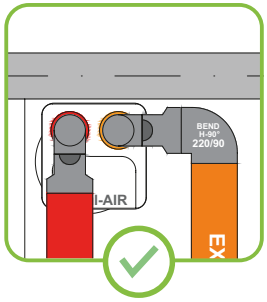
Modul-AIR Timber Stud Build-up

The exploded view on the following page details the required wall build-up to adequately support the Modul-AIR if the dwelling has timber studs. The wall build-up incorporates extra timber support noggins for the Modul-AIR bracket to be directly fixed to. The build-up also incorporates a sheet of 3/4" plywood fixed directly to the stud before the plasterboard is used as the standard wall finish.

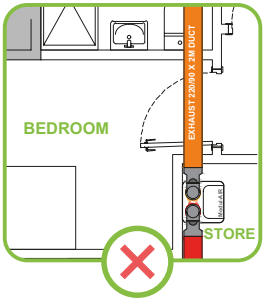
Item	Description	Qty.
1	Modul-AIR	1
2	Modul-AIR Wall Bracket	1
3	Timber Noggin	7
4	Concrete Floor Slab	1
5	¾" Plywood Sheet	1
6	Standard Wall Finish	1
7	Heavy Hex Flange Screw, M8 X 80	4
8	Timber Stud Wall	4

N.B. Must be installed using timber studs.

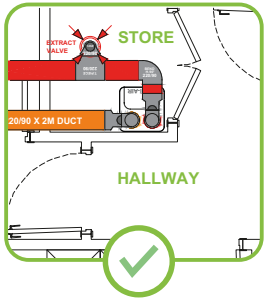
Solid External Party Wall



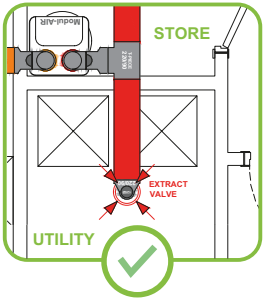
Internal Wall Adjoining Bedroom



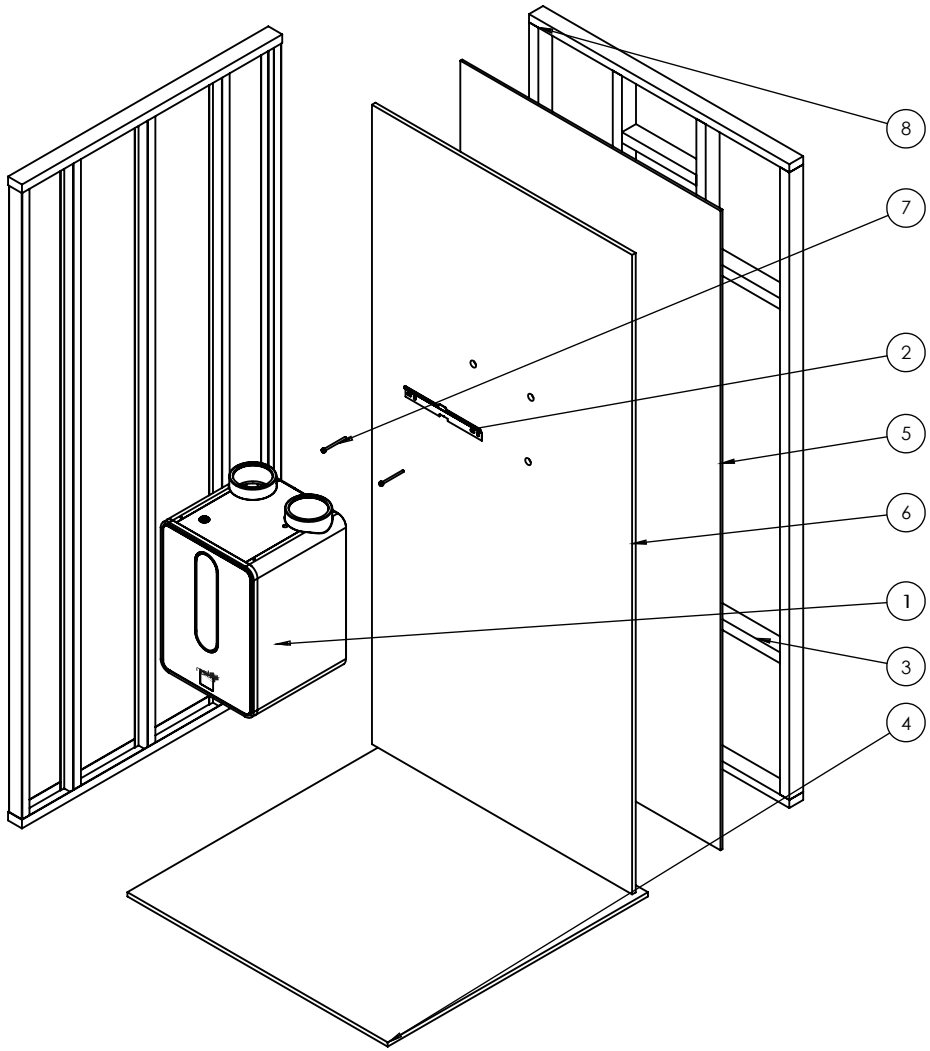
Internal Wall Adjoining Hallway



Internal Wall Adjoining Utility



Modul-AIR Timber Stud Build-up



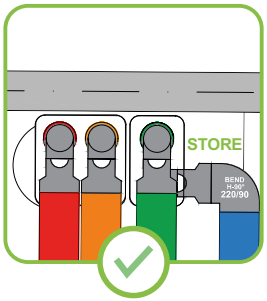
Modul-AIR and Green Comfort Timber Stud Build-up

The exploded view on the following page details the required wall build-up to adequately support the Modul-AIR and Green Comfort module if the dwelling has timber studs. The wall build-up incorporates extra timber support noggins for the Modul-AIR and Green Comfort brackets to be directly fixed to. The build-up also incorporates a sheet of 3/4" plywood fixed directly to the stud before the plasterboard is used as the standard wall finish.

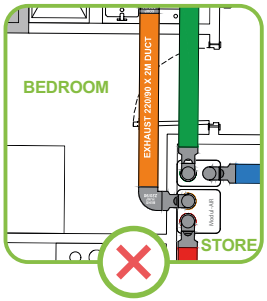
Item	Description	Qty.
1	Modul-AIR	1
2	Green Comfort	1
3	Modul-AIR Wall Bracket	1
4	Green Comfort Wall Bracket	1
5	Heavy Hex Flange Screw, M8 X 80	4
6	Standard Wall Finish	1
7	¾" Plywood Sheet	1
8	Timber Stud Wall	4
9	Timber Noggin	8
10	Concrete Floor Slab	1

N.B. Must be installed using timber studs.

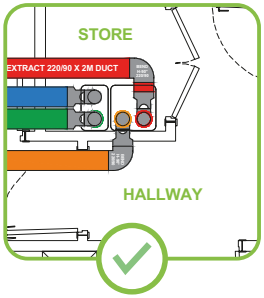
Solid External Party Wall



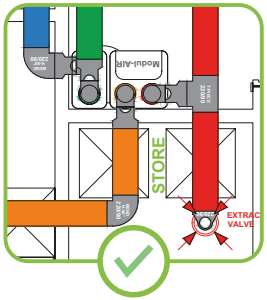
Internal Wall Adjoining Bedroom



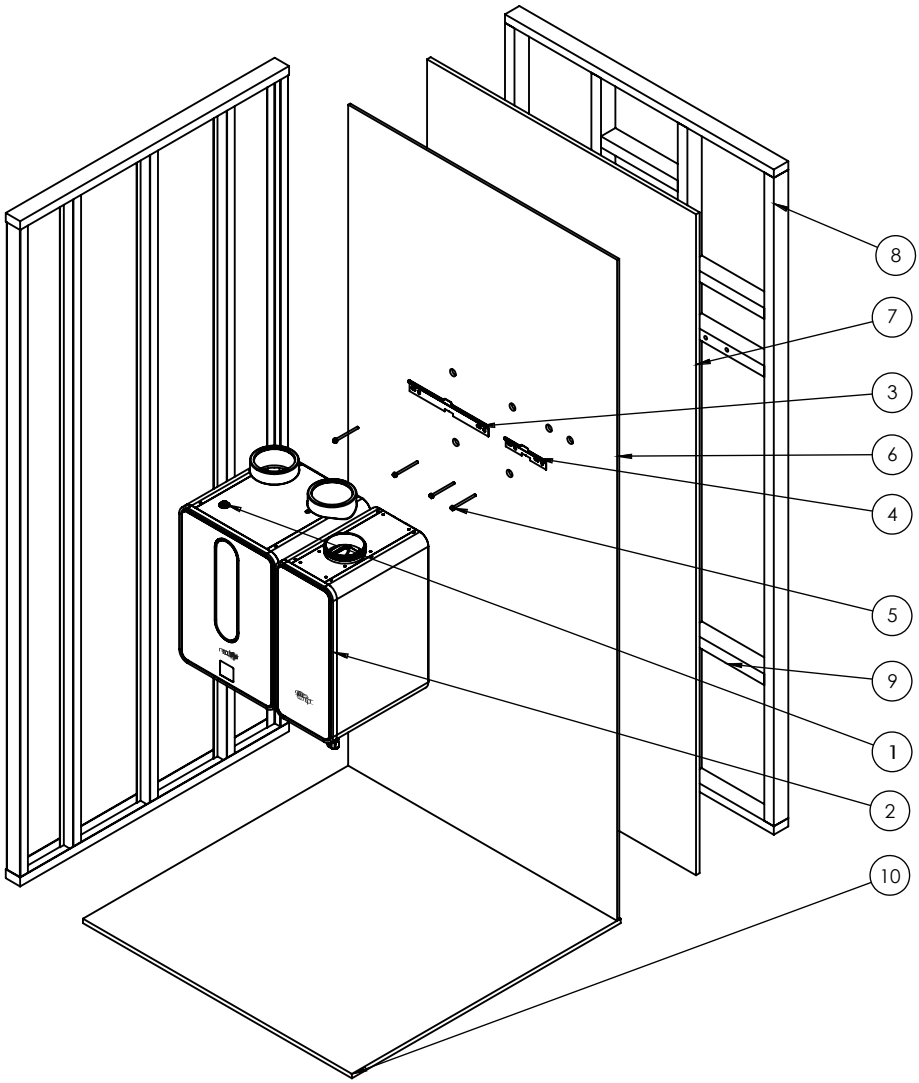
Internal Wall Adjoining Hallway



Internal Wall Adjoining Utility

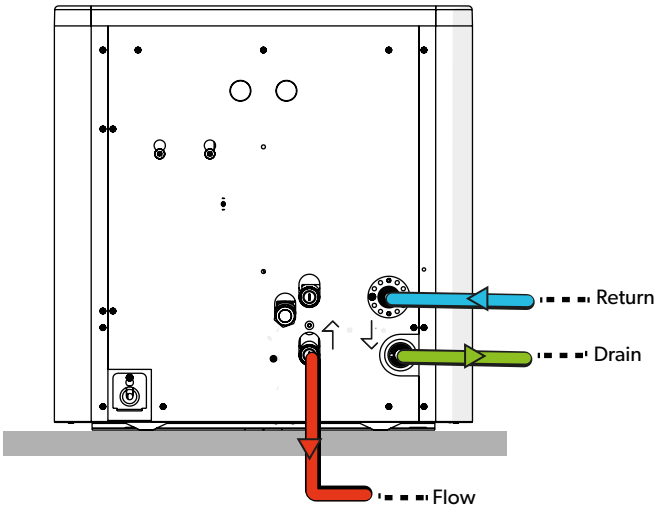


Modul-AIR and Green Comfort Timber Stud Build-up

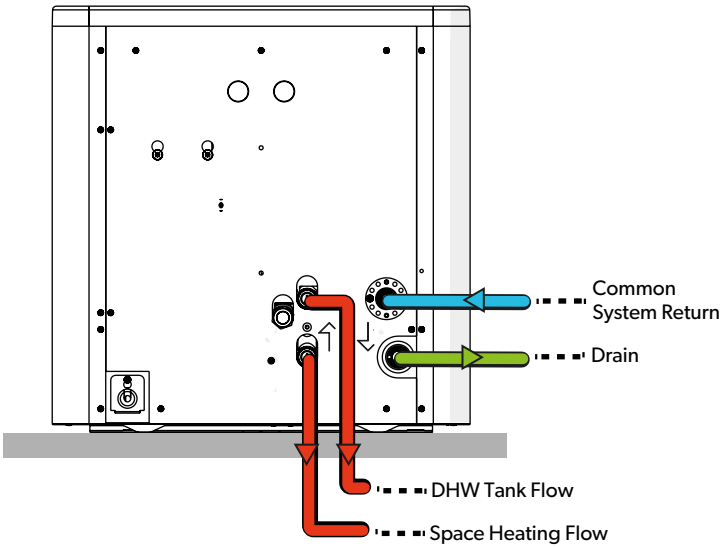


Connecting the Modul-AIR

Modul-AIR Aqua Pipe Connections



Modul-AIR ALL-E Pipe Connections



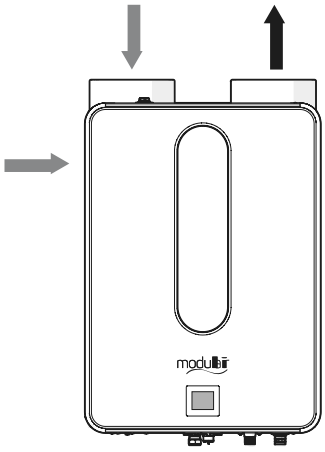
Connecting to the ventilation ductwork

The ventilation ductwork system is essential to the performance of an Exhaust Air Heat Pump. To avoid under performance of the Heat Pump or increased system noise, the following points should be considered when designing/ installing the ductwork:

- Avoid sharp bends or transitions.
- Swept 90° bends or 2x45° bends are preferred.
- Use two 45° bends instead of one 90° bend
- Ensure all burrs are removed from duct ends.
- Insulated flexible ducts must be used to connect the ductwork to the Heat Pump.
- Ensure all joints and connections are sealed appropriately
- The maximum pressure drop across the external grille of the exhaust duct shall not exceed 8 Pa.
- The maximum permissible pressure drop for the entire duct system shall not exceed 150 Pa (excluding the Heat Pump).
- The pressure drop across the Heat Pump is 30 Pa

Ductwork – Extract Air

The Extract Air or 'Air In' to the Heat Pump is the heat source to the Exhaust Air Heat Pump system. The extract air is fed via the ductwork to the Heat Pump from all wet rooms within the dwelling.



Ductwork – Exhaust Air

The Exhaust Air or 'Air Out' from the Heat Pump is the exhaust of the cooled air from the Heat Pump to outside the dwelling. It is essential this duct is insulated as the average temperature in the duct will be 4°C under normal operating conditions. When the duct passes through ceiling voids, condensation on the outside of the duct will occur. To avoid this, the entire exhaust duct must be insulated with suitably sized insulation, to local building regulations. The exhaust ducting from the unit should be connected to the roof/wall terminal using a suitably insulated adapter and grill.

The exhaust ducting should be no less than Ø150mm or 220mm x 90mm flat pack. It is necessary to adhere to this duct specification to comply with noise specifications and to prevent potential condensation. 220mm x 90mm flat pack ducting must terminate with a double air brick.

Ductwork insulation MUST be fully sealed at all joints, transitions, air bricks and/or roof cowls.

Ventilation Connection

Ductwork – Insulation Specification

Provision of insulation to ducts and pipes, in accordance with the standards specified in BS 5422:2009, should adequately limit heat loss or heat gain, as appropriate.

Ductwork – Unheated Spaces

Any supply or extract ductwork passing through an unheated space must be suitably insulated to avoid condensation and/or heat loss or heat gain. A ceiling void is not considered an unheated space as it is directly above a heated space.

Ductwork – Exhaust in heated Spaces

Any exhaust ductwork passing through a heated space must be suitably insulated to avoid condensation and/or heat gain.

Ductwork – Kitchen Extract Fan

To avoid cooking odours entering the Heat Pump, a distance of 1.5m must be maintained between the kitchen extractor fan to the kitchen ceiling valve of the extract ductwork. When cooking, always use the kitchen extractor fan.

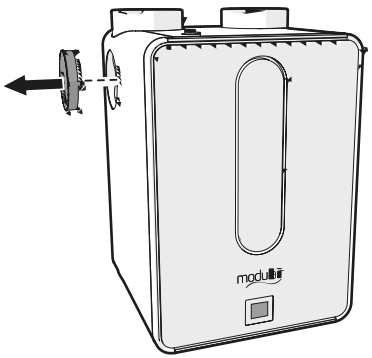
Installation Options

Before connecting the Insulated flexible ducts to the top of the Heat Pump take stock of what would be the most practical orientation to route the pipes in your installation. There are 2 connection options for the 'Air In'; top left & side and 1 option for the 'Air Out'; top right. Once the Intake option is chosen, remove the plastic dust covers from the Heat Pump.

The top connection is the most common.

If the other connections are used, the plastic caps must be removed and used to plug the top connection. A flat head screwdriver can be used to remove the caps. There is the option to use the extra 'Air In' side connection alongside the top connection. A ceiling valve can be connected directly to the side connection (via a suitable transition piece) as the extract valve for the room the Heat Pump is installed in. This would negate the need for an additional ductwork connection in the ceiling above the unit, where space can sometimes be a premium.

If this option is chosen, the minimum clearance value for the lefthand side of the unit MUST increase to 500mm.



Final ventilation connections

Connect the Insulated flexible ducts to the Heat Pump using the metal transition pieces provided with the unit.

Piping the Modul-AIR

This section is applicable to both the Modul-AIR All-E and Aqua variants.

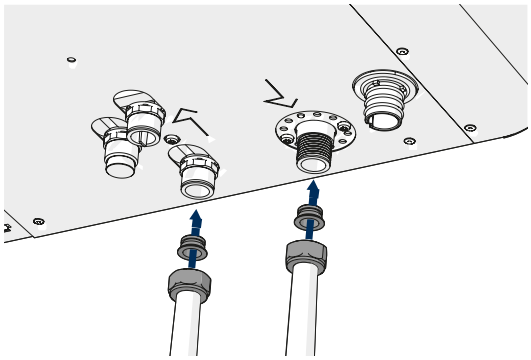
Primary Pipework

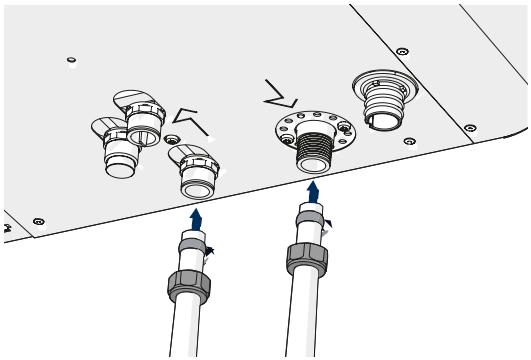
The flow and return connections on the underside of the unit are 15mm compression.

The Modul-AIR unit can be piped to in both rigid and flexible pipe. Nuts and olives are supplied with the heat pump.

It is advised to increase the size of the primary pipes to 22mm copper or 25mm Alu-plex to reduce the resistance.

Isolation valves must be installed directly below the unit to allow for maintenance and/or repair of the Heat Pump.





The piping system must be flushed out before the Heat Pump is connected so that any debris will not cause damage to the component parts

Pressure relief valve

The Heat Pump does not have a pressure relief valve incorporated. The installer MUST ensure the system is protected from over-pressurisation. The valve prevents abnormal water pressure from damaging the system by opening at a maximum pressure setting of 3.0 bar.

Filter-Ball/ Y-Strainer

Installation of the filter/ strainer is essential to protect the Heat Pump from system debris.

The filter/ strainer must be cleaned after one day of operation and it must be checked periodically to maintain the minimum system flow rate.

Fill & Flush Valve

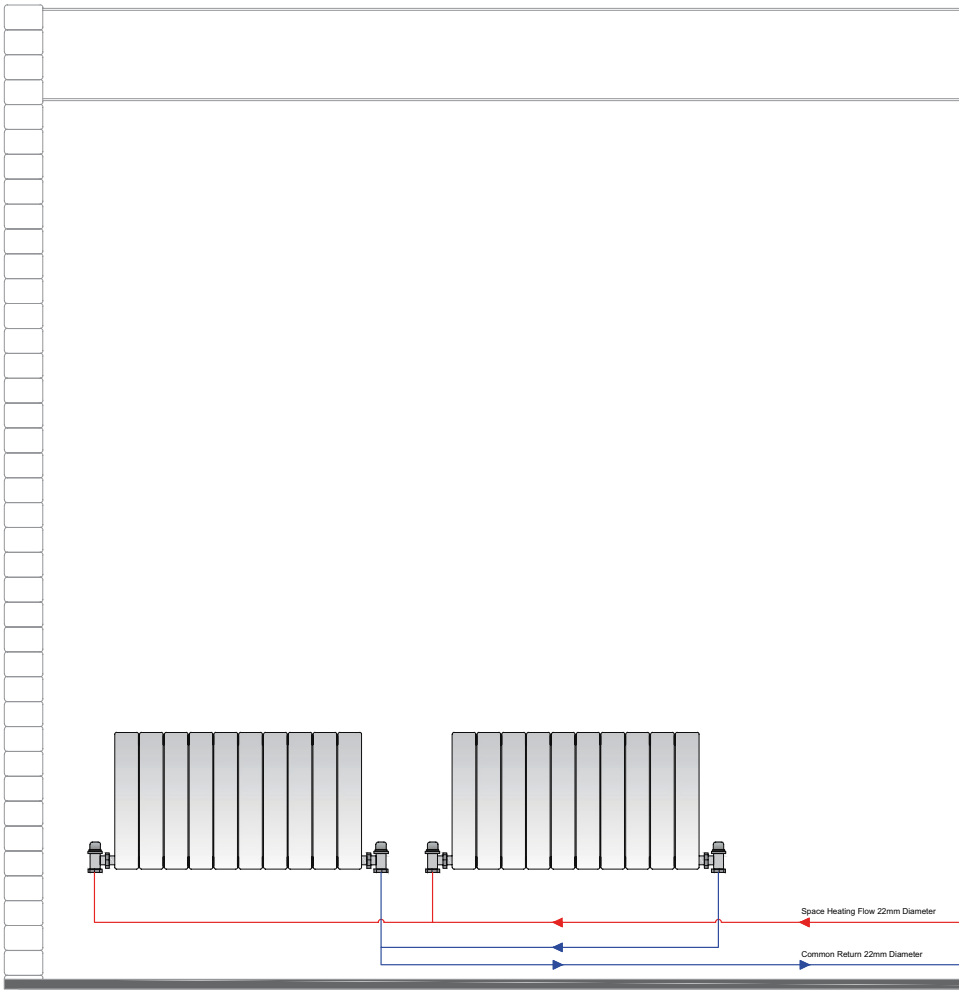
The fill & flush valve must be installed on the primary return after all system connections have been made. This ensures that when purging air from the system, the entire system is being purged correctly.

