



Surface Mounted Fan Coil Installation Guide



Surface Mounted Fan Coil Installation Guide

Surface mounted fan coils are mounted on the wall or ceiling of a home and provide spot heating and/or cooling to the room they are installed in only. This guide provides recommendations on where these units should ideally be located and the space that they are then able to condition, as well as the installation considerations that should be made when planning and installing these units.

Contents

Conditioned Space	4
General Placement Guides	4
Hall Wall Placement	5
Low Wall Placement	6
High Wall Installation	7
Low Wall Installation	11

Conditioned Space

Surface mounted fan coils units have relatively low fan power compared to ducted or built-in units, this is due to these units only being intended to condition the room that they are installed into and provide minimal heating or cooling of other rooms.

When considering these units each room where heating and/or cooling is required should have its own unit installed, or a ducted system should be used that is designed to condition multiple rooms.

The air flow from these units is intended to extend 2-4m into the room depending on the selected model, for rooms larger than this it is advisable to install multiple units to ensure all areas of the room are conditioned.

General Placement Guide

The following are some guidelines for placement of all types of fan coils:

- For rectangular shaped rooms locate the units on the long wall.
- For rooms with different areas place the unit in the larger section of the room.
- Position the units away from direct solar gain as this will cause the inbuilt thermostat to heat up and read the rooms air temperature incorrectly.
- Do not place unit above electrical appliances.
- Position the unit away from sitting areas or bed heads so the air flow has time to disperse before reaching the occupants to reduce discomfort from draughts.

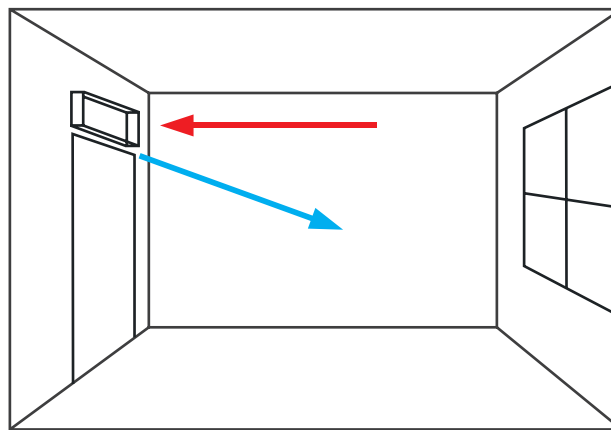
When planning the units location in a room it is important to consider the path for pipe work and condensate drainage. The pipe work needs to be positioned accurately for the installation of the unit so freedom to mount the pipes in the exact locations required is necessary. Where the unit is positioned directly on an external wall or on a wall that joins an external wall the condensate drainage can be run in the wall to the outside of the building, check that the correct fall can be maintained over the required distance for the drain to run. Where the unit is located on an internal wall the drainage for the unit will need to be more carefully planned with the drain added into/below the floor. If it is not possible to connect the unit to a drain while ensuring continues natural fall then a condensate pump may be used, but these should be used as a last solution as they add another maintenance requirement to the system.

High Wall Placement

High wall fan coil units are most effective at cooling, they are placed high in the room where the warmer air collects and can be directed to blow the cool air across the ceiling helping create natural convection currents throughout the room.

The flow path out from a high wall unit should be considered when choosing its installation location, the unit should not blow directly onto another surface, especially an external wall or window and should not blow directly onto occupants. The unit should not be positioned directly opposing a doorway to prevent the conditioned air from being blown out of the room.

High wall fan coils should be mounted with the lower side of the unit 1.9m above the floor and the clearance from the ceiling as specified in the manual should also be respected (typically min 150mm). A minimum clearance of 1.2m is required from each side of the unit to any return wall or window.



Before installation, consider the following for suitable positioning of the unit:

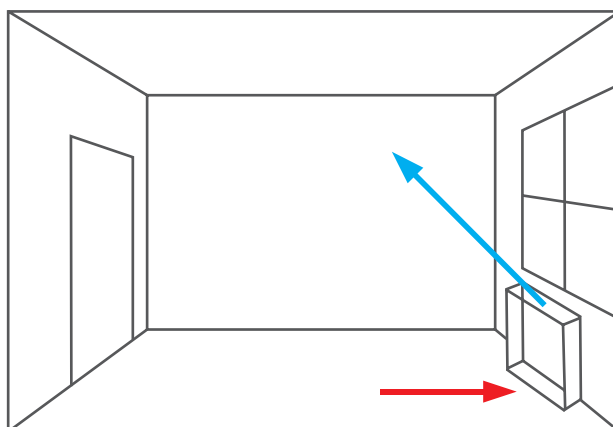
Ensure		Avoid	
✓	The wall is strong enough to support the unit	✗	The unit will not be exposed to direct sunlight
✓	There are no current or planned services in the wall that will affect the units installation or operation	✗	The unit is not exposed to sources of heat, water, or steam
✓	The units condensate can be suitably drained	✗	Units air flow will not be obstructed
✓	The air flow or noise from the unit will not be nuisance to occupants	✗	Installing the unit above an electrical appliance

Low Wall Installation

Low wall fan coil units are most effective at heating, they are placed low in the room where the cooler drawing in cooler air from the floor and heating this before dispersing this into the room. This creates a natural convection current around the room enhancing the heating effect further. These units can also provide effective cooling but their cooling performance will be lower than an equivalent sized high wall unit.

The flow path out from a low wall unit should be considered when choosing its installation location, the unit should not blow directly onto another surface, for example a deep window sill, bench, desk, or similar structure extending from the wall the unit is installed onto. It is advisable to not position the unit directly below a window where air will be blown onto the window or trapped under window furnishings.

