FAN COIL UNITS

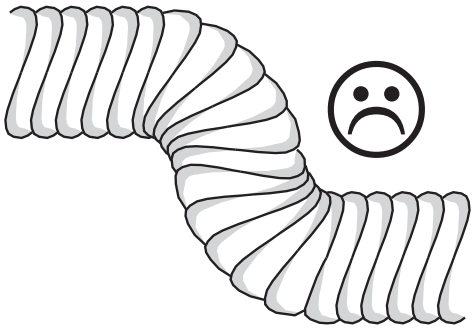
Your new Ability fan coils will operate for many years affording a comfortable, controlled working environment. This sheet provides useful installation guidelines, a trouble shooting table and a list of routine maintenance procedures.

If your fan coils behave unexpectedly then first refer to the troubleshooting suggestions and apply any remedies that appear appropriate. If this does not solve the problem then please contact Ability so that we can investigate further.

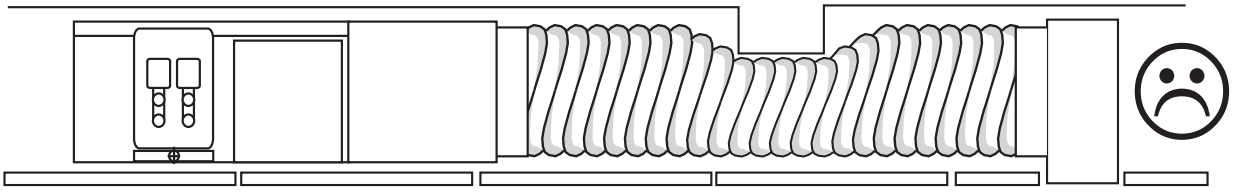
FLEXIBLE DUCTWORK

All fan coils are selected to perform against a specific external static pressure. Inadvertently increasing this resistance to the airflow will have major implications on the performance of the unit and the building as a whole. The air volumes will fall, the kW outputs will reduce, the fan speed will increase, the unit will become noisier and the balance between ducts may be upset.

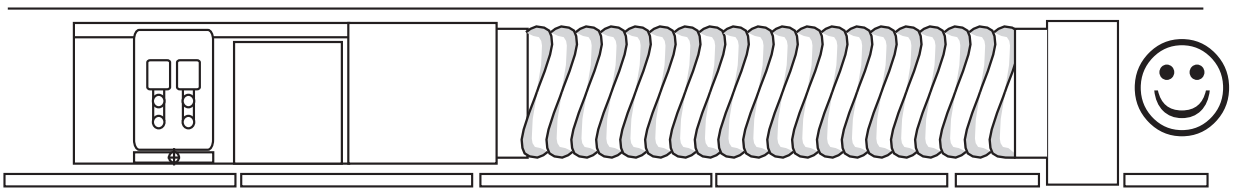
To avoid this risk flexible ductwork must be installed carefully.



- ❑ Try to avoid tight bends and keep the ducts as straight as is reasonably possible.
- ❑ Avoid squeezing ducts under or around obstructions.



- ❑ Do not use a greater length of duct than is required. Using 2 metres of duct where 1.5 metres would have been enough means the internal spiral will not have been stretched sufficiently. This leads to internal air turbulence, extra resistance and noise.



IMPORTANT NOTE ABOUT EC FAN SPEED CONTROL

EC/DC fan speeds are controlled by a 0-10V signal voltage. Ability never select fans speeds that require signal voltages in excess of 7.5 Volts, generally they will be around 5.0 Volts. If you are having to turn the signal voltage beyond 7.5 Volts to achieve your air volumes, there will be another reason for the shortfall. Check your balometer factors, that the balometer hood fits the grille properly, that your filters are clean and that all ducts are connected properly with no leaks.