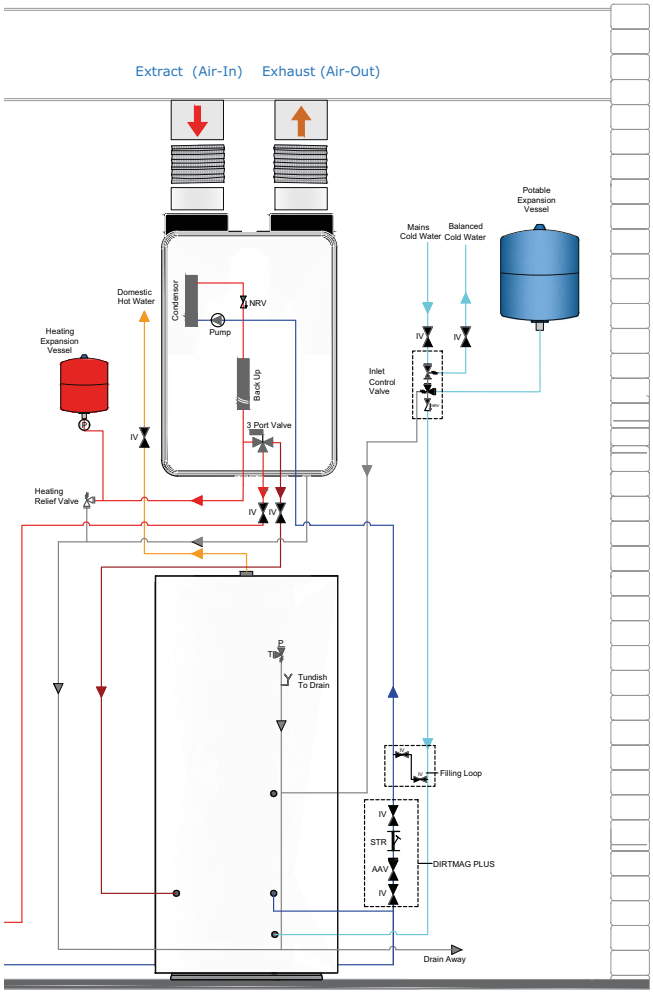
Piping insulation

Pipe insulation should comply with BS 5422:2009. Alternatively, insulation of a thickness that provides reduction of heat loss equivalent to material having a thermal conductivity of 0.035 W/mK at 40°C and thickness equal to the diameter of the pipe (or 40mm, whichever is smaller) may be used.

Modul-AIR Mechanical Schematic

ModulAir All-E - 1 Zone (Rads)





Front View of Unit & Cylinder

NOTES

All plumbing fittings and outlets must be fitted in accordance with manufacturers instructions and have isolating flow rate and pressure reducing valves as required.
The installation must be in accordance with all relevant regulations All products specified on this drawing must be fitted in accordance with all of the manufacturers installation instruction manuals
All final pipework to radiators to be 15mm diameter and run behind dry lining.
Any plastic pipework runs over 6m to radiators must be increased to 15mm diameter. Any plastic pipework runs to radiators with listed outputs greater than 1500 Watts must be increased to 15mm.
All primary pipework from a heat pump must be 22 mm.
Primary pipework must be installed to sizes stated in relevant boiler manufacturers data and takes precedence over size stated on the drawings.
The first meter of pipework from the heat pump to be copper, all pipework in the airing cupboard and all exposed pipework to be copper.

KEY

Flow and Return - F & R Hot

Hot Water Supply - HWS

Cold Water Supply - CWS

Supply Mains Cold Water - MCW

Pipework Rise To Above - T/A

Pipework Drop To Below - T/B

Pipework Drop From Above - F/A

Pipework Rise From Below - F/B

Space Heating FLow

Common Return

Domestic Hot Water Supply

Domestic Cold Water Supply

Drain

2 PORT VALVE (NON MOTORIZED)

IV ISOLATION VALVE

RELIEF VALVE

PRESSURE REDUCING VALVE

NRV NON RETURN VALVE

STR STAINER

AAV AUTOMATIC AIR VENT

P T TEMPERATURE AND PRESSURE RELIEF VALVE

P PRESSURE GAUGE

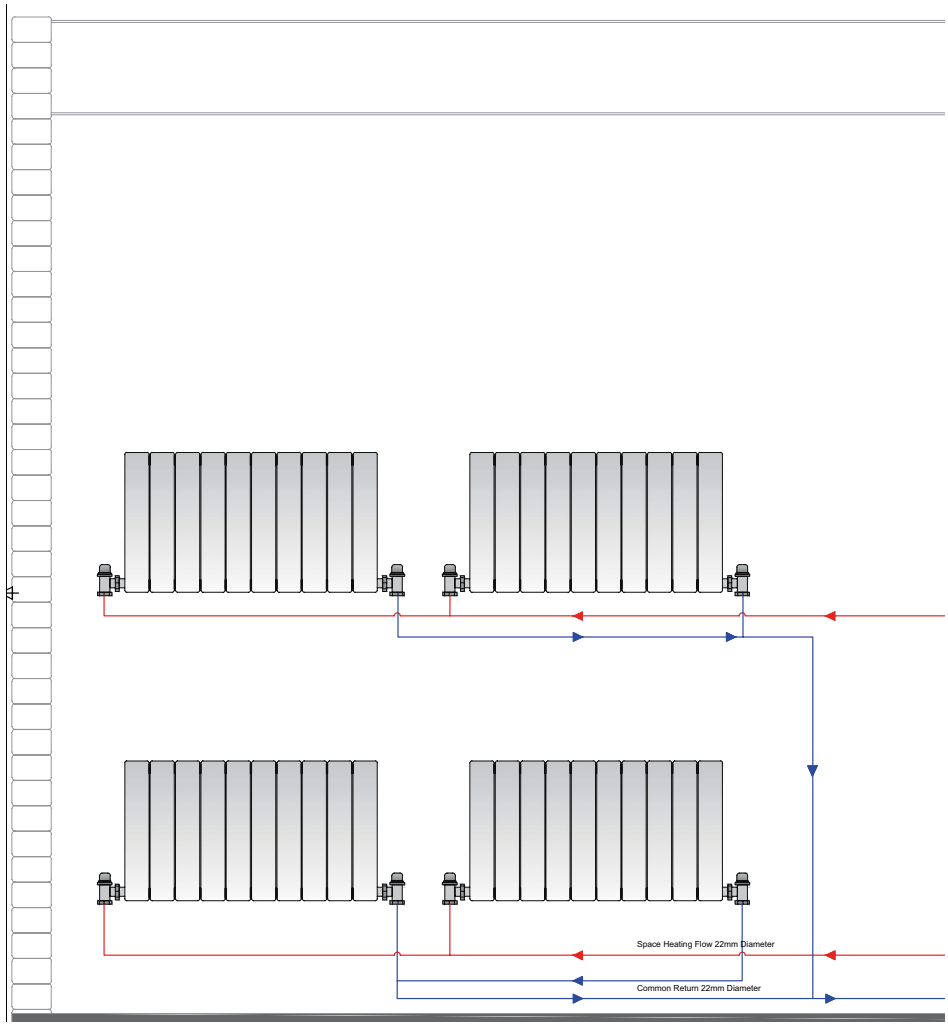
T TEMPERATURE GAUGE

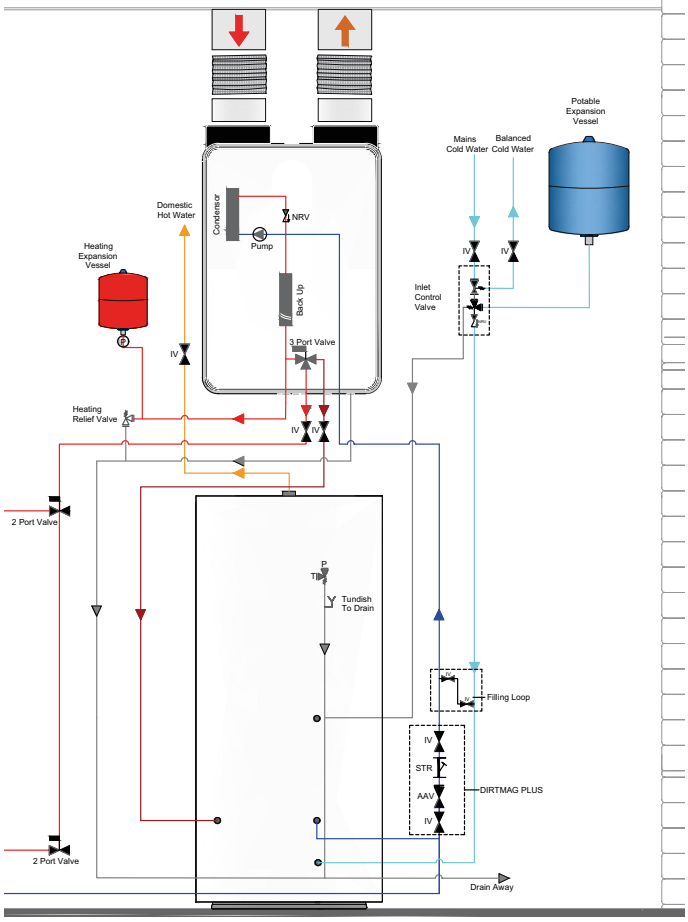
3 PORT VALVE

This drawing to be read in conjunction with the design specification & schedules and any discrepancies must be reported to Joule UK prior to installation

Modul-AIR Mechanical Schematic

ModulAir All-E - 2 Zone (Rads)





NOTES

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The installation must be in accordance with all relevant regulations All products specified on this drawing must be fitted in accordance with all of the manufacturers installation instruction manuals
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All primary pipework from a heat pump must be 22 mm.
Primary pipework must be installed to sizes stated in relevant boiler manufacturers data and takes precedence over size stated on the drawings.
The first meter of pipework from the heat pump to be copper, all pipework in the airing cupboard and all exposed pipework to be copper.

KEY

Flow and Return - F & R Hot

Hot Water Supply - HWS

Cold Water Supply - CWS

Supply Mains Cold Water - MCW

Pipework Rise To Above - T/A

Pipework Drop To Below - T/B

Pipework Drop From Above - F/A

Pipework Rise From Below - F/B

Space Heating FLow

Common Return

Domestic Hot Water Supply

Domestic Cold Water Supply

Drain

2 PORT VALVE (NON MOTORIZED)

ISOLATION VALVE

RELIEF VALVE

PRESSURE REDUCING VALVE

NON RETURN VALVE

STAINER

AUTOMATIC AIR VENT

TEMPERATURE AND PRESSURE RELIEF VALVE

PRESSURE GAUGE

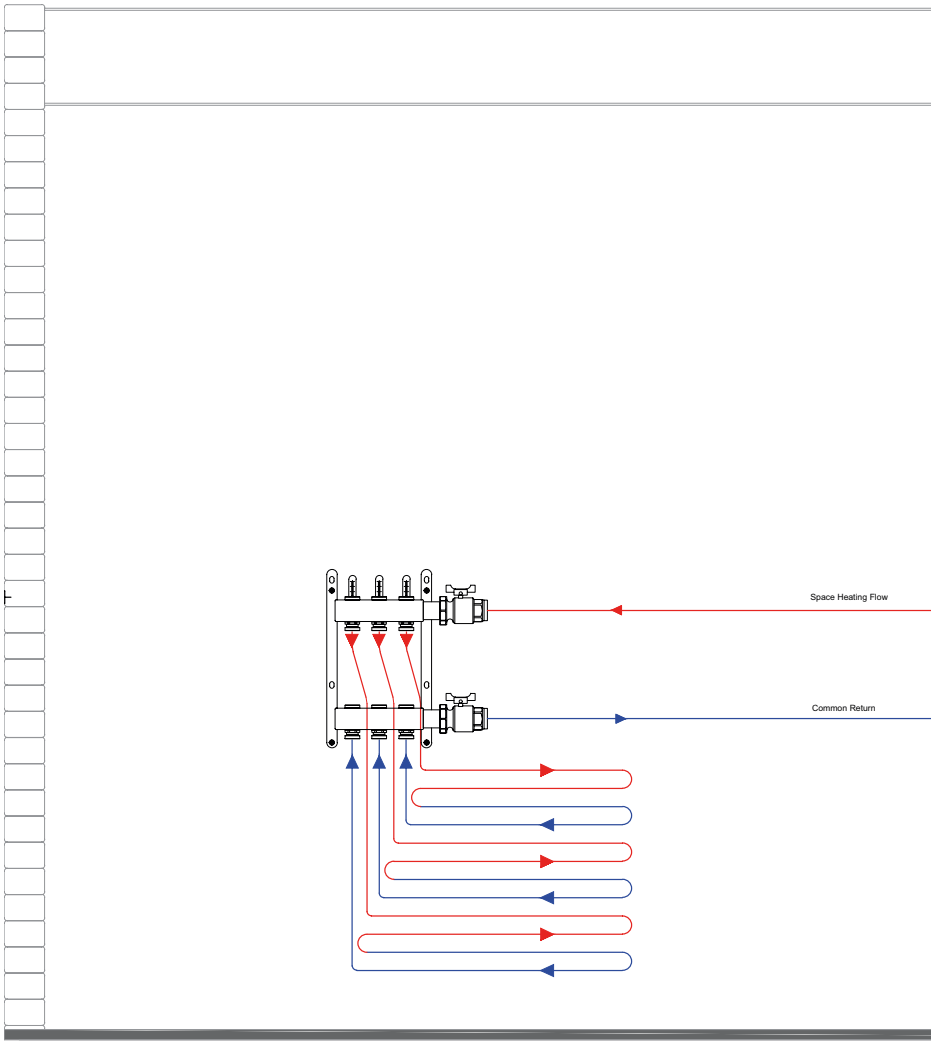
TEMPERATURE GAUGE

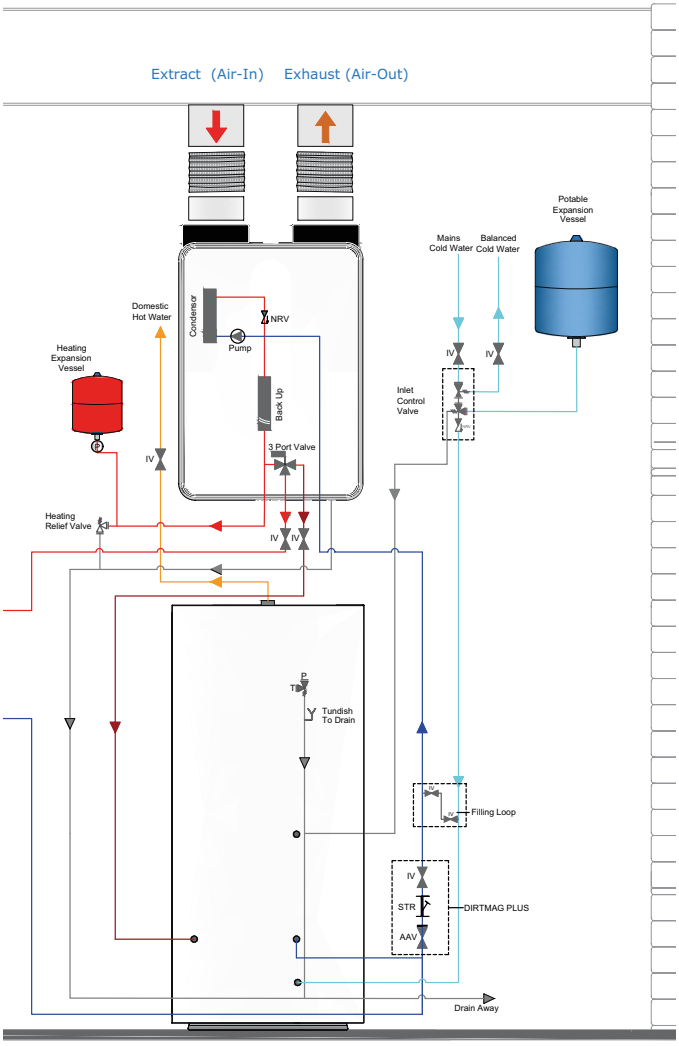
3 PORT VALVE

This drawing to be read in conjunction with the design specification & schedules and any discrepancies must be reported to Joule UK prior to installation

Modul-AIR Mechanical Schematic

ModulAir AII-E - 1 Zone (UFH)





NOTES

All plumbing fittings and outlets must be fitted in accordance with manufacturers instructions and have isolating flow rate and pressure reducing valves as required.
The installation must be in accordance with all relevant regulations All products specified on this drawing must be fitted in accordance with all of the manufacturers installation instruction manuals
All final pipework to Manifold to be 22 mm diameter for flow and common return and all UFH Circuit must be 16 mm.
Primary pipework must be installed to sizes stated in relevant boiler manufacturers data and takes precedence over size stated on the drawings
The first meter of pipework from the Heat pump to be copper, all pipework in the airing cupboard and all exposed pipework to be copper.

KEY

Flow and Return - F & R Hot

Hot Water Supply - HWS

Cold Water Supply - CWS

Supply Mains Cold Water - MCW

Pipework Rise To Above - T/A

Pipework Drop To Below - T/B

Pipework Drop From Above - F/A

Pipework Rise From Below - F/B

Space Heating FLow

Common Return

Domestic Hot Water Supply

Domestic Cold Water Supply

Drain

2 PORT VALVE (NON MOTORIZED)

IV ISOLATION VALVE

RELIEF VALVE

PRESSURE REDUCING VALVE

NRV NON RETURN VALVE

STR STAINER

AAV AUTOMATIC AIR VENT

P T TEMPERATURE AND PRESSURE RELIEF VALVE

P PRESSURE GAUGE

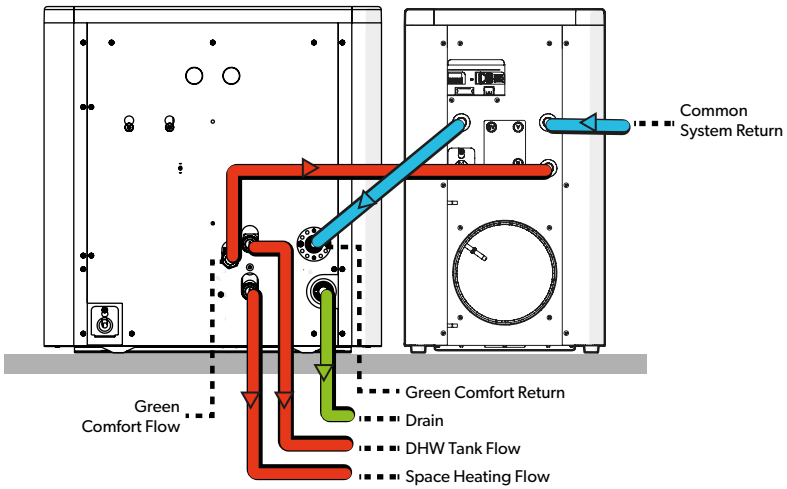
T TEMPERATURE GAUGE

3 PORT VALVE

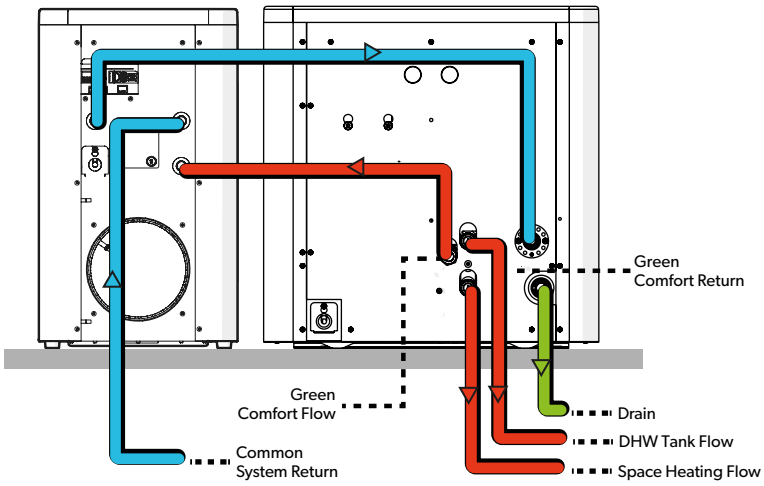
This drawing to be read in conjunction with the design specification & schedules and any discrepancies must be reported to Joule UK prior to installation

Connecting the Green Comfort

Modul-AIR All-E & Green Comfort – Righthand side



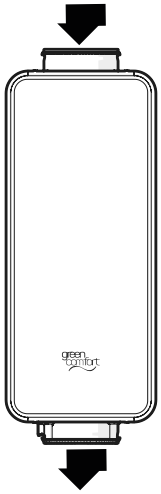
Modul-AIR All-E & Green Comfort – Lefthand side



Connection Points

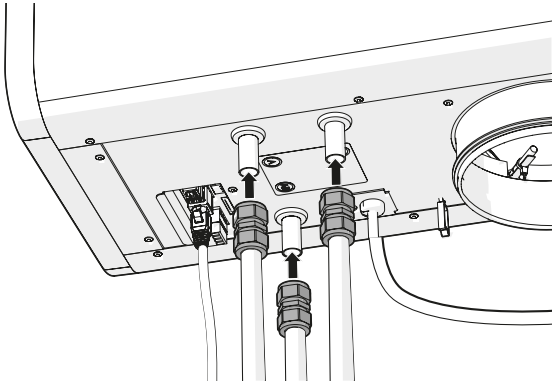
The external connection points to the Green Comfort are detailed below:

- Ventilation Fresh Air intake through the top 150mm duct connection
- Ventilation System Fresh Air supply through the bottom 150mm duct connection
- Flow and return piping connection for heating water
- Flow piping connection from the Modul-AIR unit.
- UTP data lead connection to be used to link with the Modul-AIR unit.
- Mains electrical connection through supplied fly lead.



Primary Pipework

- The flow and return connections on the underside of the unit are 15mm compression.
- The Green Comfort unit can be piped to in both rigid and flexible pipe, although it is recommended to pipe it rigidly.
- Isolation valves must be installed directly below the unit to allow for maintenance and/or repair of the Green Comfort unit.
- 15mm compression connections are supplied with the Green Comfort unit for connecting to the copper tails on the base of the unit.



Connecting to the ventilation ductwork

The Green Comfort is connected to the ventilation ductwork with the openings on the top and bottom of the product. Please make sure to follow the guidelines below in order to lay the ventilation ductworks out correctly. This procedure will ensure that there is as little resistance as possible in the duct work, so that the Green Comfort consumes less power and makes the noise from the unit is reduced as much as possible:

- Avoid sharp bends or transitions.
- Swept 90° bends or 2x45° bends are preferred.
- Use two 45° bends instead of one 90° bend.
- Use round and smooth curves.
- Ensure all burrs are removed from duct ends.
- Do not use flexible connection hoses.
- Use exhaust valves with a pressure drop between 10 and 20 Pa.
- The use of a silencer is recommended on the supply to the Green Comfort unit and on the exhaust of the Modul-AIR unit.

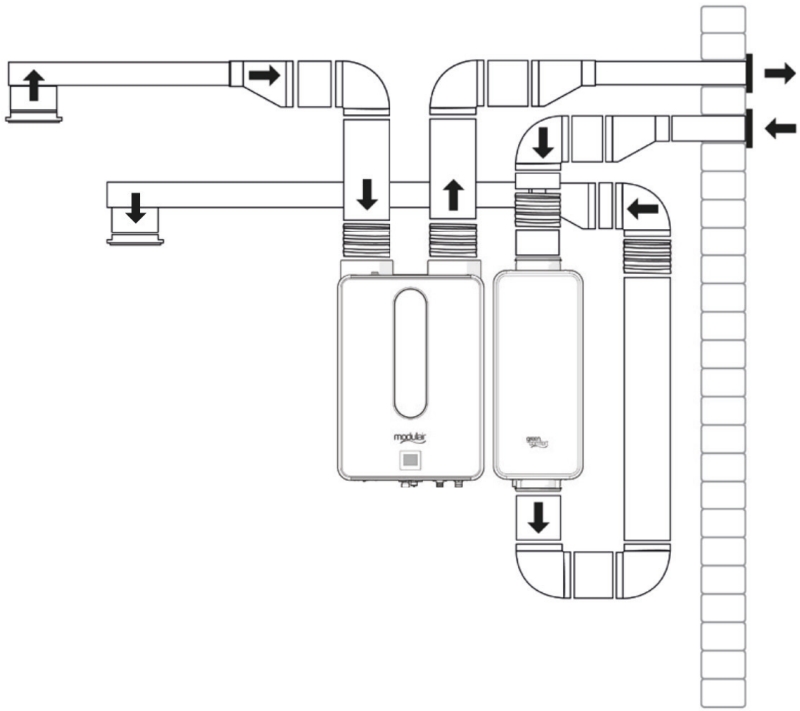
Ductwork – Supply Air

The Supply Air or 'Fresh Air' to the dwelling from the Green Comfort is the conditioned air that's has passed through the filters and heat exchanger within the Green Comfort unit. The Supply air is fed via the ductwork to all the living spaces within the dwelling. If required, the Fresh Air will be heated by the Green Comfort unit before entering the dwelling.