Low wall units should be mounted 80mm above the finished floor level and have at least 140mm clearance above the unit to any other structure. From each side of the unit the minimum clearance to a return wall or similar is 20mm but for best performance and ease of installation and servicing it is advised to instal the unit with 1.2m clearance from each side.



Before installation, consider the following for suitable positioning of the unit:

Ensure		Avoid	
✓	The wall is strong enough to support the unit	✗	The unit will not be exposed to direct sunlight
✓	There are no current or planned services in the wall that will affect the units installation or operation	✗	The unit is not exposed to sources of heat, water, or steam
✓	The units condensate can be suitably drained	✗	Units air flow will not be obstructed
✓	The air flow or noise from the unit will not be nuisance to occupants	✗	Installing the unit above an electrical appliance

High Wall Installation

Once the location for a high wall fan coil unit has been selected the following general installation process should be followed.

Step 1:

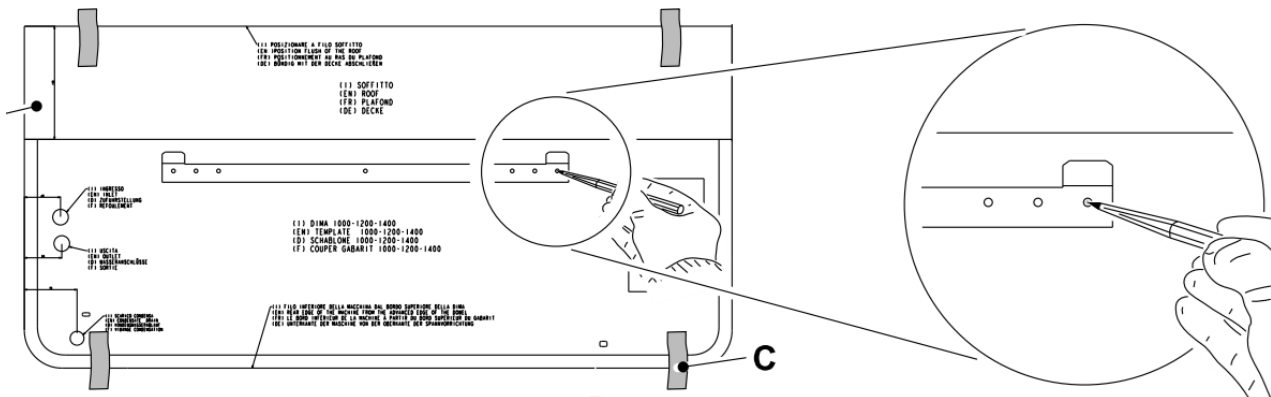
Prepare Services: Once the unit's location is determined the requirements to provide the required services to this location can be planned:

- Insulated pipes that provided the heated and/or chilled water need to be run from the heat source or plant to the unit's location ensuring that the pipe routes are as short as possible.
- Drainage for the condensate pipe needs to be provided, for units that are not mounted on or next to an external wall drainage may need to be provided for in the floor at an early stage of the project (i.e. before the concrete slab is poured).
- Electrical supplies and control cable routes are needed from the switch board and/or the systems wiring centre, if these need to be run earlier in the project this should be planned out in advance.

Step 2:

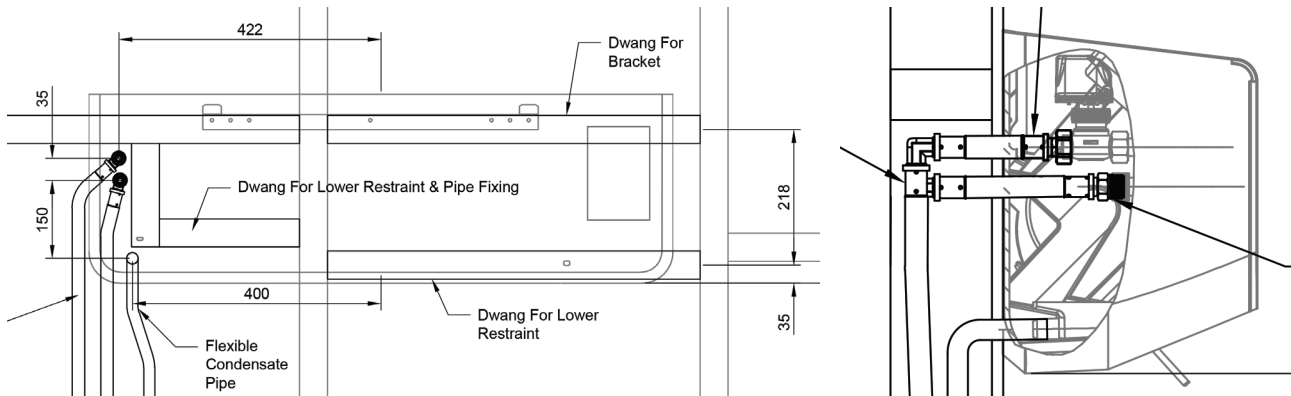
Unit Pre-Pipe: Once the walls are framed and the building is enclosed it is time to run the pipe work for the unit. It is recommended that the unit is on site to assist with positioning of bracketing and pipe work:

- a. Measure out the unit's location and using the provided template mark out the bracket fixing, pipe, and drain locations on the wall.



- b. Add any additional timber into the wall for fixing of the unit's bracket and low restraint fixings.