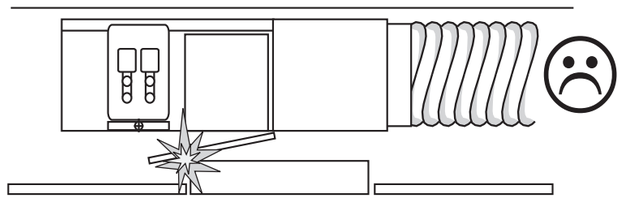
FAN COIL UNITS

ACCESS

All fan coils require regular maintenance. Filters, fans and coils need periodic cleaning to maintain their correct level of performance. It is therefore very important to leave adequate space around the access areas to make maintenance as easy as it can be.

Areas that will require periodic inspection are :-

- ❑ Filters
- ❑ Valve assemblies
- ❑ Electric box and Controls
- ❑ Fans
- ❑ Coil and Condensate tray



Keep fan coil access areas away from light fittings that cannot be removed from the ceiling grid and other immovable service ducts, pipes and conduits. Try and avoid positioning units so they span over a partition wall.

CONDENSATE CONNECTION

The condensate connection on any fan coil is delicate and should be treated with care.

Connection between the condensate tail and the main drainage system should be made using a "removeable" fitting. If removal of the condensate tray is required for cleaning or similar then this connection will need to be broken and then remade.

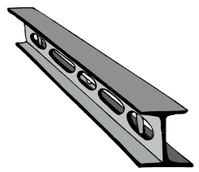
To assist condensate drainage:-

'U' bend traps between the unit and the drainage system should be installed if at all possible.
Condensate pipework should incorporate a gravity fall in line with the current regulations.
Condensate pipework should be well supported and pipework runs must not sag.
Condensate drainage pipework may need insulating depending on the drain pipe material and/or the chilled water temperatures.

NB: If condensate does not drain adequately from the fan coil it is most likely the filters have become too dirty.

FAN COIL LEVEL

Fan coil units incorporate an open condensate collection pan. To ensure the condensate collected in this pan flows away efficiently and does not overspill the fan coil should be at least level. Given the opportunity, the fan coil should be sloped slightly towards the condensate drain end which will assist the flow. The fan coil must never be installed sloping away from the drainage / valve end.



A fan coil installed sloping the wrong way will leak condensate, spoil the ceiling tile system and may damage the client's office equipment below the ceiling.

NB: If condensate leaks from the fan coil soon after installation it is most likely the filters have become laden with dust and debris thrown up during the installation process.

FAN COIL UNITS

FAN COIL CONTROLS

Many fan coil control packages, when switched on, will go through a set up or diagnostic routine. This will last at most about 15 minutes and may make the units appear "Out of Control" for this period. Remember, the diagnostics will run each and every time you turn the power off and on so it is best to let the unit controls settle before you draw any conclusions.