Ductwork – Intake Air

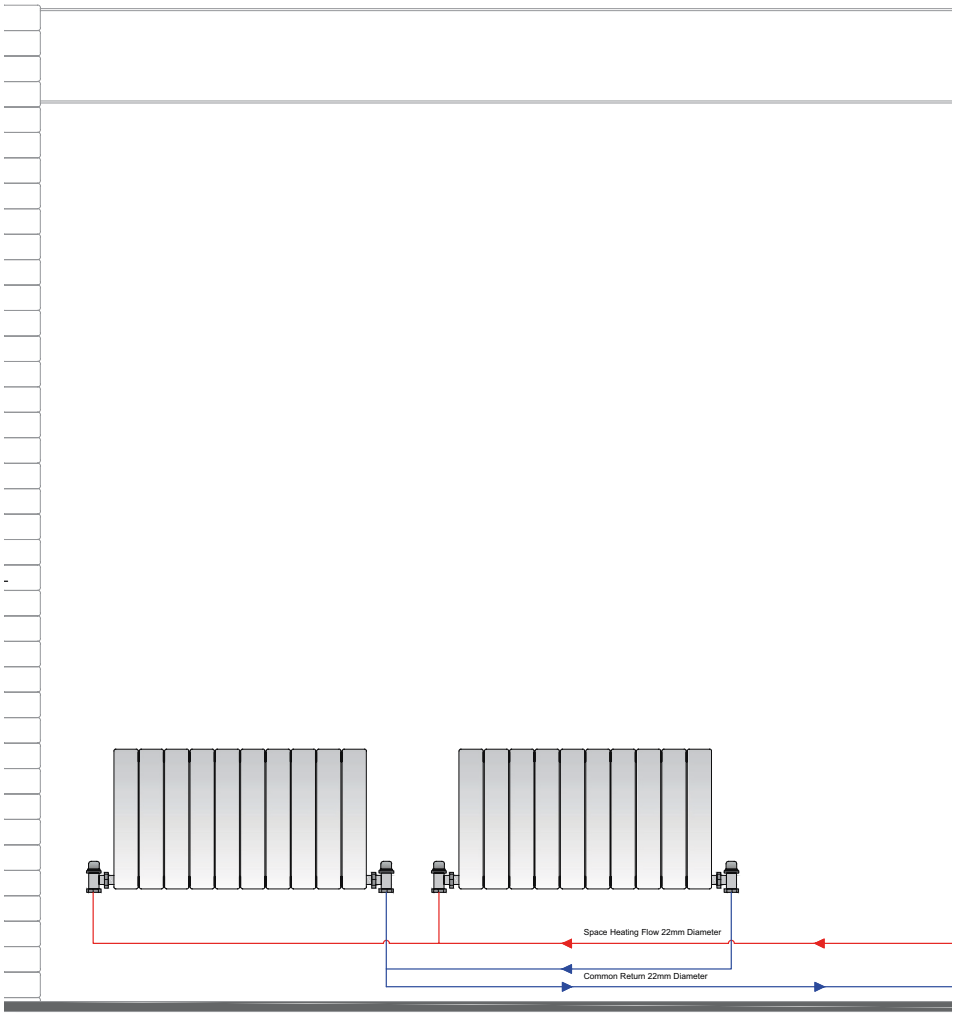
The Supply Air In or "Intake Air" from the Green Comfort is the Intake of air from outside of the dwelling. It is essential this duct is insulated as the duct will intake untreated fresh air in all atmospheric conditions. When the duct passes through ceiling voids, condensation on the outside of the duct will occur. To avoid this, the entire Intake duct must be insulated with suitably sized insulation, to local building regulations. The Intake Air duct from the unit should be connected to the roof/wall terminal using a suitably insulated adapter and grill.

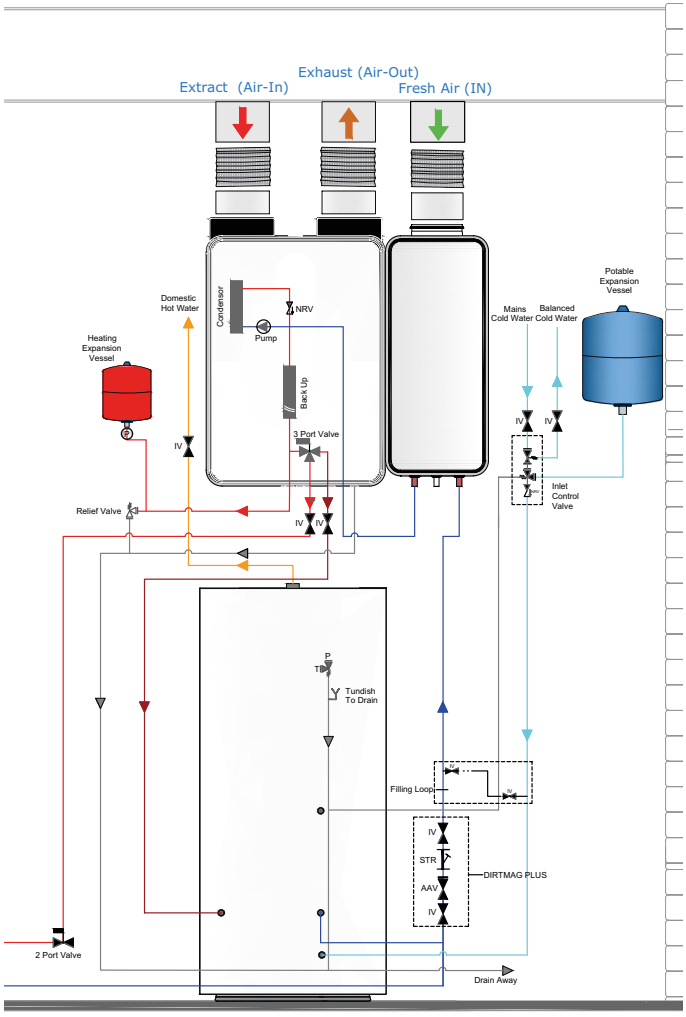
The Intake ducting should be no less than Ø150mm or 220mm x 90mm flat pack. It is necessary to adhere to this duct specification to comply with noise specifications and to prevent potential condensation. 220mm x 90mm flat pack ducting must terminate with a double air brick.



Green Comfort Mechanical Schematic

ModulAir All-E & Green Comfort - 1 Zone (Rads)





NOTES

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KEY

Flow and Return - F & R Hot

Hot Water Supply - HWS

Cold Water Supply - CWS

Supply Mains Cold Water - MCW

Pipework Rise To Above - T/A

Pipework Drop To Below - T/B

Pipework Drop From Above - F/A

Pipework Rise From Below - F/B

Space Heating FLow

Common Return

Domestic Hot Water Supply

Domestic Cold Water Supply

Drain

2 PORT VALVE (NON MOTORIZED)

IV ISOLATION VALVE

RELIEF VALVE

PRESSURE REDUCING VALVE

NRV NON RETURN VALVE

STR STAINER

AAV AUTOMATIC AIR VENT

T P TEMPERATURE AND PRESSURE RELIEF VALVE

P PRESSURE GAUGE

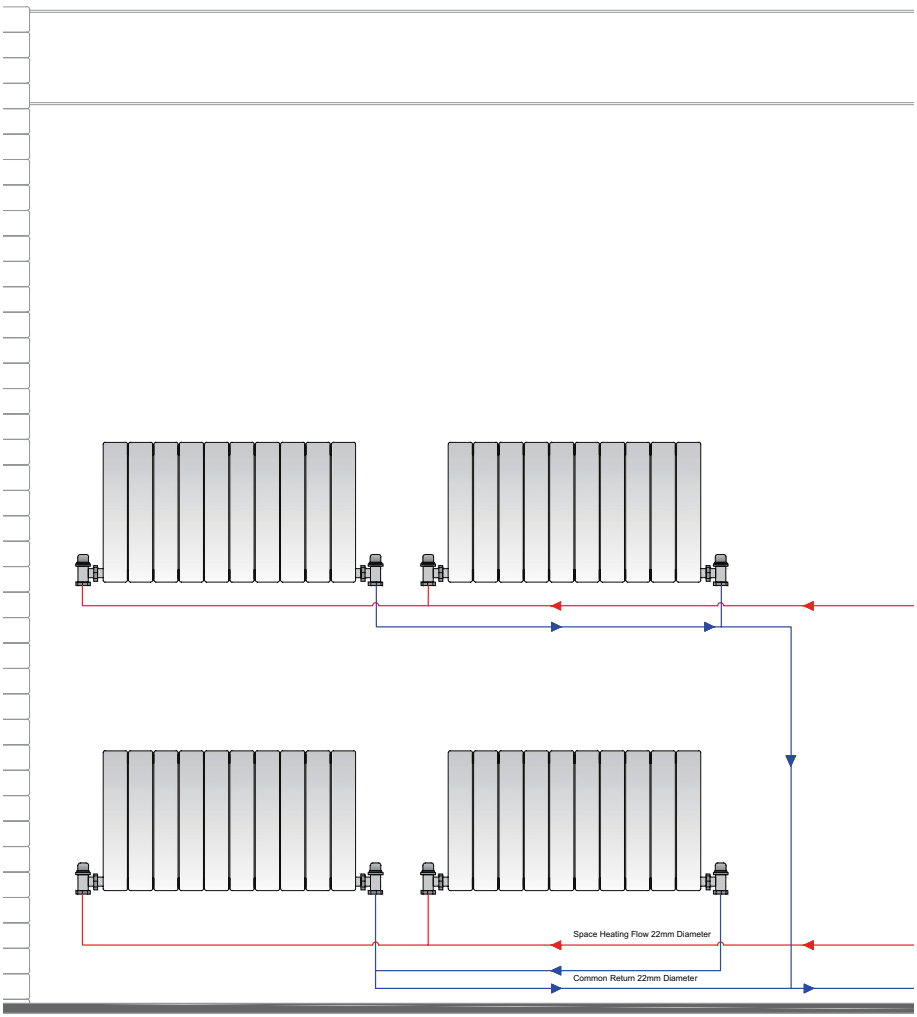
T TEMPERATURE GAUGE

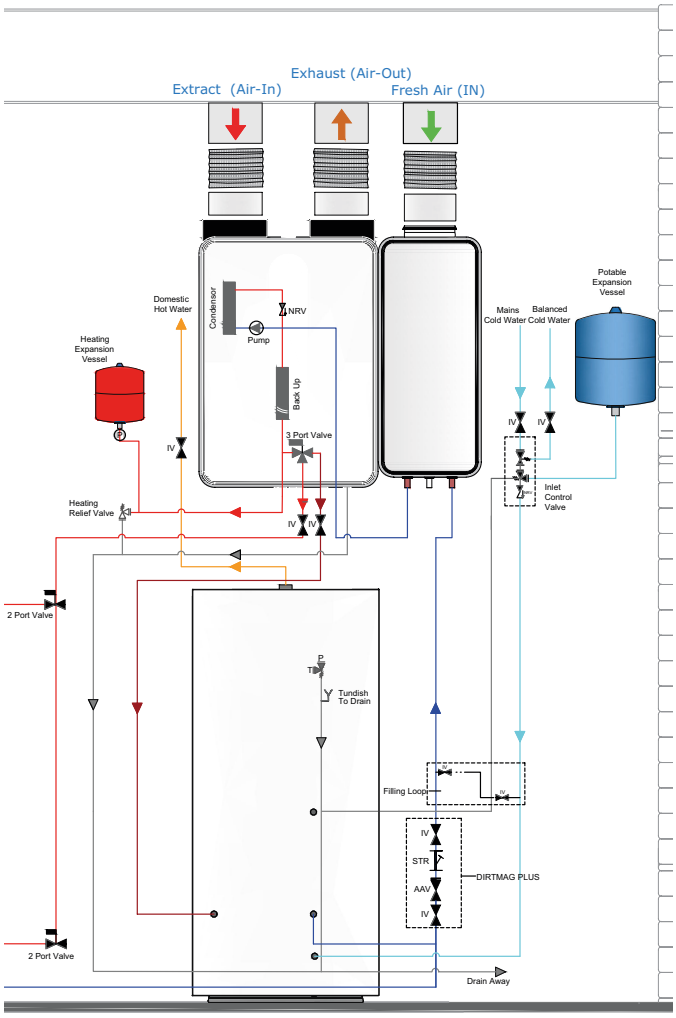
3 PORT VALVE

This drawing to be read in conjunction with the design specification & schedules and any discrepancies must be reported to Joule UK prior to installation

Green Comfort Mechanical Schematic

ModulAir All-E & Green Comfort - 2 Zone (Rads)





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Flow and Return - F & R Hot

Hot Water Supply - HWS

Cold Water Supply - CWS

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Pipework Rise To Above - T/A

Pipework Drop To Below - T/B

Pipework Drop From Above - F/A

Pipework Rise From Below - F/B

Space Heating FLow

Common Return

Domestic Hot Water Supply

Domestic Cold Water Supply

Drain

2 PORT VALVE (NON MOTORIZED)

ISOLATION VALVE

RELIEF VALVE

PRESSURE REDUCING VALVE

NON RETURN VALVE

STAINER

AUTOMATIC AIR VENT

TEMPERATURE AND PRESSURE RELIEF VALVE

PRESSURE GAUGE

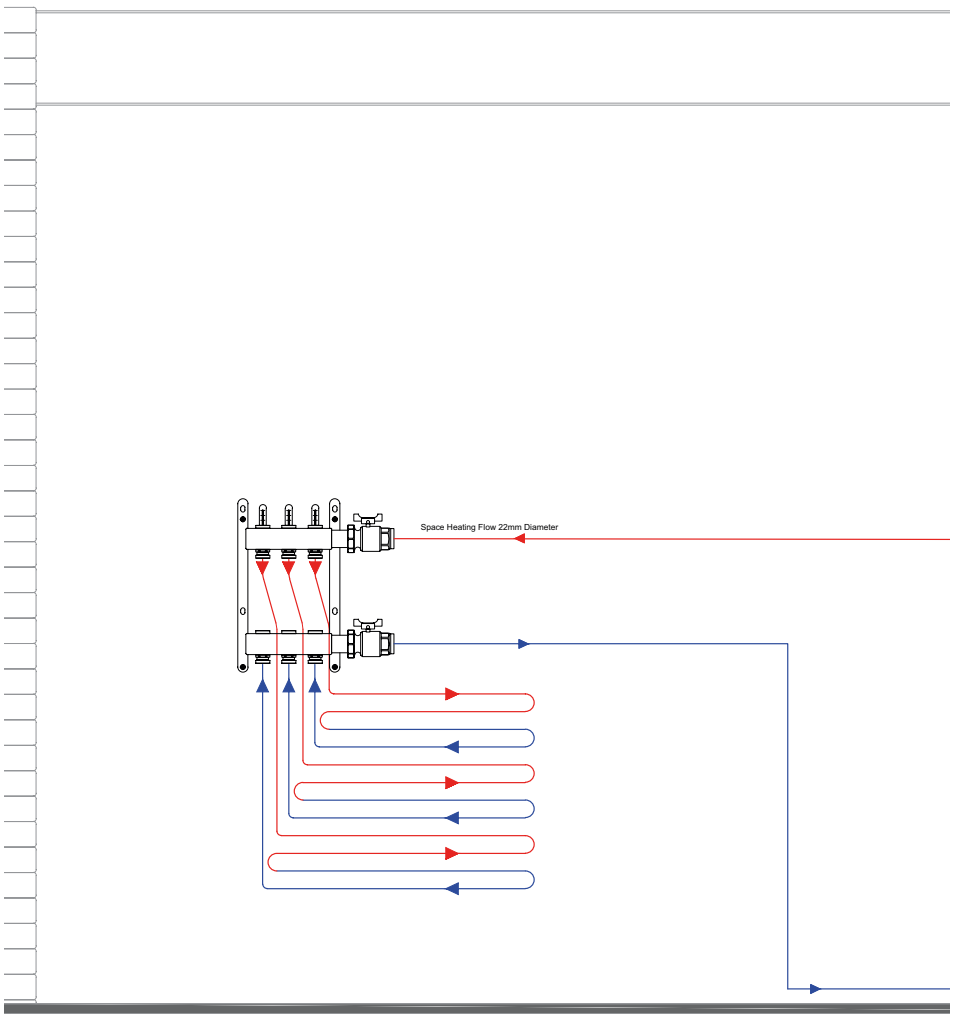
TEMPERATURE GAUGE

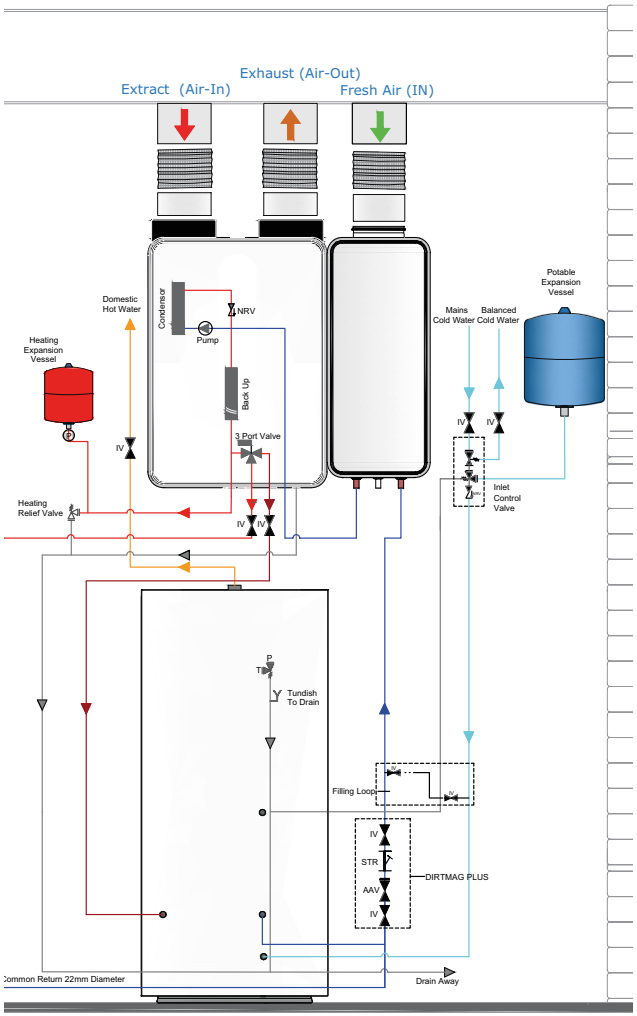
3 PORT VALVE

This drawing to be read in conjunction with the design specification & schedules and any discrepancies must be reported to Joule UK prior to installation

Green Comfort Mechanical Schematic

ModulAir AII-E & Green Comfort - 1 Zone (UFH)





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KEY

Flow and Return - F & R Hot

Hot Water Supply - HWS

Cold Water Supply - CWS

Supply Mains Cold Water - MCW

Pipework Rise To Above - T/A

Pipework Drop To Below - T/B

Pipework Drop From Above - F/A

Pipework Rise From Below - F/B

Space Heating FLow
Common Return
Domestic Hot Water Supply
Domestic Cold Water Supply
Drain

2 PORT VALVE (NON MOTORIZED)
ISOLATION VALVE
RELIEF VALVE
PRESSURE REDUCING VALVE
NON RETURN VALVE
STAINER
AUTOMATIC AIR VENT
TEMPERATURE AND PRESSURE RELIEF VALVE
PRESSURE GAUGE
TEMPERATURE GAUGE
3 PORT VALVE

This drawing to be read in conjunction with the design specification & schedules and any discrepancies must be reported to Joule UK prior to installation

General Pipework

Sizing, positioning and pre-charge pressure of the heating system expansion vessel

The Exhaust Air Heat Pump does not have an expansion vessel incorporated. The installer must ensure the system is protected from the effects of expansion by installing a suitably sized expansion vessel.

The vessel prevents water pressure spikes in the system by absorbing the increased pressure as the temperature increases.

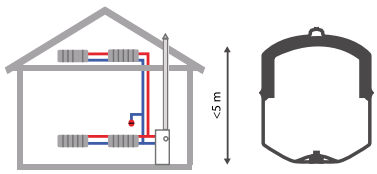
- Only use dry nitrogen or air to set the expansion vessel pressure.
- Inappropriate setting of the expansion vessel pre-charge pressure will lead to malfunction of the system.
- The pressure should only be set and/or adjusted by a competent installer.
- The adjusting of the pressure should be done before the expansion vessel is installed - i.e. the pipe connection must be open to atmosphere.

The vessel must be sized in accordance with EN 12828. The following system data will assist in sizing a vessel:

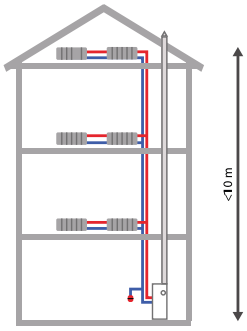
1	Vessel pre-charge pressure	*-0.5 bar below working pressure
2	Safety valve set pressure	3 bar, industry standards
3	**The difference in height (H)	0 m, typical install setup
4	Total system volume, in litres	Calculated by the installer
5	System maximum temperature	65°C
6	% Antifreeze glycol in the system	Zero, as it's an indoor installation

* A pre-charge pressure of 0.5 bar equates to a static head of 5 metres.

** The difference in height (m) is the difference between the position in which the safety valve is installed and the position of the vessel.



Pre-Charge Pressure 0.5 bar



Pre-Charge Pressure 1.0 bar

Calculations:

[1] Expansion Volume (EV) = $\frac{200 \times 1.94}{100}$ = 3.88 litres

[2] Reserve Volume (RV), 25% = 3.88 x 1.25 = 4.85 litres

[3.1] Required Gross Volume (L) = $\frac{4.85}{0.63}$ = 7.7 litres ~ 8 litres

[3.2] Required Gross Volume (L) = $\frac{4.85}{0.5}$ = 9.7 litres ~ 10 litres

Worked Example:

Using the above calculations and an example system volume of 200 litres

- A 8L expansion vessel pre-charged to 0.5 bar is sufficient.
- A 10L expansion vessel pre-charged to 1.0 bar is sufficient.

NOTE: if any of the system data values change a different vessel would be required.

[1] Expansion Volume (EV) = $\frac{\text{System Volume} \times 1.94}{100}$

[2] Reserve Volume (RV), 25% = EV x 1.25

[3.1] Required Gross Volume (L) = $\frac{RV}{0.63}$ ~ (if pre - charge = 0.5 bar)

[3.2] Required Gross Volume (L) = $\frac{RV}{0.5}$ ~ (if pre - charge = 1.0 bar)

Positioning the vessel

It is recommended to position the vessel below the heat pump on the primary return pipe.

Pre-charge pressure of the vessel

Deciding the pre-charge pressure of the vessel is part of the vessel sizing procedure. If the vessel is sized at 0.5 bar and the difference in height (H) is zero, then the vessel must be pre-charged to 0.5 bar. If the difference in height increases or decreases, then an additional charge pressure will be required. Use the formula below to calculate the additional charge and add this to the pre-charge pressure:

$$Pg\ (bar) = \left(\frac{H}{(10 + 0.3)} \right)$$

Filling & Venting Modul-AIR

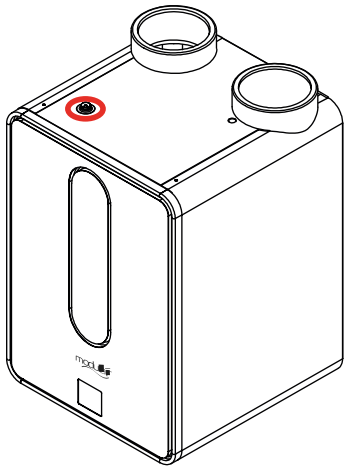
Follow the steps below to Fill and Vent the system in the correct order:

1. Ensure all system valves are open fully.
2. Fill the system using the incorporated filling loop to the recommended pressure (min 1.5 bar – max 2.0 bar).

