Artus

Installation, Operation and Maintenance Manual

Artus REF No Artus IOM 10.0_06_24

07/06/2024 **Version 10.0**

Artus®

This manual shall enable operational and service personnel to install, operate and maintain the product in a safe and efficient manner.

The information contained in this manual is critical to the correct operation and maintenance of the unit and should be read by all persons responsible for the installation, operation and maintenance of this Artus Air Ltd product.

The product may only be transported, unpacked, installed, operated, maintained and otherwise used by suitably qualified, trained and authorised technical staff.

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This manual is applicable to the model variants detailed in the table below.

AR6021CGMB	AR6021HGMB	AR60211CMB	AR6021CGEB	AR6021HGEB	AR60211CEB
AR6041HCMB	AR6042HCMB	AR6041HCEB	AR6042HCEB		
AR7521CGMB	AR75213CMB	AR75215CMB	AR7521HGMB	AR7541HCMB	AR7542HCMB
AR7521CGEB	AR75213CEB	AR75215CEB	AR7521HGEB	AR7541HCEB	AR7542HCEB
AR7521CGMP	AR7521HGMP	AR7541HCMP	AR7542HCMP		
AR7521CGEP	AR7521HGEP	AR7541HCEP	AR7542HCEP		

CONTENTS

1. Health and Safety

The information contained in this manual is critical to the correct operation and maintenance of the unit and should be read by all persons responsible for the installation, operation and maintenance of this Artus Air Ltd product.

Safety

The product has been designed and manufactured to meet international safety standards but, like any mechanical/ electrical equipment, care must be taken if you are to obtain the best results.

1.1 Symbols and markings

The following symbols and text formatting are used within this manual to alert the reader to a potential hazard and possible consuquence.

 DANGER	This indicates an imminent hazardous situation which will result in death or serious injury if not avoided. Any measures described MUST be observed.

 WARNING	This indicates a potentially hazardous situation which may result in death or serious injury if not avoided. Working should be exercised with extreme caution.

 CAUTION	This indicates a potentially hazardous situation which may result in moderate injury or property damage if not avoided. Working should be exercised with caution.

 INFORMATION	This indicates a potentially hazardous situation which may result in equipment or property damage if not avoided. Working should be exercised with caution.

This product should not be used by children under 8 years old; anyone with reduced physical, sensory or mental capabilities; or by anyone who has insufficient experience or knowledge of the appliance; unless they are being supervised by someone who is responsible for their safety and in possession of the operating instructions of the product.

2. Environmental policy

It is our policy to:

- Take a proactive approach to resolve environmental issues and ensure compliance with regulatory requirements.
- Train personnel in sound environmental practices.
- Pursue opportunities to conserve resources, prevent pollution and eliminate waste.
- Manufacture products in a responsible manner with minimum impact on the environment.
- Reduce our use of chemicals and minimise their release to the environment.
- Measure, control and verify environmental performance through internal and external audits.
- Continually improve our environmental performance.

3. CE Directive

Artus Air Ltd certify that the equipment detailed in this manual conforms with the following EC Directives:

Machinery Directive (MD)	89/392/EEC version 2006/42/EC
Restriction of the use of certain hazardous substances (RoHS)	2011/65/EU
Quality Management System standard	ISO 9001:2015
Environmental Management System standard	ISO 14001:2015
Energy Management System standard	ISO 50001:2018
REACH Regulation	1907/2006
Safety of machinery	UNI EN ISO 12100-1:2010
Electromagnetic compatibility Household and similar electrical appliances	EN61000-6-2:2005; 6-3:2007+ A1:2011; 3-2:2014; 3-3:2013 EN60335-1: 2012 + A11:2014 EN60335-2-40:2003 + A1:2006 + A2:2009 + A11:2004 + A12:2005 + A13:2012

To comply with these directives appropriate national & harmonised standards have been applied. These are listed on the Declaration of Conformity, supplied with each product.

Maximum and Minimum Operation Temperature (TS) and Pressure (PS)

Waterside

Allowable Temperature Range (TS) =	Min -5°C* to Max 82°C **
Maximum Allowable Pressure (PS) =	10 Barg

*Based on the water temperature in the unit off state in the lowest permitted ambient temperature.

** Based on the maximum allowable water temperature.

ROHS COMPLIANCE

Under the EU Directives, Artus Air Ltd hereby declares that Artus products are RoHS compliant according to the definitions and restrictions given by the Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE).

This product is protected by the following patents and other pending patent applications:

AU 2015295067 GB 2528890 GB 2569943 CN 111868391 JP 7138280 JP 7220858 US 1118793 US 11378284

4. Description

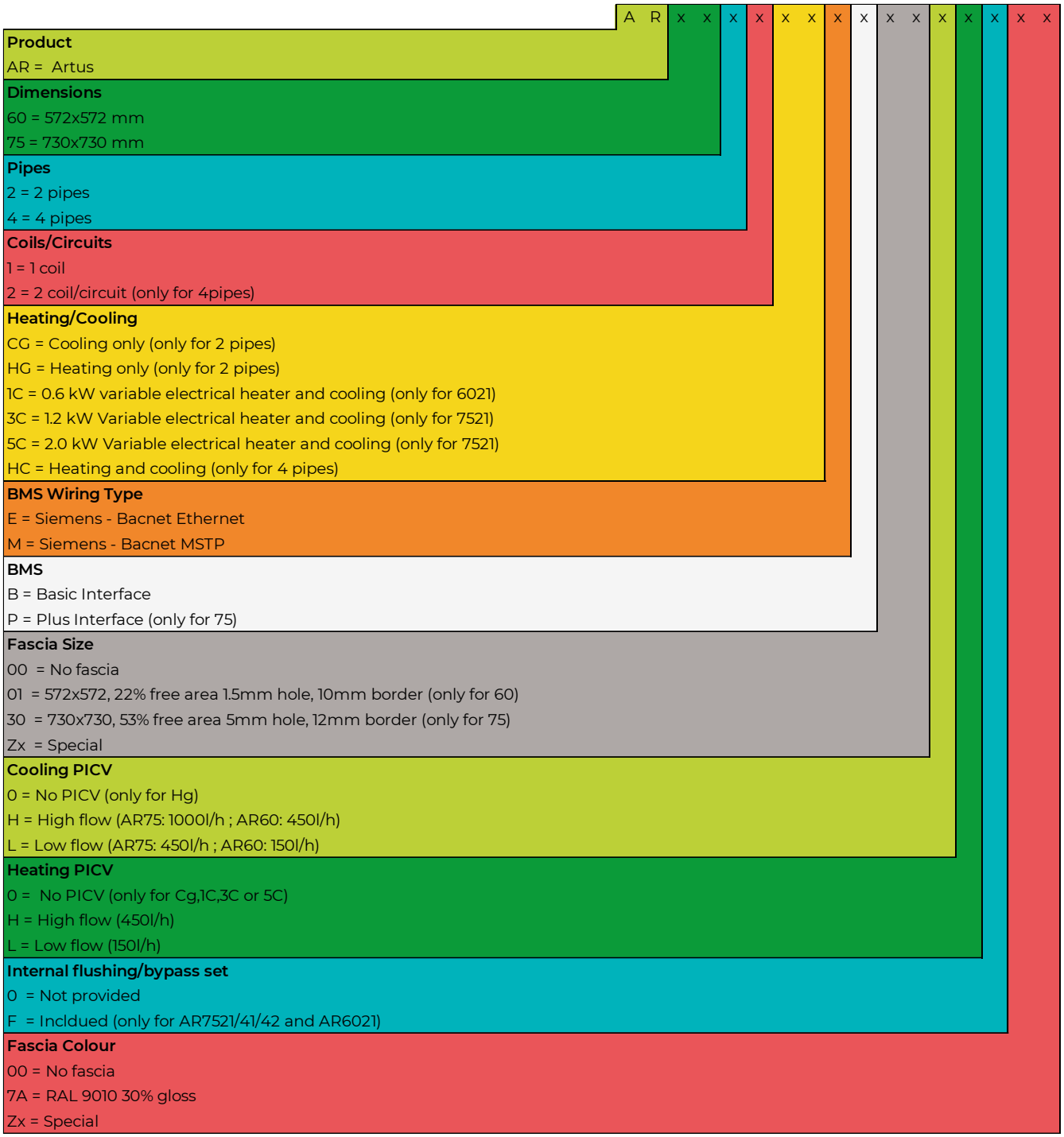
The Artus Low energy fan coil unit is designed for both cooling and heating with no system ductwork. The unit is self-contained with all controls, control valves and auxiliary equipment required for operation. The Artus is a versatile, flexible solution designed with ease of installation, operation, and maintenance in mind.

This document is intended to outline the installation, operation and maintenance for all Artus units.

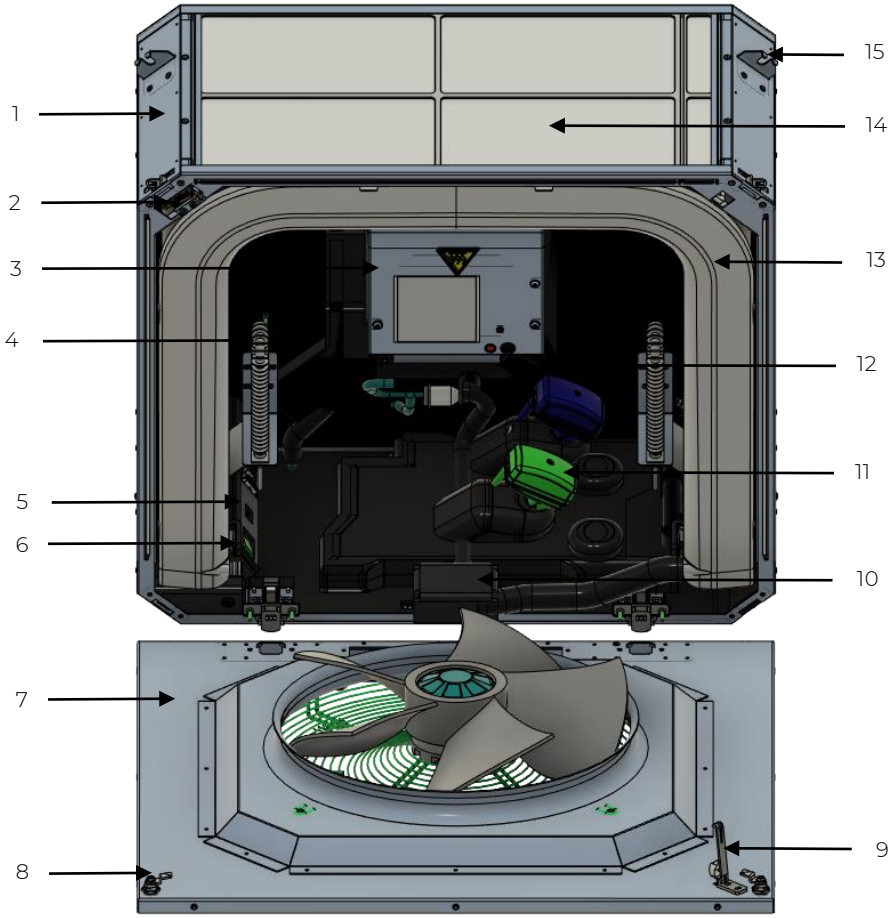
4.1 Product variants

Artus units are supplied in numerous configurations. The product nomenclature is shown below, the following sections cover all variants. Any specific options or details are highlighted within the text.

4.2 Product nomenclature



5. Unit overview



Item	Description
1	Unit chassis
2	Fan microswitch
3	Control panel
4	Electric heater element (Optional)
5	Return air temperature sensor/commissioning plug socket
6	Connection panel
7	Hinged fan plate
8	Latch
9	Safety latch
10	Condensate pump reservoir
11	Pressure independent control valves
12	Condensate pump
13	Condensate drain tray
14	Washable filter
15	Hanging lugs

6. Product specification

6.1 AR60 Range

Chassis

The Artus Chassis is constructed from Galvatite Z2 G275N 1.2mm galvanised steel.

Edges are formed inwards to reduce sharp edges.

Chamfered corners with integral mounting brackets minimise the unit footprint.

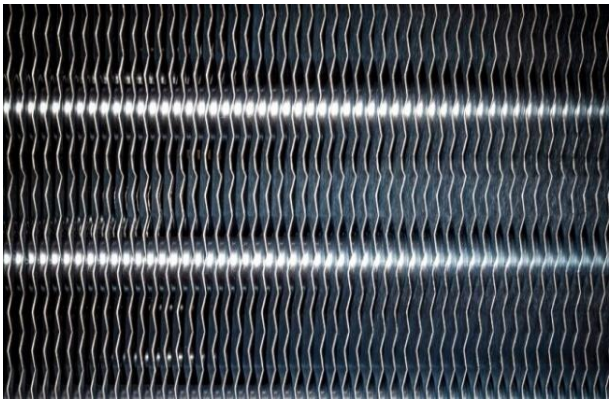
Insulation

The Artus unit is lined internally with fire resistant foam (UL94 VO) for thermal and acoustic insulation. Insulation density is between 30 and 80 kg/m^3.

Heat exchanger

Heat exchangers are manufactured from seamless 3/8" copper tube, mechanically expanded onto hydrophilic coated aluminium fins. Fins are die punched to form collars which to maximise surface contact with the copper coil tubes, ensuring optimal heat transfer. Key operated vents and drains are fitted as standard to aid installation/commissioning.

Each heat exchanger is leak tested using dry air under water to 20 bar pressure. The factory fitted valve arrangement is pressure tested as part of the end of line test procedure.



Condensate tray

The condensate tray is UL94 V0 rated acrylonitrile butadiene styrene (ABS) with fall to drain. The condensate trays are covered with 6mm closed cell, class 'O' insulation to prevent condensation forming on the outside. The tray is removable for maintenance.

Fan

The fan is an axial type with polypropylene sickle shaped blades, a cast aluminium motor housing and polyester powder coated finger guard. Motor and impeller assemblies are statically and dynamically balanced in two planes to grade G 6.3 in accordance with DIN ISO 1940.

The fan has Electronically Commutated (EC), Direct Current (DC), direct drive motors, utilising matched electronics for improved performance and enhanced reliability. Motor safety features include soft start, current limitation, and overvoltage detection, with reverse polarity, locked rotor and thermal overload protection as standard. Motors are fitted with maintenance free ball bearings for reliability, each motor is connected into the wiring loom by a quick connector.

Filter

Artus units incorporate synthetic nylon monofilament filter media encased in a UL94 V0 rated acrylonitrile butadiene styrene (ABS). Filter media open area is 43% and mesh size is 195µm. The filter frame features snap barb edges which simplify filter removal and replacement. The media is reusable and may be washed or vacuum cleaned.

Electric element.

Finned sheathed tubular heating elements are offered in the electric heat product variants. Available output 0.6kW.

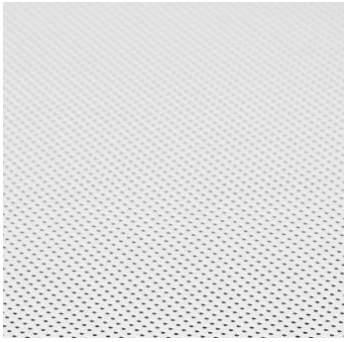
The integral controls strategy is pre-configured to ensure safe operation of the element, with auto and manual high temperature cut-outs pre-fitted for safety.

Fascia (Standard option)

The fascia is a perforated ceiling tile that can be removed for easy maintenance from the hinged fan assembly.

The fascia size is 572x572mm with a micro perforation pattern giving 22% free area. Constructed from 0.7mm polyester powder coated Zintec with a standard colour of RAL 9010 30% gloss finish.

Other fascia options are available upon request.



6.2 AR75 Range

Chassis

The Artus Chassis is constructed from Galvatite Z2 G275N 1.2mm galvanised steel.

Edges are formed inwards to reduce sharp edges.

Chamfered corners with integral mounting brackets minimise the unit footprint.

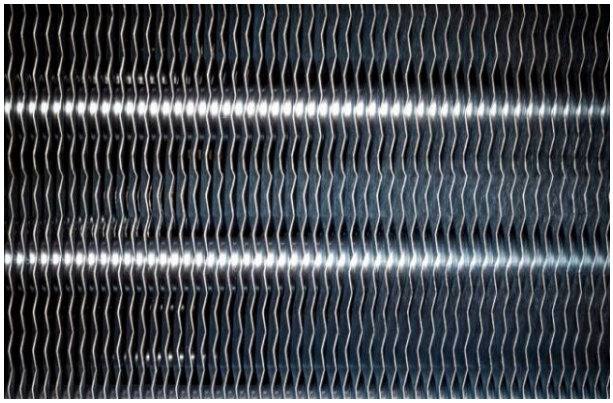
Insulation

The Artus unit is lined internally with fire resistant foam (UL94 VO) for thermal and acoustic insulation. Insulation density is between 30 and 80 kg/m^3.

Heat exchanger

Heat exchangers are manufactured from seamless 3/8" copper tube, mechanically expanded onto hydrophilic coated aluminium fins. Fins are die punched to form collars which to maximise surface contact with the copper coil tubes, ensuring optimal heat transfer. Key operated vents and drains are fitted as standard to aid installation/commissioning.

Each heat exchanger is leak tested using dry air under water to 20 bar pressure. The factory fitted valve arrangement is pressure tested as part of the end of line test procedure.



Condensate tray

The condensate tray is UL94 V0 rated acrylonitrile butadiene styrene (ABS) with fall to drain. The condensate trays are covered with 6mm closed cell, class 'O' insulation to prevent condensation forming on the outside. The tray is removable for maintenance.

Fan

The fan is an axial type with polypropylene sickle shaped blades, a cast aluminium motor housing and polyester powder coated finger guard. Motor and impeller assemblies are statically and dynamically balanced in two planes to grade G 6.3 in accordance with DIN ISO 1940.