FAN COIL CONTROL SENSOR POSITION

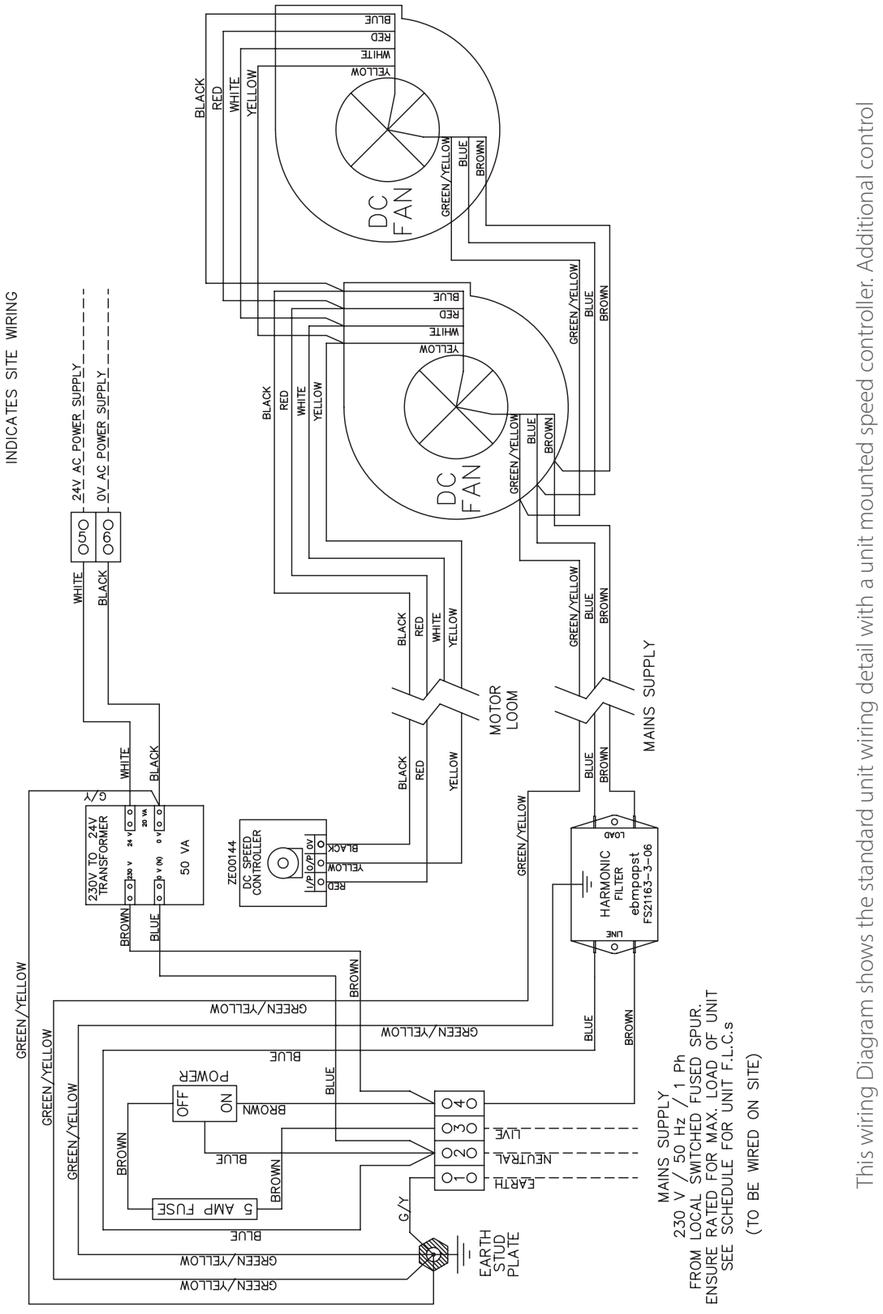
If the fan coils have room sensors remember :-

- ❑ Do not mount the sensors in direct sunlight, in a draft or near a door.
- ❑ Sensors can also be affected by cold drafts in a plasterboard cavity especially if they have been recessed into the cavity.

Also :-

- ❑ If you relocate a unit mounted sensor ensure the new position is away from sources of heat and cold such as light fittings and pipework.
- ❑ If, after a fitout, a single fan coil is now serving two rooms, the sensor may need relocation or the whole control package may need reconfiguring.
- ❑ Some control packages incorporate a small time delay before they react to a new demand from their sensors. This is to prevent controls "hunting" as they respond to every slight temperature swing.
- ❑ Sometimes the temperature above the false ceiling can be a couple of degrees above the room temperature below. This can lead to a "cooler than expected" room environment. If this happens you can either offset the controls to compensate or you may have to consider relocation of the sensors.