- c. Run the insulated pipe work that provides the heated or chilled water to the unit and locate this to enable the pipe to penetrate at the centres required to fit off the unit. It is recommended to run and fix these pipes with the unit in place ensuring the unit can be easily connected to these when it needs to be fitted off later. There is limited space inside the unit for pipe connections so having these perfect at the pre-pipe stage is key to ensuring an easy connection later. Position the pipes back in the wall framing using elbows to bring the pipes out straight into the connection locations. If the unit cannot be used for test fitting at this stage CHNZ can provide some detailed drawings and measurements to support this:

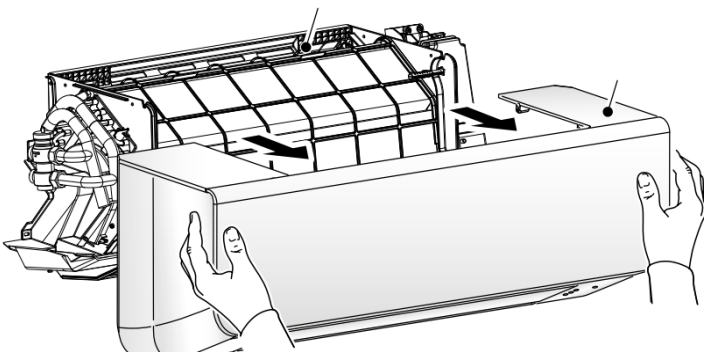


- d. Using PVC/pressure pipe run a rigid drain pipe from the drain location to the unit ensuring fall is maintained along the length of the run. The rigid pipe should terminate in the wall below the unit. Using a suitable flexible drain pipe run the drain from the unit into the wall and connect this into the rigid drain pipe. Ensure the flexible drain is only run vertically. Test the condensate drain by pouring some water into the condensate tray/hose ensuring there is no leakage in the wall.
- e. Run electrical supplies and control signals from the fan coil to the switchboard and/or central heating controls wiring centre. It is recommended to terminate the cables at the correct location behind the unit in a flush box.
- f. If the unit was used on site for the pre pipe remove this from the wall and place back into the packaging to protect the unit from damage until fit off.

Step 3:

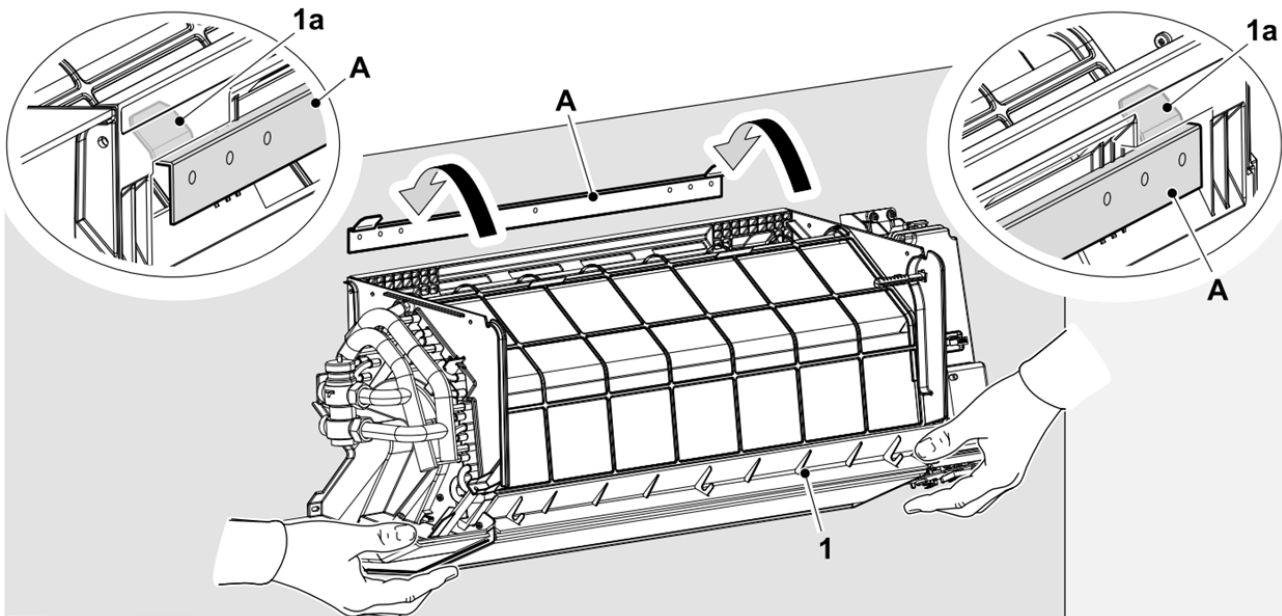
Fit off: Once the walls are lined and painted the unit can be fitted off and tested:

- a. Remove the casing from the unit for ease of making the hydraulic, condensate, and electrical connections:

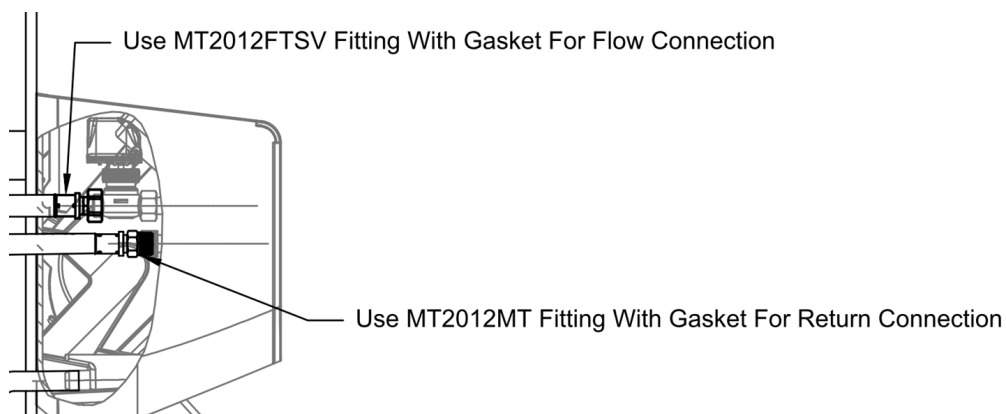


Refer to the manual for instructions on removing the outer casing without damage and store this out of the way.