The fan has Electronically Commutated (EC), Direct Current (DC), direct drive motors, utilising matched electronics for improved performance and enhanced reliability. Motor safety features include soft start, current limitation, and overvoltage detection, with reverse polarity, locked rotor and thermal overload protection as standard. Motors are fitted with maintenance free ball bearings for reliability, each motor is connected into the wiring loom by a quick connector.

Filter

Artus units incorporate synthetic nylon monofilament filter media encased in a UL94 V0 rated acrylonitrile butadiene styrene (ABS). Filter media open area is 43% and mesh size is 195µm. The filter frame features snap barb edges which simplify filter removal and replacement. The media is reusable and may be washed or vacuum cleaned.

Electric element.

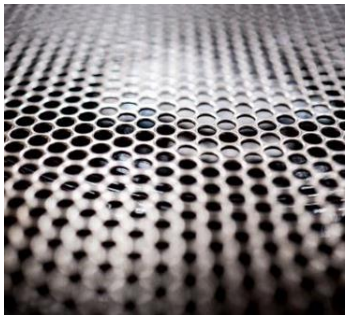
Finned sheathed tubular heating elements are offered in the electric heat product variants. Available outputs are 1.2 and 2.0kW.

The integral controls strategy is pre-configured to ensure safe operation of the element, with auto and manual high temperature cut-outs pre-fitted for safety.

Fascia (Standard option)

The fascia is a perforated ceiling tile that can be removed for easy maintenance from the hinged fan assembly.

The fascia size is 730mm x 730mm with a perforation pattern giving 53% free area. Constructed from 0.7mm polyester powder coated Zintec with at standard colour of RAL 9010 30% gloss finish. Other fascia options are available upon request.



7. Delivery and storage

7.1 Delivery

Standard delivery will be made by curtain side/tail lift lorry, between the hours of 9am to 4pm Monday to Friday. The vehicle meets FORS Bronze standard. A forklift is required for offloading.

Specialised delivery for no forklift availability will be detailed on the project specific quotation and order acknowledgement.

The client will be notified a minimum of three days before the agreed delivery date.

The maximum quantity of AR60 units per pallet is 7.

The maximum quantity of AR75 units per pallet is 5.

Any shortages or damage must be recorded on the delivery note and notified to Artus Air Limited within 48 hours of receipt.

Artus Air Limited cannot accept liability for any damage caused to the product after it has been unloaded from the transportation vehicle. It is the client's responsibility to ensure the product does not get damaged once the product has been unloaded. Artus Air Limited assumes no responsibility for damages or delays caused by failures/damages due to handling damage (including consequential and indirect / accidental damages) any replacements will be charged at full cost to the client responsible.

7.2 Packaging

Artus units are individually packaged, banded onto pallets then shrink-wrapped. They should remain in their original packaging until installation.

On completion packaging should be disposed of appropriately, recycling used material.

7.3 Manual handling

Movement of products around site to the final installation location should be undertaken.

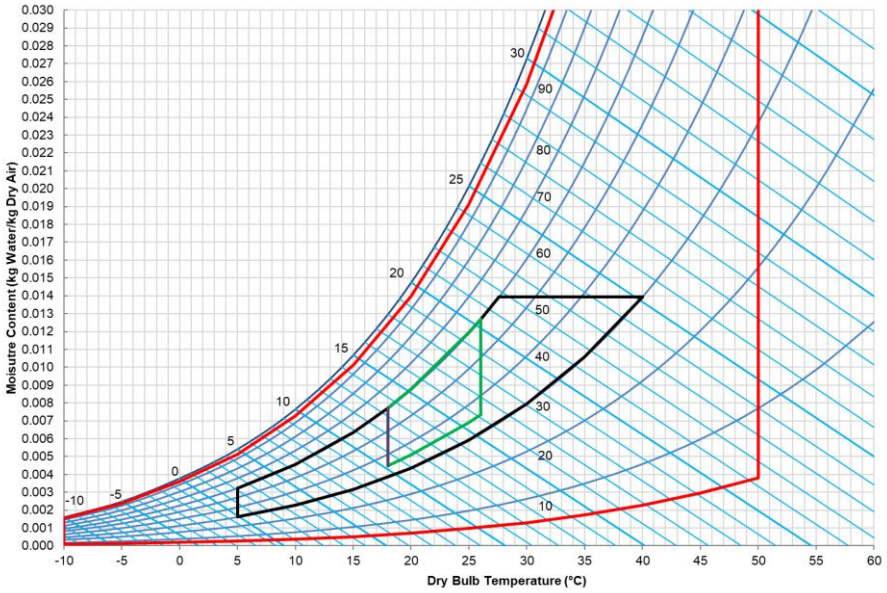
- In the original packaging.
- With the load secured against tipping or falling.
- With suitable mechanical aids.
- Avoiding any shock or impact.

7.4 Storage and operating limits

Products should be stored internally in a dry environment, in the original packaged state. The stored product should be kept free from any falling building material, dampness or extreme cold or heat.

Acceptable storage conditions are between -10° C and 50° C with a relative humidity no greater than 95%. Care should be taken to ensure no condensation forms on the inside of the packaging.

The product must not be stored on a vibrating floor as this may lead to damage to the bearings.



CIBSE comfort envelope — Artus operating limits — Storage envelope

Cooling envelope*	Minimum dry bulb return air temperature Maximum dry bulb return air temperature Relative humidity	+18°C +40°C 30 to 60%

Heating envelope	Minimum dry bulb return air temperature Maximum dry bulb return air temperature	+5°C +21°C

Water flow	Minimum entering water temperature Maximum entering water temperature Maximum operating pressure Maximum circuit differential pressure (41 units)	+6°C +82°C 10 barg 2.5 barg

Airflow	Minimum air volume flow rate AR60 Minimum air volume flow rate AR75 Maximum air volume flow rate AR60 Maximum air volume flow rate AR75	30 $l.s^{-1}$ 109 $l.s^{-1}$ 166 $l.s^{-1}$ 368 $l.s^{-1}$

* Note: the maximum cooling envelope is less than the extreme required by the EN 1397:2015 sweat test

** 50-60% for 30 minutes maximum

7.5 Extended Storage

For any storage period beyond 6 months Artus Air Limited recommend the following monthly inspections.

- Packaging should be checked for external damage and repaired as necessary.
- Packaging should be checked to ensure they are adequately sealed to prevent ingress of dust and debris.
- Fan impellers should be manually rotated to ensure free movement and to prevent bearing damage.

8. Installation

⚠ WARNING	All personnel involved in the installation of Artus units must be suitably trained and competent. They must be conversant with the current legislations including Manual Handling Operations Regulations, the Approved Codes of Practise published by the Health and Safety Commission. They should be trained for working at height in accordance with the Work at Height Regulations and for the use of lifting equipment as detailed in the Lifting Operations and Lifting Equipment Regulations

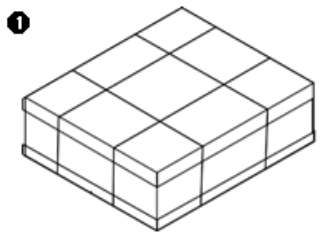
8.1 Pre installation checks

Before installation

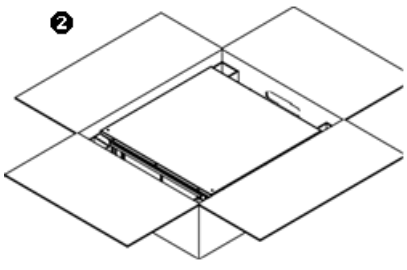
Please ensure.

- The Artus unit will be installed in a thermally insulated, low-leakage building. The installation location must be frost free and dry.
- The Artus unit configuration matches the layout plans for the installation location. Please contact Artus Air Ltd for advice if this is incorrect.
- The installation location allows sufficient access to the serviceable items of the Artus unit. Recommended access requirements are detailed in the General Arrangement drawings contained within the appendices of this manual.
- The electrical supply available is suitable for the. Artus unit
- The Artus unit is suitable for the atmosphere and environment in which it is to operate.
- The Artus unit is suitable for the working media, temperature, and pressure for which it to be used.
- The substrate to which the Artus unit is to be suspended is adequate to support up to 4 times the weight of the unit.
- Components used to suspend the Artus unit are certified and suitable for the load.

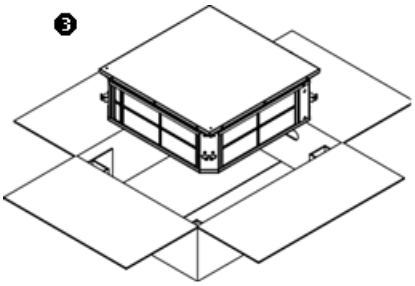
8.2 Unpacking the unit



Carry and place the box in a safe area for unpackaging. It is advised that 2 people perform this operation or a trolley is used

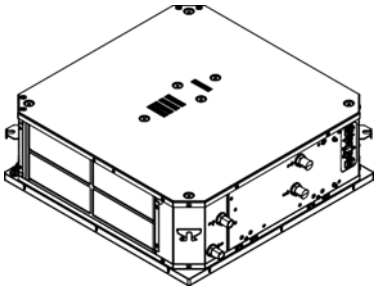


Open the box from top face as shown. Be careful not to damage fascia panel when opening the box.



Lift the unit out of the box by placing hands either side of the unit on the inside edge of the box. Be careful not to damage the filter. It is advised that 2 people perform this operation.

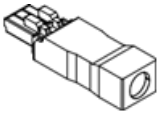
8.3 Contents



Unit

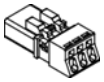
Small filter (x2)

Large filter



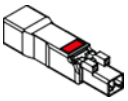
Power supply plug

KNX-PL Link plug

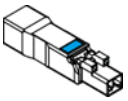


BACnet MSTP plug

External relay plug



Heating override plug

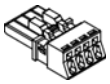


Cooling override plug

Electrical connection tool

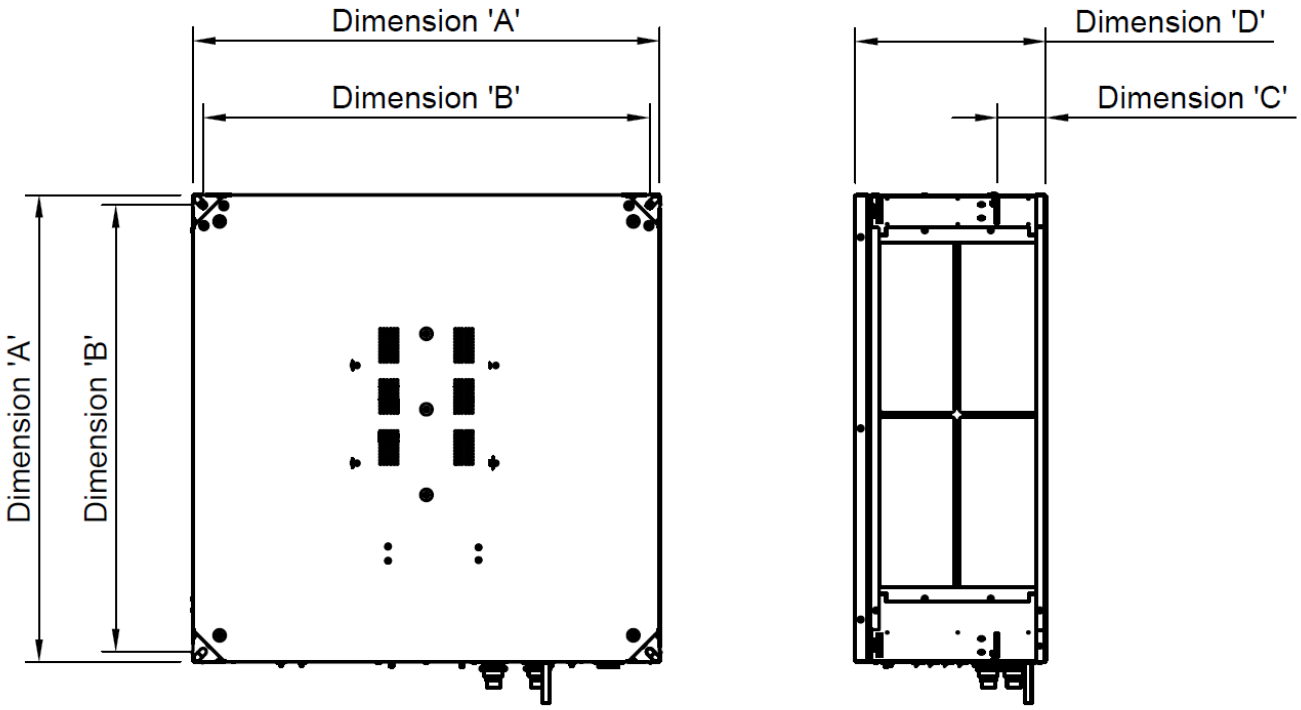
Additional DI plug (Plus version only)

Additional AO plug (Plus version only)



Additional DO plug (Plus version only)

8.4 Unit dimensions



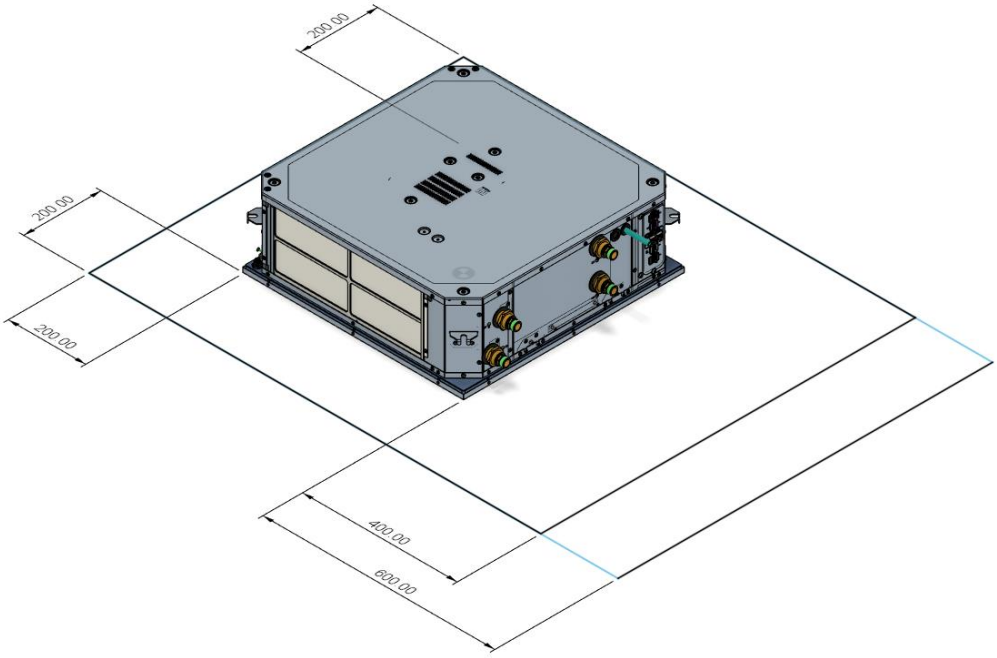
	Dimension 'A'	Dimension 'B'	Dimension 'C'	Dimension 'D'
AR60	572	540	76	204
AR75	730	698	76	300

8.5 Unit weights

Weight [kg]	AR6021CG AR6021HG	AR60211C	AR6041HC	AR6042HC	AR7521CG AR7521HG	AR75213C	AR75215C	AR7541HC	AR7542HC
Unit weight (dry) [kg]	20.5	21.5	21.5	22	42	43	43.5	44	43
Unit weight (operating) [kg]	21.4	22.4	22.4	23.2	45.5	46.5	47	47.5	46.5
Unit water volume [l]	0.9	0.9	0.9	0.9/0.3	3.5	3.5	3.5	3.5	3.04/0.46

8.6 Unit clearance requirements

8.6.1 AR60 Unit clearance details



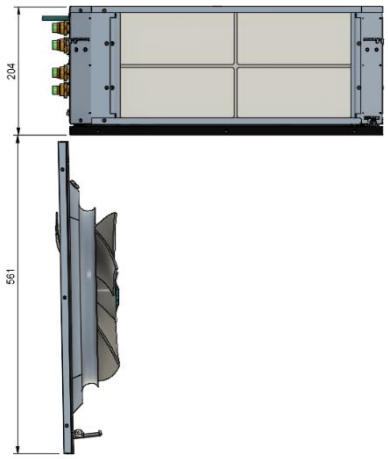
200mm clearance is recommended around the units three return air sides to ensure correct, efficient operation. This is for airflow as return air from the ceiling void enters the unit on three sides. For mechanical services 600mm is recommended, 400mm clearance may be suitable on the pipework side depending on the system arrangement.

The Artus unit is designed for a very low pressure drop on the air side and an appropriate return air path must be provided when used in a false ceiling. Without this the fan duty may reduce, the specific fan power may increase, and the noise may increase.

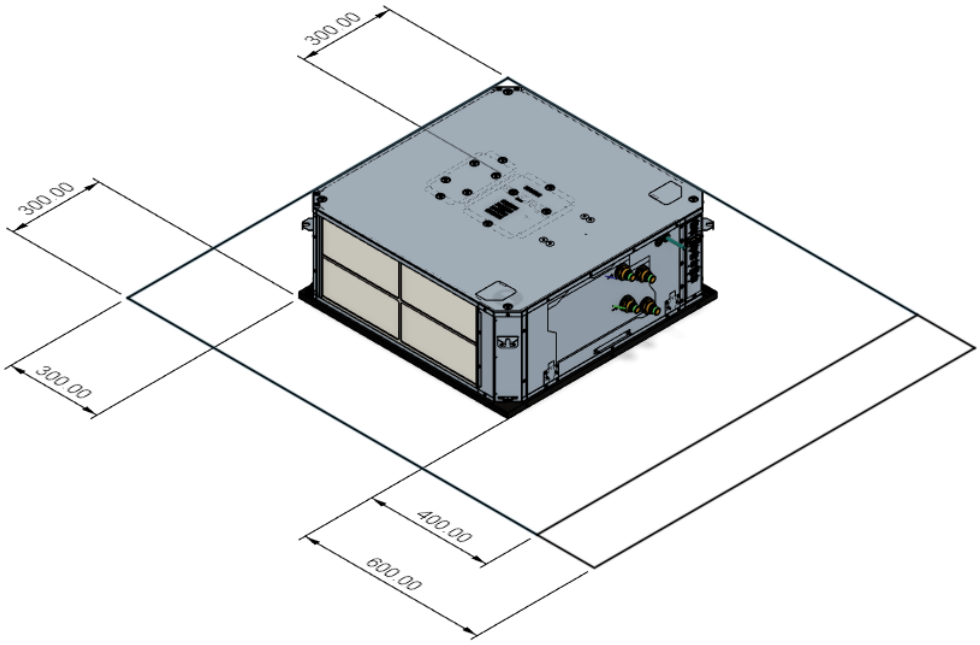
This air path may be provided by return air grilles, air handling light fittings or other architectural details or openings such as flash gaps. The area of return air path should match the open area of the supply fascia.