FAN COIL UNITS



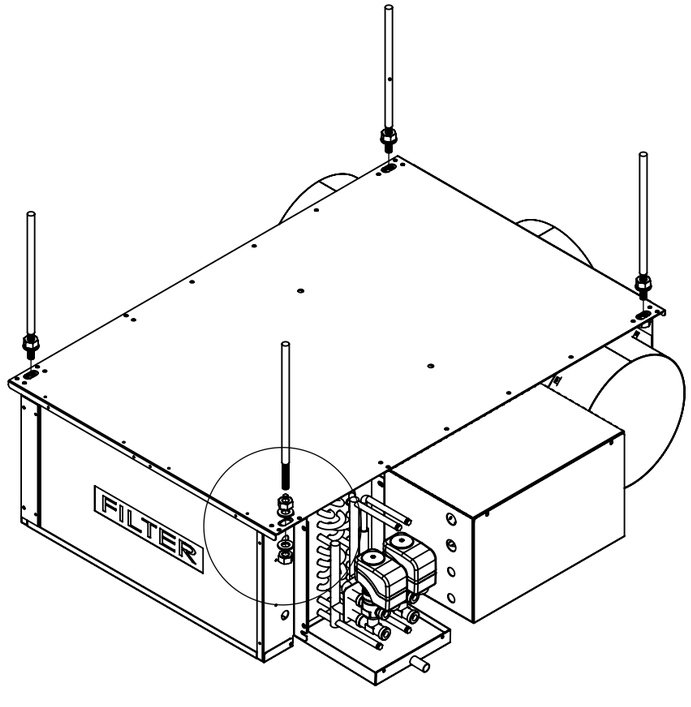
This wiring Diagram shows the standard unit wiring detail with a unit mounted speed controller. Additional control wiring will be job specific and is therefore not shown.

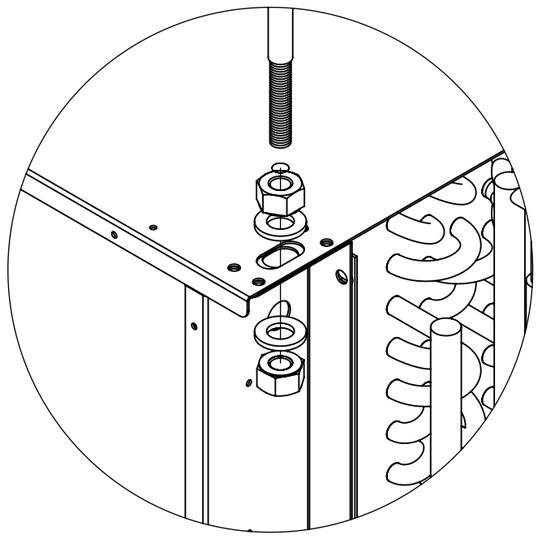
FAN COIL UNITS

SERVICING AND ROUTINE MAINTENANCE	
Before handover to client	Clean Filters
	Recheck design fan speed and temperature settings
	Ensure all valve commissioning pegs and caps have been removed
Every 3 Months	Clean filters
Every 6 months	Clean filters
	Brush or vacuum coil surface
Every 12 months	Clean or replace filters
	Brush or vacuum coil surface
	Wipe out condensate tray and chemically clean if required
	Vacuum fan and motor sets if required.
	Visually inspect for any failures or failing components

PROBLEMS AND POSSIBLE CAUSES	
Air Volumes are lower than expected or the noise level is higher than expected	Signal voltages above 7.5V will never be selected by Ability. If you have an installation defect or measurement error, turning the fan speed ever higher will not solve the problem but will, generate noise.
	Is the filter dirty
	If VCD's are fitted, have they been left closed.
	Are the flexible ducts installed correctly. There should be no tight bends, no restrictions and no excess material in the lengths of duct.
Condensate does not drain or the unit leaks	Is the air filter dirty — Dirty filters impede condensate flow
	Is the fan coil installed out of level
Controls do not work	Have the commissioning valve caps or pegs been removed
	Has the set point temperature been reset correctly after commissioning
	Is the sensor being "fooled" by an external temperature influence
	Have the controls not yet finished their start-up diagnostics routine.
Unit becomes noisier over time	Is the filter dirty