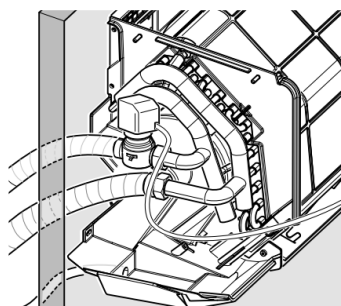
- b. Fit the supplied wall bracket (A) to the timber added to the wall at the pre-pipe stage and then hang the unit on the bracket and adjust horizontally until the pipe and electrical connections are lined up:



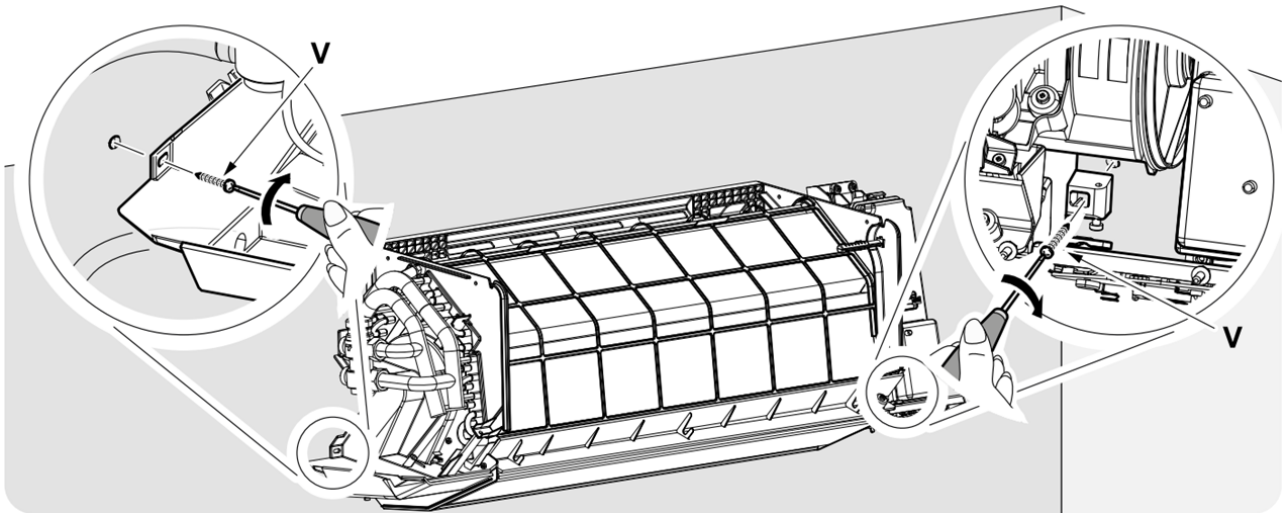
- c. Fit off the unit to the flow and return pipes ensuring to use 2 spanners or wrenches to prevent the internal pipes from bending or cracking. Both flow and return connections are advised to be made with gasket sealed connections for ease of future maintenance, an example of the connections are shown below:



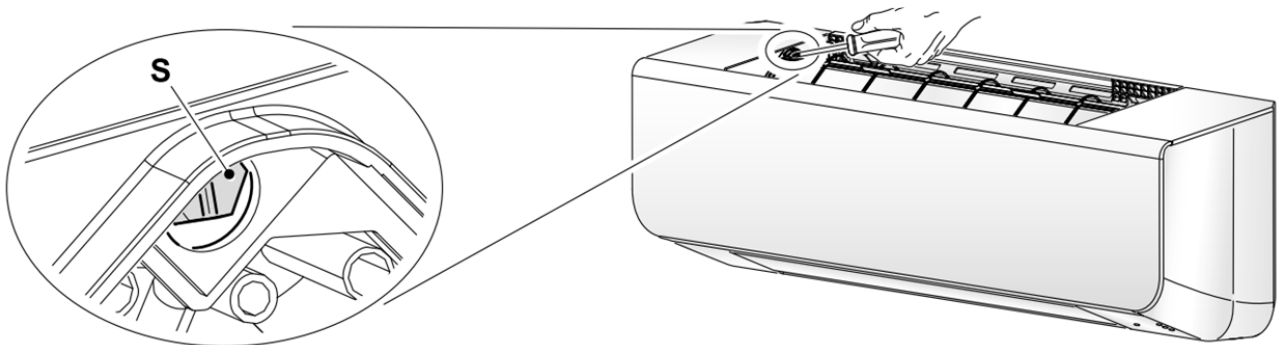
- d. Attach the condensate hose to the units drain and secure with a cable tie or pipe clamp.
- e. Once all connections are made insulate the pipes that are outside of the condensate tray catchment area:



- f. Using the two preformed holes (V) in the bottom sections of the units frame secure the unit to the wall:



- g. Fill the unit with water and using the manual vent (S) on the inside of the coil vent any air from the heat exchanger:



Complete this step before fitting the unit casing and once filled and flushed check the unit for any leaks.

- h. Once the unit is filled, flushed, and leak free fit off the electrical connections, generally this is just a 230V power supply but some systems may also include an additional 2 core connection to the end switch of the units zone valve.
- i. Replace the units casing ensure that this is fitted correctly to the unit to prevent any distortion of the casing.

Step 4:

Commissioning & Testing: Now that the unit is installed the functioning and system integration must be tested:

- a. From factory the unit is set with an ambient temperature compensation of -3°C , for applications that are primarily for cooling it is recommended that this setting is changed to 0°C . Refer to the Board Software Configuration instructions in the supplied manual to make this adjustment.