While filling the system, air should be released via the manual or automatic air vents within the system.

During the filling process it is important to release air from the heat pump. There is a manual air vent on the top of the unit.

3. Ensure the system is watertight.



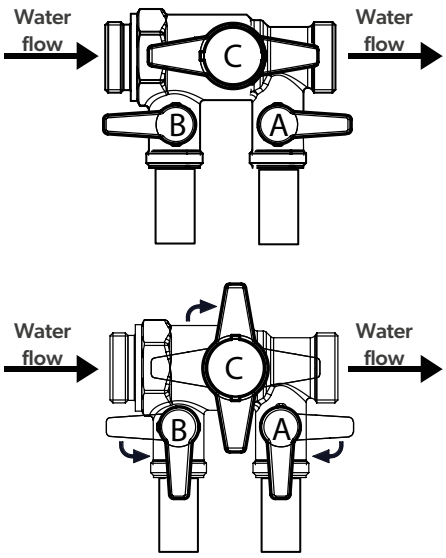
The fill & flush valve MUST be connected on the 'return' pipe to the Heat Pump. Refer to the system schematics for more information.

Follow the steps below to Flush the system in the correct order:

1. Connect the fill & flush pump to the fill & flush valve (as shown).

It is important to connect the feed hose from the fill & flush pump to Valve A and the drain hose to Valve B. This ensures the water flows through the Heat Pump first and then out to the Heating Circuit. It also ensures that any trapped air in the Heat Pump and/or the Heating Circuit is pushed back to the fill & flush pump's reservoir and expelled from the system.

2. Valve C is turned to the closed position (90° to the pipe direction). Open valves A and B and switch on the fill & flush pump.
3. Water is circulated through the system for a minimum of 45 minutes.



Filling & Venting the Modul-AIR

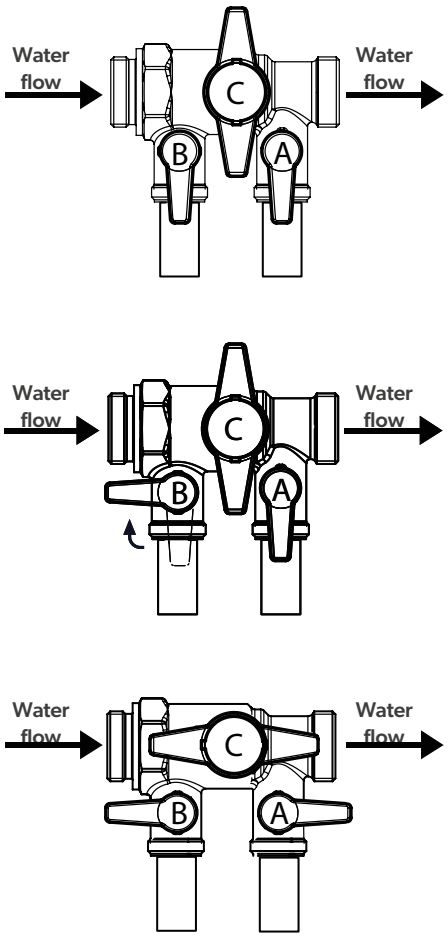
While flushing the Heating Circuit, it is essential to flush each emitter separately. As most emitters will be piped down from the main runs at ceiling level, this helps remove all air pockets from each leg.

During the flushing process it is important to regularly release air from the heat pump.

4. Valve C can be intermittently opened and closed to remove air pockets within the fill and flush valve body. Ensure valve C is always returned to the closed position while flushing the system.
5. After 45 min, if all air has been removed from the system, Valve B should be closed, and the pump allowed to pressurise the system. The recommended pre-charge pressure is between 1.5 and 2.0 bar.
6. When the pre-charge pressure has been reached, Valve A should be closed.

If the pre-charge pressure has exceeded 1.5 bar, Valve B can be opened to allow system pressure to be reduced.

7. Valve C is now opened to allow for normal system operation.
8. The fill and flush pump may now be switched off and the hoses disconnected. The blanking caps can now be replaced on Valves A & B.



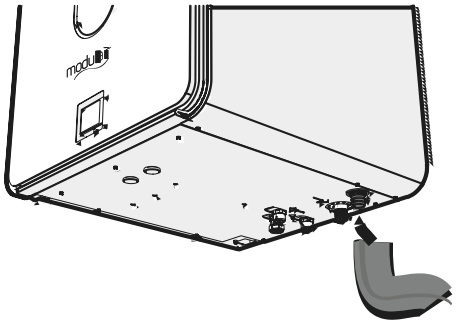
If the Heat Pump configuration has a Hot Water Tank, it is essential to Power On the Heat Pump and run the Purge function. The Purge function is designed to vary the pump speed while alternating the 3-port valve inside the unit. This function is particularly useful as the Hot Water Tank's coil cannot be completely vented during the system flushing.

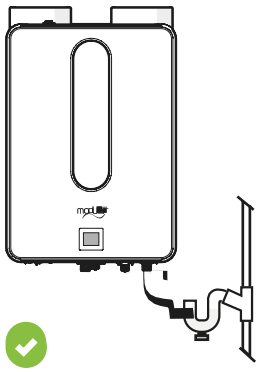
Connecting the Drain Hose

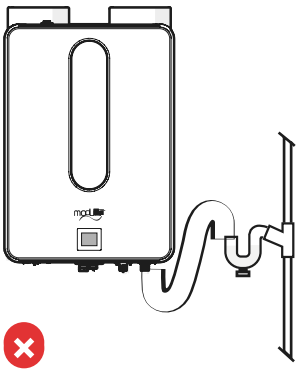
The Exhaust Air Heat Pump absorbs heat from the extracted indoor air. The moisture in the air condenses on the cold evaporator. The condensation water must be drained from the unit to allow the unit to function normally. That is why the Heat Pump must be connected to a drain pipe.

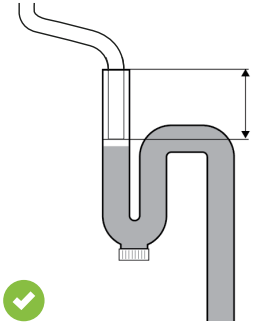
To connect the Modul-AIR to the drainpipe:

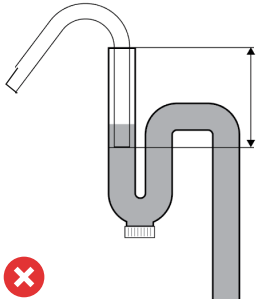
1. Press the corrugated condensation drain hose over the rubber sleeve.
2. Connect the drain hose end to the drain line through a siphon.
3. Make sure the drain hose is above the water level of the siphon.











Filling & Venting the Modul-AIR & Green Comfort

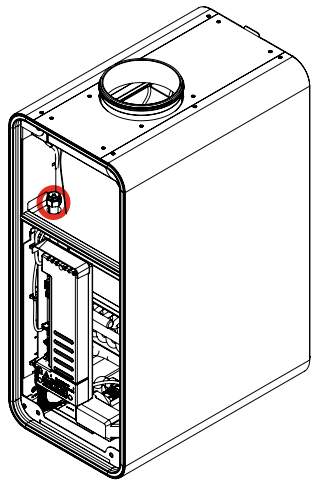
Follow the steps below to Fill and Vent the system in the correct order:

1. Ensure all system valves are open fully.
2. Fill the system using the incorporated filling loop to the recommended pressure (min 1.5 bar – max 2.0 bar).

While filling the system, air should be released via the manual or automatic air vents within the system.

During the filling process it is important to release air from the heat pump and Green Comfort module. There are manual air vents incorporated in both units.

3. Ensure the system is watertight.



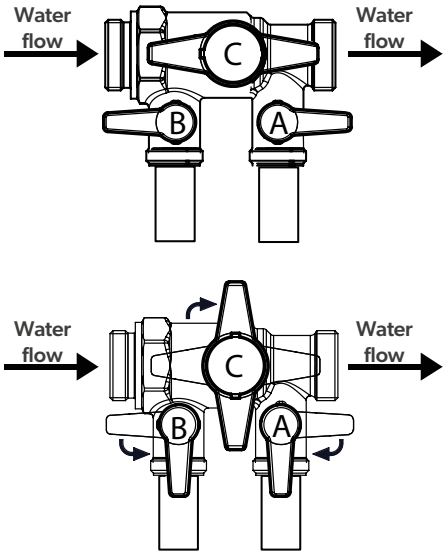
The fill & flush valve MUST be connected on the "return" pipe to the Green Comfort. Refer to the system schematics for more information.

Follow the steps below to Flush the system in the correct order:

1. Connect the fill & flush pump to the fill & flush valve (as shown).

It is important to connect the feed hose from the fill & flush pump to Valve A and the drain hose to Valve B. This ensures the water flows through the Heat Pump first and then out to the open circuit. It also ensures that any trapped air in the Heat Pump and/or the open circuit is pushed back to the fill & flush pump's reservoir and expelled from the system.

2. Valve C is turned to the closed position (90° to the pipe direction). Open valves A and B and switch on the fill & flush pump.
3. Water is circulated through the system for a minimum of 45 minutes.



Filling & Venting the Modul-AIR & Green Comfort

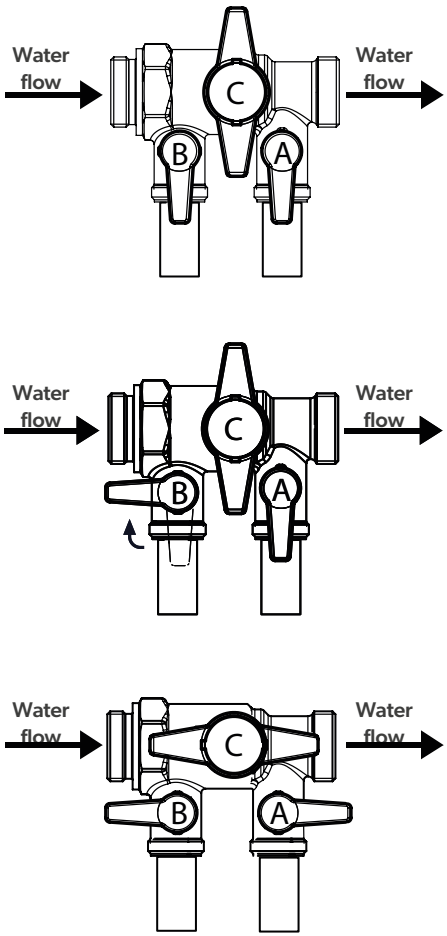
While flushing the heating circuit, it is essential to flush each emitter separately. As most emitters will be piped down from the main runs at ceiling level, this helps remove all air pockets from each leg.

During the flushing process it is important to regularly release air from the heat pump.

4. Valve C can be intermittently opened and closed to remove air pockets within the fill and flush valve body. Ensure valve C is always returned to the closed position while flushing the system.
5. After 45 min, if all air has been removed from the system, Valve B should be closed, and the pump allowed to pressurise the system. The recommended pre-charge pressure is between 1.5 and 2.0 bar.
6. When the pre-charge pressure has been reached, Valve A should be closed.

If the pre-charge pressure has exceeded 1.5 bar, Valve B can be opened to allow system pressure to be reduced.

7. Valve C is now opened to allow for normal system operation.
8. The fill and flush pump may now be switched off and the hoses disconnected. The blanking caps can now be replaced on Valves A & B.



If the Heat Pump configuration has a Hot Water Tank, it is essential to Power On the Heat Pump and run the Purge function. This is also true if there is a Green Comfort module installed. The Purge function is designed to vary the pump speed while alternating the 3-port valve(s) inside the unit(s). This function is particularly useful as the Hot Water Tank's coil and/ or the GC module Heat Exchanger cannot be completely vented during the system flushing.

Modul-AIR Electrical Connections

Power Specification

Unit	HZ	Volts	Phase	Starting Current	Mains Fuse
Joule Modul-AIR Aqua	50	230	Single	10 Amp	16 Amp
Joule Modul-AIR All-E	50	230	Single	10 Amp	25 Amp
Green Comfort	50	230	Single	10 Amp	16 Amp

- The Heat Pump MUST be connected to the mains through a suitably sized RCBO.
- The power cable is pre-wired to the Exhaust Air Heat Pump.
- This Equipment complies with IEC 61000-3-12.
- If extension of the power cable is required, use the grade H05V2V2-F or equivalent materials.
- Ensure that main supply connection is made through a switch that disconnects all poles, with contact gap of a least 3 mm.
- Devices disconnected from the power supply should be completely disconnected in the condition of overvoltage category III.
- Keep distances of 20mm or more between power cable and communication cables.

Modul-AIR - Cable Specifications			
Unit Mains Power	3 Core Flex, 6mm2, 1 meter Fly Lead	x1	Supplied
Tank Sensor	2 Core, 0.25-0.50mm2, 2 meter	x2	Supplied
Immersion Power	3 Core, 1.5mm2	x1	Not supplied
Room Thermostats	2 Core, 0.75mm2 OT	x1	Not supplied
RF Receiver (Optional)	3 Core, 0.5mm2	x2	Not supplied

Green Comfort - Cable Specifications			
Unit Mains Power	3 Core Flex, 6mm2, 1 meter Fly Lead	x1	Supplied
UTP Comms cable	UTP Data cable, 3 meter	x1	Supplied

During the unit installation first install the ventilation connections, then the piping connections and then finally the electrical connections.
If the unit is being uninstalled disconnect it in a reverse procedure to the above

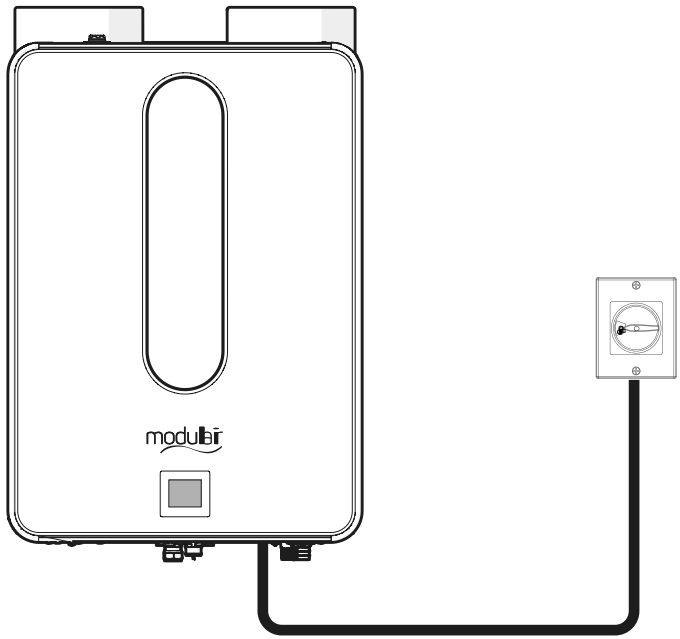
Modul-AIR Electrical Connections

Power Specification

The Heat Pump power cable is to be connected to a suitably sized isolator which disconnects all poles with a contact gap of at least 3mm. The isolation switch is not standard with the Modul-AIR supplied. The Isolator allows for disconnection of the electrical power supply for maintenance and/or repair of the Heat Pump.

The Heat Pump is to be wired to the mains through use of a suitably sized RCBO.

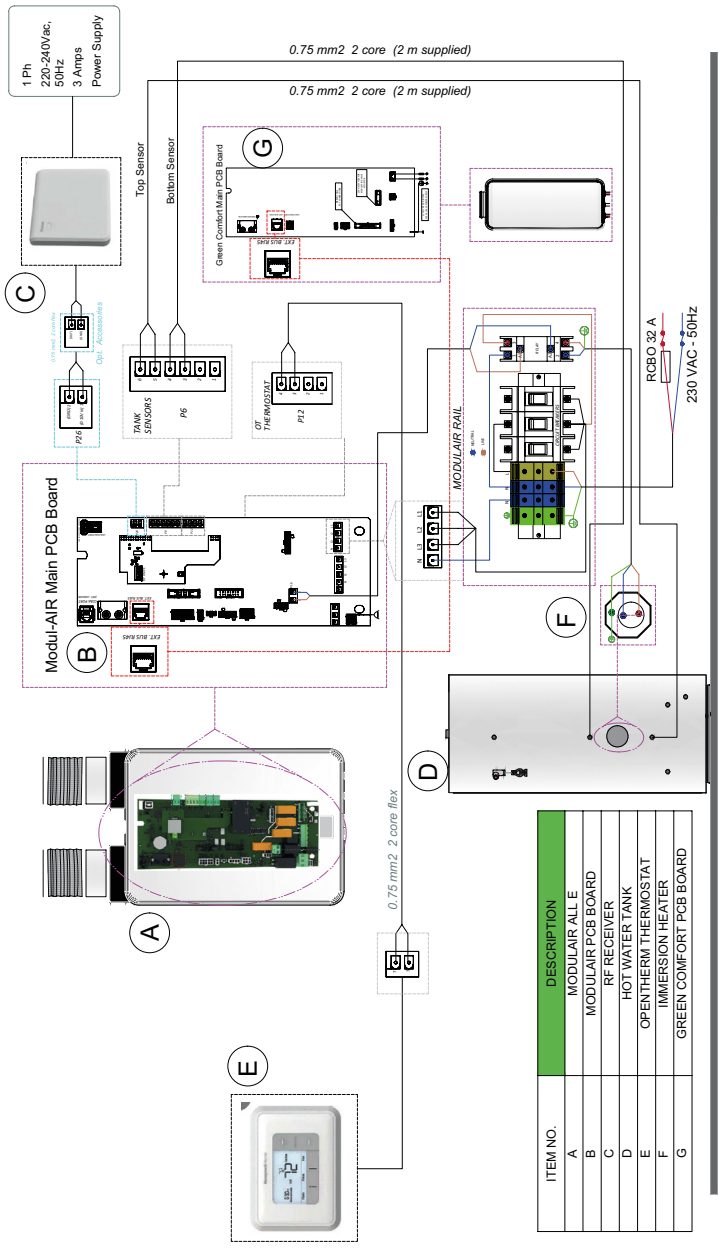
- Check all connections and the mains voltage is correct before powering On the Heat Pump to prevent damage to the Heat Pumps electronics.
- If the power cable is damaged, contact Joule to have it repaired before powering On the Heat Pump.
- The electrical installation must be carried out by a suitably qualified electrician or under the supervision of one. All installation work and cabling must comply to local building regulations .



The Heat Pump MUST not be powered on unless the system is filled with water and at the recommended pressure.

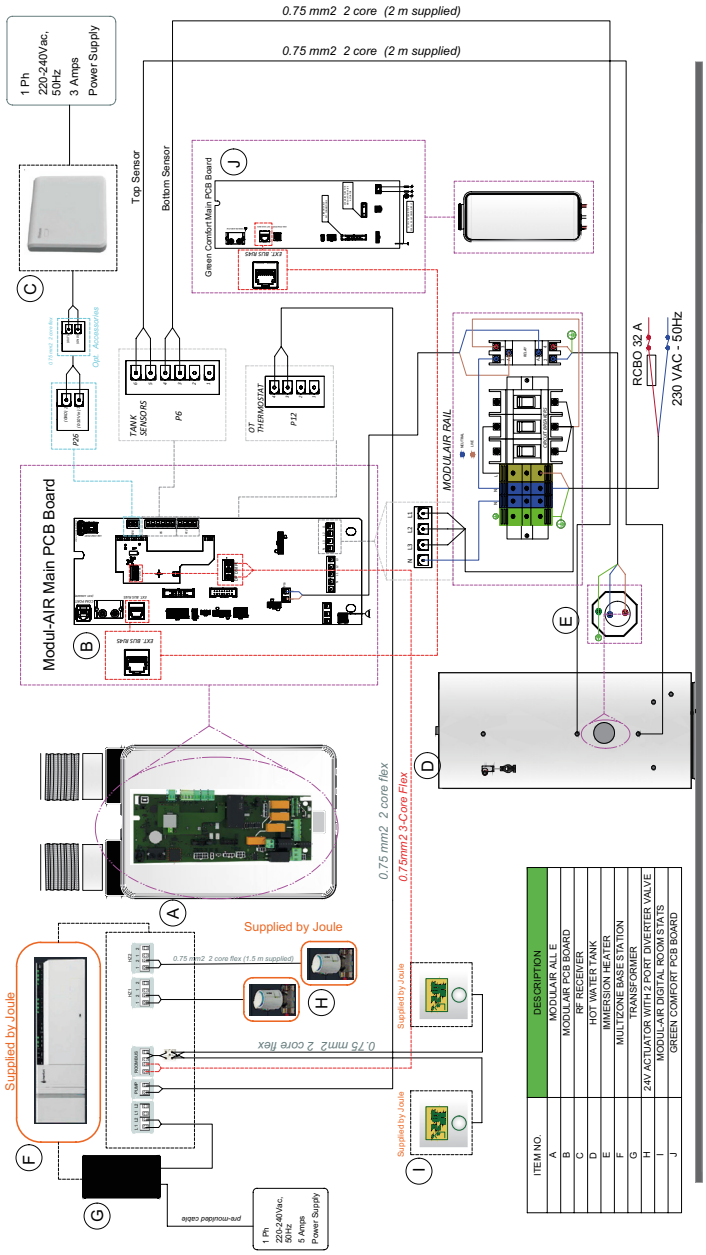
Modul-AIR Electrical Schematic

ModulAIR All-E & Green Comfort 1 Zone UFH/Radiators



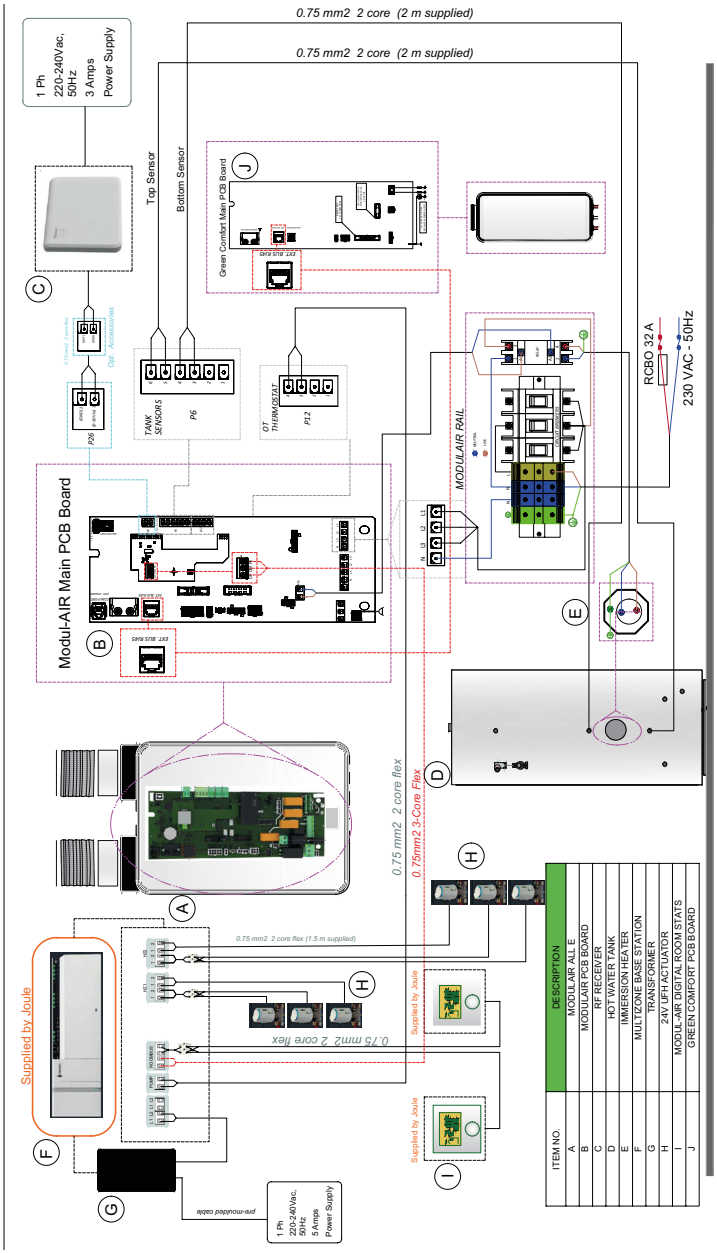
Modul-AIR Electrical Schematic

ModulAir All-E & Green Comfort - 2 Zone (Rads)