FAN COIL UNITS

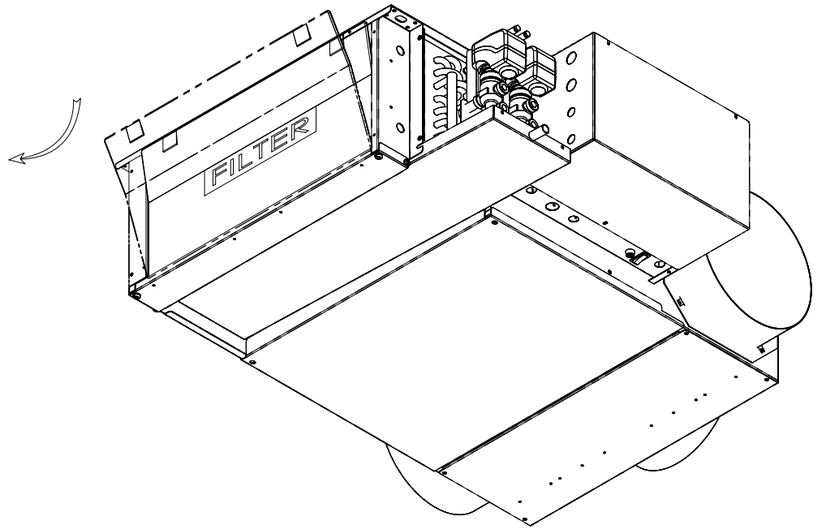




- Drop rod size should ideally be M12
- If you are going to use a 'spacer' to normalise the distance of the fan coil from the slab, make sure you do not overdo the nuts on the drop rods (especially when using power tools) as you can inadvertently break the back of the fan coil.
- The arrangement shown is ideal. Resilient mounts are not really necessary as the unit motors are already resiliently isolated from the fan coil chassis

FAN COIL UNITS

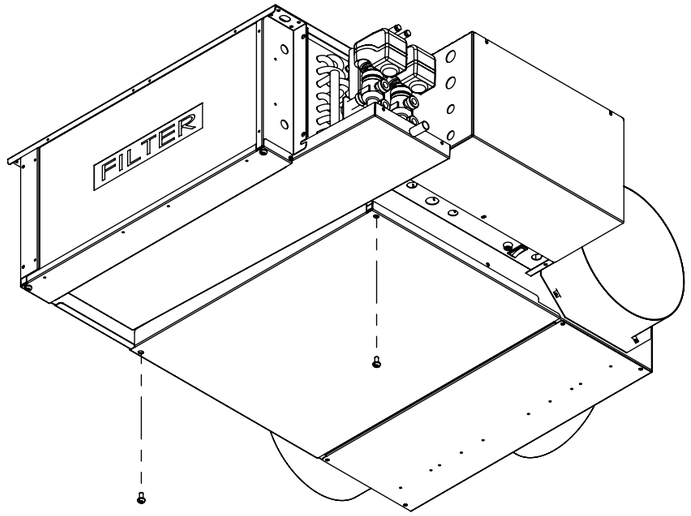
- Firmly grasp the black, fabric tags at the top of the filter, nearest the back panel of the fan coil unit.
- Gently apply downwards pressure on the tags. This will ease the filter out of its top location slot on the fan coil unit.
- When the top of the filter is clear of the rear flange on the fan coil unit, the filter can be lifted clear of its lower location slot. Note: If there is difficulty removing the filter in the above fashion, e.g. due to obstructions in the ceiling void, it is possible to remove the fan access and coil access panels (260/235 Models only) or pivot the rear access panel (270 Model). Removal of the coil/rear access panel will allow the filter to drop out.
- Carefully remove the filter from the ceiling void for cleaning. Avoid snagging the filter media on suspended ceiling wires for example. Also avoid twisting the filter to clear obstacles. This may deform the filter, and make it more difficult to refit.