- b. While testing the system functions the unit should also be tested, operation in all intended operating modes should be tested ensuring water flow through the coil is achieved and the fan operates as expected.
- c. If the end switch of the fan coil is intended to provide an output to the system test that this function works as expected.

Low Wall Installation

Once the location for a low wall fan coil unit has been selected the following general installation process should be followed.

Step 1:

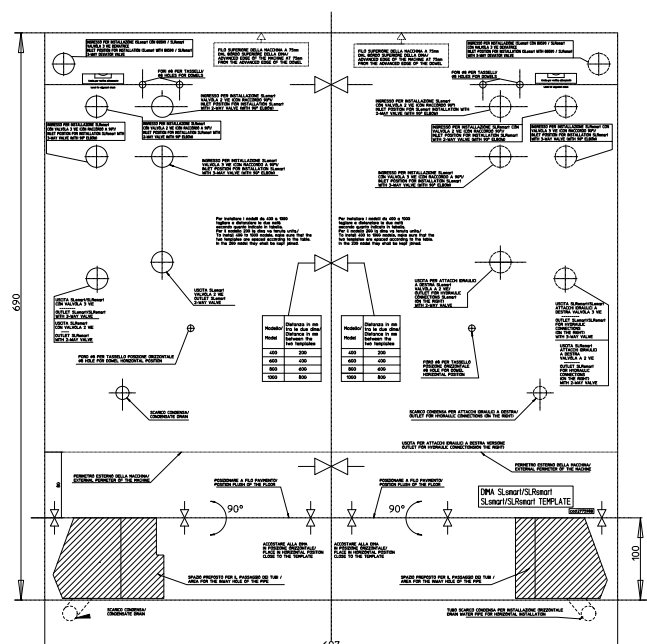
Prepare Services: Once the unit's location is determined, the requirements to provide the required services to this location can be planned:

- a. Insulated pipes that provided the heated and/or chilled water need to be run from the heat source or plant to the unit's location ensuring that the pipe routes are as short as possible.
- b. Drainage for the condensate pipe needs to be provided, for units that are not mounted on or next to an external wall, drainage may need to be provided for in the floor at an early stage of the project (i.e. before the concrete slab is poured).
- c. Electrical supplies and control cable routes are needed from the switch board and/or the systems wiring centre, if these need to be run earlier in the project this should be planned out in advance.

Step 2:

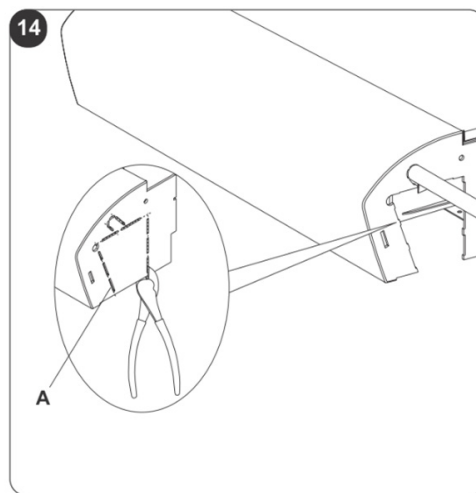
Unit Pre-Pipe: Once the walls are framed and the building is enclosed it is time to run the pipe work for the unit. It is recommended that the unit is on site to assist with positioning of bracketing and pipe work:

- a. Measure out the unit's location and using the provided template mark out the bracket fixing, pipe, and condensate drain locations on the wall. Add any additional timber into the wall as required for fixing of the unit's bracket and low restraint fixings.



01/25-V1

- b. If the water and condensate pipes will penetrate the wall, the condensate drain reference on the above mounting template will likely be relevant. It is suggested that the wall penetration is no higher than 150mm off the floor (assuming the template is being used with the unit 80mm off the ground) to ensure adequate slope for drainage. It is recommended that the unit be on site for the pre-pipe stage to ensure correct penetration points for the water pipes, as the mounting template water connection points are likely irrelevant.
- c. If the water and condensate pipes will penetrate the floor, the left-hand end panel has a removeable section at the bottom allowing for the pipes to enter and be connected as shown below. Again, it is recommended that the unit is on site for this pre-pipe stage, however the mounting template will provide an idea of the condensate drain penetration point, and the water pipes will naturally be situated immediately next to it. In this scenario, feet covers are available for a more aesthetic finish, product code FCOSLPF2.