For example, for each AR60 unit with a free area fascia of 22%, a return air path of free area of 0.08m^2 should be provided.

Clear unhindered access is required beneath the unit to allow the fan assembly to swing down.



8.6.2 AR75 Unit clearance details



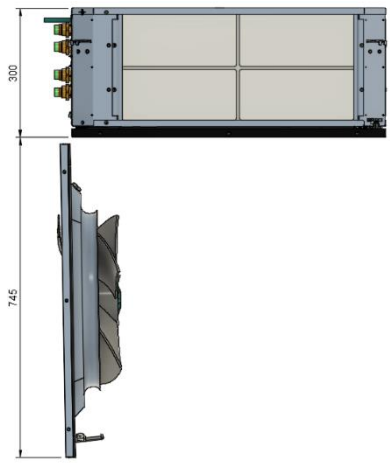
300mm clearance is recommended around the units three return air sides to ensure correct, efficient operation. This is for airflow as return air from the ceiling void enters the unit on three sides. For mechanical services 600mm is recommended, 400mm clearance may be suitable on the pipework side depending on the system arrangement.

The Artus unit is designed for a very low pressure drop on the air side and an appropriate return air path must be provided when used in a false ceiling. Without this the fan duty may reduce, the specific fan power may increase, and the noise may increase.

This air path may be provided by return air grilles, air handling light fittings or other architectural details or openings such as flash gaps. The area of return air path should match the open area of the supply fascia.

For example, for each AR75 unit with a free area fascia of 53%, a return air path of free area of 0.19m^2 should be provided.

Clear unhindered access is required beneath the unit to allow the fan assembly to swing down.



8.7 Mechanical installation

Artus units are provided with 4 off hanging lugs on each corner complete with 12mm diameter by 18mm slots.

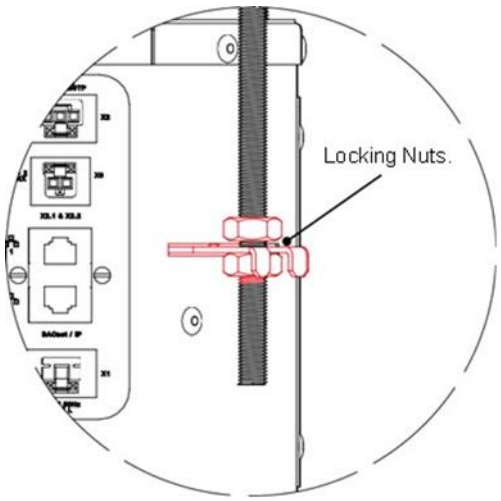
Numerous methods are available to suspend units, this guide will detail the prevalent industry method of threaded rod.

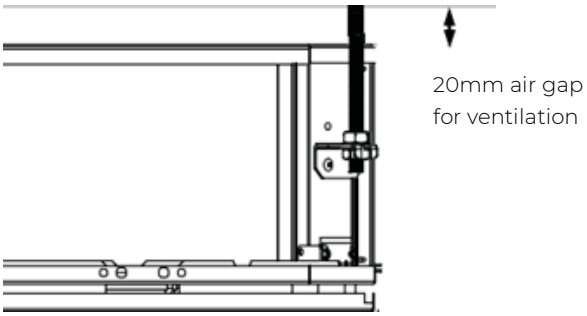
Threaded rod from M6 to a maximum of M10 may be utilised depending on the load to be carried and the safe working load or working load limit of the suspension components.

The Artus unit should be carefully lifted to its installation location. Take precautions to spread the load to prevent damage to the chassis. Take care with vulnerable protrusions such as the coil connections and ensure the fascia is not damaged during this operation.

Air vents are incorporated into the top panel of the Artus unit to allow heat dissipation of the internal control enclosure. Ensure that a minimum gap of 20mm is maintained between the top panel and the building structure and the ventilation path is free from obstructions.

Ensure the unit is level in all planes before tightening the lock nuts.





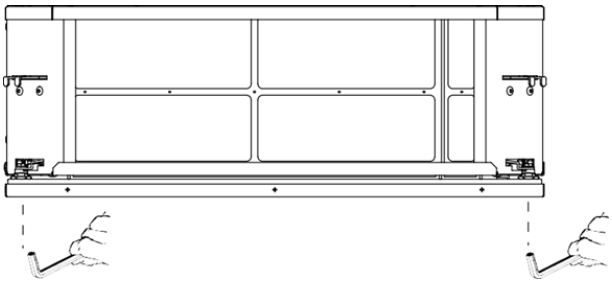
If Artus units are intended to be integrated into a ceiling system a two-tier Unistrut arrangement is recommended to give flexible x,y,z adjustment.

If there is a delay in moving to the next phases of installation all openings and fascia panel should be suitably covered to prevent contamination.

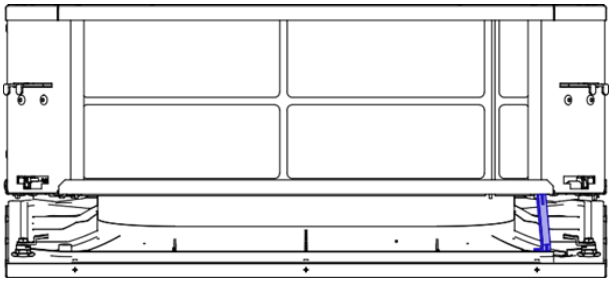
9. Opening the unit

Locate the latch side of the unit which can be identified by the 2 larger 6mm holes in the fascia panel.

Latches are provided on the two corners of the unit

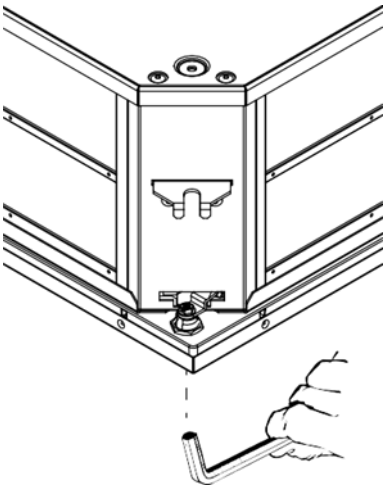


Once both latches have been released, the hinged fan assembly should be carefully lowered on to the safety catch (blue coloured part in diagram). This will trigger the fan interlock and stop the fan from running if energized.



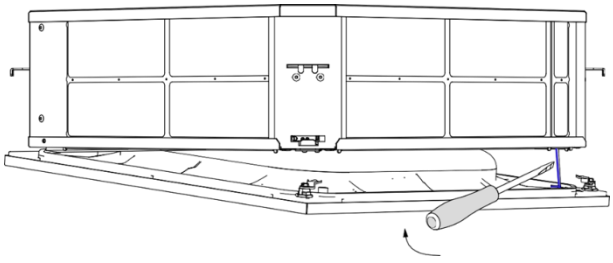
A 4mm Allen key should be offered up to the unit through the 6mm perforated holes in the fascia panel and on to the hex socket on the latch housing.

Turn the first latch mechanism through 90°. Ensure the weight of the assembly is countered before repeating this process on the remaining corner of the unit.



⚠ CAUTION	Ensure the fan has stopped spinning before proceeding.

The safety catch can then be released by moving the catch away from the unit.



10. Pipework connections

10.1 Heat exchanger overview

The AR7542 units incorporate a mono block water to air heat exchanger. The heat exchanger has provision for connection to chilled water (CHW) and low temperature hot water (LTHW) systems.

The AR6021 and AR7521 units incorporate a single water to air heat exchanger. The heat exchanger has provision for connection to chilled water (CHW) or low temperature hot water (LTHW) systems.

The AR6041 and AR7541 units incorporate a single water to air heat exchanger. The heat exchanger has provision for connection to chilled water (CHW) and low temperature hot water (LTHW) systems. Factory fitted change over valves are incorporated to switch from cooling to heating mode.

The AR6042 unit incorporates dual water to air heat exchangers. The heat exchangers have provision for connection to chilled water (CHW) and low temperature hot water (LTHW) systems.

CHW flow and return connections are ½" BSPP.

LTHW flow and return connections are ½" BSPP.

The heat exchangers incorporate a vent at the highest point of the headers. On 42 variants there are 2 air vents, one on the coil header, the other is accessed from the outside as shown below.

10.2 Heat exchanger operating limits

INFORMATION	The following materials must NOT come into contact with the heat exchanger. Acetylene, Ammonia, Ammonium nitrate, Black lacquer-sulphate process, Chromic acid, Ferric chloride, Ferric sulphate, Hydrocyanic-acid, Hydrogen peroxide (over 10%), Hydrogen sulphide, Lime sulphur, Mercury, Mercury salts, Nitric acid, Picric acid, Potassium cyanide, Potassium dichromate, Silver salts, Sodium cyanide, Sodium dichromate, Sodium sulphide, Sodium thiosulfate, Sulphur, Sulphur chloride..

- Water temperature must be kept above freezing point.
- The maximum operating temperature should not exceed 82° C.
- The recommended maximum operating pressure is 10 bar.
- The water quality must be satisfactory. Please see following section Water Quality for more details

10.3 Water quality

Ensure that the system to which any Artus units are fitted, has been pre-cleaned and flushed in accordance to the standards and principles detailed in the BSRIA guide "Pre commission cleaning of pipework systems" (BG29/2021)

The water quality must be maintained to standards as detailed in BSRIA guide "Water treatment for closed water systems" (BG50/2021).

Valves contain several O-Rings, washers and seats made variously of NBR, EPDM, PTFE and Viton, please ensure compatibility of these materials with any water treatments, chemical cleaning agents and other compounds exposed to the media such as pipe sealants. Valves may be damaged by high levels of suspended solids (particularly Iron Oxide and other corrosion products), it is critical that levels of suspended solids in the system are kept to a minimum in line with BSRIA guide BG29/2021.

10.4 Pre system connection checks

For Artus units that do not include isolating/flushing valve sets ensure that an external valve package is fitted which is suitable for achieving a pre-commission clean of the CHW and LTHW systems in accordance with BG29/2021: Pre-Commission Cleaning of Pipework Systems. The external valve package should;

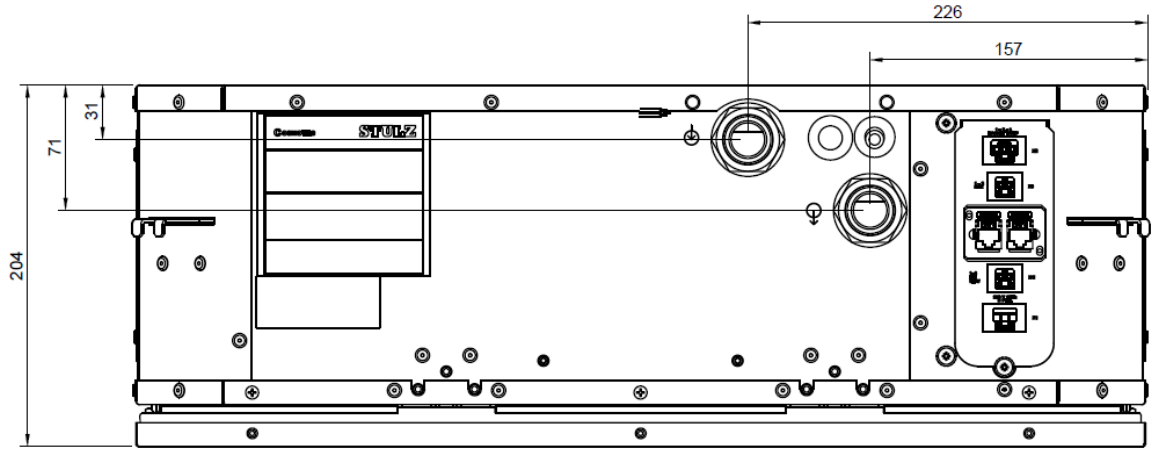
- Have a clear path for flushing the system and Artus unit at the recommended flushing velocity.
- Have flexibility to forward flush the Artus unit.
- Have the capability to isolate the Artus unit.
- Have the flexibility to drain the flow and/or the return of the Artus unit.
- Have the flexibility to fill and vent the Artus unit.

As a final check ensure;

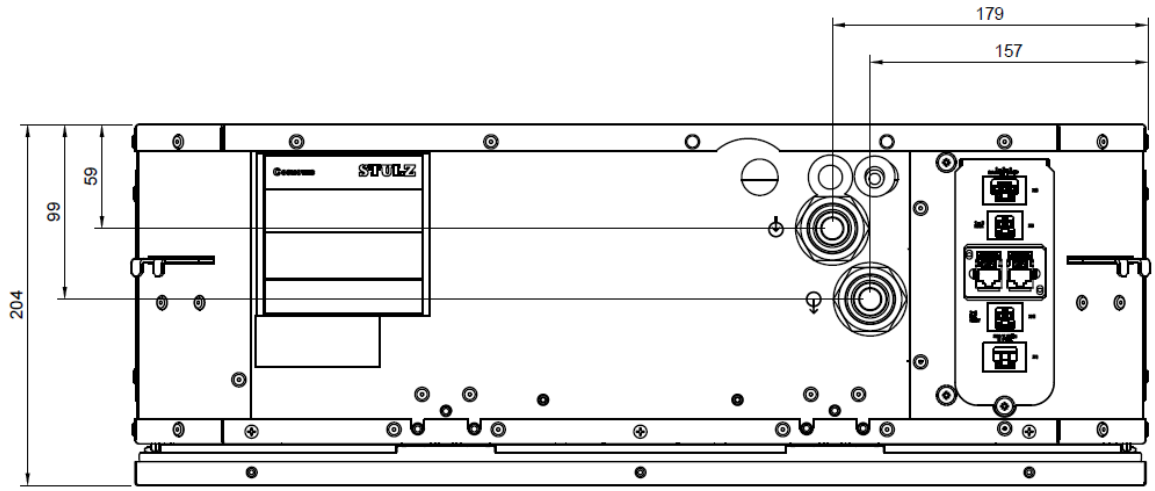
- The valve reference label matches the Artus unit reference.
- All test points and flushing valves are accessible.
- Check all joints for tightness.
- Check system connection is suitable for the means of connection.
- All bypass handles are operable., adjust bypass handles so that it is bypass mode.

10.5 Pipework terminations

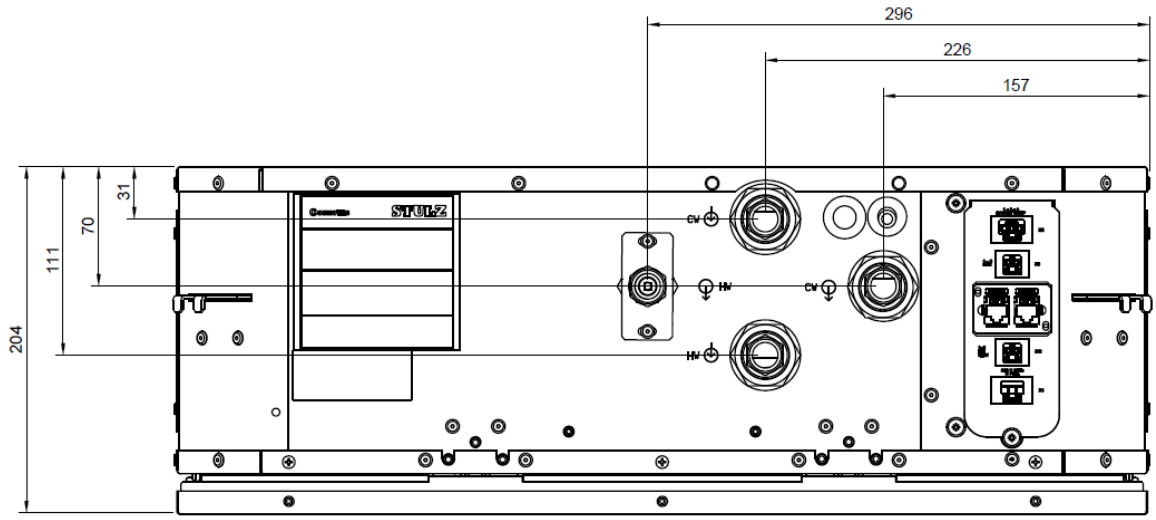
10.5.1 AR6021CG and AR6021HG



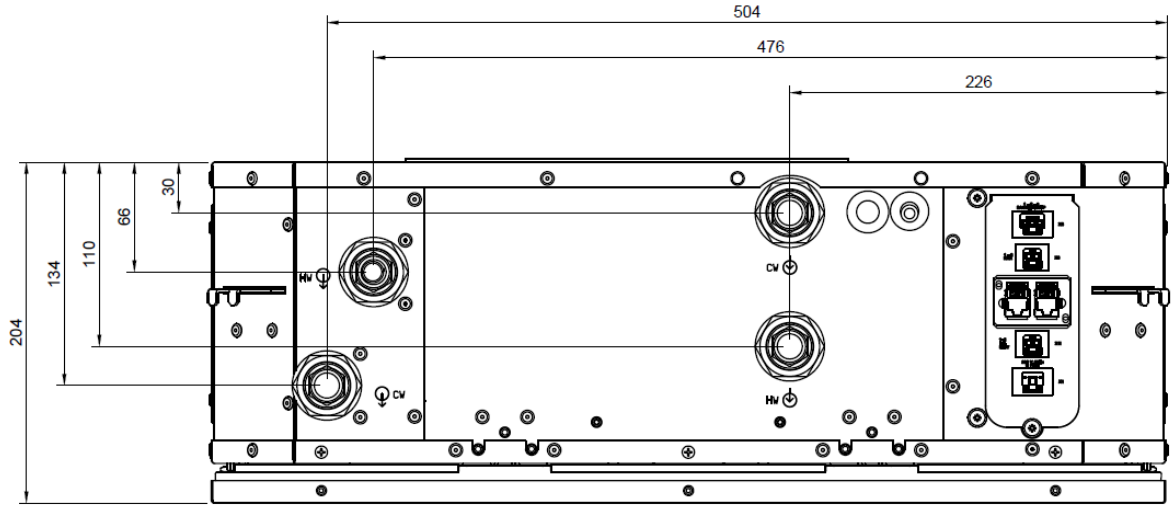
10.5.2 AR6021CG and AR6021HG with flushing bypass