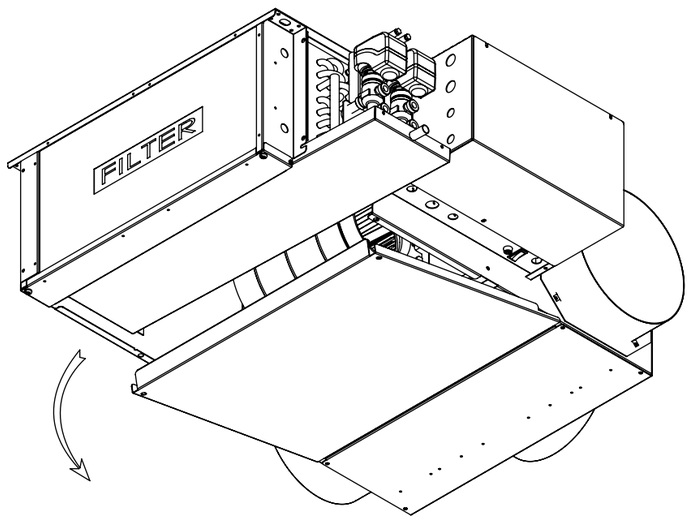


- Clean the filter using a vacuum cleaner. The filter can also be cleaned using warm water and a mild detergent, if required.
- Installation of the filter is the reverse of removal. First ensure the filter is the correct way round and locate the bottom of the filter inside the lower location slot of the fan coil unit. Next, use the fabric tags to compress the filter into its "V" formation. Once compressed slightly, tuck the top edge into the top location slot of the fan coil unit.
- Check the filter is correctly located. If the filter is damaged or too dirty to clean satisfactorily, it must be replaced. Contact Ability Projects for any replacement parts.
- Note: Larger fan coil units have 2 filters to ease removal/refitting.

FAN COIL UNITS

- Isolate unit from mains supply.
- Remove fan/main access panel





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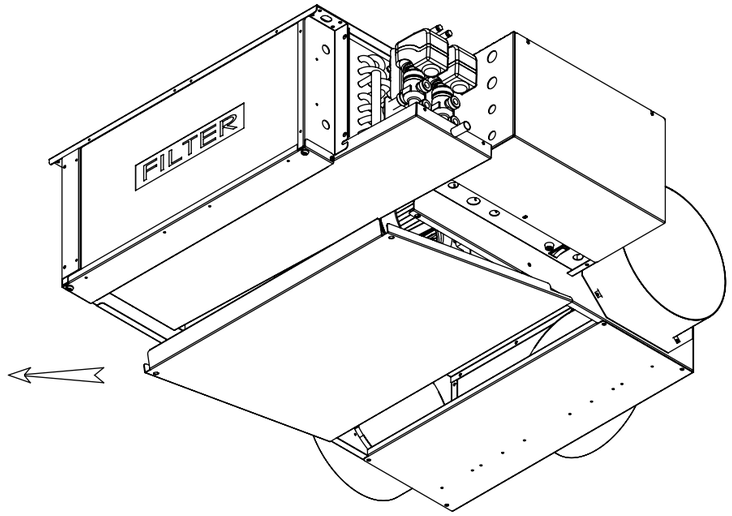
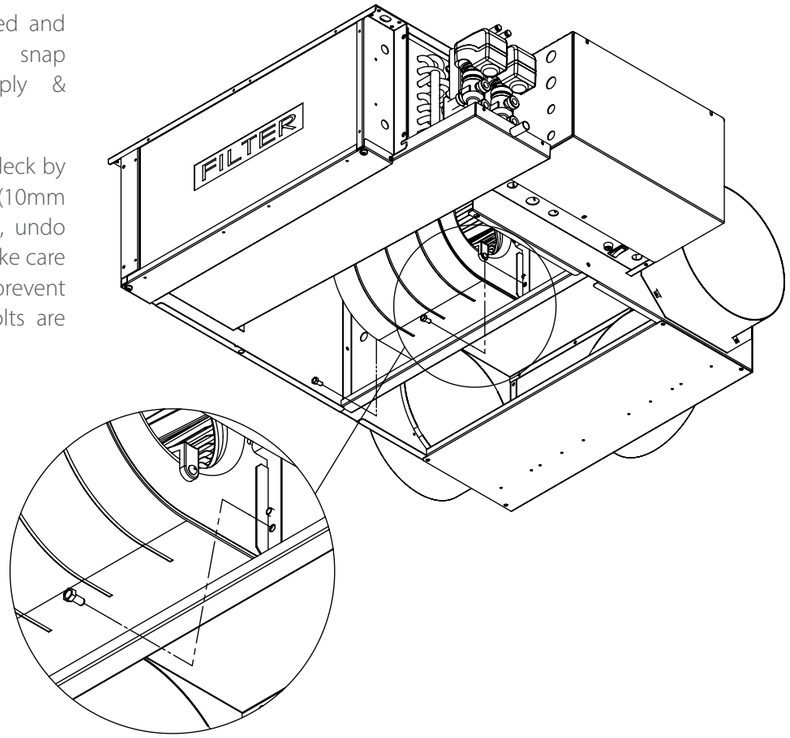