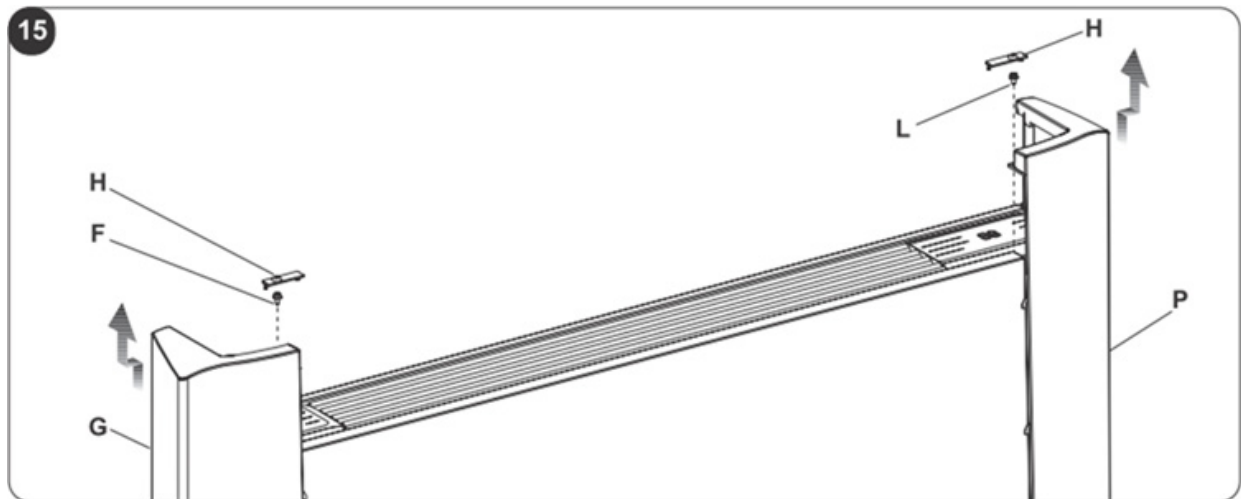


- d. Run the insulated pipe work that provides the heated or chilled water to the unit and locate this to enable the pipe to penetrate at the centres required to fit off the unit. Position the pipes back in the wall framing or under the floor using elbows to bring the pipes out or up straight into the connection locations.
- e. Using PVC/pressure pipe run a rigid drain pipe from the drain location to the unit ensuring fall is maintained along the length of the run. The rigid pipe should terminate in the wall below the unit, with a downward slope always exceeding 1 degree to ensure adequate drainage. Test the condensate drain by pouring some water into the condensate tray/hose ensuring there is no leakage in the wall.
- f. Run electrical supplies and control signals from the fan coil to the switchboard and/or central heating controls wiring centre. It is recommended to terminate the cables at the correct location behind the unit in a flush box.
- g. If the unit was used on site for the pre pipe remove this from the wall and place back into the packaging to protect the unit from damage until fit off.

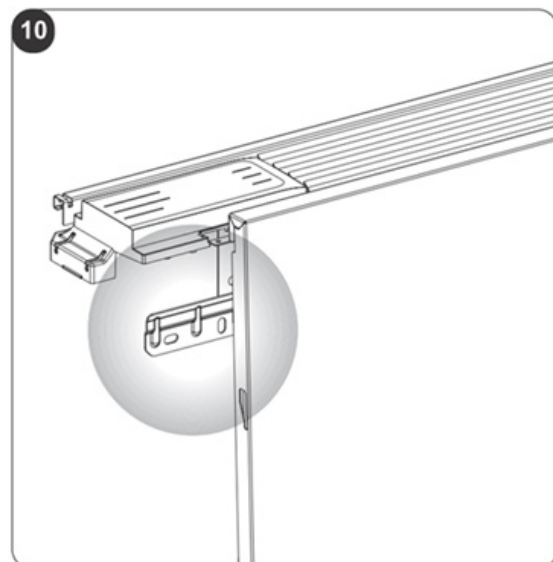
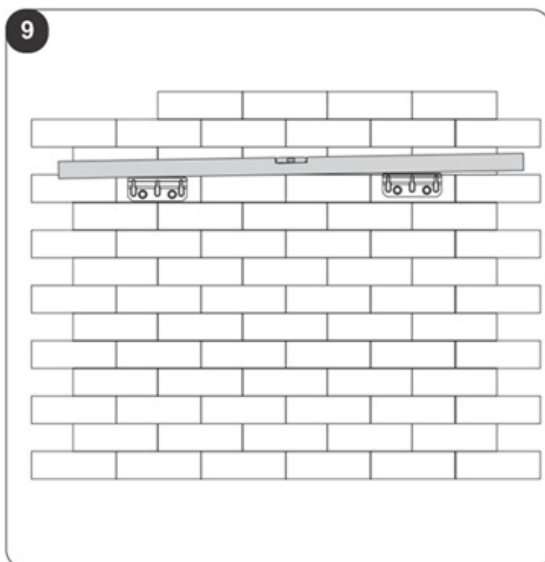
Step 3:

Fit off: Once the walls are lined and painted the unit can be fitted off and tested:

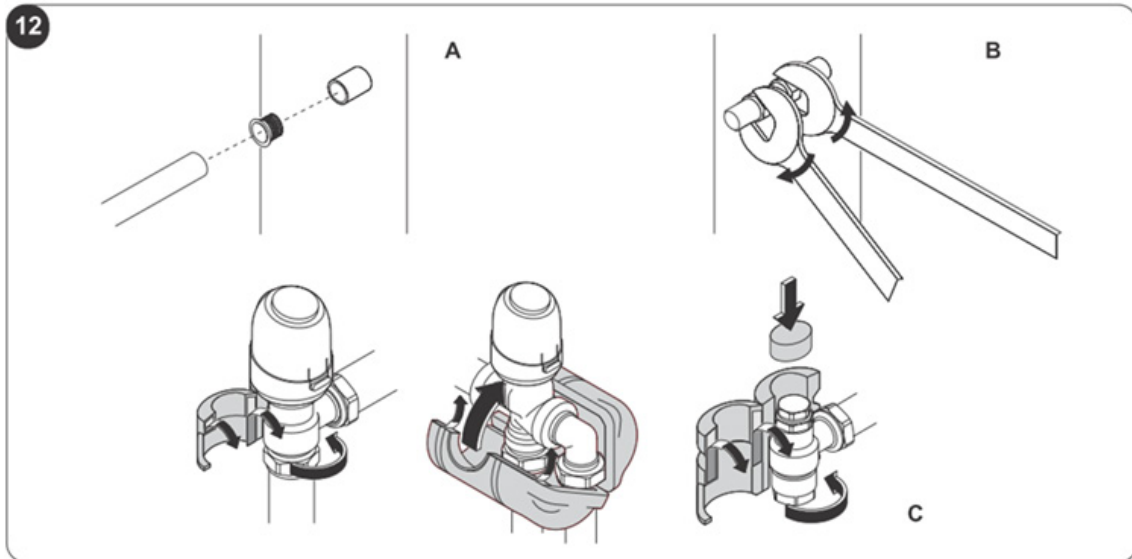
- a. Remove the end panels from the unit for ease of making the hydraulic, condensate, and electrical connections. Lift the screw covers (ref. H) to access and remove the screws (ref. L) so that the side panels can be lifted slightly upwards and outwards to be removed:



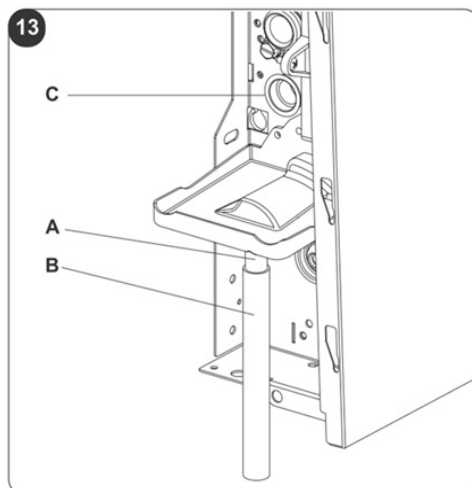
- b. Before completely tightening the screws, ensure the brackets are level and flush on the wall (Fig. 9). Hang the unit on the brackets, the hanging points will sit on the inner part of these brackets (Fig. 10). Check the unit is sitting flush and securely.



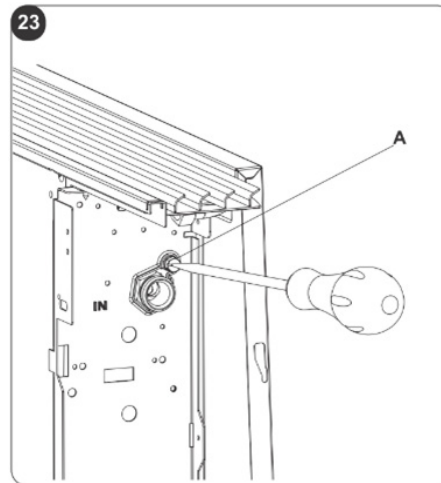
- c. Secure the included valve with actuator to the flow (top) and valve with lock shield to the return (bottom) connections. The system pipework can then be connected onto these valves, using Teflon tape for the threaded connections. Ensure any connections are secured using the “double spanner” method to avoid contorting or otherwise compromising the components.



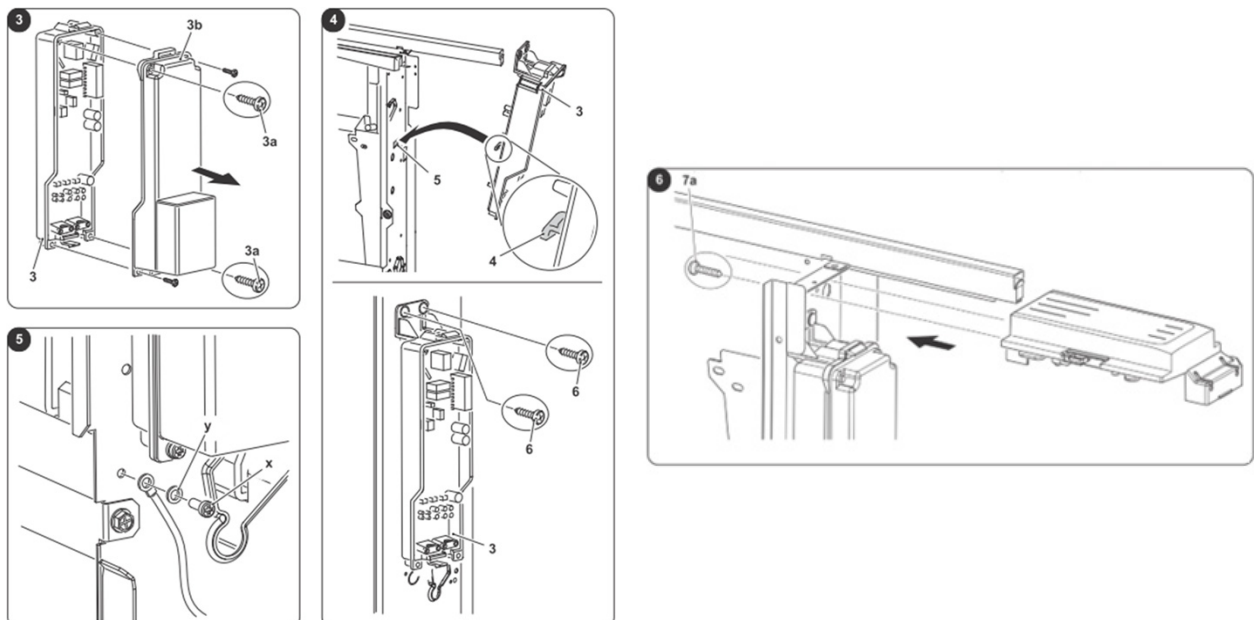
- d. Insulate the valves using the supplied adhesive covers (Fig. 12 above). If the fan coil will be operating in cooling mode, the entire pipework must be insulated completely up to and including the valves to prevent condensation forming. If the fan coil will be operating in heating mode only, it is not critical for the pipework to be completely insulated, however it is recommended as far as practical to increase the efficiency of the system.
- e. Attach the condensate hose to the units drain and secure with a cable tie or pipe clamp.