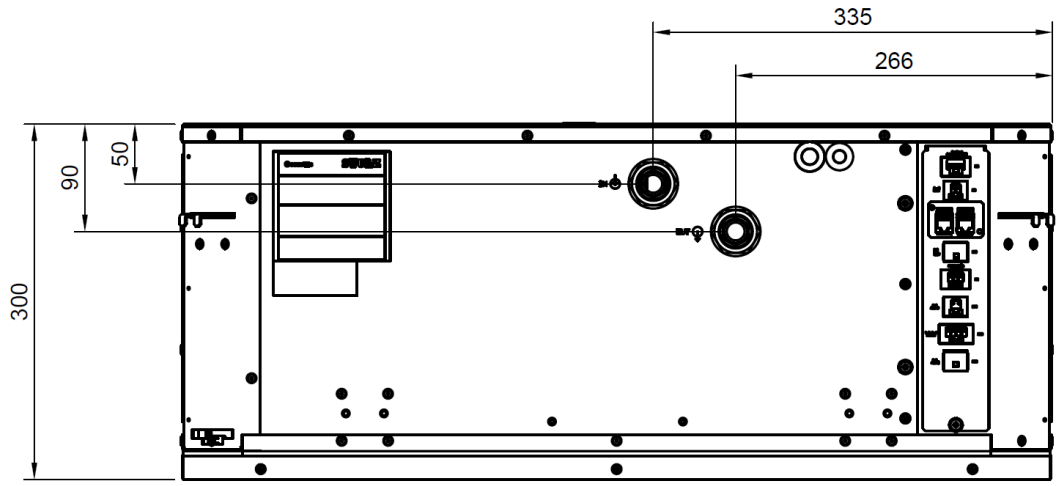
10.5.3 AR6041HC



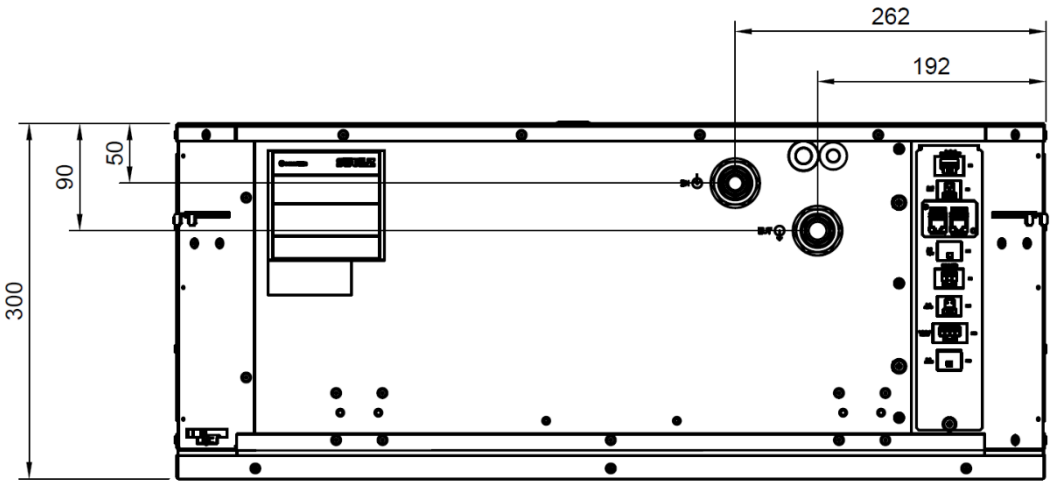
10.5.4 AR6042



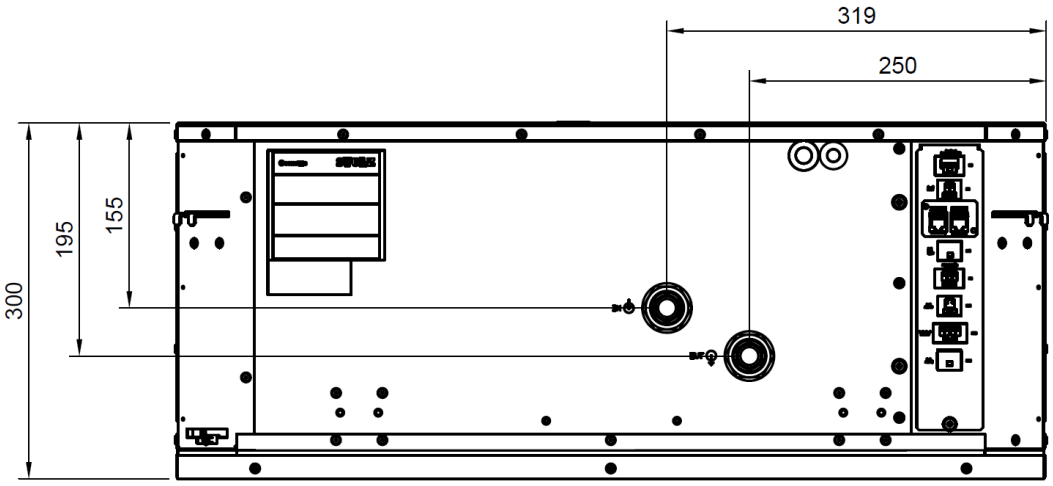
10.5.5 AR7521CG, AR75213C and AR75215C



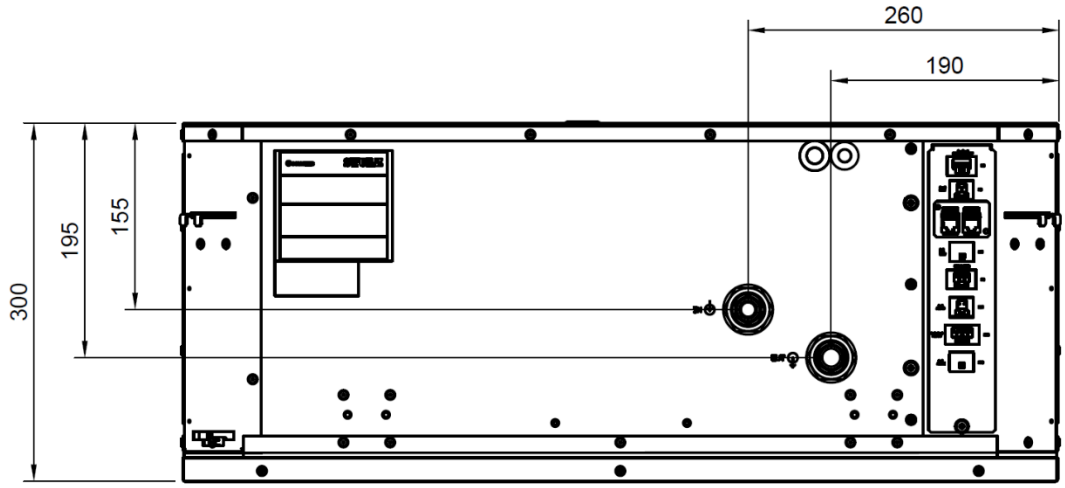
10.5.6 AR7521CG, AR75213C and AR75215C with flushing bypass



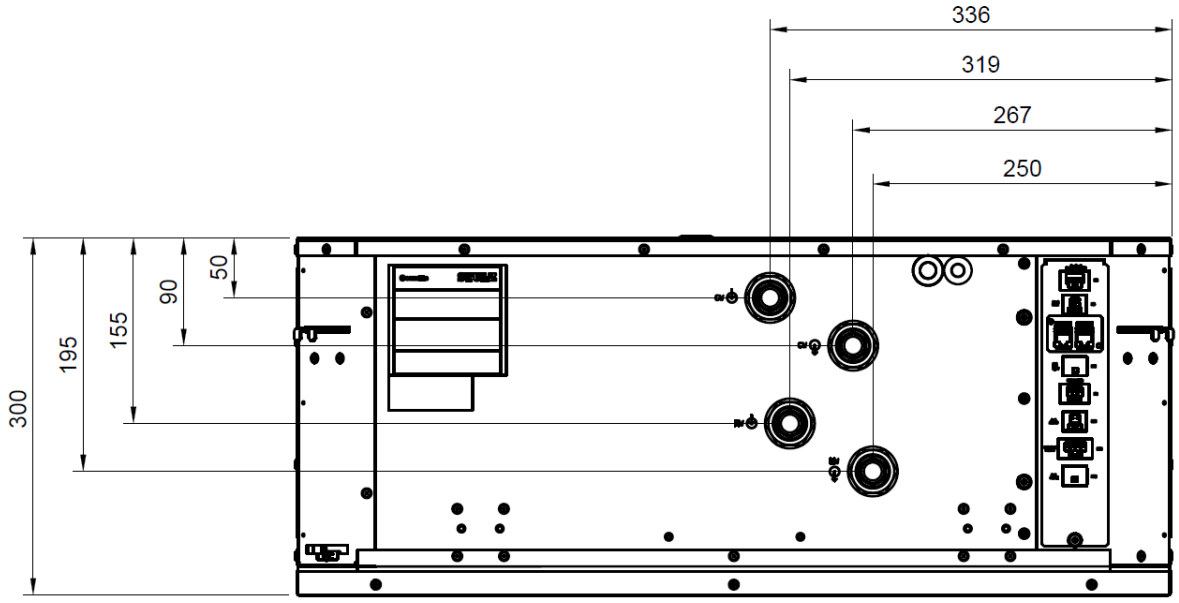
10.5.7 AR7521HG



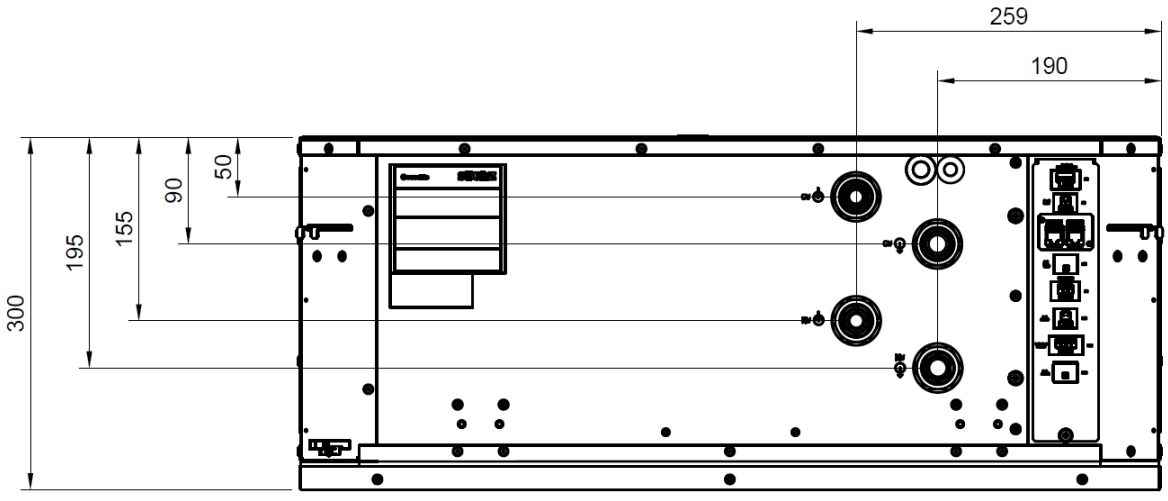
10.5.8 AR7521HG with flushing bypass



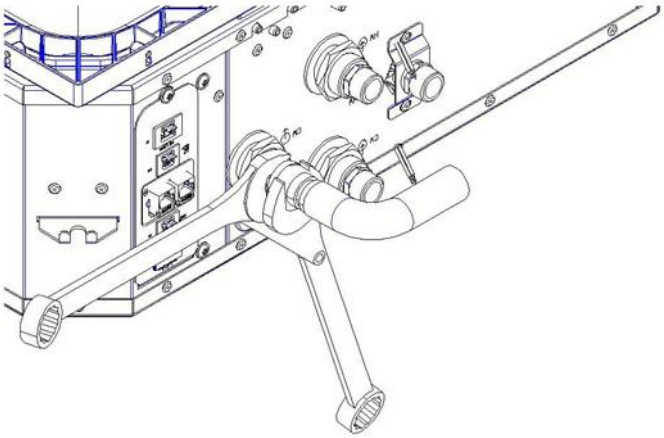
10.5.9 AR7541 and AR7542



10.5.10 AR7541 and AR7542 with flushing bypass



10.6 Final connections



The pipe connections on all Artus units are covered by a plastic plug to prevent contaminants, these should only be removed immediately before making the final connections.

Care must be taken when screwing pipe adaptors to the Artus unit not to over-stress the joints. We would also recommend that a liquid pipe sealant or PTFE tape is used in preference to hemp and other fillers.

Do not use serrated jawed tools to tighten these or any other brass fittings as this will cause damage and void any warranty.

Artus recommends the use of a specialised flare nut spanner or a crows foot spanner.

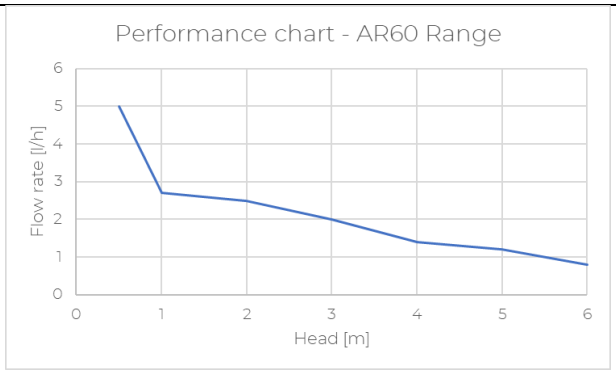
When connecting end fittings to the valve assembly ensure that any torque applied is properly countered so that other connections are not loosened.

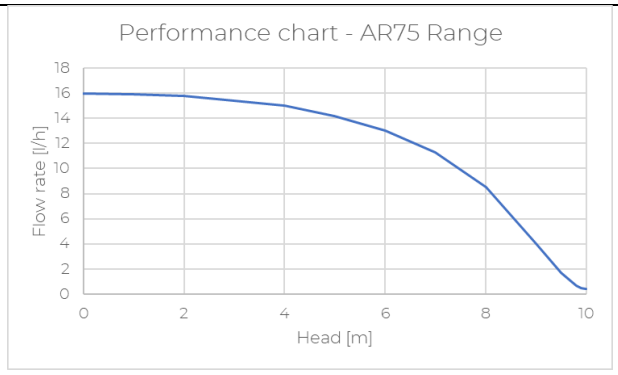
INFORMATION	The maximum torque to be applied when completing external pipework connections is 10Nm.

10.7 Condensate pump

10.7.1 Condensate pump overview

Artus condensate pumps use a rotary diaphragm control technology. The pump is self-priming, and offers advertised flow even in high lift and high head applications.

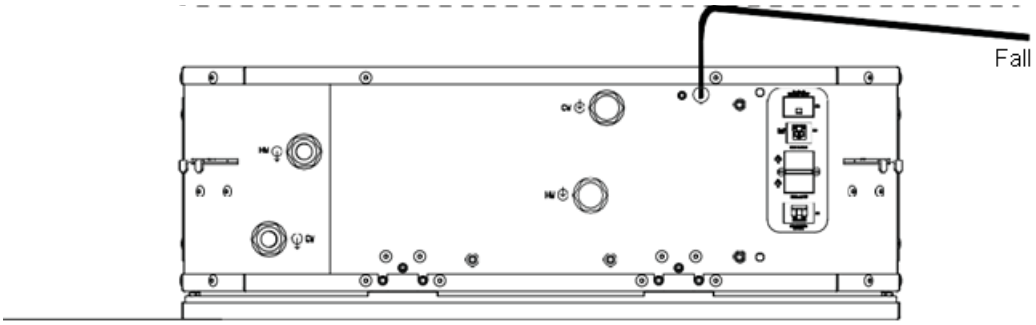




Vertical head [m]	Horizontal run [m]	Vertical head [m]	Horizontal run [m]
5	0	8	0
4	3	7	3
3	6	6	6
2	9	5	9
1	12	4	12
		3	15
		2	18
		1	21

*Performance with 6mm ID hose.

10.7.2 Condensate pipe connection



The condensate pump outlet must be connected to the building drainage system as shown above.

6mm ID braided hose is recommended for the condensate drain hose. Ensure that the hose is not damaged or kinked during installation.

If discharging to a gravity drain system ensure a fall of 1/50 to 1/100. Any fall, provision of air gaps (such as a tundish or water trap) and connection to appropriate drainage should meet the contract specification and any local regulations.

An alternative is to have a fully pumped system, with the drain running flat, providing the pipe sizes and water flows have been properly calculated and designed by a qualified engineer.