- Identify fan to be removed and unplug the two loom snap connectors (mains supply & control signal)
- The fan is secured to the deck by 2 off M6 hex head bolts (10mm head). To remove the fan, undo and remove these bolts. Take care to support the fan to prevent it dropping when the bolts are removed.



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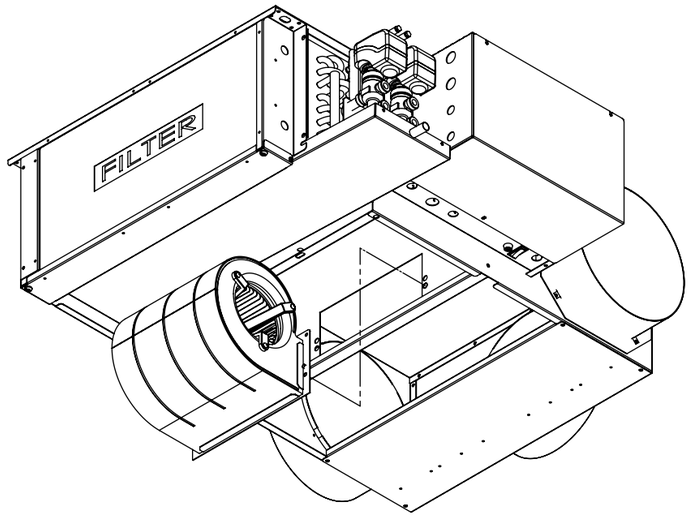
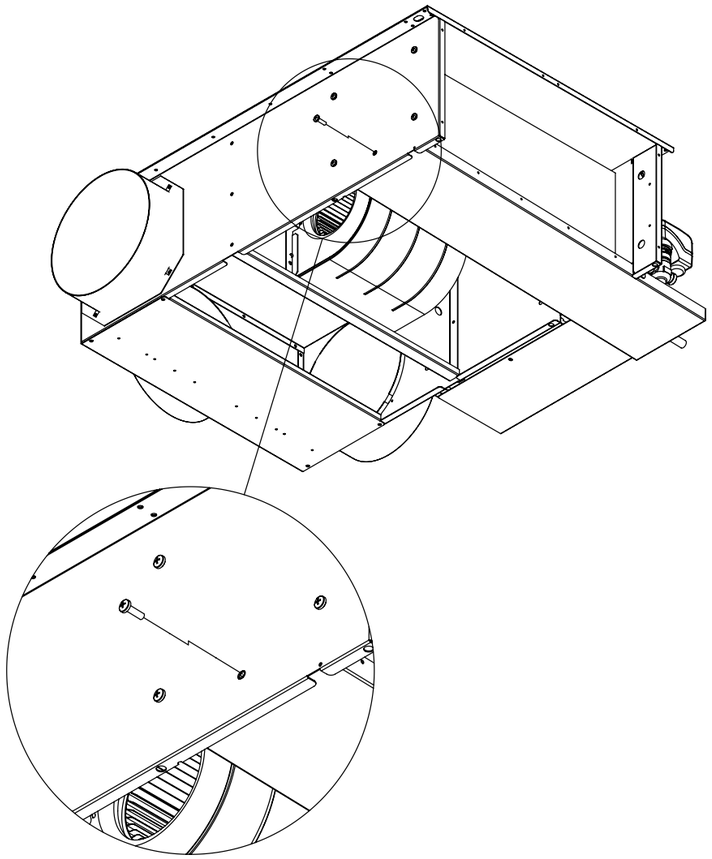