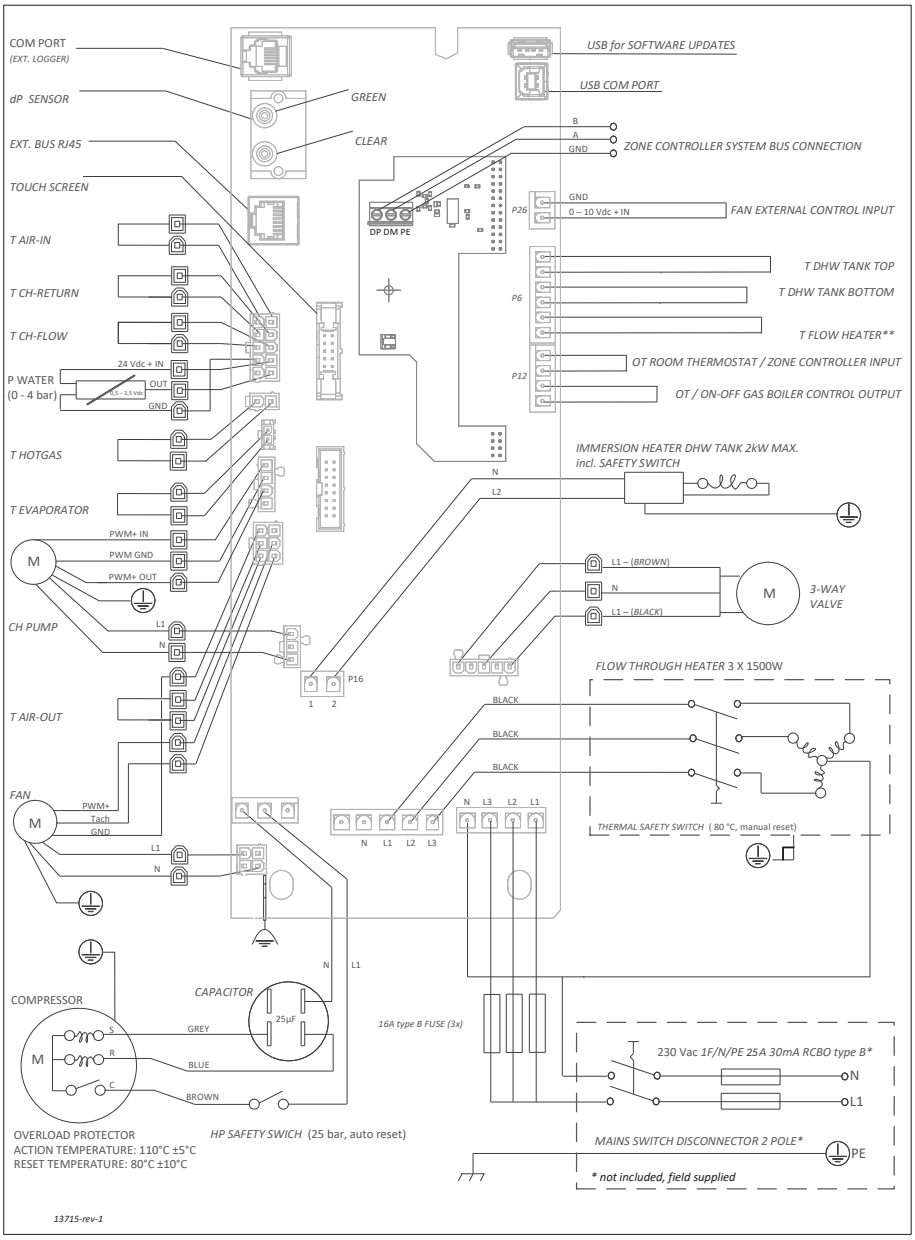


Modul-AIR Electrical Schematic

ModulAir All-E & Green Comfort - 2 Zone (UFH)



Modul-AIR Main PCB Board



The internal electrical connection layout of the Modul-AIR is shown above.

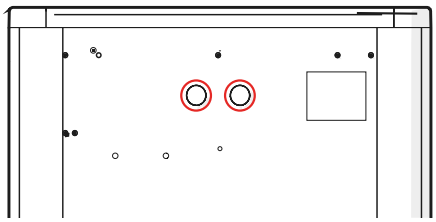
Modul-AIR Electrical Overview

All electrical wiring must be carried out by a competent installer and be installed in accordance with current local Wiring Regulations.

External Cable Entry

All external connections must be routed through the entry points on the underside of the Modul-AIR unit, these entry points are shown on the diagram to the right.

Remove the front panel to access the electrical enclosure. Cable entry to the enclosure is via an M25 cable gland. Ensure all cables are secured using cable fixings.

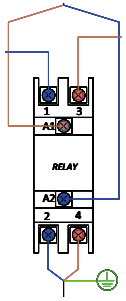


Power Supply Internal Connections

The Modul-AIR main PCB board was designed to take a 3 phase or Single-phase power feed. For ease of installation in domestic applications the 3 Phase Mains Power board connection is prewired internally by Joule to 3 no. 16Amp MCBs on a DIN rail. These are then connected in parallel to a single-phase Live rail terminal. The Neutral and Earth for the board is also wired to terminals on said DIN rail. A 1 meter, 3 Core 4mm2 fly lead, fed through the unit's cable gland, is supplied prewired to these terminals by Joule.

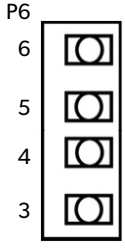
Tank Immersion Connection

The Modul-AIR tanks immersion needs to be separately wired into the Relay on the DIM rail of the Modul-AIR unit during installation. The immersion requires a 3 Core, 2.5mm2 power cable. This cable is to be fed into the Modul-AIR unit using the entry grommets. The Immersion's Live cable should be connected into Terminal number ,4' on the DIM rail relay and the Immersion's Neutral cable should be connected into Terminal number ,2' on the DIM rail relay. The immersion must be grounded using the provided earthing connections on the Modul-AIR casing.



DHW Tank Sensors

Two Domestic Hot Water Tank Sensors are provided with the unit. The sensors are 2m in length. The Sensor is to be installed securely into the tanks aqua stat pockets, one for the Top pocket the other for the Bottom pocket. The sensor cables are to be fed into the Modul-AIR unit using the entry grommets. Connect the probe cores to connector block "P6". Top sensor cores to 5 & 6 and Bottom sensor cores to 3 & 4. There is no connection polarity sensitivity. If required, the cables can be extended using a 2 core 0.5mm2 cable.

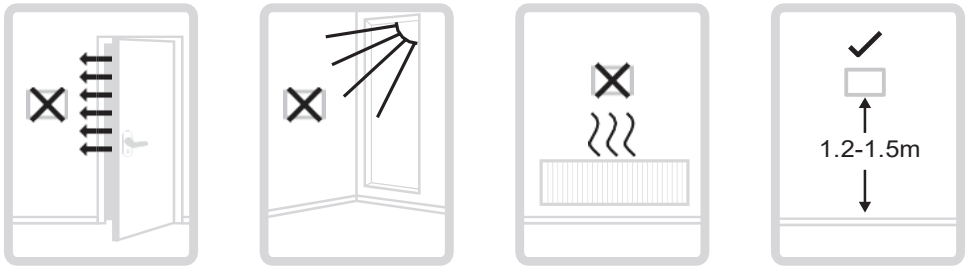


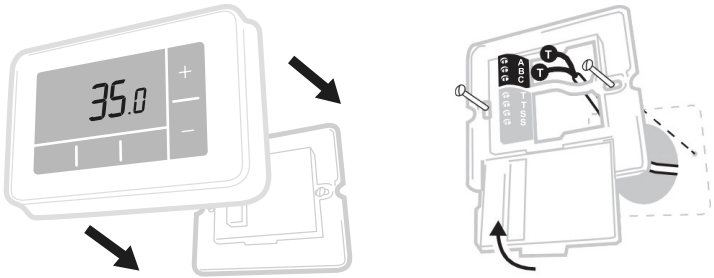
OT Thermostat

The external temperature control for the Modul-AIR unit is achieved through the use of wall mounted Opentherm room thermostat. Always use the OT thermostat models supplied by Joule to ensure correct operation of the Modul-AIR system.

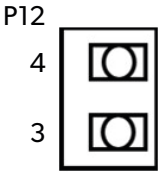
The OT Thermostat is typically installed in the living area (zone 1) where it also acts as the temperature sensor for that zone. The recommended location for the OT Thermostat is at eye level, 1.5m off the floor and kept away from sources of heat and/or cooling like radiators, drafts or direct sunlight. Local regulations should be adhered to when planning the location of any room sensor.

Room thermostats/sensors need a free flow of air to operate correctly, so they must not be covered by curtains or blocked by furniture. Nearby electric fires, televisions, walls or table lamps may also prevent the sensor from sensing the correct temperature. Read instructions supplied with your OT Thermostat fully so you get the best from the product.

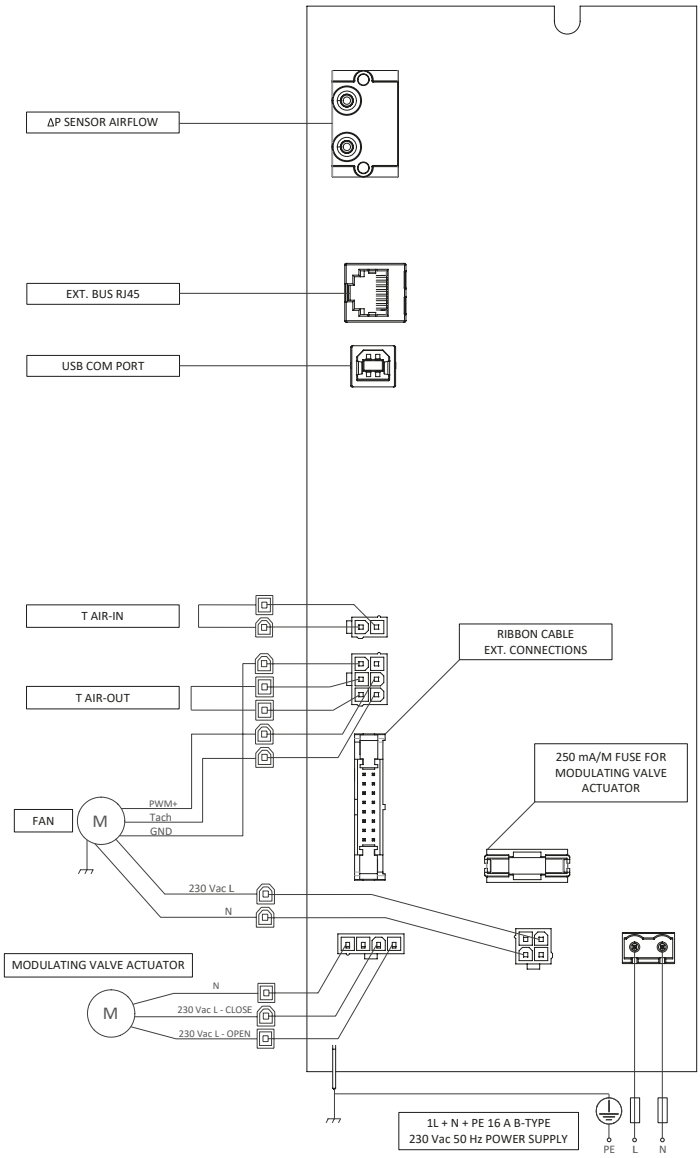




In order to power the stat and for it to communicate to the Modul-AIR unit the OT Thermostat requires a 2 Core, 0.5mm2 cable. The OT Thermostat cable is connected from T & T on the thermostat to P12 connector block on the Modul-AIR PCB on ports 3 & 4. There are no polarity restrictions on this connection. This cable is to be fed into the Modul-AIR unit using the entry grommets previously described.



Green Comfort Main PCB Board

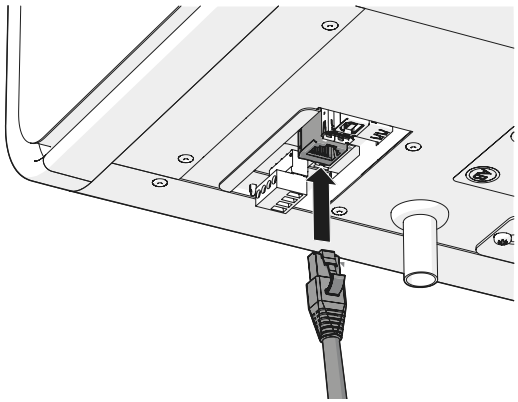


The internal electrical connection layout of the Green Comfort is shown above.

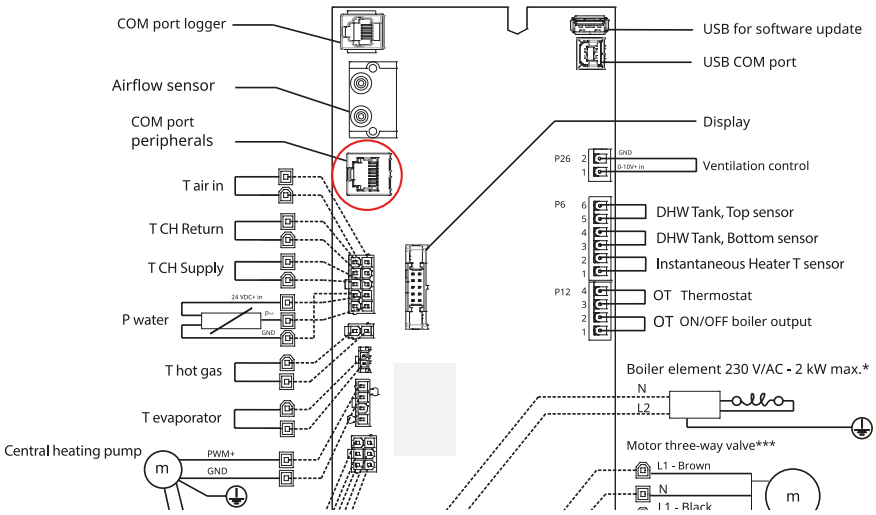
Green Comfort Electrical Overview

Green Comfort

The Green Comfort must be connected to the Modul-AIR with the supplied UTP data cable. One end of the UTP cable is directly plugged into the data port on the bottom side of the Green Comfort Unit.



The other end of the UTP cable is to be fed into the Modul-AIR unit using the entry grommets and plugged into the COM port on the Modul-AIRs PCB. The exact port is highlighted below:



The Green Comforts power supply cable is a prewired 230V cable with plug on a 3Amp fuse. This can be plugged directly into a mains socket.

Ventilation RF Accessories

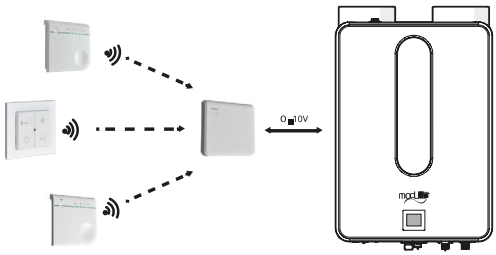
Ventilation Control RF Receiver

The Modul-AIR can optionally be supplied with RF remote ventilation control. Remote control of the ventilation requires a wireless switch and receiver. The communication between the switch and the receiver is achieved via radio frequency. The switch itself is powered by a coin cell battery and the receiver is connected to the mains by its own separate 230V plug. The RF switch and sensors must be ordered separately. A maximum of 20 switches or sensors can be connected to the system.

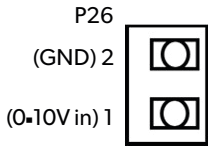
RF switch (3 positions + auto)

RF receiver

This wireless system can be expanded with a CO_2-sensor and/or a humidity sensor. The CO_2-sensor is connected to the mains and the humidity sensor is powered by two AA batteries. Place the CO_2-sensor in the living room for optimum air quality. Place the humidity sensor in the bathroom for an optimal ventilation while showering. Joule strongly recommends expanding the system with at least one of the two sensors. This makes it possible for the system to activate reactively based on the actual conditions within the dwelling.

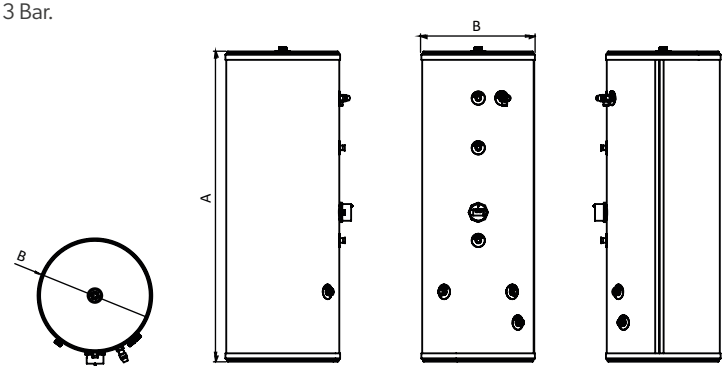


In order to communicate to the Modul-AIR unit the RF Receiver requires a separate 2 Core, 0.5mm2, Ground and 0-10V+ communication cable from the power supply cable. The RF Receiver communication cable is connected to P26 connector block on the Modul-AIR PCB on ports 1 & 2. This cable is to be fed into the Modul-AIR unit using the entry grommets.



Modul-AIR Tank

The All-E and Aqua versions of the Modul-AIR Exhaust Air Heat Pump system is supplied with a purpose-built Modul-AIR indirect Hot Water Tank. The Tank is designed from the ground up to work in tandem with the Modul-AIR unit specifically. The Tank is provided with a 2kW backup water heating immersion that can work in conjunction the Modul-AIR unit to speed up how water recovery times, in certain hot water modes. An unvented kit is also provided with the tank allowing the hot water system to be pressured to a working pressure of 3 Bar.

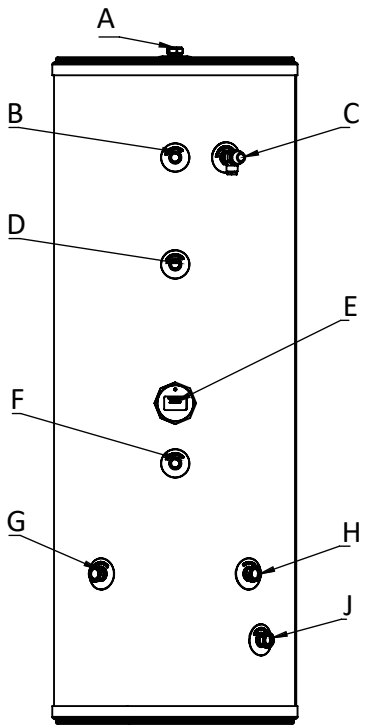


Plan View | Left Side View | Front View | Right Side View

Modul-AIR Indirect Tank Specs			
Item No	TUMA-00150-LFC	TUMA-00180-LFC	TUMA-00210-LFC
Capacity	150L	180L	210L
Internal Tank Material	Stainless Steel - Duplex LDX 2101		
Thermal Insulation	Polyurethane foam CFC-Free & HCFC Free		
Casing	Painted Galvanised Carbon Steel DX51D		
Coil Material	Stainless Steel Tube AISI 316L		
Weight (empty) kg	38	42	45
Weight (full) kg	184	217	250
Max. Operating Pressure	5 (bar)		
Test Pressure	10 (bar)		
Max. Working Temperature	90°C		
Heating Elements	1. No. 2kW Incoloy Immersion		
Heat Loss (Watts)	60	68	76
Heat up Time (mins)*	24	29	33
Energy Efficiency Class**	C		
V40 Volume (Draw off above 40°C)	129L	161L	195L
Height (mm) "A"	1102	1293	1478
Diameter (mm) "B"	545		

* - Heat up time is based on the EN12897 standard and the Heat Pump reheat time may differ.
** - Heat loss is based on the EN12897 standard.

N.B If an appliance capable of heating the tank above 89°C is connected to the primary coil then, a separate non-self-resetting thermostat and 2 port valve must be installed in the primary circuit



Reference	Description	Connection Size
A	Hot water Outlet	22mm compression connection
B	Overheat Stat	22mm Pocket
C	T&P Relief Valve	½" Female BSP
D	Top Tank Sensor	ID Ø7mm Stat Pocket
E	2kW Immersion Heater	1 ¾" Female BSP
F	Bottom Tank Sensor	ID Ø7mm Stat Pocket
G	Coil Flow/Return	22mm compression connection
H	Coil Flow/Return	22mm compression connection
I	Cold Water Inlet	22mm compression connection

For further details on the Modul-AIR Tank and for detailed installation instructions regarding Indirect unvented tanks please consult the Direct, Indirect, Slimline & Modul-AIR Un-Plumbed Unvented Cylinder Installation & Maintenance Manual (INS-JUKCYL-020).

Commissioning the Modul-AIR Unit

Preface

To be able to commission the Modul-AIR system correctly specific knowledge is required. If you are not certified by Joule, you may not put the Modul-AIR into operation. To be certified by Joule the installer must have successfully completed the Joule Modul-AIR training course. If you do not meet these requirements, please contact Joule directly to enquire about booking a place in one of our training sessions. The installer of the Modul-AIR system does not need to be in possession of a STEK or F-gas approval to be able to install the Modul-AIR system.

Sequence of commissioning

Before the Modul-AIR Unit can be commissioned both the full mechanical system installation and full electrical wiring procedure must be entirely complete. Before you start the commissioning procedure make sure you have received and read all the provided information sheets. The data in the info sheets is necessary to know in order to install the Modul-AIR successfully.

When commissioning the Modul-AIR follow the work sequence below for best practice:

1. Check whether the air ducts are clean and that there are no blockages.
2. Properly adjusted the ventilation rates as per Joules specific design rates for your installation.
3. Set the Modul-AIR units general settings as per this manual.
4. Ensure the Central Heating & DHW systems are correctly balanced.
5. Set the individual radiators heating controls if any.
6. Ensure the OT Room thermostat is connected and correctly calibrated.
7. Ensure the RF receiver is connected and properly communicating with the sensors (if present)
8. Set the DHW tank settings on the Modul-AIR display (All-E and Aqua)
9. Commission the Green Comfort Module (if present).
10. Handover the Modul-AIR to the end user.

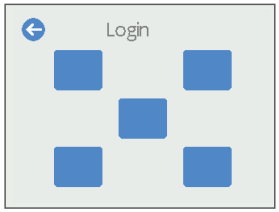
Using the Modul-AIR unit's display

To access and make changes to the Modul-AIR units operation settings you have to first unlock the installer menu by entering a password. This password is entered by performing a number of tasks in a fixed sequence on the display. In order to receive this drawing pattern you first must have successfully completed the Joule Modul-AIR installation training course

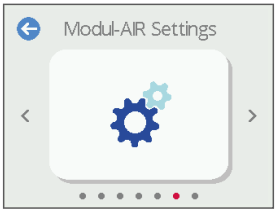
To Navigate through the menus on the Modul-AIR unit use the left and right arrows on the display. The arrow at the top left of the screen is used to return to a higher menu.

If you have changed a setting and want to exit the screen, a dialog box will appear with the text "Are you sure?"