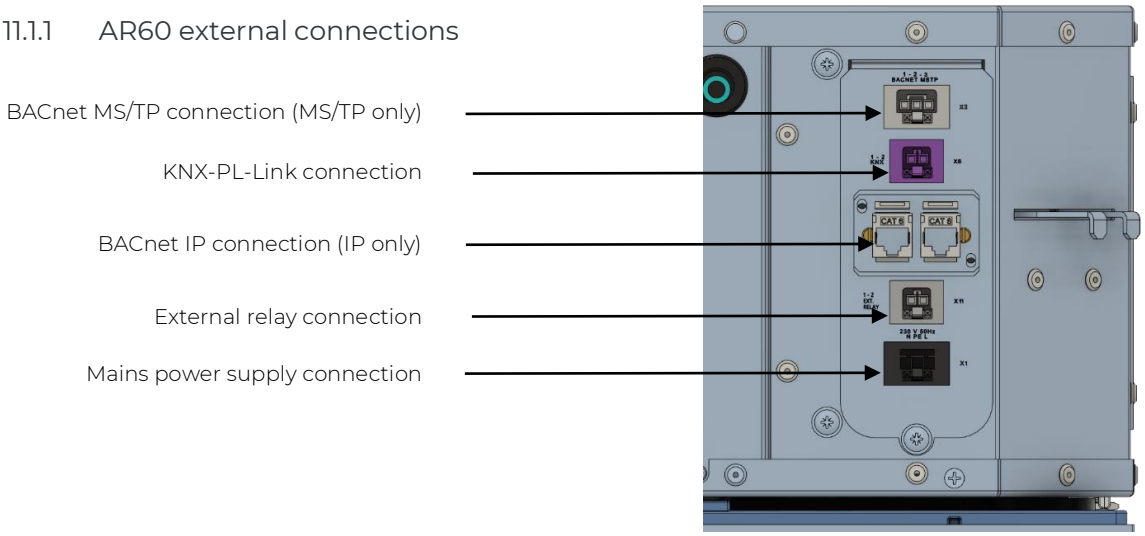
11. Electrical connections

DANGER	The Artus unit carries a dangerous electrical voltage! All external wiring to the Artus unit must be undertaken by suitably qualified personnel. The Artus unit must be isolated from all phases of the mains electrical supply. Isolation must be secured to prevent the Artus unit supply from becoming live An approved voltage indicator is recommended to verify that the Artus unit is dead. Any connections made within the Artus unit should only be carried out when the unit is dead. The Artus unit is suitable for connection to a 230V AC, single phase, 50Hz mains supply.

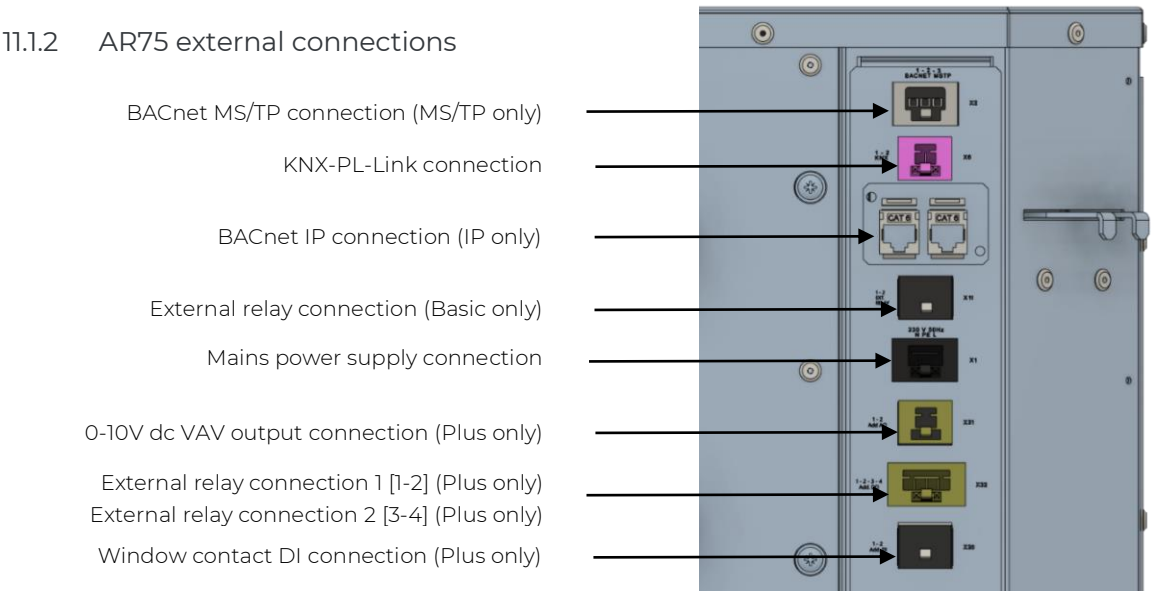
11.1 External connections

The Artus units have been designed for convenience and safety in mind, all necessary connections are located on an external face of the chassis. Plugs are provided within the supply of the unit to allow the connections to be made without accessing the internal control enclosure.

11.1.1 AR60 external connections

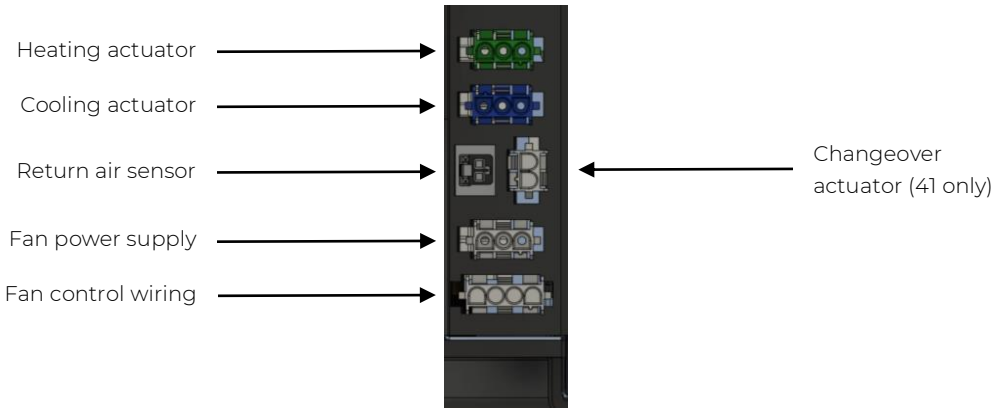


11.1.2 AR75 external connections

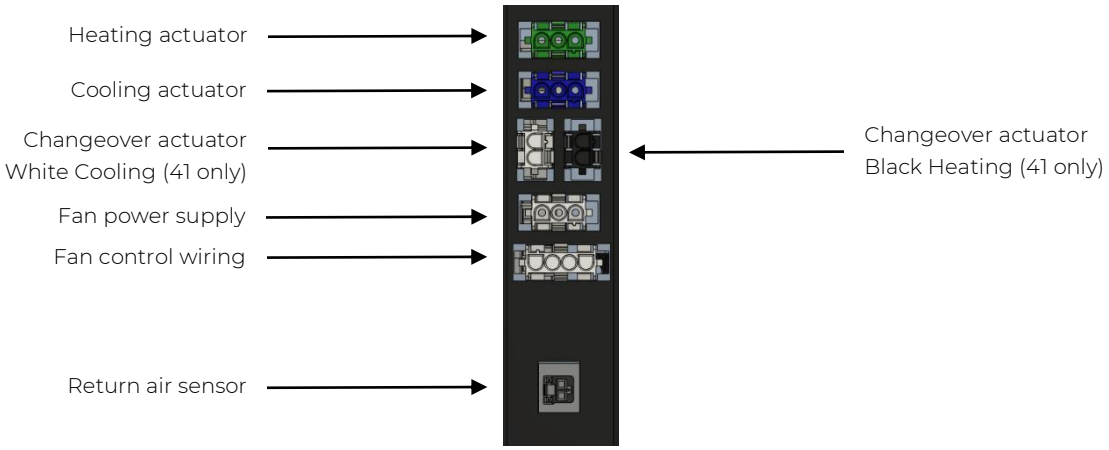


11.2 Internal connections

11.2.1 AR60 external connections

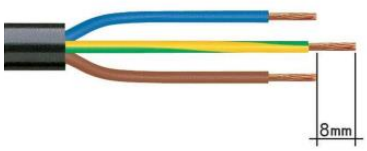


11.2.2 AR75 internal connections

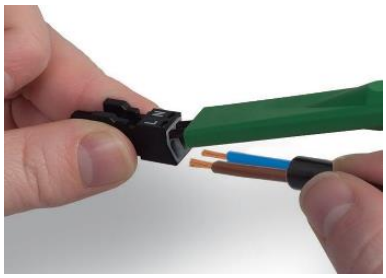


11.3 Wago installation instructions

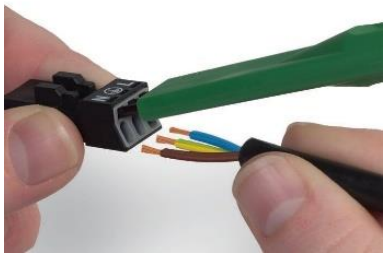
Strip outer insulation 30mm for 2-wire plugs, 37mm for 3-wire plugs, 45mm for 4 and 5 pole. Strip conductor 9mm. Ground conductor should extend 8mm



For 2-wire plugs, to terminate stranded conductors use a 2.5mm wide flat screwdriver or use WAGO operating tool 890-382. Insert conductors until they hit the backstop. Solid conductors can be simply pushed in



For 3-wire plugs, to terminate stranded conductors use a 2.5mm wide flat screwdriver or use WAGO operating tool 890-383. Insert conductors until they hit the backstop. Solid conductors can be simply pushed in



11.3.1 Mains power supply connection

The Artus unit is provided with a 3 pole plug socket connector complete with strain relief to enable the wiring of a suitably rated flexible cord to a double pole fused switched isolator.

The double pole fused switched isolator must be located within 1.5m of the Artus unit and provide a suitable means of locking off to enable safe isolation procedures to be carried out in accordance with the Electricity at Work Regulations.

Any cables used must be suitable for the supply voltage and power rating of the Fan Coil Unit. All connections must comply with local wiring regulations and codes of practice. All wiring must comply with BS7671 IET Wiring Regulations.

The wired connector should be latched into the base of the strain relief housing.

Attach strain relief clamp and push down.

Using a 2.5mm flat screwdriver push down the strain relief clamp, alternate asides to ensure even pressure.

Latch the top of the strain relief housing

Check housing and cable are secure before installation.

⚠ CAUTION	The Artus unit should not be energised until the pre-commission inspection has been completed.

11.3.2 MSTP Connection

The optional MSTP connection is made with a Wago plug and socket, the socket is panel mounted with the plug supplied with the unit.

Plug connections are; Terminal 1 – MSTP Gnd. Terminal 2 – MSTP (-). Terminal 3 – MSTP (+).

11.3.3 KNX PL-Link

The KNX PL-Link connection is made with a Wago plug and socket, the socket is panel mounted with the plug supplied with the unit.

Plug connections are; Terminal 1 – KNX PL-Link (+) -. Terminal 2 – KNX PL-Link (-).

The KNX PL-Link plug should only be connected when the QMX3 room operator unit is fully installed.

11.3.4 External relay connection (AR60 and AR75 Basic)

The external relay connection is made with a Wago plug and socket, the socket is panel mounted with the plug supplied with the unit.

Plug connections are; Terminal 1 – 230V AC Live -. Terminal 2 – 230V AC Neutral.

Connection is suitable for 230V AC/1PH/50Hz, maximum current 1 Amp.

11.3.5 0-10V DC VAV output connection (AR75 Plus)

The 0-10V DC VAV output connection is made with a Wago plug and socket, the socket is panel mounted with the plug supplied with the unit.

Plug connections are; Terminal 1 – 0-10V DC Output -. Terminal 2 – 0V DC Common.

11.3.6 External relays (AR75 Plus)

The external relay connections are made with a Wago plug and socket, the socket is panel mounted with the plug supplied with the unit.

External relay 1 plug connections are; Terminal 1 – Normally open contact. Terminal 2 – Common.

External relay 2 plug connections are; Terminal 3 – Normally open contact. Terminal 4 – Common.

Connection are suitable for 230V AC/1PH/50Hz, maximum current 1 Amp.

11.3.7 Setback digital input connection (AR75 Plus)

The setback digital input connection is made with a Wago plug and socket, the socket is panel mounted with the plug supplied with the unit.

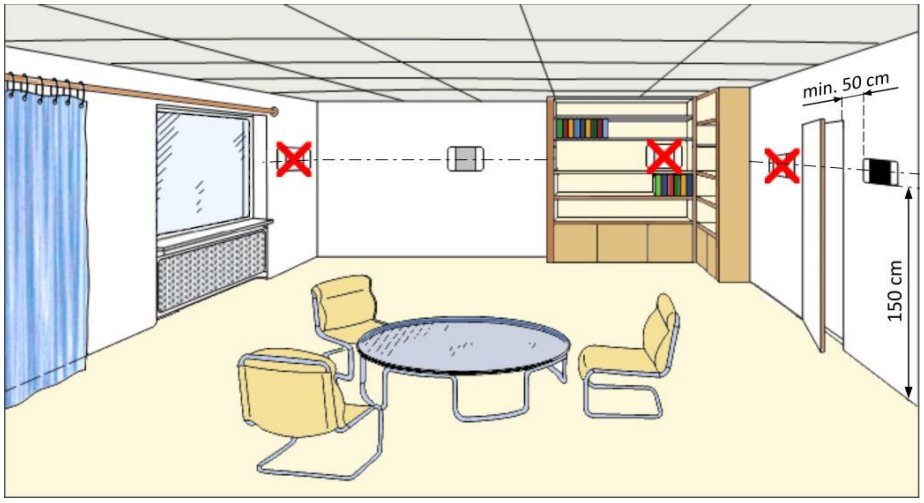
Plug connections are; Terminal 1 – Digital input input -. Terminal 2 – Digital input common.

12. Ancillary Items

12.1 QMX Series wall operator units

The QMX3.P34 and QMX3.P74 room operator units offered by Artus are suitable for wall box or surface mounting. Power and data are supplied via the KNX PL-Link. This manual covers the mechanical installation, for set-up and configuration please refer to the Controls Manual.

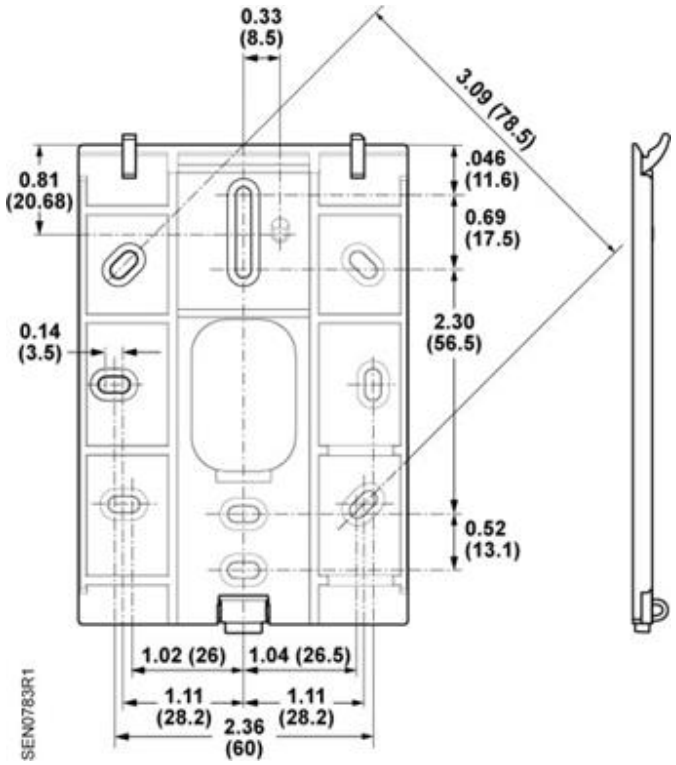
12.1.1 QMX3 installation location



The QMX3 room operator units are suitable for wall mounting. The following points should be observed.

- Recommended height 1.5m above finished floor level.
- Do not mount devices in recesses, shelves, behind curtains or doors, or above or near heat sources.
- Avoid direct solar radiation and drafts.
- Seal the conduit box or the installation tube, as air currents can affect sensor readings.
- Unit to remain within allowed ambient conditions.

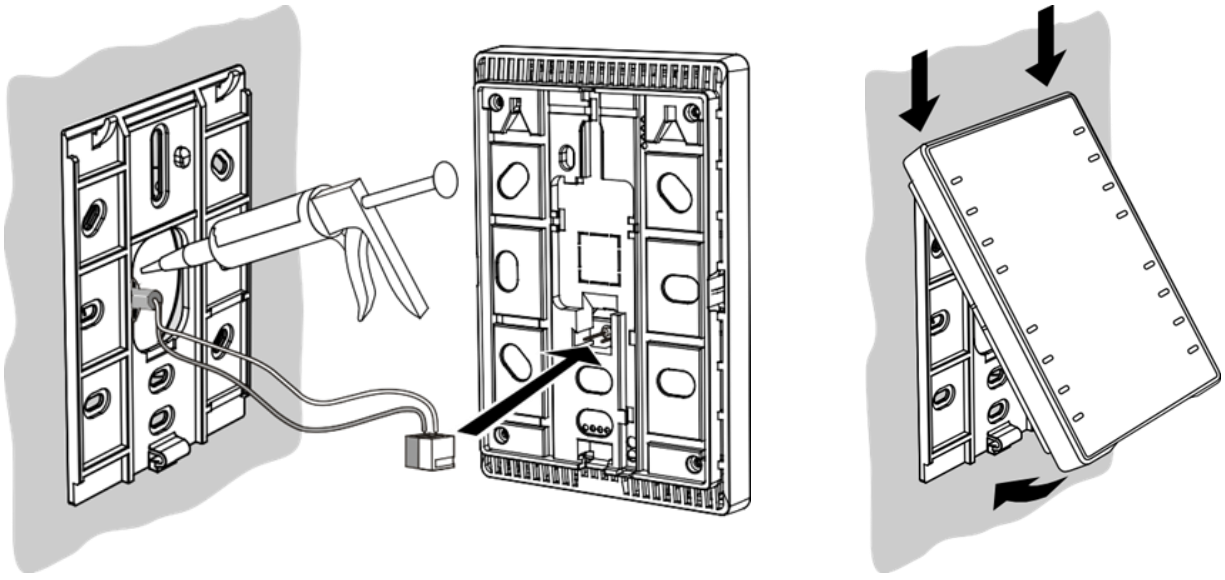
12.1.2 QMX3 mounting plate dimensions.