- f. Fill the unit with water and using the manual vent (A) above the flow connection of the coil vent any air from the heat exchanger:

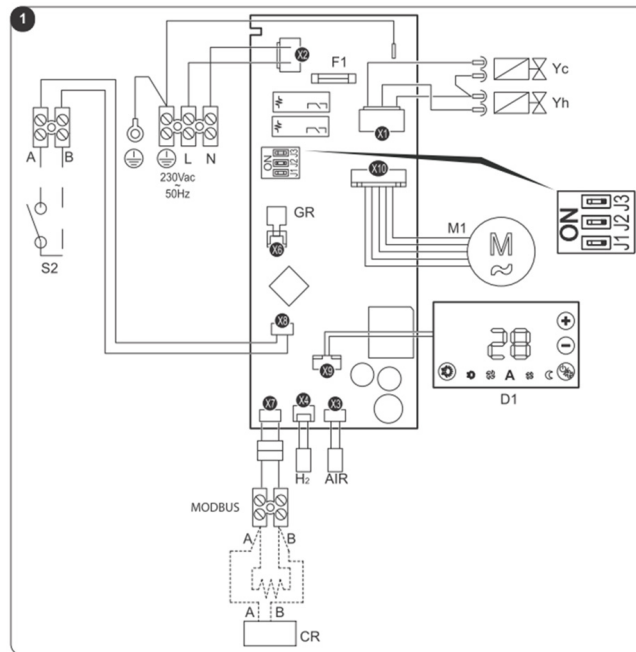


- g. Once the unit is filled, flushed, and leak free fit off the electrical connections and power supply by attaching the control panel unit.
- h. To attach the connection box and exterior control panel, remove the screws to open the connection box (Fig. 3). With the main unit side panel still removed, hook the connection box onto the unit and fasten it with the provided screws (Fig. 4) making sure to also include connecting the earth cable (Fig. 5). Slide the provided control panel into the top from the side and fasten with the provided screw (Fig. 6) from inside the unit (the top grill may need to be removed).

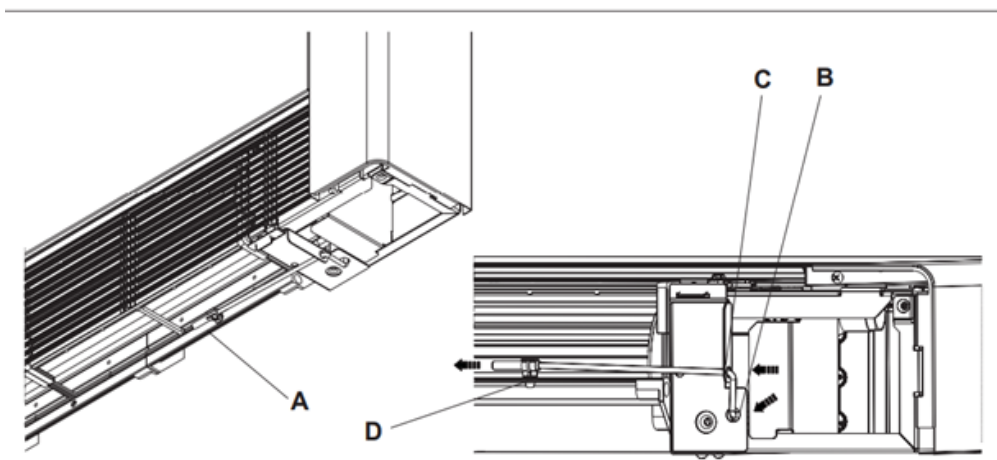


- i. Connect both the external and internal wiring to the connection box per the diagram below. S2 is the volt-free NO contact coming from the system control demand. M1 is the cable from the fan motor of the unit. X4 is the water temperature sensor which has a harness for connection. X3 is the air temperature

sensor, which is supplied with the unit, follow the instructions further down for fitting this to the unit. If the supplied actuator is being used on the water connection valve, this will be wired as Yc. The DIP switches are recommended to be set to J1-OFF, J2-OFF, J3-ON. If modifying the system, not installing following a CHNZ design, or using a 4-pipe system with two actuators, refer to the unit's instruction manual for DIP switch or Yh wiring settings.



- j. To position the air temperature probe, push the probe end through the hole in the shoulder near the bottom of the connection box side (B) then pass through the horizontal hole immediately next to it (C). Directly underneath the fan and filters, there will be a plastic clip to secure the end of the sensor probe (D). Ensure any excess cable is pulled into the cavity behind the side panel to avoid any loose cable hanging underneath the unit.



- k. Replace the unit's casing and end panels to ensure that this is fitted correctly to the unit to prevent any distortion of the casing.

Step 4:

Commissioning & Testing: Now that the unit is installed the functioning and system integration must be tested:

- a. Final electrical connections and dip switch settings should be setup. Refer to the instructions in the supplied manual/installation guide for further reference.
- b. While testing the system functions the unit should also be tested, operation in all intended operating modes should be tested ensuring water flow through the coil is achieved and the fan operates as expected.
- c. If the end switch of the fan coil is intended to provide an output to the system test that this function works as expected.

New Zealand's Experts

The combination of our skills, products, experience and people, make us New Zealand's experts in the central heating industry. We take pride in supplying the right heating system or products for our customers' specific functionality and budget requirements so that at the end of every project, both our customers and their clients are delighted—and warm.

Central Heating New Zealand: the experts in hydronic central heating and cooling products, systems and design.

Keep up to date with the latest products and promotions on our mobile-friendly website **trade.centralheating.co.nz**.

We have tailored our website to make it easier for you to search products, checkout faster, store multiple shipping addresses and view your past orders.



Find out more at **centralheating.co.nz**

52 Pilkington Way, Wigram, Christchurch, 8042
info@centralheating.co.nz
0800 357 1233