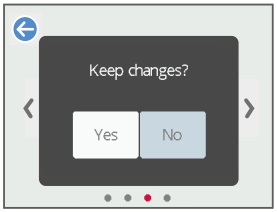
- Press Yes to save the setting.
- Press No not to save the setting.



The installer menu access screen



The navigation button.



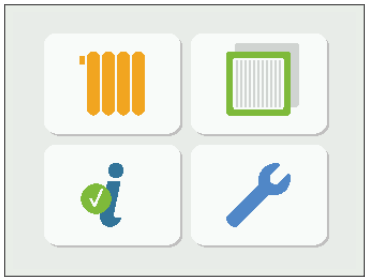
Confirming a new setting.

The Modul-AIR Units Main Menus

After switching on the display, you will be shown the start screen of the Modul-AIR's user interface. On this start screen you can choose from four main menus:

Running hours

Information

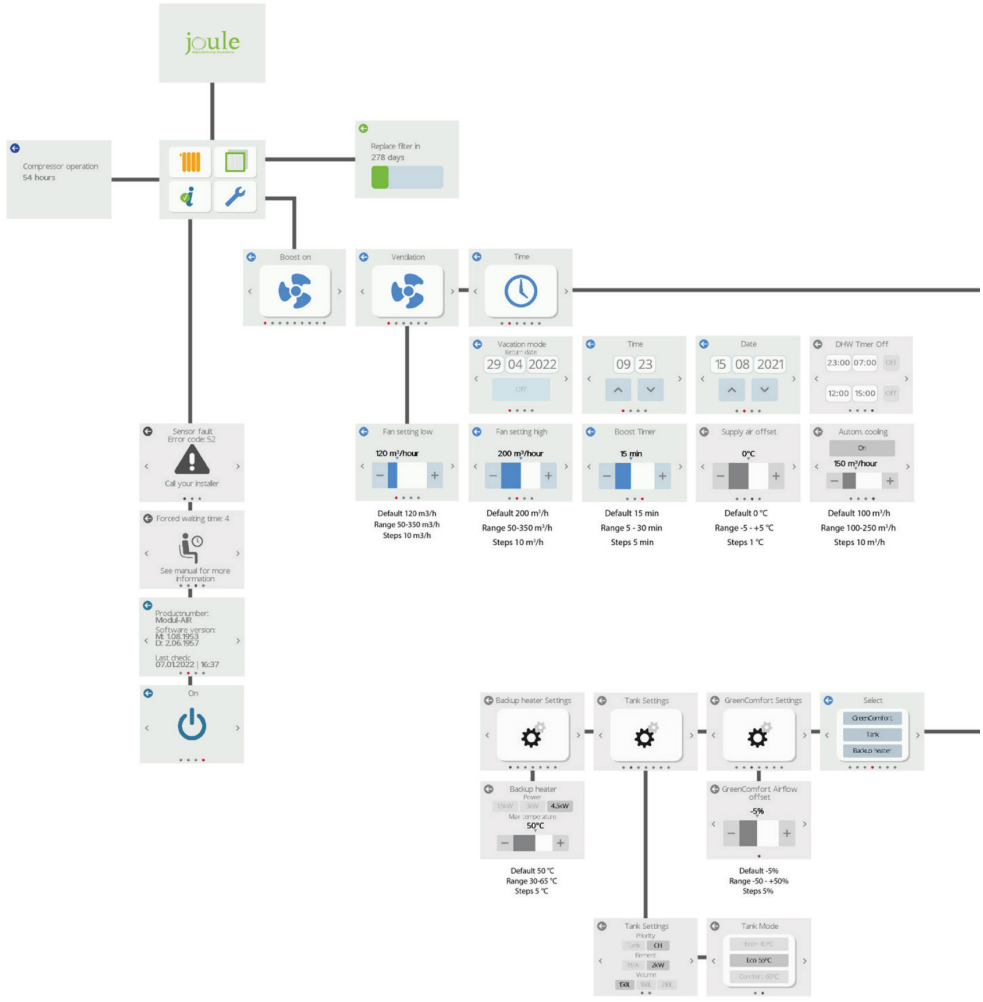


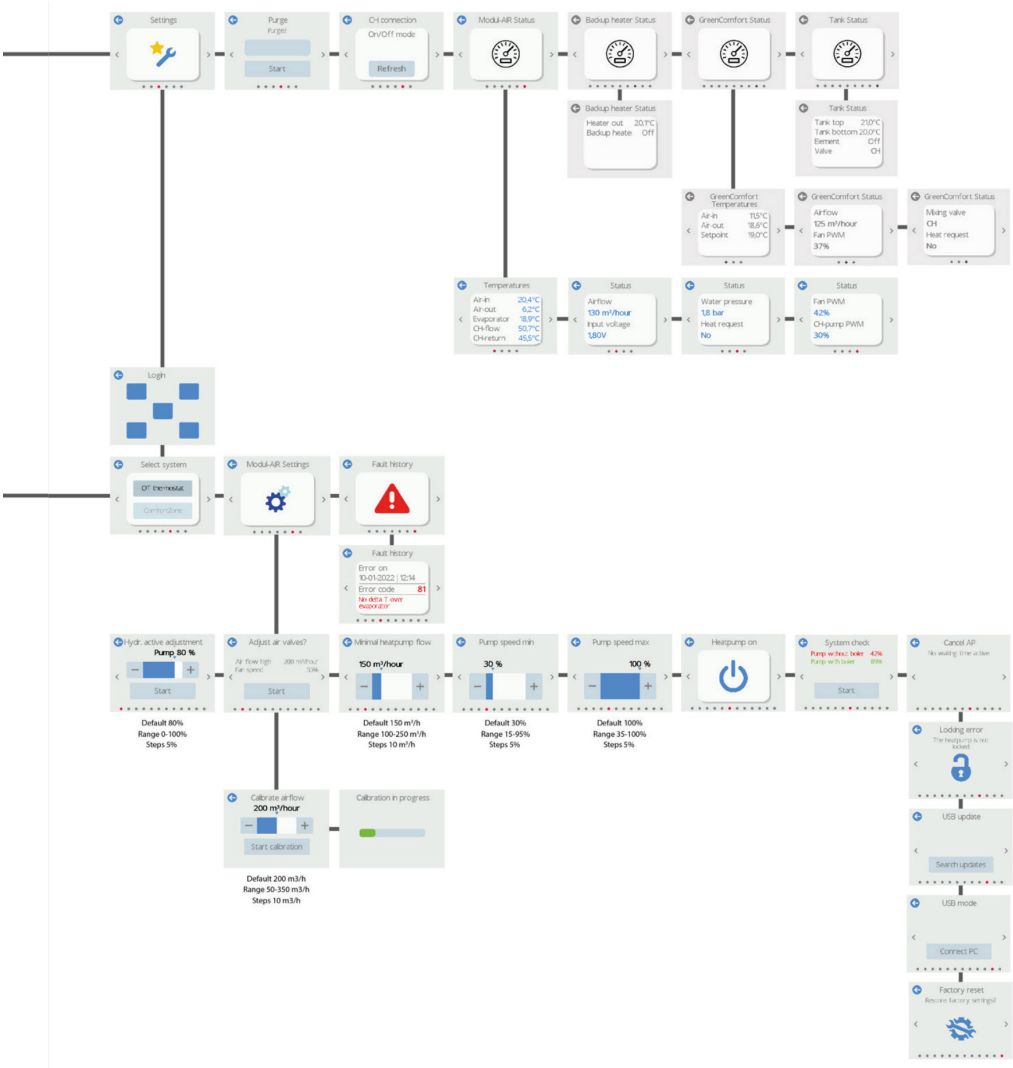
Filter Control

Settings

The flowchart on the following page shows the contents of the four main menus. The contents of the installer menu are also highlighted in this flowchart.

Modul-AIR Unit Menu Overview




Settings
Purge
Purge!
Start
CH connection
On/Off mode
Refresh
Modul-AIR Status
Backup heater Status
Heater out 20.1°C
Backup heater Off
GreenComfort Status
Tank Status
Tank top 21.0°C
Tank bottom 20.0°C
Element Off
Valve CH
GreenComfort Temperatures
Air-in 11.5°C
Air-out 18.6°C
Setpoint 19.0°C
GreenComfort Status
Airflow
125 m³/hour
Fan PWM
37%
GreenComfort Status
Mixing valve
CH
Heat request
No
Temperatures
Air-in 20.4°C
Air-out 6.2°C
Evaporator 18.9°C
CH-flow 50.7°C
CH-return 45.5°C
Status
Airflow
130 m³/hour
Input voltage
1.80V
Status
Water pressure
1.8 bar
Heat request
No
Status
Fan PWM
42%
CH-pump PWM
30%
Login
Select system
Modul-AIR Settings
Fault history
Fault history
Error on
10-01-2022 | 12:14
Error code 81
No delta T over evaporator
Hydr. active adjustment
Pump 80 %
Start
Default 80%
Range 0-100%
Steps 5%
Adjust air valves?
Air flow high 200 m³/hour
Fan speed 50%
Start
Minimal heatpump flow
150 m³/hour
Default 150 m³/h
Range 100-250 m³/h
Steps 10 m³/h
Pump speed min
30 %
Default 30%
Range 15-95%
Steps 5%
Pump speed max
100 %
Default 100%
Range 35-100%
Steps 5%
Heatpump on
System check
Pump w/bac boiler 42%
Pump w/h boiler 89%
Start
Cancel AP
No waiting time active
Locking error
The heatpump is not locked
USB update
Search updates
USB mode
Connect PC
Factory reset
Restore factory settings?
Calibrate airflow
200 m³/hour
Start calibration
Default 200 m3/h
Range 50-350 m3/h
Steps 10 m3/h
Calibration in progress

Commissioning the Modul-AIR

Ventilation Modes Explained

The Modul-AIR are 3 ventilation modes:

- Low (or Trickle)
- Heat Pump (or Boost)
- High

Low

Low is the continuous ventilation mode which provides the Trickle airflow rate.

Heat Pump

Heat Pump is the ventilation mode which provides a higher airflow rate then the Low mode. This mode is active when the compressor is running.

High

High is a temporary ventilation mode which can be activated in 2 ways. The High mode only operates for a fixed time period, after which the ventilation mode is then returned to the previous setting.

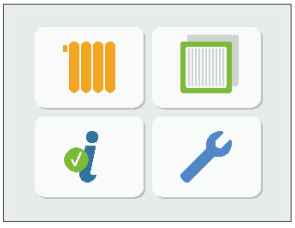
1. Via the Boost feature on the Modul-AIR's user interface.
2. Via the optional RF accessories.

Calibrating the Fan

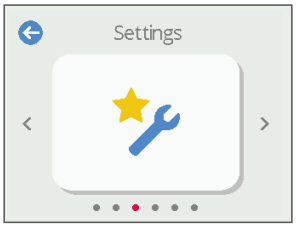
As each ventilation setup will vary, there is a fan calibration feature on the Modul-AIR. It is essential to run the fan calibration feature before setting the Low and High airflow rates, as the fan calibration feature sets the system curve for the fan.

The procedure to Calibrate the fan is as follows:

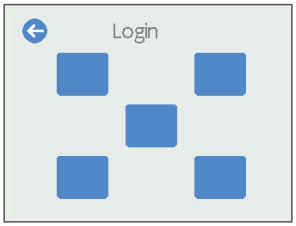
Navigate to the spanner icon on the home screen.



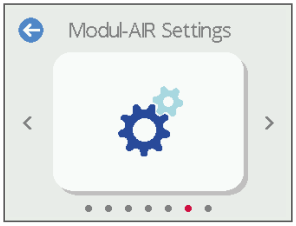
Next, scroll to the right to the Settings tile and press the icon



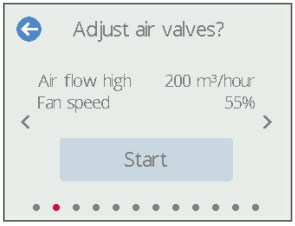
Enter the login code to access the installer functions. The installer code is issued during the Modul-AIR Joule installer training program.



Navigate to the Modul-AIR settings menu and press the icon.

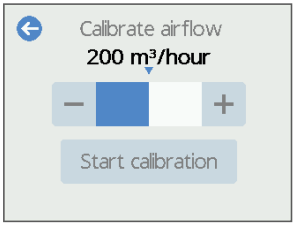


Navigate to the Adjust air valves screen and press start.



On the Calibrate airflow screen the total airflow can be adjusted. In this mode, the fan will increase and/or decrease its speed to keep the airflow constant.

The ceiling valves can now be adjusted.



Adjusting the ceiling valves

Adjust the valves as follows:

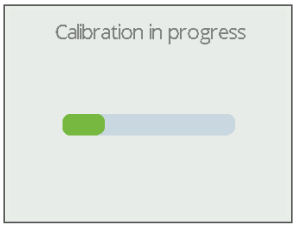
1. Note the calculated the flow rate for each valve as per the table supplied by Joule.
2. Make sure all valves are in the fully open position.
3. Using a suitable anemometer, measure the sum of the ceiling valves.

   If the sum does not match the required airflow rate (the required airflow is the sum of the Boost airflow rates supplied by Joule), the fan speed can be adjusted using the plus and minus buttons. Adjust the flow rate on the 'Calibrate airflow' screen until the desired total sum is reached.
4. Next each ceiling valve can be adjusted. Start with the valve that has the most resistance and therefore needs the least adjustment- this is most often the furthest valve from the unit.
5. Next work back towards the unit and adjust each ceiling valve until the desired airflow rate is achieved.
6. When all valves are set correctly, press 'Start calibration'. The fan system curve will now be set.

The Modul-AIR will now run the calibration process. The process takes 2 minutes.

It is important to note the ceiling valve positions are now fixed and should not be adjusted.

Now the fan is calibrated, the Low and High settings can be set.



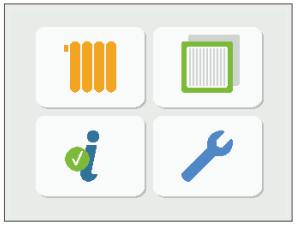
Setting the Ventilation Rates

The required airflow rates are supplied by Joule on a case-by-case basis. The rates are specifically calculated for each install. The rates are calculated using the Building Regulations.

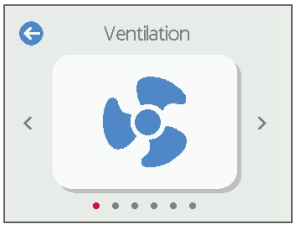
Please contact Joule at commissioning stage to receive this rate design.

The procedure to input the rates is as follows:

To access the Ventilation functions of the Modul-AIR, navigate to the spanner icon on the home screen.



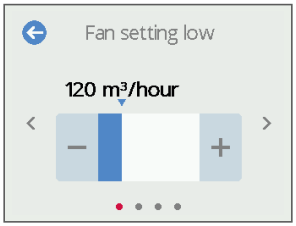
Next press the Ventilation icon.



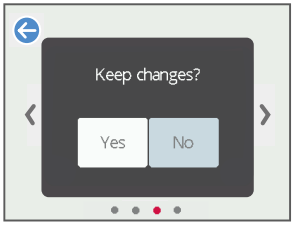
Set the value of the low setting- using the minus and plus buttons.

Press the right arrow. The confirmation screen appears.

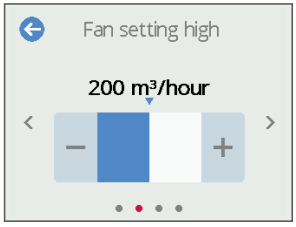
N.B: the Low setting is the total of the Trickle airflow rates supplied by Joule



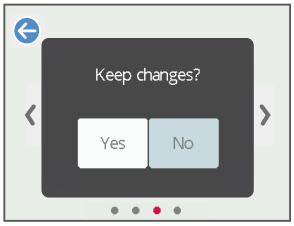
Press Yes to save the value.



Enter the value of the high in the same way.



Press the right arrow and press Yes to save the setting.

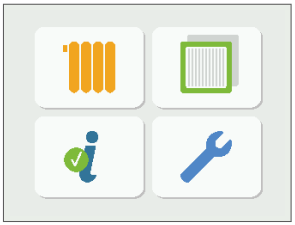


Setting the Heat Pump airflow rate

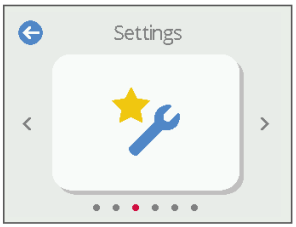
After setting up the Modul-AIR and any external parts connected to it the heat pump air flow rate must be entered.

The procedure to input the HP rate is as follows:

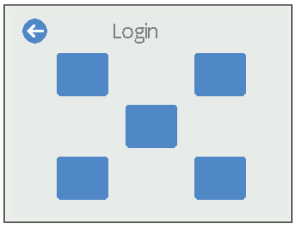
To access the heat pump flow rate function of the Modul-AIR unit, navigate to the spanner icon on the home screen.



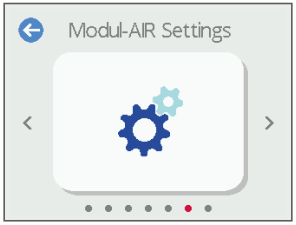
Press the right arrow and press Yes to save the setting.



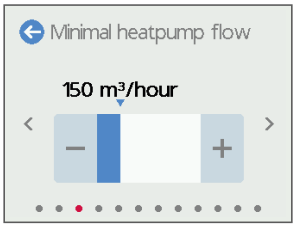
Enter the login code to access the installer functions. The installer code is issued during the Modul-AIR Joule installer training program.



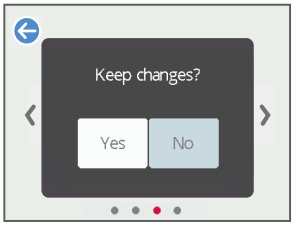
Navigate to the Modul-AIR settings menu and press the icon.



Set the minimum heat pump air flow, this is sized to match your dwellings volume. This value will be provided to you by joule at commissioning stage of your system. Use the minus and plus buttons to input the value given. Press the arrow at the top left to exit the screen. The confirmation screen appears.



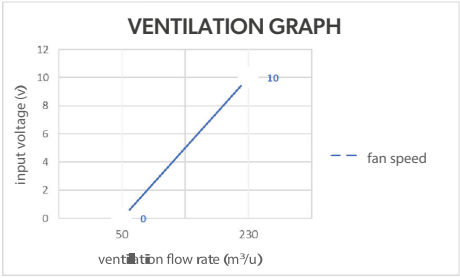
Press the right arrow and press Yes to save the setting.



Ventilation RF accessories Setup

The Modul-AIR has three ventilation settings to be inputted. These values are to be set during the initial commissioning of the unit and left unchanged for the operating lifespan of the Modul-AIR system, unless there is significant change to the heating/ventilation demands of the dwelling. The first two values inputted are the Low and High speed fan settings for the Modul-AIR unit. If joules RF accessories are installed on the Modul-AilR system the unit can vary its ventilation flow rate between these two values based on the 0-10V input voltages from the RF sensors. The third ventilation flow rate that is set is the default minimum heat pump flow rate for the Modul-AIR system. When the RF accessors are installed on the Modul-AIR system and the Modul-AIR is placed in Auto the units ventilation flow rate will be regulated automatically.

The RF receiver is designed to interpret the signals from the CO_2 and/or Humidity sensors and convert these to a 0 – 10V voltage. The strength of this voltage is determined by the receiver depending on how high or how low the CO_2 concentrations or humidity percentages are that the sensors are detecting. This voltage signal is translated into a corresponding ventilation flow rate that is between the low and high positions that were previously set on the Modul-AIR unit during commissioning.

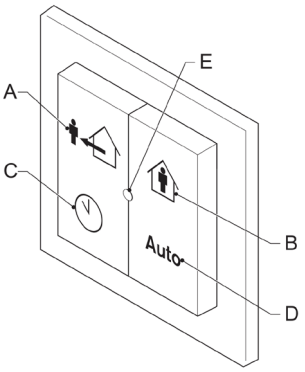


On systems that have sensors the "Auto" mode is recommended to be used at all times.

For systems without sensors the unit should be left to "Home" during normal operation conditions. This is the standard trickle flow setting for the Heat Pump.

The "Absent" setting is designed to be used when the dwelling will be left empty of occupation.

The "Timer" setting is a boost mode, this is generally used during times of high requirements for ventilation from situations like excess humidity or fumes/odours from activities like cooking.



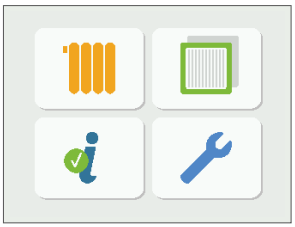
Setting	Fan Speed	Default Setting
A = absent	Low	20%
B = present	Average	50%
C = timer	High for some time	100%
D = auto	Low - High, based on measured values	
E = Status LED		

Date and Time Setting

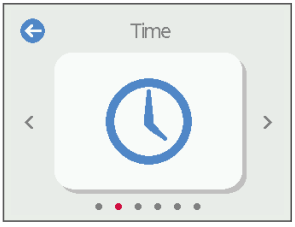
Several functions of the Modul-AIR are affected by the date and time. It is required for proper operation of the Modul-AIR unit that date and time are set correctly.

The procedure to input the time and date is as follows:

Navigate to the Modul-AIR settings menu and press the icon.

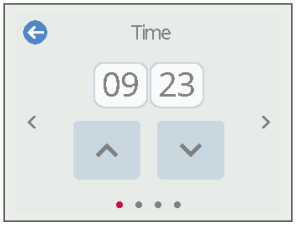


Navigate to Time and press the icon.

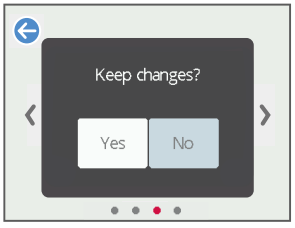


Set the hours and minutes on the first screen. Use the up and down arrows to do this.

Press the arrow right. The confirmation screen appears.

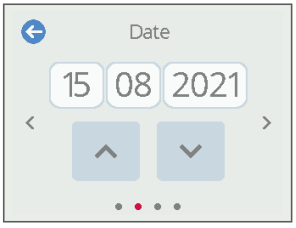


Press Yes to save the setting.



Set the date on the second screen. Press the arrow right. The confirmation screen appears.

Press Yes to save the setting

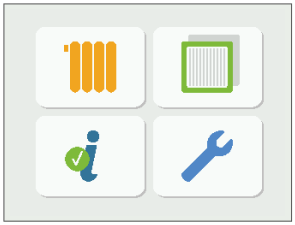


Modul-AIR Unit setup – Setting up the thermostat type (All-E)

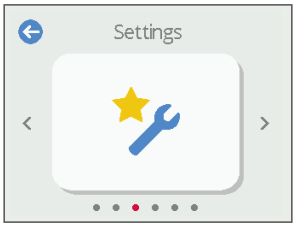
The Modul-AIR unit works with an OpenTherm Thermostat for external heating control. Typically, the system will be OT thermostat controlled, this is the method detailed in this manual.

The procedure to set the external controls is as follows:

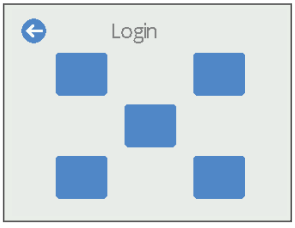
First access the installer functions of the Modul-AIR unit. Navigate to the spanner icon on the home screen.



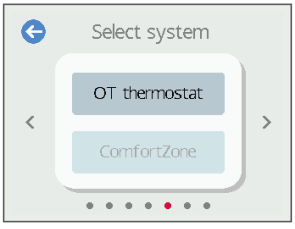
Next, scroll to the right to the Settings tile and press the icon.



Enter the login code to access the installer functions. The installer code is issued during the Modul-AIR Joule installer training program.



Press the "OT thermostat" setting so it is highlighted and the "ComfortZone" selection is greyed out.