Mounting plate dimension in Inches(mm)

12.1.3 QMX3 mounting over a wall box.

Ensure pink Wago plug is disconnected from the Artus unit before commencing QMX3 installation. The QMX3 base plate has holes for common boxes. Ensure screw head height does not exceed 3mm.



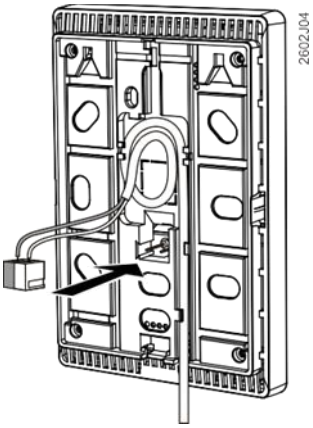
The QMX3 devices incorporate an internal temperature sensor, ensure any openings in the wall box are sealed to prevent false readings.

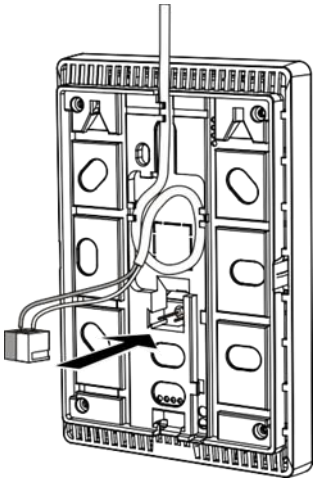
The QMX3 devices are supplied with a KNX plug, connection at the Artus unit is via the pink Wago plug. Ensure correct polarity before connecting to the QMX3.

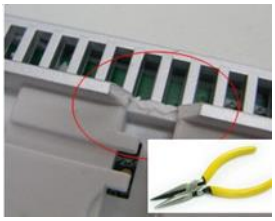
Plug in the KNX plug and hook the QMX3 device over the top of the mounting plate, pushing the device towards the wall will engage the bottom clip. The pink Wago plug can now be connected at the Artus unit.

12.1.4 QMX3 surface mounting with cable conduit.

Remove the breakout on the housing prior to installing cable. When mounting the base plate ensure screw head height does not exceed 3mm.







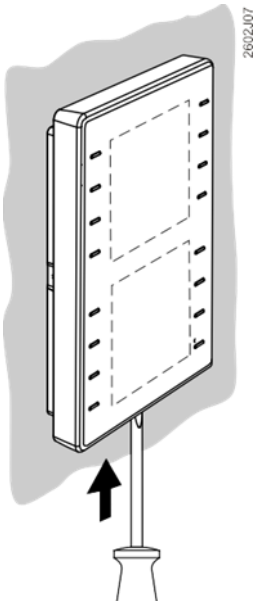
Bottom entry

Top entry

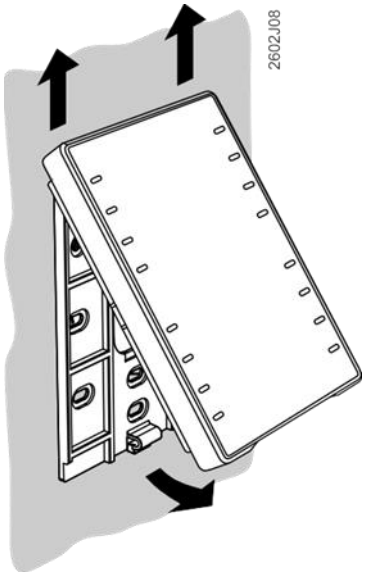
When connecting with cable trunking ensure a 30mm gap for top entry or 20mm for bottom entry to enable the device to be connected/disconnected from the base plate.

12.1.5 Dismounting QMX3 from base plate.

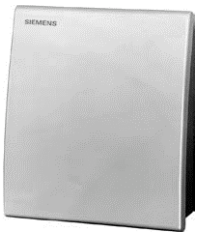
With a flat bladed screwdriver push up on the base plate retaining clip



Pull the base of the QMX3 away from the wall and upwards to remove from the base plate.



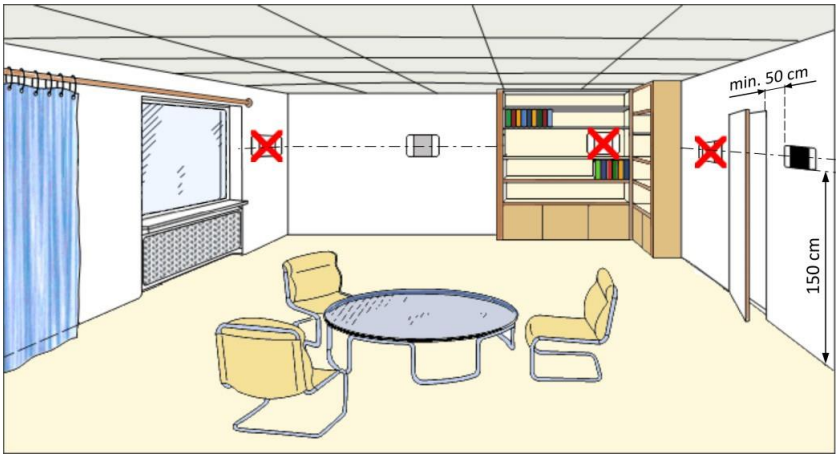
12.2 QAA2030 Passive room sensor



The QAA2030 Passive room temperature sensor has been designed for wall mounting. They are suitable for use with most types of commercially available recessed conduit boxes. The cables can be introduced from the rear (concealed wiring) or from below or above (surface-run wires) through knock-out openings.

The units consist of 2 major sections: Housing and base. Both snap together but can be detached again. The base carries the connection terminals.

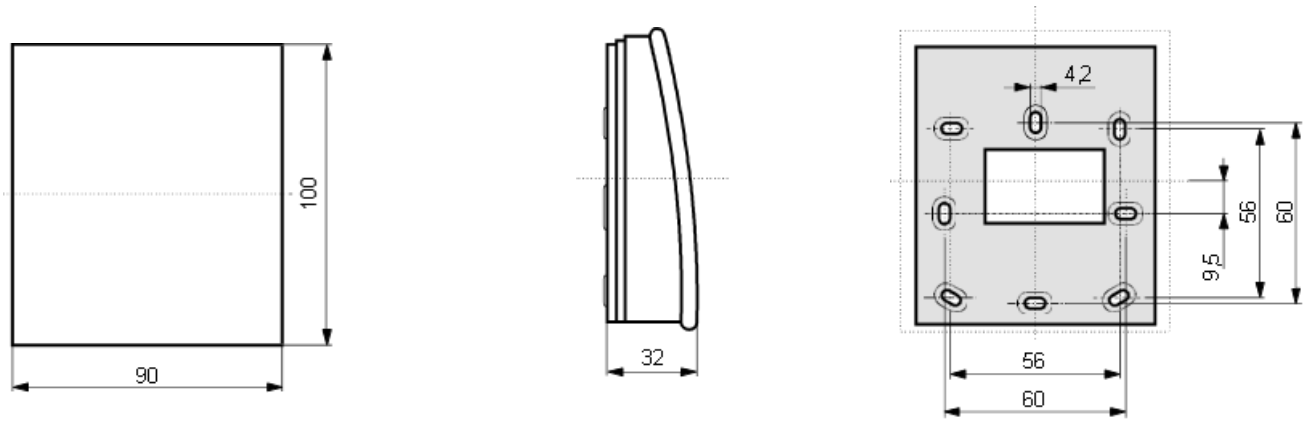
12.2.1 QAA2030 Passive room temperature sensor installation location



The QAA2030 passive room temperature sensor is suitable for wall mounting. The following points should be observed.

- Recommended height 1.5m above finished floor level.
- Do not mount devices in recesses, shelves, behind curtains or doors, or above or near heat sources.
- Avoid direct solar radiation and drafts.
- Seal the conduit box or the installation tube, as air currents can affect sensor readings.
- Unit to remain within allowed ambient conditions.

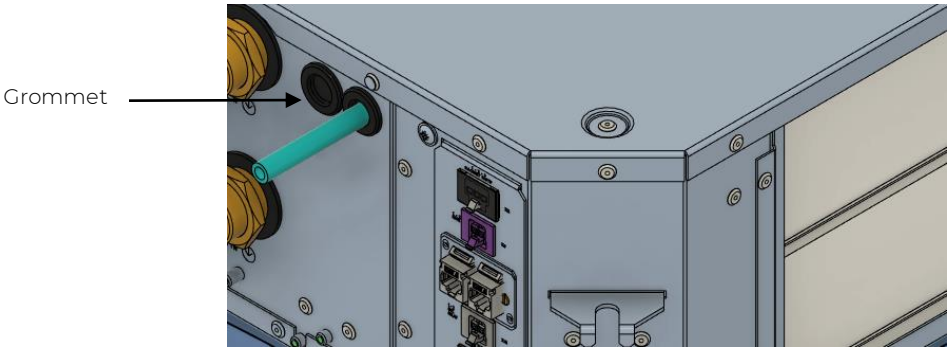
12.2.2 QAA2030 Mounting dimensions



All dimensions in mm

12.2.3 QAA2030 connection details

The QAA203 should be wired back to the Artus unit, a spare cable grommet is conveniently located on the pipe work connection side of the unit.



Return air sensor plug

The QAA2030 connection is made with a Wago plug and socket, the socket is panel mounted internally with the plug supplied with the unit and connected to the factory fitted return air sensor.

The existing return air senor needs to be disconnected from the Wago plug, if retained for future use the sensor cable should be coiled up and secured otherwise it may be removed.

The cable running to the QAA2030 should be connected to the Wago plug, polarity independent. The maximum length of cable allowed is 30m. Connection at the QAA2030 is made at the terminal block on the base unit.

Cable entry way be through the rear of the base if mounted on a conduit box or through the top or bottom knockouts if the cable is surface mounted.

Once the wiring is completed the front cover of the QAA2030 snaps into place, to remove the cover use a flat bladed screwdriver in the top slot of the unit to disengage the snap connector.

13. Commissioning

13.1 Pre-commission inspection

⚠ CAUTION	The Artus unit should not be energised until the pre-commission inspection has been completed.

Pre-commission inspection check list	Yes	No
External		
Artus unit is installed level in all planes, lock nuts secured, 20mm ventilation gap above unit and free from obstruction		
Air filters present and clean, sufficient clearance for air path with no obstructions.		
Heat exchanger clean and free from damage		
Wago plugs secure and cable strain reliefs in place		
Condensate connection secure, drain hose free from kinks		
Pipework connections correct and secure, insulation present and undamaged		
Unit chassis and fascia panel undamaged.		
Supply voltage is 230V ac, 1ph, 50Hz		
Chilled water and/or LTHW system in bypass or isolation mode		
Internal		
Quarter turn latches secure, retaining safety catch operational and undamaged.		
Electrical enclosure lid secure.		
Condensate tray secure and clean		
Heat exchanger clean and free from damage		
Insulation covers present, clean and secure.		
Actuator heads fitted and secure, cables secure and connected.		
Condensate pump hoses secure, vent tube secure and unobstructed.		
Check fan for free rotation, ensure impeller does not rub on inlet ring.		
Unit On/Off switch in “On” position.		

13.2 Initial start up

Only proceed if all pre-commission checks have been completed.

Switch on power supply to unit and wait for controller to complete its start up routine.

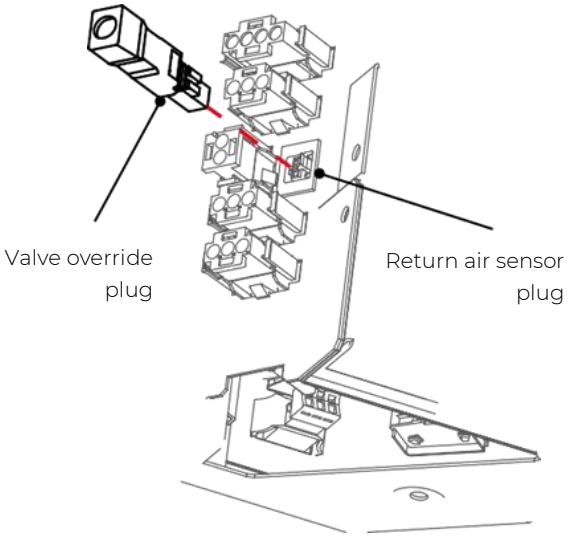
Fan should be operational after 5 minutes.

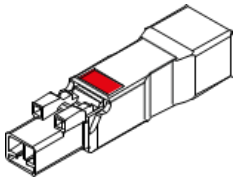
13.3 Waterside commissioning

⚠ CAUTION	Electrical power is needed at the unit to drive the valve gear during waterside commissioning. Electrical installation and commissioning must be fully completed before the waterside installation and commissioning can take place.

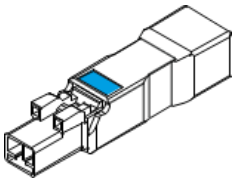
⚠ CAUTION	Artus Air Ltd do not offer any commissioning services for the Artus. Mechanical commissioning, including water side balancing, must be completed by others before Artus Air Ltd or other third party Siemens Solution Partners configure the Artus(s) for master / slave operation, room operator units, BMS integration and so forth..

13.3.1 Temperature Simulation Valve Override Plugs





Red plug – heating mode



Blue plug – cooling mode

The valve override plugs are used to simulate a cooling (blue plug) or heating (red plug) demand. The plug is inserted into the return air sensor socket inside the unit to force it into 100% cooling or heating for commissioning/balancing purposes. Each Artus unit is supplied with plugs for cooling and heating. The Artus unit must be commissioned prior to network setup.

13.3.2 Waterside commissioning steps

The Artus valve override plugs must be used during commissioning to simulate a heating/cooling demand. This is important as the actuators should not be removed during commissioning and must instead be driven to the correct heating or cooling position.

13.3.3 Heating circuit

Ensure there is permanent power to the unit. Insert the red (heating) valve override plug into the sensor/commissioning socket to automatically drive the heating actuator fully open. This will take approximately 6 minutes. Do not attempt to manually open the valve. Always use the electrical connection tool provided when inserting/removing temperature sensors and valve override plugs to reduce the risk of damage to the retaining clip.

Ensure the heating actuator is in full flow mode – LED green steady On

Heating flush and fill with external bypass set.

To perform a forward flush/fill. Set the return leg isolation valve to the closed position. Slowly open the flow leg isolation valve to pressurise the unit. Open the blow down valve to allow a small amount of treated water to be drawn into a bucket, thus ensuring the entire valve set and coil is full of the treated water.

Bleeding air out of the coil - An air bleed is located at the top of the coil. Care must be taken to not spill water on surrounding equipment. The air bleed can be carefully opened by using a 10mm spanner/nut runner or flat bladed screwdriver.

When the coil has been fully vented close the blow down valve and set the return leg isolation valve to the open position.

On Artus units with internal bypass sets proceed as follows;

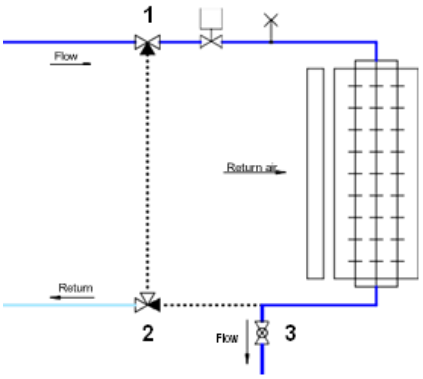
Connect hose to hose drain valve number 3;

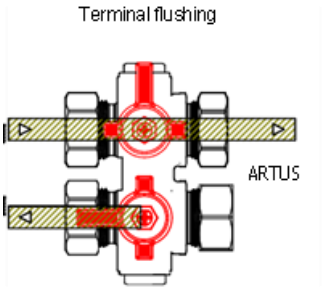
Slowly open three way by-pass valve number 1 to pressurize the terminal unit;

Open hose drain valve number 3 and forward flush to external drain;

Close three way by-pass valve number 1;

Close drain valve number 3 and remove hose





To drain return branch, proceed as follows:

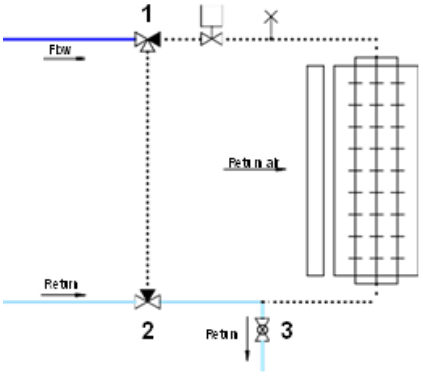
Connect hose to hose drain valve number 3;

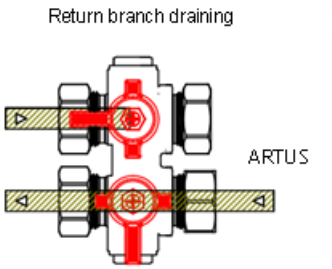
Slowly open three way by-pass valve number 2 to pressurize the terminal unit;

Open hose drain valve number 3 and forward flush to external drain;

Close three way by-pass valve number 2;

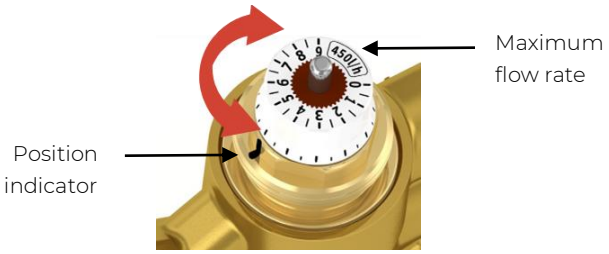
Close drain valve number 3 and remove hose.