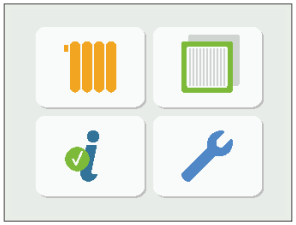


Modul-AIR Unit setup – Setting up the backup heater (All-E)

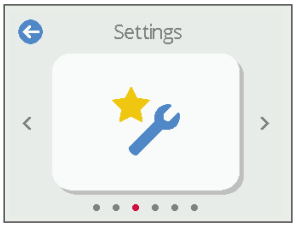
The All-E variant of the Modul-AIR contains an electric backup heater. This makes it possible to select different additional powers based on the system requirements.

The procedure to setup the backup heater is as follows:

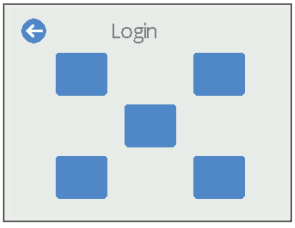
To access the installer functions of the Modul-AIR unit, navigate to the spanner icon on the home screen.



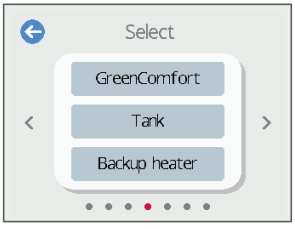
Next, scroll to the right to the Settings tile and press the icon.



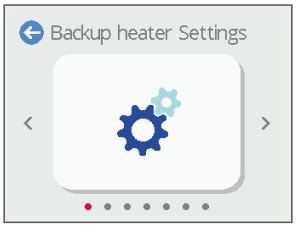
Enter the login code to access the installer functions. The installer code is issued during the Modul-AIR Joule installer training program.



Navigate to the selection menu and select the backup heater.



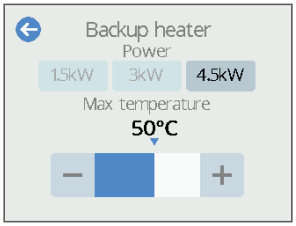
Tap the settings icon.



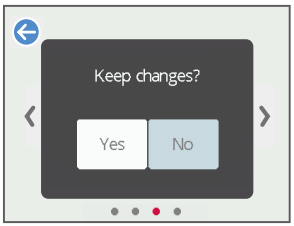
Set the additional power of the backup heater.

Set the maximum temperature of the flow heater. Use the minus and plus buttons for this.

Press the arrow in the top left to exit the screen.



The confirmation screen will appear. Press Yes to save the settings.

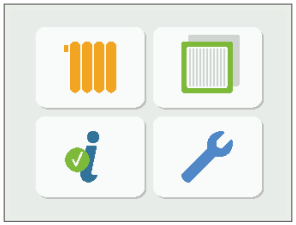


Commissioning Hot Water Tank

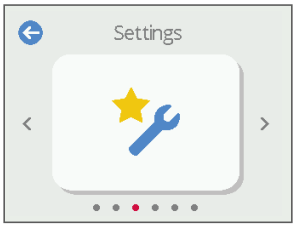
The All-E and Aqua variants of the Modul-AIR are designed to be connected to a Joule hot water storage tank. This in conjunction with 2 hot water sensors provided with the unit, allows the Modul-AIR to also provide the dwelling with domestic hot water for taps and showers.

The procedure to setup the tank is as follows:

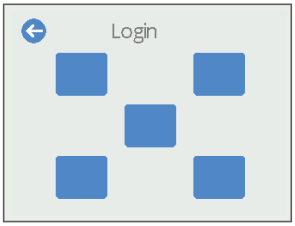
To access the installer functions of the Modul-AIR unit, navigate to the spanner icon on the home screen.



Next, scroll to the right to the Settings tile and press the icon.



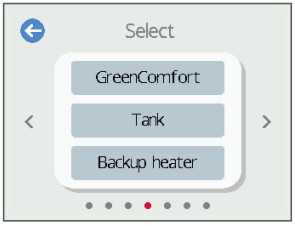
Enter the login code to access the installer functions. The installer code is issued during the Modul-AIR Joule installer training program.



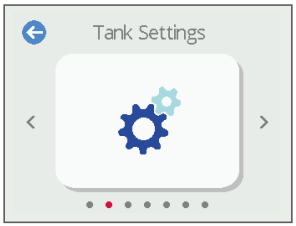
Navigate to the selection menu.

Select the Tank.

Once the Tank is enabled, the Tank Settings option will then be available in the menu.



Tap the settings icon.



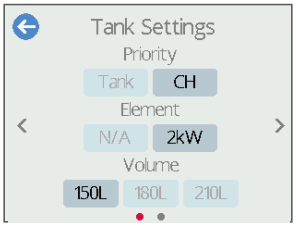
Select the desired Priority for the Modul-AIR unit.

(Tank = DHW Priority or CH = Space Heating Priority)

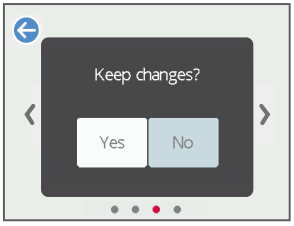
If the tank has an element, enable to 2kW option. Otherwise, select N/A.

Select the volume of the tank installed.

Press the right arrow.



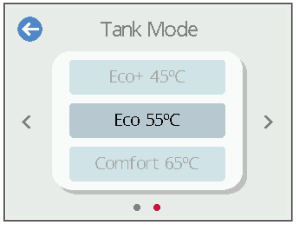
The confirmation screen will appear. Press Yes to save the settings.



Select the desired setpoint temperature for the Tank.

The default setting is 'Eco 55°C' and this is Joules recommended setting.

N.B: The lower setting used, the more economical the Modul-AIR will be BUT the higher the chance of running out of hot water.

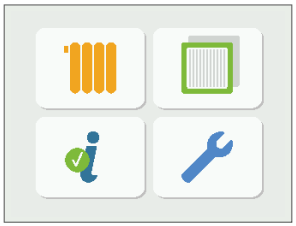


Commissioning Green Comfort unit

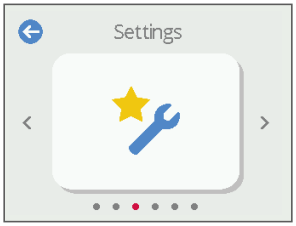
The All-E version of the Modul-AIR can be connected to a Green Comfort Module. With this module the dwelling can also be ventilated balanced and treated fresh air supply.

The procedure to setup the Green Comfort Module as follows:

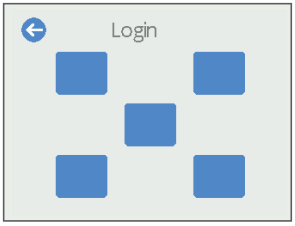
To access the installer functions of the Modul-AIR unit, navigate to the spanner icon on the home screen.



Next, scroll to the right to the Settings tile and press the icon.

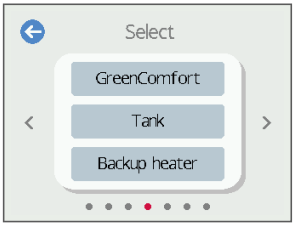


Enter the login code to access the installer functions. The installer code is issued during the Modul-AIR Joule installer training program.



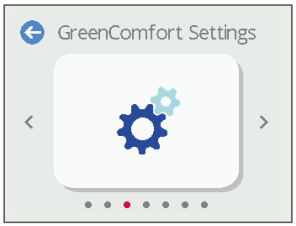
Navigate to the selection menu.

Select the Green Comfort.



Tap the settings icon.

Once the Green Comfort is enabled, the Green Comfort Settings option will then be available in the menu.

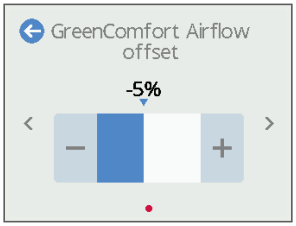


Set the incoming airflow deviation from the Green Comfort module compared to the Modul-AIR.

The default setting is -5%.

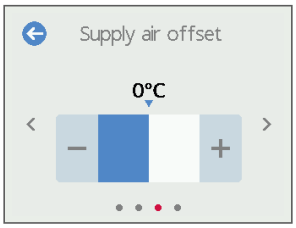
Use the minus and plus buttons for this.

Press the right arrow.

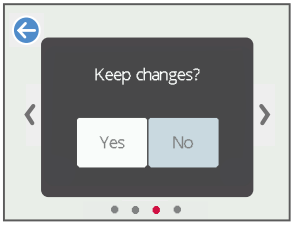


Set the deviation from the outgoing air temperature of the Green Comfort module in relation to the desired room temperature (room thermostat).

Press the arrow in the top left to exit the screen leave.



The confirmation screen will appear. Press Yes to save the settings.



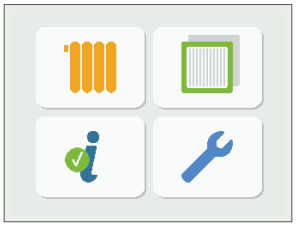
Filling and Venting the Modul-AIR Unit

After you have set up all the accessories of your Modul-AIR system and have adjusted the ventilation positions, you must fill and vent the central heating system.

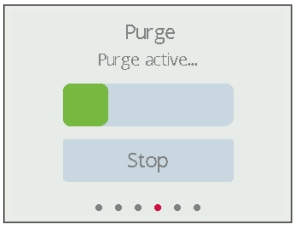
The procedure to run the Purge function is as follows:

1. Fill and vent the central heating system in accordance with the operating instructions detailed in the previous Filling & Venting section of this manual.
2. Turn on the Modul-AIR.
3. On the display, the procedure is as follows:

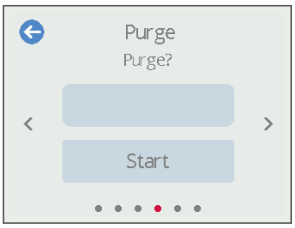
Tap the Settings icon in the main menu



Navigate to purge and press Start.



Wait a few minutes until the bar in the screen is completely green.



4. Vent the central heating system with the manual-air vent on top of the Modul-AIR, on the integrated instantaneous water heater and in the GC Module (if present).
5. Check the central heating system.
6. If necessary, top up the heating system again to the recommended pressure.

Reset Flow Protection

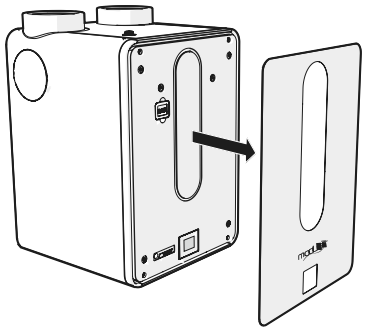
If the water temperature in the system exceeds the pre-set value (75°C), the need could arise where the over-temperature reset button may need to be reset. An error code 71 on the Modul-AIR would signal this.

The procedure to reset the flow protection is as follows:

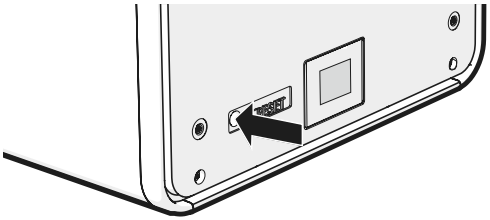
1. Check whether the central heating system is properly vented. To do this, operate the manual air vent on top of the Moduł-AIR and start the venting cycle.

If only water comes out of the deaerator, the system is properly vented. If air also comes out of the vent, the central heating system must be vented again.

2. Disconnect the power supply to the Modul-AIR
3. If present, disconnect the power supply to the Green Comfort Module.
4. Remove the front plate from the Modul-AIR



5. Operate the reset button on the backup heater. Use a pen or a Phillips screwdriver to do this

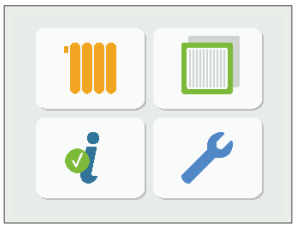


6. Switch the Modul-AIR and Green Comfort Module on again.
7. Operate the room thermostat and ensure a heat demand of at least 3°C above the current room temperature. This causes the backup water heater to start operating.
8. Check if sensor error 71 has been resolved. This can only occur when the water temperature has reduced by a minimum of 10K. If this temperature has not dropped, go back to step 1.
9. Set the room thermostat back to the correct temperature.

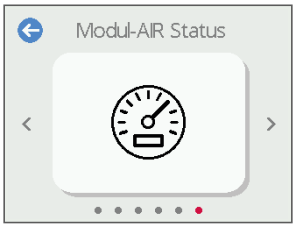
Checking the Modul-AIR Status

Information about the status of the Modul-AIR can be found in the installer menu under the Modul-AIR Status tab;

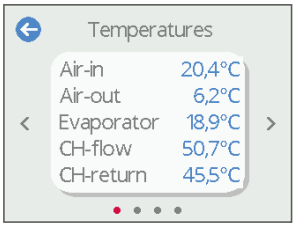
Tap the Settings icon in the main menu



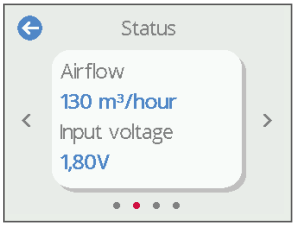
Navigate to Modul-AIR Status and press the icon.



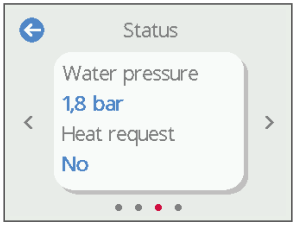
The temperatures sensor values are displayed here.



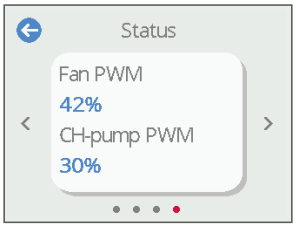
On the next page, the unit's airflow rate and the voltage input from the optional RF ventilation accessory are displayed here.



On the next page, the Water pressure and Heat request are displayed here.



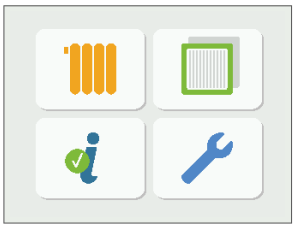
On the next page, the Fan speed and Circulation pump speed are displayed here.



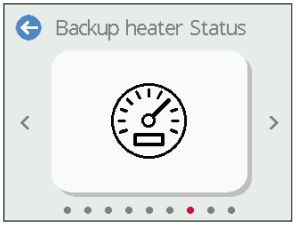
Checking the backup heater Status

Information about the status of the Backup heater can be found in the installer menu under the Backup heater Status tab;

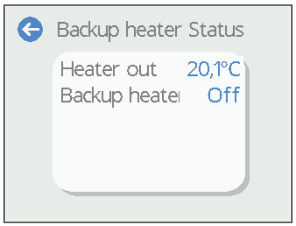
Tap the Settings icon in the main menu.



Navigate to backup heater Status and press the icon.



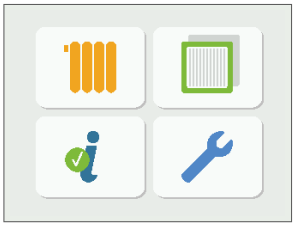
The temperatures sensor value and back-up heater status are displayed here.



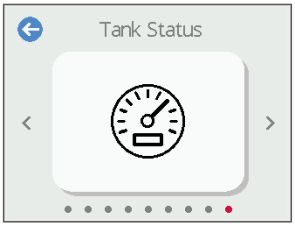
Checking the Tank Status

Information about the status of the Tank can be found in the installer menu under the Tank Status tab;

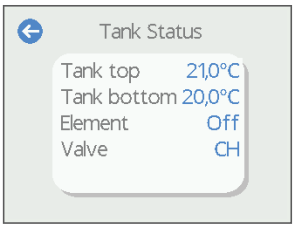
Tap the Settings icon in the main menu.



Navigate to Tank Status and press the icon.

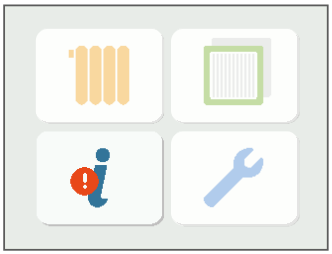


The tank temperature sensor values, Tank element status and 3-way valve direction are displayed here.



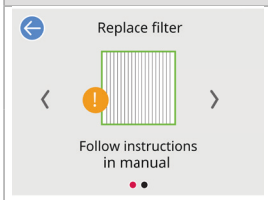
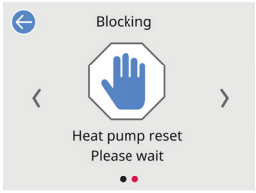
Error Messages

The Modul-AIR heat pump will display a warning icon on the display if there is something wrong with the system that requires attention. There are two types of warning icons, both are detailed in this section.



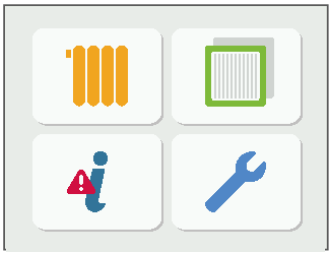
The first type of warning icon looks like this. This icon is informing you that the Modul-AIR heat pump is continuing to operate but that it may be running less efficiently then would be expected normally.

If you press the icon, you will see one of the following screens:

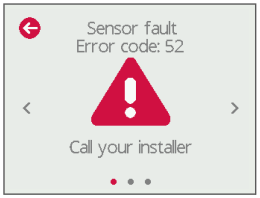
Warning Screen	Error Code	Error Meaning	Possible Solution
	10	Water Pressure low, < 0.8 bar	Increase water pressure
	20	Filter reached end of lifespan	Replace the Air Filter
	80*	No temperature difference across the condenser	Check the circulating pump operation, possible air in the system.
	81*	No temperature difference across the evaporator	Check the fan operation, possible blockage in the duct system.
	AP2**	The average central heating temperature is higher than 60°C.	Action is not necessary. The device will reboot within 35 minutes.
	AP3**	The freeze protection is active.	
	AP4**	Pause mode - the compressor must not be started yet.	

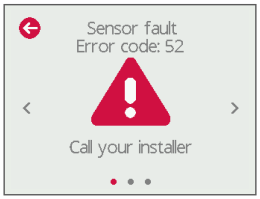
* - Temporary blocking of the Heat Pump. The Heat Pump automatically restart after 1 hour
** - These are informational notifications and may occur under normal operating conditions.

The second type of warning icon looks like this. This icon means that the Modul-AIR heat pump is locked and out of operation. Only an installer can manually override this lock.



If you press the icon, you will see one of the following screens:

Warning Screen	Error Code	Error Meaning	Possible Solution
	12	No communication with the room thermostat	Check electrical connections. Check the thermostat is operating correctly
	13	No communication with the boiler	Check electrical connections. Check the boiler is operating correctly
	30	Top tank temperature sensor error	Check sensor. Replace if necessary
	31	Bottom tank temperature sensor error	Check sensor. Replace if necessary
	32	Back up heater water heater temperature sensor error	Check sensor. Replace if necessary
	33	Air-In sensor error - Green Comfort Module	Check sensor. Replace if necessary
	34	Air-Out sensor error - Green Comfort Module	Check sensor. Replace if necessary
	35	Airflow sensor error - Green Comfort Module	Check sensor. Replace if necessary
	36	Frost protection active - Green Comfort Module	Check sensor. Replace if necessary
	37	Lost connection with Green Comfort Module	Check cable. Replace if necessary
	38	Lost communication between ComfortZone UFH wiring centre and the Green Comfort Module	Check cable. Replace if necessary
	51	Air-In sensor error	Check sensor. Replace if necessary
	52	Air-Out sensor error	Check sensor. Replace if necessary
	53	Evaporator sensor error	Check sensor. Replace if necessary

Warning Screen	Error Code	Error Meaning	Possible Solution
	54	HP Return sensor error	Check sensor. Replace if necessary
	55	HP Supply sensor error	Check sensor. Replace if necessary
	56	Hot Gas sensor error	Check sensor. Replace if necessary
	60	Airflow sensor error	Check sensor. Replace if necessary
	70	Water pressure sensor error	Check sensor. Replace if necessary
	71	Back up heater protection active	Check sensor. Replace if necessary
	90	Compressor locked (repeated error 80)	Remove error 80
	94	Compressor locked (repeated error 81)	Remove error 81
	95***	Water pressure is critically low (< 0.3 bar).	Increase water pressure

*** - Automatically resets when water pressure is increased.

Maintenance of the Modul-AIR and Spare Parts

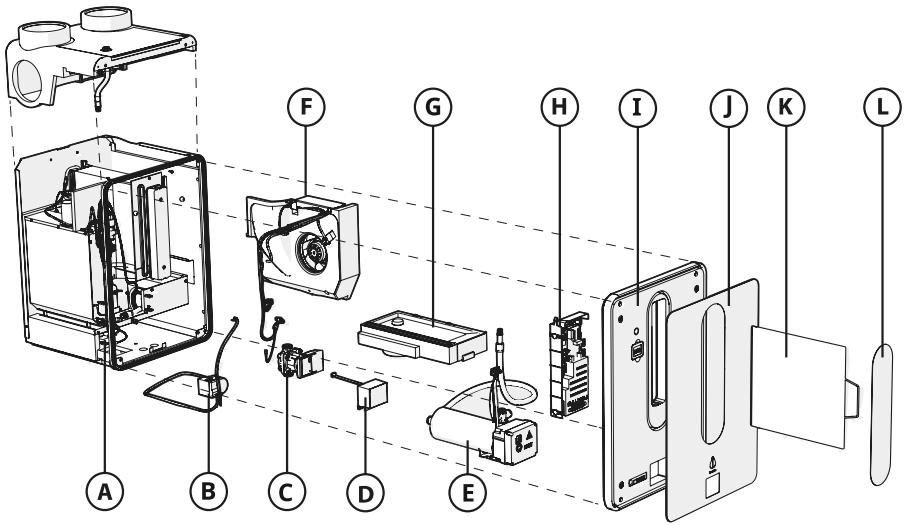
This chapter describes the simplest maintenance work on the Modul-AIR Unit itself.

ONLY the replacement of the filter may be done by the user themselves, any other work on the Modul-AIR heat pump must be completed by a technician specially trained by Joule.

Always replace parts of the Modul-AIR with original Modul-AIR parts from Joule. The use of third-party parts may cause the product to malfunction or create a hazard. Disregarding of these points may have a negative effect on the Modul-AIR warranty and void Joules statutory responsibilities.

Spare parts list

The design and operation of an exhaust air heat pump system has a direct link to its output and efficiency. Consideration should be given to heating and ventilation at an early stage in any project as the system requires to be integrated with construction and building project process.



A	Modul-AIR housing	E	Electric backup heater*	I	Front cover
B	Three-way valve*	F	Fan box	J	Front plate
C	Central Heating Pump	G	Drip tray	K	Air Filter
D	Touch display	H	Control Unit	L	Filter cap

* - These parts are only present in the AII-E variant of the Mould-AIR unit.

Spare parts list

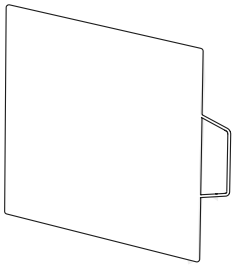
	Joule item No.	Description
1	HQZ-V-S1600004	Control unit
2	HZQ-V-S1013661	Central Heating Pump
3	HZQ-V-S1012817	Inlet / return CH sensor
4	HZQ-V-S1012792	Air-in sensor
5	HZQ-V-S1012791	Air-out sensor
6	HZQ-V-S1012284	Non-return valve
7	HZQ-V-S1051086	Fan box
8	HZQ-V-S1012742	Air Filter
9	HZQ-V-S1012787	Capacitor
10	HZQ-V-S1051312	Heat pump block assembled
11	HQZ-V-S1600003	Touch display
12	HZQ-V-S1012217	Evaporator sensor
13	HZQ-V-S1012793	Hot gas sensor
14	HZQ-V-S1012790	CH-pressure sensor
15	HZQ-V-S1013274	Service power cable (3-way valve)
16	HZQ-V-S1013313	3-way valve body
17	HZQ-V-S1013240	3-way valve actuator head
18	HZQ-V-S1051434	Electric backup heater assembly
19	HZQ-V-S1029010	Condensate hose
20	HZQ-V-S1012811	Pipe socket 150 mm
21	HZQ-V-S1051095	Support fix assembly
22	HZQ-V-00012708	Modul-AIR Mounting bracket
23	HZQ-V-S4013152	DHW Tank Sensor (x2)
24	HZQ-V-S1013385	Green Comfort Wall Mount
25	HZQ-V-S1013480	UTP cable
26	TI-I-L-14-02-1	2kW Modul-AIR immersion
27	TZK-0V-00015RB	15mm butterfly isolation valve
28	TV-P0-0000019L	Potable Expansion Vessel 19L
29	TZG-3.0-00.75I	ICGV 3 Bar 22mm
30	TZU-000015X022	Tundish 15x22mm
31	HZK-0B-0000.75	3/4" Ball Valve w/Filter
32	HZK-0F-0000022	Fill + Flush Point 22mm
33	HZMA-RFCO-0001	RF CO_2 SENSOR
34	HZMA-RFHU-0001	RF HUMIDITY SENSOR
35	HZMA-RFSW-0001	RF 4-WAY BOOST SWITCH
36	HZMA-SENS-0001	RF RECEIVER
37	AEHP-T4M-00000	T4M OT Thermostat

Air Filter - 6 - 12 Months

The first replacement of the Air filter is required to take place 6 months after installation.

Replacements after this require the standard frequency of 12 months.

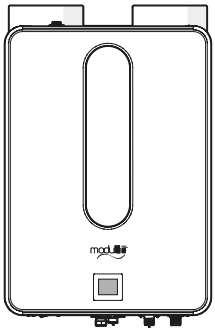
Check the filter menu on the display to see when the filter needs to be replaced.



Modul-AIR internals - 1 Year

Inspection and cleaning, if necessary, of the heat exchangers, fans.

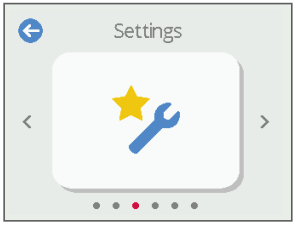
Inspection of condensation, discharge pipe and siphon every 1 year.



Operation of Heating and Hot Water - 1 Year

Ensuring system pressure is correct and the system is free from air.

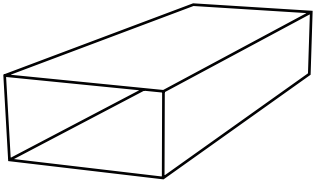
Ensuring control parameters are still set correctly and that there are no heat pump errors.



Air Distribution System - 2 Years

Inspection of duct work where possible.

Check air flow rate on all ceiling extract valves.



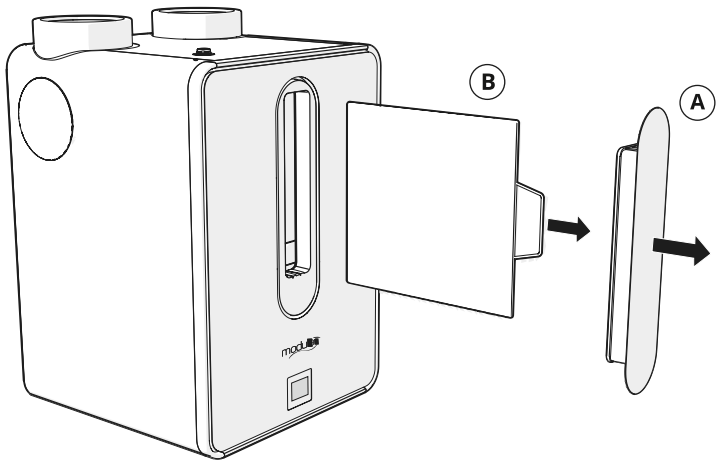
Safety notes

- Always securely disconnect the power for the Modul-AIR before installing, opening or performing maintenance on the product.
- Ensure that the unit could not be accidently switched on while any maintenance procedure is underway.
- Do not use this appliance for functions other than those described in this booklet.
- Never touch the appliance with wet or damp hands, or when barefoot.
- Do not store inflammable products in the neighbourhood of the unit.
- The unit is only suitable for 230 VAC/50Hz electric mains.
- Never modify the fan or electronics by yourself.

Replacing the Air Filter

Filter replacement procedure:

1. Loosen and remove the filter cap (A) by prising it at the sides. It is possible the cap can be jammed so do this carefully to prevent damage or bending.
2. Remove the filter (B) from the housing, pulling it forwards.
3. Install the replacement filter (B).
4. Replace the filter cap (A).
5. Reset the filter change timer in the settings.

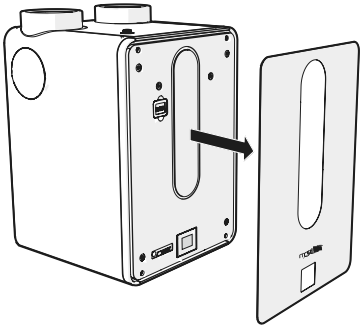


Accessing Internal Aspects of the Modul-AIR

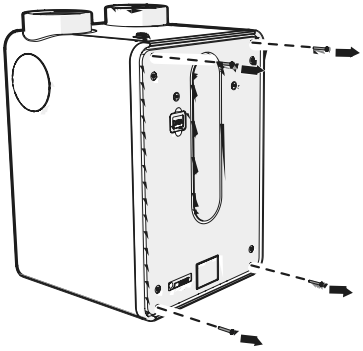
Periodically the Modul-AIR's drip tray will need to be cleaned. This necessitates the opening of the Modul-AIR unit to access its internals. This also allows the perfect opportunity to inspect and clean the other parts of the unit that may require it.

Opening of Modul-AIR procedure:

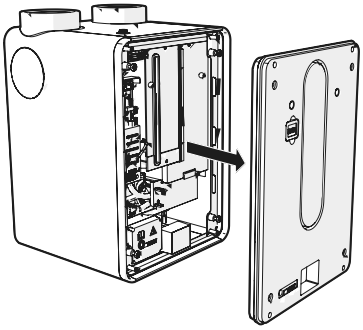
Remove the front plate. The plate is held on with magnets, so no tools are required for this.



Loosen the four screws at each corner of the front cover.



Remove the front cover.

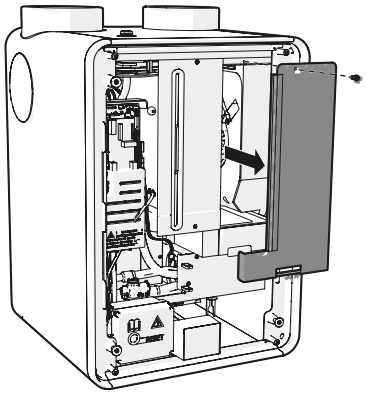


Cleaning the drip tray

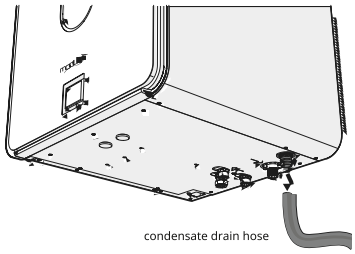
The drip tray should be checked from time to time and cleaned when necessary.

How to clean the drip tray:

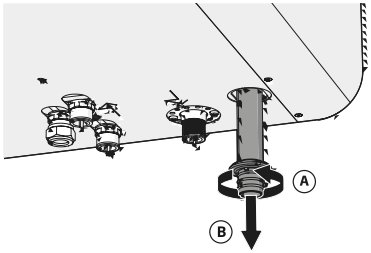
Unscrew the single top screw and remove the cover plate.



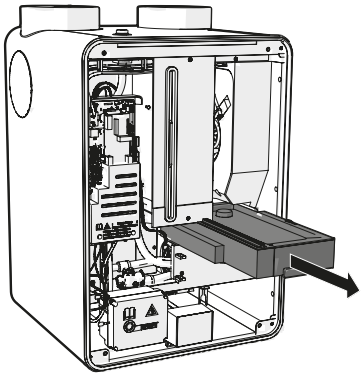
Remove the drain hose.



Turn the plastic sleeve a quarter turn (A) and take off (B)



Cleaning the drip tray



Carefully pull the drip tray out of the Modul-AIR.

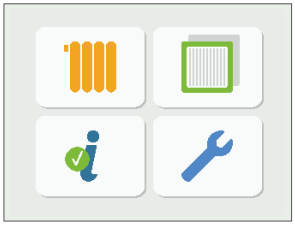
Clean the drip tray.

Reassemble the Modul-AIR by reversing the previous steps.

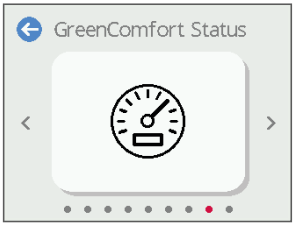
Checking the Green Comfort Status

Information about the status of the Green Comfort can be found in the installer menu under the Green Comfort status tab;

Tap the Settings icon in the main menu

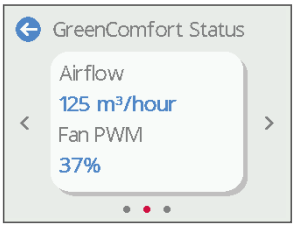


Navigate to Green Comfort Status and press the icon.

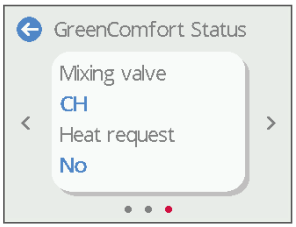


The temperatures sensor values are displayed here.

On the next page, the unit's airflow rate and Fan speed are displayed here.



On the next page, the 3-way valve direction and the status of the Heat request are displayed here.



Maintenance of the Green Comfort

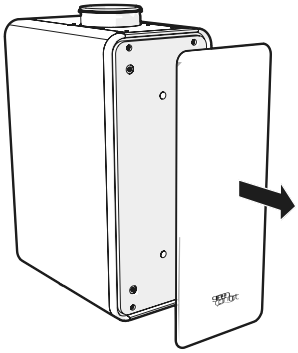
Replacing the GreenComfort filter

In the case of new construction, the Green Comfort filter must be replaced 6 months after delivery after this the standard required interval for filter replacement is every 12 months. Check the filter menu on the Modul-AIR display to see when the filter needs to be replaced.

How to replace a filter:

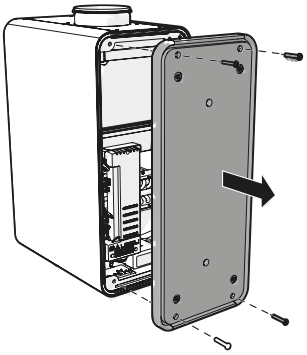
Switch off the Green Comfort.

Remove the front plate. The plate is held on with magnets, so no tools are required for this.



Loosen the four screws at each corner of the front cover.

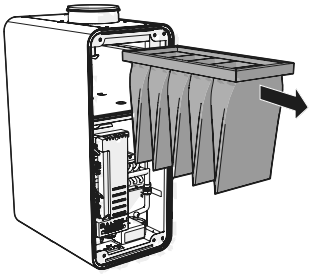
Remove the front cover.



Remove the filter from the housing, pulling it forwards.

Install the replacement filter.

Reassemble the front cover in the reverse order.

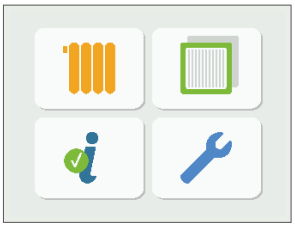


Refilling the Heating System

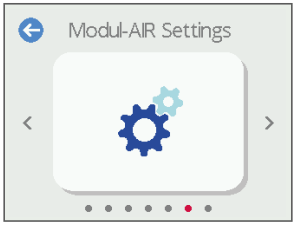
The central heating system needs to be topped up every so often to maintain the recommended pressure.

The procedure is as follows:

Tap the Settings icon in the main menu



Navigate to the Modul-AIR Settings screen and press the icon.



Check the water pressure. Is it lower than 1 bar? Then it's time to top-up the central heating system.

To top-up the central heating system:

a. Locate the filling valve on your installation.
b. Connect the filling hose to a (cold) water tap and open the tap.
c. Make sure the hose is completely filled with water.
d. Remove the cap from the filling valve and connect the filling hose.
e. Open the filling tap and the (cold) water tap.
f. Close the fill valve.

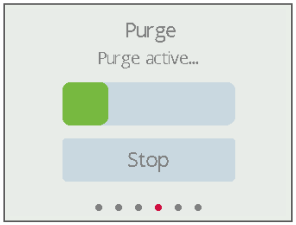
In the settings menu, navigate to purge.

Press Start and wait for the status bar to fill.

Operate the manual air vent on top of the Modul-AIR several times during the purge program until only water comes out of the vent.

Check that the water pressure has remained between 1.5 and 2.0 bar. If not, repeat steps 4-7.

Remove the filling hose and close the filling valve properly.



Warranty

Joule Modul-AIR EAHP Warranty Terms & Conditions

Registrations

It is a condition of the warranty that the System Recording and Installation Checklist is completed and left in the Handover Pack. The online Warranty Application is registered for using the Joule commissioning App during the Installation process carried out by the Joule trained and qualified installer.

Terms & Conditions

The Modul-Air system can only be commissioned by a qualified installer. This installer must have been trained by Joule specifically in the installation of the Joule Modul-Air system. Systems installed by an installer that does not meet these qualifications will have no warranty.

The unit must bee serviced annually. Invoices for servicing may be requested to prove that the unit has been serviced annually.

Warranty

Joule hereby guarantees to you, the purchaser of the exhaust air heat pump system to which this warranty is attached that the product will be free from defects in materials and workmanship, for a period of two (2) years from the date of Practical Completion (PC); provided that the product is installed in accordance with:

a) The accompanying Modul-AIR Installation Manual;

b) Any special written design or installation guidelines provided by Joule;

c) All applicable laws, rules, regulations, codes and standards applying in the territory in which the product is installed, including without limitation, all applicable local building and electrical codes.

This warranty is transferable to subsequent owners of the product.

Exclusions

If Joule finds the product to be defective as a sole result of defects in material or workmanship - then, during the Warranty Period, upon receipt of due notice from you and subject to the terms of this Warranty –

Joule shall:

Repair the product

Refund the cost for repair of the Product, as well as labour and materials required to repair the Product

Replace the Product, or parts thereof; or

Refund part or all the original purchase price.

The warranty does not cover, and Joule shall not be held liable for any of the following damages:

a) damages caused, wholly or partially, due to abuse, misuse, negligence, application and/or maintenance not as recommended by Joule

b) damages to the product caused by workers, visitors on the job site, or post- installation work;

c) damages caused by accident, natural disaster (such as fire, foods, lightning, etc.) force majeure, sabotage, or any unforeseen circumstances;

d) special, indirect, incidental, secondary, consequential or any other damages of any nature arising out of ownership or use of the product including inconvenience or loss of use.

Joule refuses any warranty not provided herein, including any implied warranty of the merchant ability or implied warranty of fitness for a particular purpose. There are no warranties, which extend beyond the face of this document. No agent or representative of Joule has any authority to extend or modify this warranty unless such extension or modification is made in writing by a corporate officer.

Joule Cyclone Warranty

Terms & Conditions

The JOULE Cyclone stainless steel vessel carries a fully transferable 25-year guarantee against faulty materials or manufacture provided that:

- It has been installed in the United Kingdom or the Republic of Ireland as per the instructions provided in the installation manual provided with the tank and in accordance with all of the relevant standards, regulations and codes of practice in force at the time;
- It has not been modified in any way, other than by JOULE;
- It has not been misused, tampered with or subjected to neglect;
- The system is fed from the public mains water supply;
- It has only been used for the storage of potable water;
- It has not been subjected to frost damage.
- The unit has been serviced annually;
- The Service Log Book has been completed after each annual service;

Exclusions

The guarantee does not cover tanks affected by the following:

- The effects of scale build up on the tank;
- Any labour charges associated with replacing the unit or its parts;
- Any consequential losses caused by the failure or malfunction of the unit.

Please note that invoices for servicing may be requested to prove that the unit has been serviced annually.

Unvented Kit & Other Components.

The expansion vessel and cold water controls supplied with JOULE models carry a 2-year guarantee.

All other components that are fitted to, or supplied, with the unit carry a 2-year guarantee.

The Joule 25-year warranty covers Joule tanks installed in domestic properties against corrosion for a period of 25 years from the Practical Completion (PC).

All other components, including valves, expansion vessels, immersion heaters, fittings and controls are covered by a 2-year warranty from the date of Practical Completion (PC) which includes one year's parts and labour and one year parts only.

Warning To the User

- Do not remove or adjust any part of this unvented water heater.
- If the unvented water heater develops fault, such as a flow of water from the discharge pipe switch the heater off.
- In all cases contact a competent installer.
- The Benchmark Checklist at the end of the manual must be filled in at annual service.

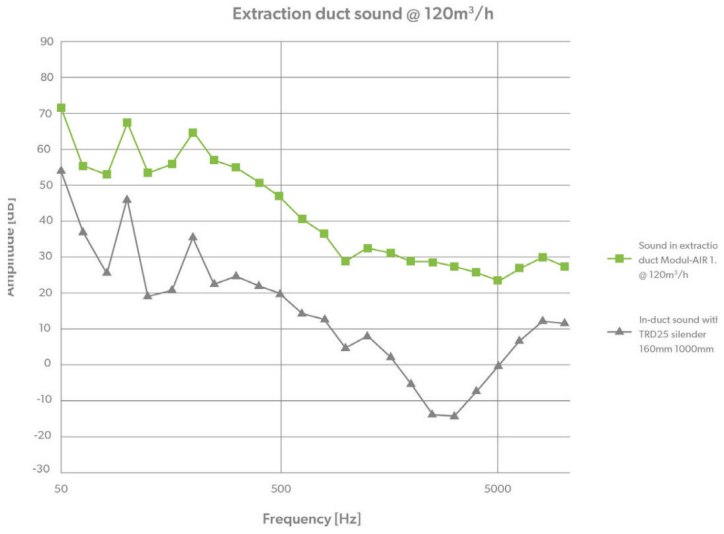
Warning To the Installer

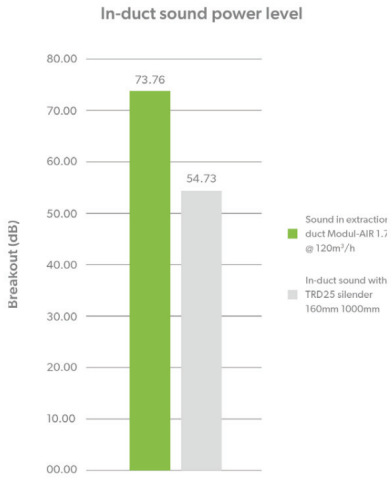
- Read the installation instructions before commencing.
- Unvented water heaters are a controlled service as defined in the latest edition of the Building Regulations and should only be fitted by a competent installer.
- The installation is subject to approval.
- You must notify the local authority of intention to install.
- After installation the instructions manual must be completed and left with the householder.
- Use only manufacturer's recommended replacement parts.

Modul-Air System Sound Data

The given figures below are excluding any attenuator accessory. The use of attenuators is recommended to reduce noise transmitted inside ventilation ductwork. With the Modul-AIR, depending on the frequency, the in-duct sound power level can reduce by up to 25% (as seen in graph) through the use of the attenuator accessory. In-room sound levels could also be reduced by as much as 50%.

Based on a ducting arrangement with 130Pa's, @ 120m³/h c/w TRD25 Ø160mm 1m silencer.





Modul-AIR All-E Sound Data

	Flow Rate	160m³/h	Compressor Off							
	Hz	63	125	250	500	1k	2k	4k	8k	WEIGHTED
Breakout (dB)										
Modul-AIR	-	48.1	44.7	48.3	46.7	42.8	39.6	35.1	32.9	48.5
Induct										
Modul-AIR	Extract	59.2	69.4	63.7	52.3	38.6	34.3	30.6	27.7	57
Modul-AIR	Exhaust	68.6	68.3	67.6	61.7	55.5	51.6	49.5	47.9	63.5

	Flow Rate	200m³/h	Compressor Off							
	Hz	63	125	250	500	1k	2k	4k	8k	WEIGHTED
Breakout (dB)										
Modul-AIR	-	52	45.4	50.1	47.2	42.9	40.1	36.2	35.1	49
Induct										
Modul-AIR	Extract	59.9	69.9	64	54	41.4	36.5	33.9	32.3	57.5
Modul-AIR	Exhaust	68.9	68.8	72.2	64.3	57.8	53.7	52	50.5	67

	Flow Rate	200m³/h	Compressor Off							
	Hz	63	125	250	500	1k	2k	4k	8k	WEIGHTED
Breakout (dB)										
Modul-AIR	-	63.4	50.8	49.7	46.9	45.8	43.4	37.7	33.5	50.5
Induct										
Modul-AIR	Extract	71.6	67.7	65.4	52.3	38.2	34.2	30.2	32.7	57
Modul-AIR	Exhaust	70	69.3	67.3	60.8	53.8	49.2	45.6	43.4	62.5

Modul-AIR All-E & Green Comfort Sound Data

	Flow Rate	160m³/h	Compressor Off							
	Hz	63	125	250	500	1k	2k	4k	8k	WEIGHTED
Breakout (dB)										
Modul-AIR	-	48.1	44.7	48.3	46.7	42.8	39.6	35.1	32.9	48.5
GreenComfort	-	48.2	60.8	49.6	39.2	34.8	32	26.1	29	47
Induct										
Modul-AIR	Extract	59.2	69.4	63.7	52.3	38.6	34.3	30.6	27.7	57
GreenComfort	Supply	57.1	62.3	71.4	48.8	43	35.8	29.3	15	63
GreenComfort	Intake	57	65.8	62.5	46.2	34	32.4	28.5	19.4	54.5
Modul-AIR	Exhaust	68.6	68.3	67.6	61.7	55.5	51.6	49.5	47.9	63.5

	Flow Rate	200m³/h	Compressor Off							
	Hz	63	125	250	500	1k	2k	4k	8k	WEIGHTED
Breakout (dB)										
Modul-AIR	-	52	45.4	50.1	47.2	42.9	40.1	36.2	35.1	49
GreenComfort	-	49.6	54.5	53.2	39.3	35.3	31.3	24.4	25	46.5
Induct										
Modul-AIR	Extract	59.9	69.9	64	54	41.4	36.5	33.9	32.3	57.5
GreenComfort	Supply	57.8	62.1	70.2	49.8	44.2	37.7	31.6	17.6	62
GreenComfort	Intake	58.8	61.9	61.6	46	35.3	33.6	29.9	20.4	53.5
Modul-AIR	Exhaust	68.9	68.8	72.2	64.3	57.8	53.7	52	50.5	67

	Flow Rate	200m³/h	Compressor Off							
	Hz	63	125	250	500	1k	2k	4k	8k	WEIGHTED
Breakout (dB)										
Modul-AIR	-	63.4	50.8	49.7	46.9	45.8	43.4	37.7	33.5	50.5
GreenComfort	-	46.5	57.2	45.4	38.6	34.2	31.4	25.7	29.2	44
Induct										
Modul-AIR	Extract	71.6	67.7	65.4	52.3	38.2	34.2	30.2	32.7	57
GreenComfort	Supply	57.8	63	57.6	48.2	41.4	33.7	26.6	12.6	56.5
GreenComfort	Intake	60.6	64	62.1	44.8	32.4	30.6	26.5	17.7	53.5
Modul-AIR	Exhaust	70	69.3	67.3	60.8	53.8	49.2	45.6	43.4	62.5

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