To set the desired flow rate it is necessary to remove the actuator from the PIC valve body.

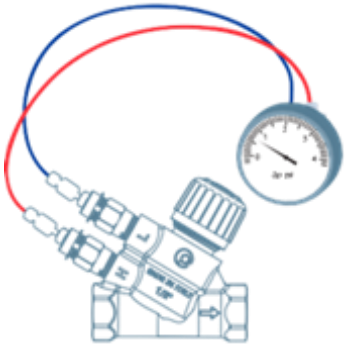
Removing actuator head

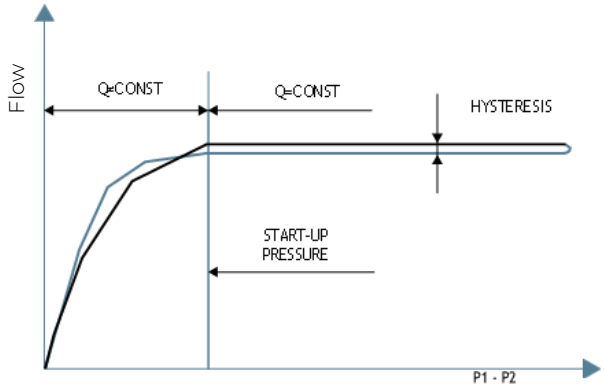


Dial details

To set the selected flow, rotate the dial on the valve to the desired position. Line up the desired preset position to the indicator mark on the valve body. The table indicates the required position for various flow rates for the different cartridges. The cartridges are labelled with the maximum flow rate as shown above.

To ensure that the valve is working in the operating range, the differential pressure across the valve must be measured.

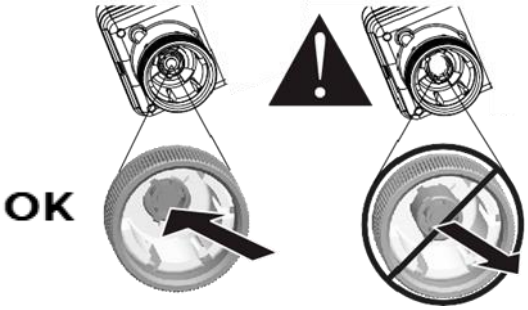




The valve is in the operating range if the value measured P1-P2 (ΔP) is higher than the start-up value shown in the table below. If a flow measuring device is installed this should be used to validate the design flow

	DN15 150 l/h		DN15 450 l/h		DN20 1000 l/h	
	Min. operating pressure	25 kPa	Min. operating pressure	35 kPa	Min. operating pressure	25 kPa
	Flow rate		Flow rate		Flow rate	
Dial position	l/h	l/s	l/h	l/s	l/h	l/s
0	0	0	0	0	0	0
0.5	9	0.002	32	0.009	45	0.013
1	19	0.005	53	0.015	154	0.043
2	40	0.01	94	0.026	278	0.077
3	55	0.015	135	0.038	359	0.100
4	71	0.019	179	0.050	442	0.123
5	85	0.023	219	0.061	564	0.157
6	100	0.027	281	0.078	678	0.188
7	114	0.031	358	0.099	782	0.217
8	134	0.037	408	0.113	897	0.249
9	150	0.042	450	0.125	1000	0.278

The actuator must be re-connected before moving to the next phase.



Ensure actuator spindle is fully retracted before re-fitting

Hand tighten only. Do not over tighten. When mounting the actuator on the valve, only hand tighten the brass threaded coupling. Using a wrench to tighten the coupling will damage the actuator, cause it to fail, and will void the warranty. Position the actuator on the valve before tightening by hand.

13.3.4 Cooling system

Replace the red (heating) valve override plug with the blue (cooling) valve override plug to automatically drive the cooling actuator fully open. This will take approximately 6 minutes. Do not attempt to manually open the valve. Always use the electrical connection tool provided when inserting/removing temperature sensors and valve override plugs to reduce the risk of damage to the retaining clip.

Ensure that the cooling actuator is in full flow mode – LED green steady On

Cooling flush and fill with external bypass set

To perform a forward flush/fill. Set the return leg isolation valve to the closed position. Slowly open the flow leg isolation valve to pressurise the unit. Open the blow down valve to allow a small amount of treated water to be drawn into a bucket, thus ensuring the entire valve set and coil is full of the treated water.

Bleeding air out of the coil - An air bleed is located at the top of the coil. Care must be taken to not spill water on surrounding equipment. The air bleed can be carefully opened by using a 10mm spanner/nut runner or flat bladed screwdriver.

When the coil has been fully vented close the blow down valve and set the return leg isolation valve to the open position.

On Artus units with internal bypass sets proceed as follows;

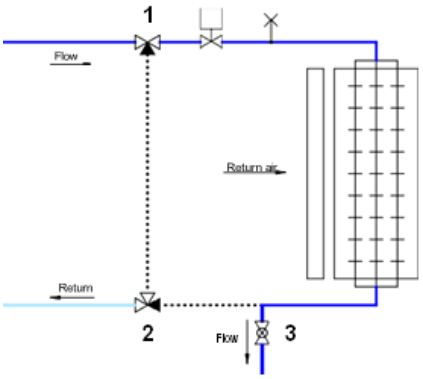
Connect hose to hose drain valve number 3;

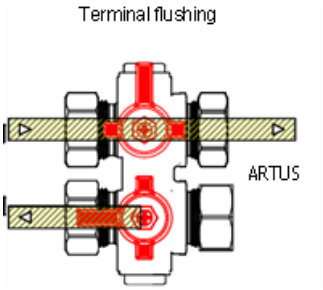
Slowly open three way by-pass valve number 1 to pressurize the terminal unit;

Open hose drain valve number 3 and forward flush to external drain;

Close three way by-pass valve number 1;

Close drain valve number 3 and remove hose





To drain return branch, proceed as follows:

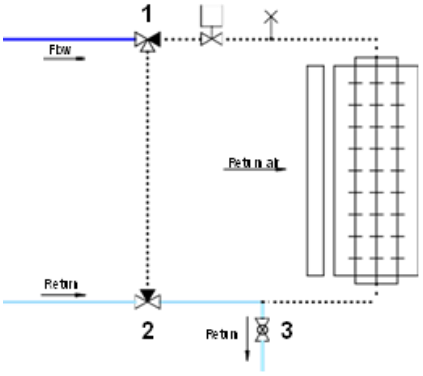
Connect hose to hose drain valve number 3;

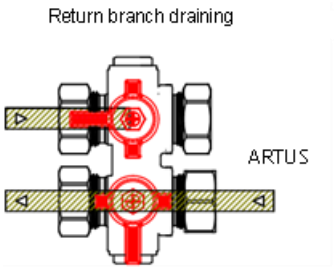
Slowly open three way by-pass valve number 2 to pressurize the terminal unit;

Open hose drain valve number 3 and forward flush to external drain;

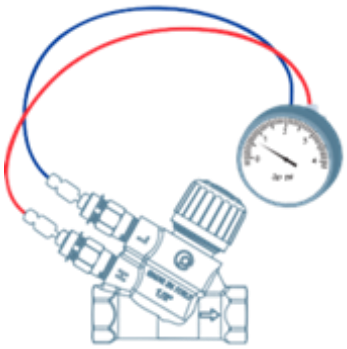
Close three way by-pass valve number 2;

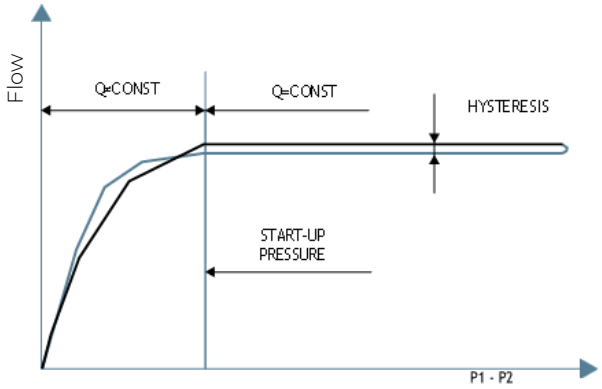
Close drain valve number 3 and remove hose.





To ensure that the valve is working in the operating range, the differential pressure across the valve must be measured.





The valve is in the operating range if the value measured P1-P2 (ΔP) is higher than the start-up value shown in the table below. If a flow measuring device is installed this should be used to validate the design flow

	DN15 150 l/h		DN15 450 l/h		DN20 1000 l/h	
	Min. operating pressure	25 kPa	Min. operating pressure	35 kPa	Min. operating pressure	25 kPa
	Flow rate		Flow rate		Flow rate	
Dial position	l/h	l/s	l/h	l/s	l/h	l/s
0	0	0	0	0	0	0
0.5	9	0.002	32	0.009	45	0.013
1	19	0.005	53	0.015	154	0.043
2	40	0.01	94	0.026	278	0.077
3	55	0.015	135	0.038	359	0.100
4	71	0.019	179	0.050	442	0.123
5	85	0.023	219	0.061	564	0.157
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7	114	0.031	358	0.099	782	0.217
8	134	0.037	408	0.113	897	0.249
9	150	0.042	450	0.125	1000	0.278

13.3.5 Fitting insulation jacket

To fit the insulation jacket all actuator heads need to be removed, it is imperative that no water can flow through the Artus unit during this procedure so both the chilled water and LTHW systems need to be set to bypass mode.

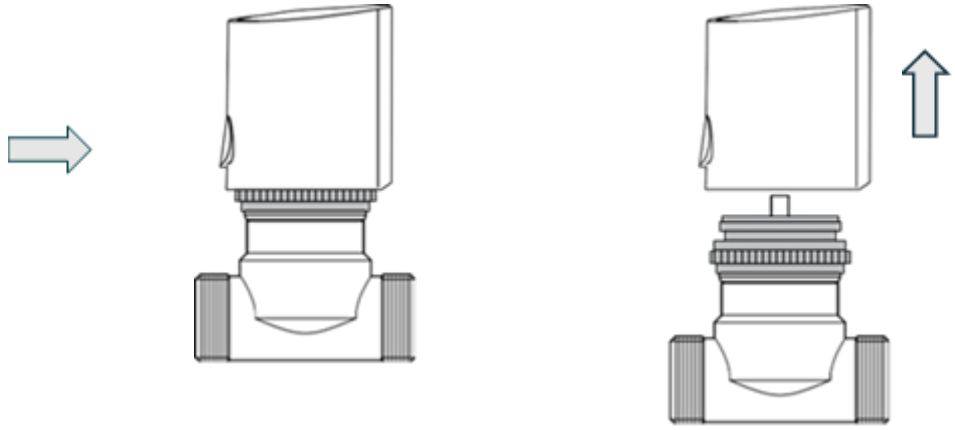
Disconnect the cooling actuator from the internal electrical socket to prevent the spindle from moving.

Replace the blue (cooling) valve override plug with the red (heating) valve override plug to automatically drive the heating actuator fully open. This will take approximately 6 minutes. Do not attempt to manually open the valve. Always use the electrical connection tool provided when inserting/removing temperature sensors and valve override plugs to reduce the risk of damage to the retaining clip.

Ensure the heating actuator is in full flow mode – LED green steady On

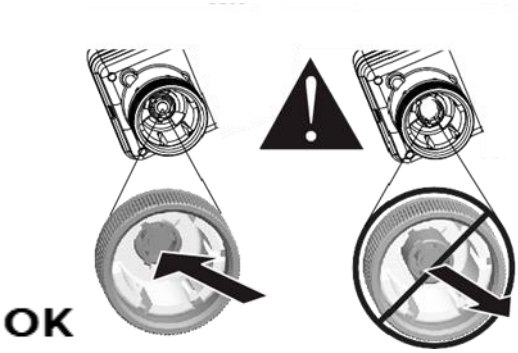
Disconnect the heating actuator from the internal electrical socket to prevent the spindle from moving.

Disconnect the changeover actuator(s) from the changeover valves if fitted.



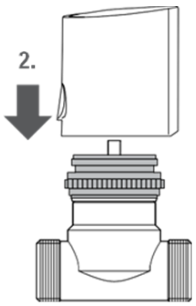
Fit the insulation jacket, ensuring the Velcro is firmly attached.

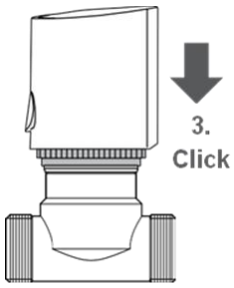
The actuator(s) must be re-connected to the valve bodies before re-connecting the electrical sockets.



Ensure actuator spindle is fully retracted before re-fitting

Hand tighten only. Do not over tighten. When mounting the actuator on the valve, only hand tighten the brass threaded coupling. Using a wrench to tighten the coupling will damage the actuator, cause it to fail, and will void the warranty. Position the actuator on the valve before tightening by hand.





Replace the red (heating) valve override plug with return air sensor plug to return the unit to automatic control. This will take approximately 6 minutes. Always use the electrical connection tool provided when inserting/removing temperature sensors and valve override plugs to reduce the risk of damage to the retaining clip.

Both the chilled water and LTHW systems can now be set to normal operation mode.

13.4 Airside commissioning

Artus is a packaged unit with all relevant components provided and set up to work with each other ahead of delivery to site. The packaged unit has been independently tested in laboratory conditions to establish the air volume flow rates for the controller supply voltage range (1.5-10V).

	Air volume flow rate [$l.s^{-1}$]		
Control signal [V DC]	AR6021, AR6041 v3	AR6042 v3	AR75
1.5	34	31	75
2.0	48	45	109
3.0	79	74	179
4.0	107	105	245
5.0	136	134	304
6.0	169	163	368
8.0	234	229	486
10.0	296	294	576

Due to the nature of the air flow pattern generated by the unit with a circular motion and the low flow rates the use of a traditional balometer capture hood is unlikely to provide accurate measurement of air flow and is not recommended.

As such air side balancing/measurement of the unit is not required on site.

Should the unit be installed in a bespoke arrangement where the air flow is restricted or modified in any way Artus recommends undertaking a laboratory condition test to calibrate the performance.

13.5 Post commission checks

After 2 weeks of running it is advisable to check the following;

- Air filter condition
- Pipe-work connections for signs of leaks.
- Condensate drain tray, pump and filter for signs of leaks.

14. Maintenance

14.1 General notes

The design of the system allows servicing to be carried out readily and easily. Lowering the fascia enables access and allows inspection/replacement of certain parts.

 DANGER	The Artus unit carries a dangerous electrical voltage! All maintenance tasks conducted on the Artus unit must be undertaken by suitably qualified personnel. The Artus unit must be isolated from all phases of the mains electrical supply. Isolation must be secured to prevent the Artus unit supply from becoming live An approved voltage indicator is recommended to verify that the Artus unit is dead. Any tasks undertaken within the Artus unit should only be carried out when the unit is dead. The Artus unit is suitable for connection to a 230V AC, single phase, 50Hz mains supply.

14.2 Maintenance schedule

	Every 3 months	Every 6 months	Every 12 months
Check/Clean Filters	■		
Fan impeller		●	
Water control valves		●	
Condensate drain tray and pump		●	
Electrical connections		●	
Controls			●
Casing/fascia			●
Coil			●

It may be necessary to cover any office equipment situated below the unit being serviced. Seek permission before switching off any equipment that needs to be covered. Take care not to damage, stain or mark ceiling tiles. Clean gloves are beneficial. The unit should be serviced in accordance with the HVCA's Standard Maintenance Specification for Mechanical Services in Buildings (87). In very dusty environments or where contaminants are present more frequent servicing may be necessary. After removing access panels, the condition of fans, motors and coils should be checked and, if necessary, these components should be cleaned, particularly if filters have previously failed through lack of service or maintenance.

Three monthly checks.

The Filters are fitted primarily to stop the build-up of dirt and dust on fans, motors and coils that could be difficult to clean. Dirty components would have a significant effect on the performance and life of the unit. The unit must not be operated without filters. The filters require cleaning by vacuuming on both faces. If necessary, they should be cleaned by gentle cleaning with a brush. If this cleaning is insufficient, or if the filter has been damaged, they should be replaced. The service interval referred to above is for average air conditions. In a dirty environment, filters will need more frequent cleaning or replacement.

Personal protective equipment (PPE), cordoned-off areas, vacuuming regimes and sealed refuse sacks to remove and contain dust and particles that could become airborne may be required. Because of the potential hazard, dirty filters need to be disposed of in an environmentally friendly manner in accordance with national and local regulations.

Contractors carrying out this work should ideally be registered under BS EN ISO 14001: Environmental Management Systems (19).

Six monthly checks

Fan impeller.

Once the hinged fan assembly is lowered down it should be carefully cleaned by brushing and vacuuming. The fan can be spun by hand to check if the impeller is in balance and is not rubbing or touching the fan housing. If an impeller is tight to turn or stops spinning much sooner than other identical fans there may be a problem with the motor/fan bearings.

Water control valves

Water control valves and valve actuators should be inspected for damage and signs of wear.

Check for leakage of water from valves and fittings.

Condensate drain tray and pump

The condensate drain tray should be periodically flushed with clean water. To prevent potential issues caused by legionella bacteria the condensate drain tray should be cleaned with appropriate biocide.

Electrical Connections

Electrical wiring should be inspected for damage including evidence of burning or overheating. Electrical connections should be examined for tightness and re-terminated if necessary.

12 Monthly Checks

Controls

The controls need to be checked for correct functionality including operation of the deadband between heating and cooling modes.

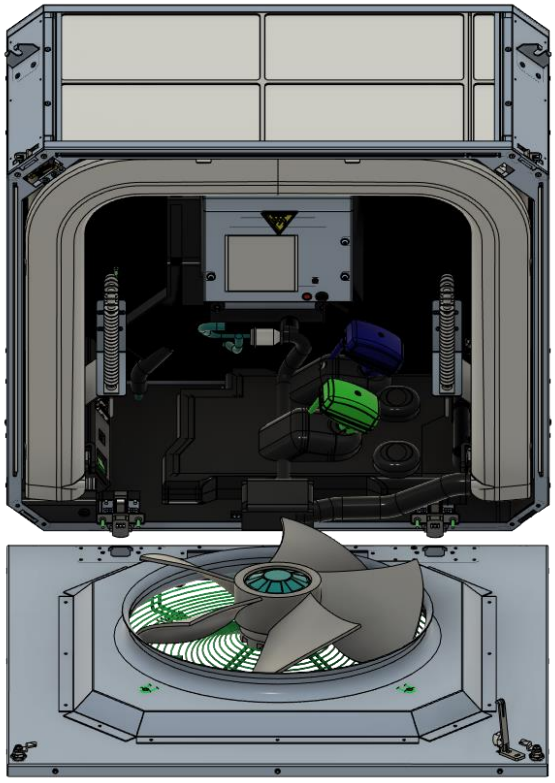
Chassis and fascia

The Artus chassis should be inspected for damage and repaired if necessary. Exposed decorative fascias should be cleaned using warm water and a mild detergent. Abrasive cleaning materials should not be used. Ensure that all fixed panels, access panels, grilles and covers are secure, and fixings and fasteners are tight to protect against electrical and mechanical hazards. Ensure cables do not get trapped during any installation or maintenance work.

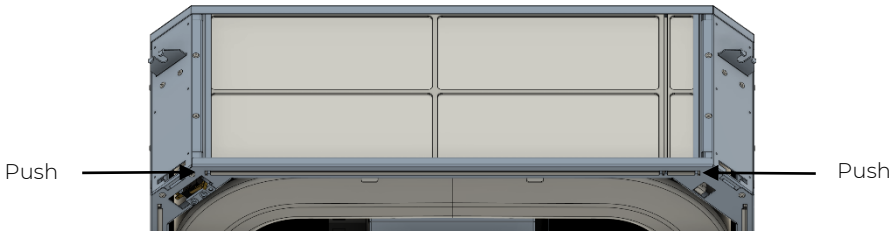
Coil

Coil surfaces should be cleaned using a vacuum cleaner, drawing air through the heat exchanger in the opposite direction to the normal air flow. Adjacent ceiling tiles may require moving for access. Coil faces, fins, pipe headers, return bends and sheet metal end plates should be inspected for any damage, corrosion or leaks. These should be repaired as necessary. The coil block should be vented to remove any air and damaged areas of fins should be combed out straight.

14.3 Filter removal



Open unit, see section 9 for details

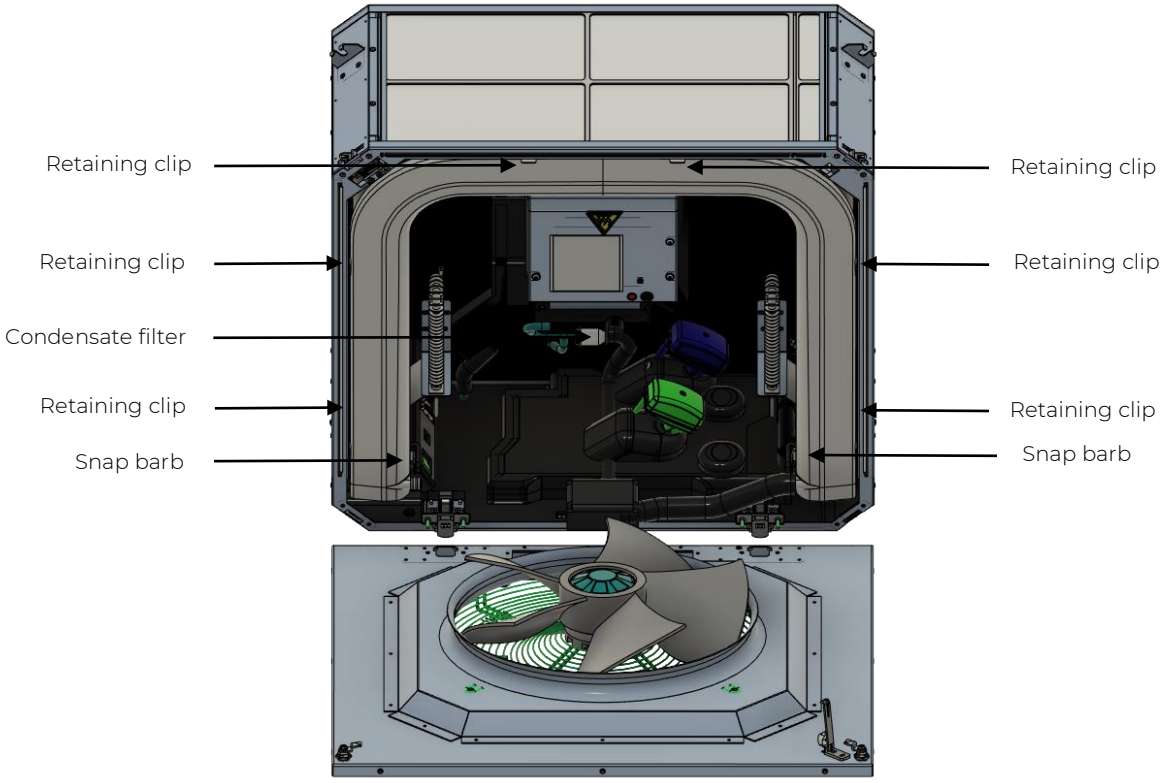


Push barbs towards the centre of the filter to release.

Drop filters from the base of the unit. Each Artus unit has three filters, one large and two small.

To re-fit filter locate in slot and channels, push filter up until barbs snap into place.

14.4 Condensate tray removal

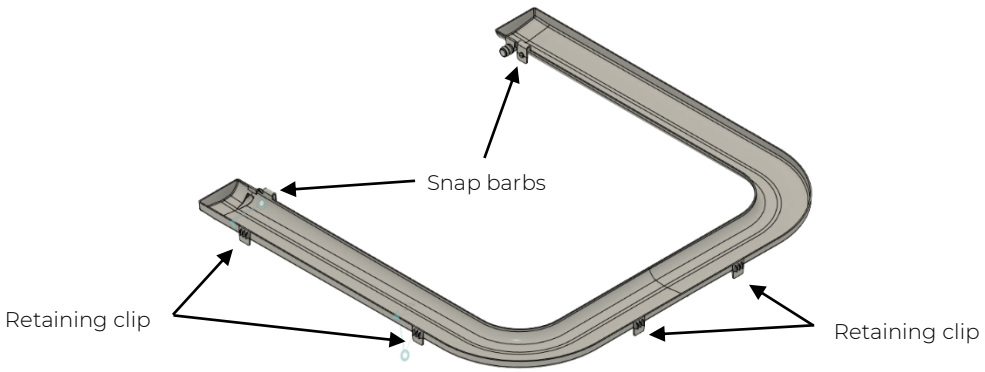


Remove push fit hose from condensate tray tails either side prior to removing tray. The hose is retained by a spring clip which needs to be released. (be aware the tray could contain condensate).

Disengage snap barbs at either end of condensate tray to remove from coil end plates.

Manipulate the condensate tray from the retaining clips to drop the tray out from the unit / ceiling void.

Clean thoroughly with mild soapy water, refit and ensure hoses are fitted to either side of the condensate tray securely on the tails. If chemical cleaners are used, ensure that both the coil and drain tray are flushed with clean water before re-connecting the drain connection. Chemicals such as acetone or bleach should not be used.

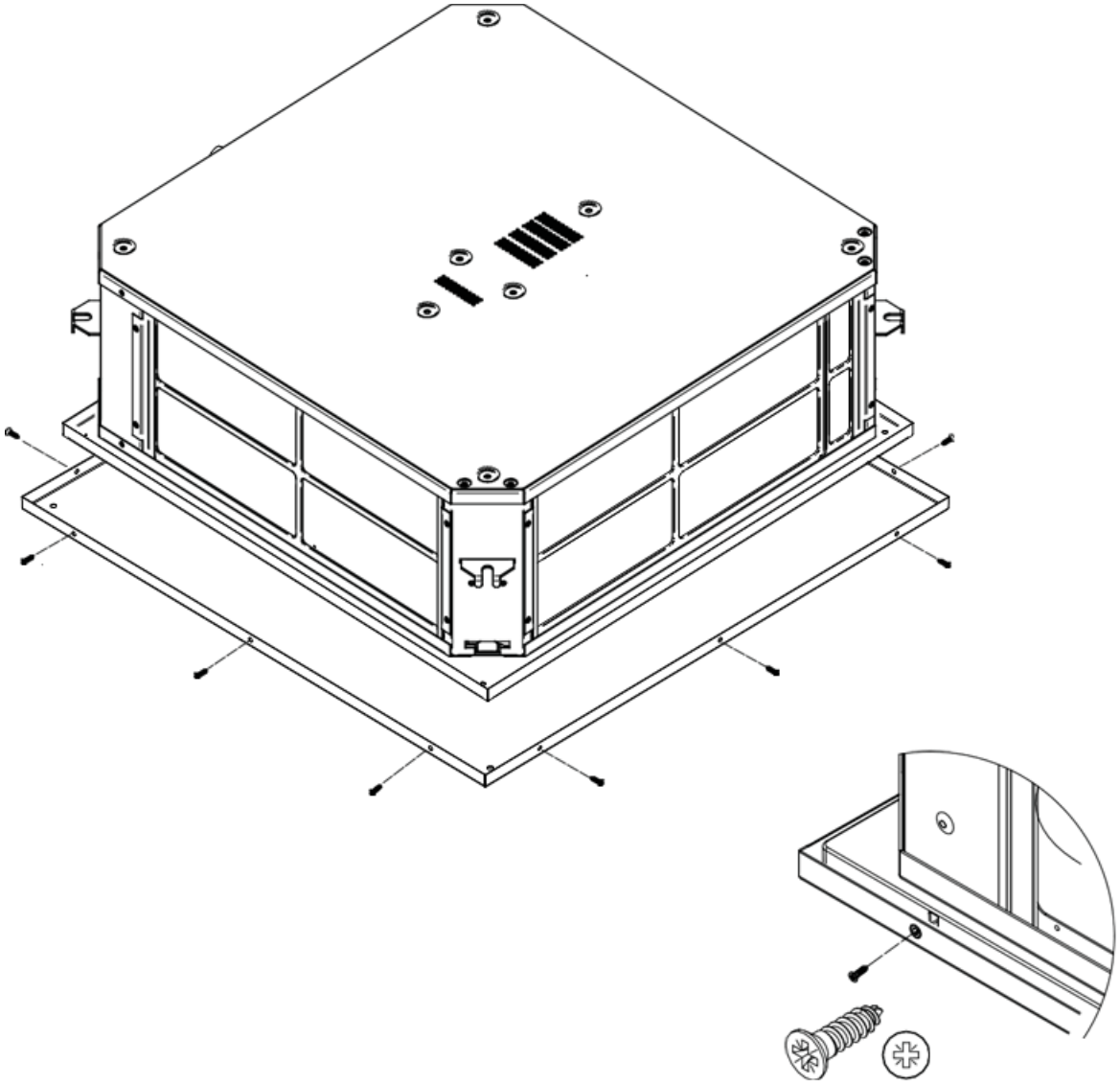


The condensate drainage system should be flushed clean of dirt and debris and condensate pumps cleaned and inspected. When cleaning the coil and/or the condensate tray, remove the condensate drain connection to prevent debris from entering the condensate pump. We recommend dilute soapy water (washing up liquid). Ensure the condensate pump filter is clean.

14.5 Fascia removal

The fascia can be removed via the self-tapping screws if required.

12 off 3.5mmx12.5mm countersunk pozi drive 1 self-tapping screws.



⚠ CAUTION	Use hand tools for fixings. PZ1 screwdriver. Do not over tighten or damage the fixing heads.

15. Troubleshooting

15.1 Alarm conditions

Fault	Cause	Status	Remedial action
Control panel LED illuminated. Alarms communicated to BMS	Temperature discrepancy	Non critical	General waterside/airside fault check chilled water and/or LTHW system is operational. Check fan is running.
	Condensate high level alarm	Critical 1	Clear drain, check condensate pump
	Return air sensor alarm	Critical 2	Check/replace sensor
	Supply air sensor alarm	Non critical	Check/replace sensor
	Room operator unit error	Non critical	Check/replace

Temperature discrepancy occurs when there is no temperature difference between the return air and supply air sensors when there is a demand for cooling or heating.

15.2 Alarm actions

Alarm	Reset	Fan operation	Control valve position	Changeover valve position
Non critical	Auto	Yes	Open	Open
Critical 1	Auto	Yes	Close	Close
Critical 2	Auto	No	Close	Close

15.3 Fault finding

Fault	Possible cause	Remedial action
Unit will not start	No power	Check On/Off switch is in the On position
		Check fuse (F1)
		Check mains power is available at fused spur
	Controller failure	No lights on controller when power is applied, then the microprocessor is faulty and requires replacing/investigation.
	Incorrect wiring	Check wire connections in accordance with the wiring diagram on inside of the control box lid.
	Loose connection	Check all wires, connections, terminals etc
Fan will not run	Fan microswitch open	Check quarter turn latches are fully engaged.
	Loose connection	Check all wires, connections, terminals etc
	Faulty motor.	Check fan motor, replace if faulty.
	Controller fault.	If fans can be operated by bypassing the control signal, then the microprocessor is faulty and requires replacing/investigation.
Excessive Noise	Incorrect fan speed setting	Check BMS points to ensure correct settings
	Obstacle caught in fans.	Remove any obstacle from fan.
	Worn fan motor.	Replace fan motor.

Fault	Possible cause	Remedial action
No Cooling	Incorrect MODE setting.	Check BMS point, the present operating mode should be set to Comfort
	Set point too high.	Check the set point and adjust if necessary.
	Blocked or dirty filter.	Remove filter and clean or replace.
	High level condensate alarm.	Drain the condensate tray and investigate the cause of the alarm.
	Actuator fault	Check actuator is correctly fitted to valve body. Check cooling signal is present from controller. Check valve actuator by manually opening the valve. Replace actuator if necessary.
	Sensor failure	If any of the sensors are faulty the controller will prevent operation (refer to Alarms:).
No Heating	Incorrect MODE setting.	Check BMS point, the present operating mode should be set to Comfort
	Set point too low.	Check the set point and adjust if necessary.
	Blocked or dirty filter.	Remove filter and clean or replace.
	Actuator fault	Check actuator is correctly fitted to valve body. Check heating signal is present from controller. Check valve actuator by manually opening the valve. Replace actuator if necessary.

16. Materials and end of life disposal

16.1 AR60 range

Component	Material	Disposal method	Weight [kg]
Chassis	GALVATITE Z2 G275N 1.2MM	Recyclable	8.1
Cosmetic Fascia Panel	Polyester Powder Coated ZINTEC 0.7mm	Recyclable	1.2
Heat Exchanger	Tubes: Copper Endplates: Galvanised Steel Fin plates: Aluminium (Hydrophilic Coating)	Recyclable	3.0
Fan	Blades: Polypropylene Motor housing: Cast Aluminium Guard: Steel Shroud: 30% Glass Filled Nylon		5.0
Pipework	Copper	Recyclable	0.1
Pipework Fittings	DZR Brass	Recyclable	0.1
Valves	DZR Brass	Recyclable	1.5
Valve Actuators	Cover: ABS / Polycarbonate Body: Polyamide PA66 Adapter : Brass CuZn40Pb2	Recyclable	0.4
Condensate Drain Tray	ABS		0.2
Condensate Pump	Pump enclosure: Polycarbonate / ABS Pump internals: Polypropylene / Thermoplastic Elastomers Reservoir: Polycarbonate	Recyclable	0.5
Filters	Nylon Monofilament Media Encased in ABS Frame		0.1
Air Filter Runners	Aluminium Alloy 6063 T6	Recyclable	0.2
Condensate Tube	Silicone	Recyclable	0.2
Controller	Housing- Polycarbonate Wire spring- Stainless Steel Others - PA/CuZn/Fe	Recyclable	0.7
Panel Insulation	Impregnated Polyether Foam 6.0MM	Recyclable	0.2
Air Tight Seal	Foam Sealing Tape	Recyclable	0.0
	Recycle all packaging according to local standards		

16.2 AR75 range

Component	Material	Disposal method	Weight [kg]
Chassis	GALVATITE Z2 G275N 1.2MM	Recyclable	15.5
Cosmetic Fascia Panel	Polyester Powder Coated ZINTEC 0.7mm	Recyclable	3.1
Heat Exchanger	Tubes: Copper Endplates: Galvanised Steel Fin plates: Aluminium (Hydrophilic Coating)	Recyclable	9.6
Fan	Blades: Polypropylene Motor housing: Cast Aluminium Guard: Steel Shroud: 30% Glass Filled Nylon		9.0
Pipework	Copper	Recyclable	0.2
Pipework Fittings	DZR Brass	Recyclable	0.1
Valves	DZR Brass	Recyclable	1.5
Valve Actuators	Cover: ABS / Polycarbonate Body: Polyamide PA66 Adapter : Brass CuZn40Pb2	Recyclable	0.4
Condensate Drain Tray	ABS		0.45
Condensate Pump	Pump enclosure: Polycarbonate / ABS Pump internals: Polypropylene / Thermoplastic Elastomers Reservoir: Polycarbonate	Recyclable	1.0
Filters	Nylon Monofilament Media Encased in ABS Frame		0.4
Air Filter Runners	Aluminium Alloy 6063 T6	Recyclable	0.3
Condensate Tube	Silicone	Recyclable	0.2
Controller	Housing- Polycarbonate Wire spring- Stainless Steel Others - PA/CuZn/Fe	Recyclable	0.7
Panel Insulation	Impregnated Polyether Foam 6.0MM	Recyclable	0.4
Air Tight Seal	Foam Sealing Tape	Recyclable	0.1
	Recycle all packaging according to local standards		

Discover more

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