- Carefully manoeuvre the fan from the unit.
- Refitting is the reverse of removal.

FAN COIL UNITS

- Remove screws retaining main access panel. Lower panel clear of the unit and remove - this procedure is described earlier in this publication.
- Remove filter(s).
- Remove screws retaining rear access panel. Pivot rear access panel downward.
- If you are going on to remove the coil as part of this process, it is advisable to now isolate coil from water supply. Remove pipework connections to coil and allow to drain into condensate pan and away through condensate pipework. Open coil drains and vents and allow to fully drain. Remove con pan pipework connection.
- To remove condensate pan, remove the machine screw in chassis side panel (opposite pipework end).



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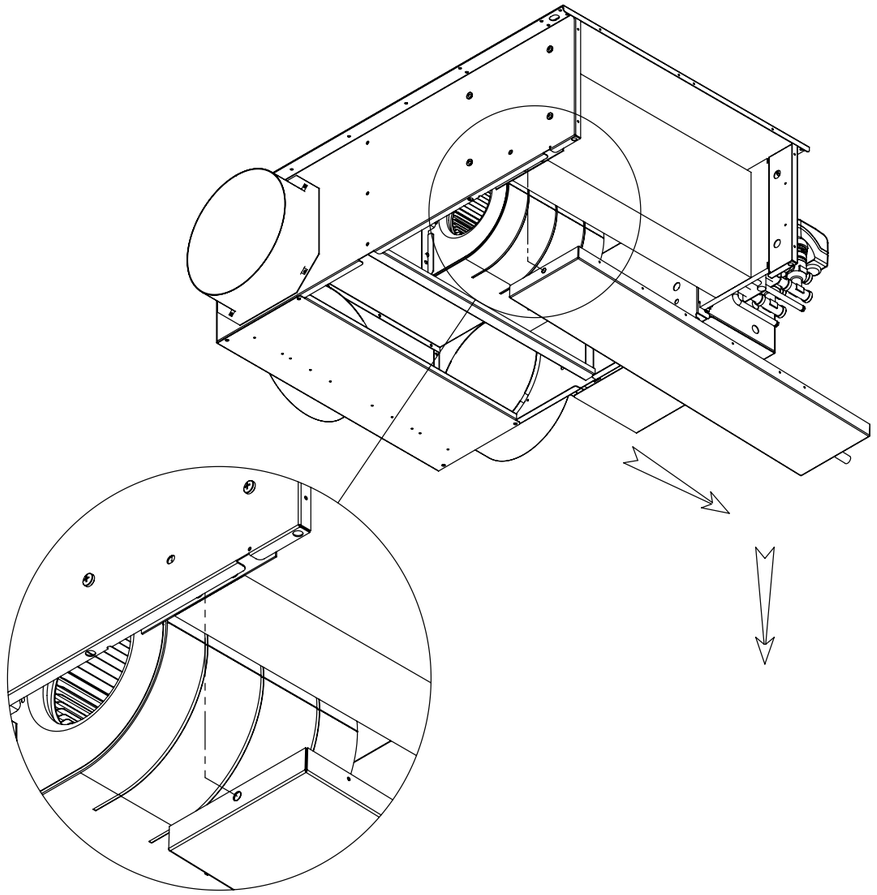
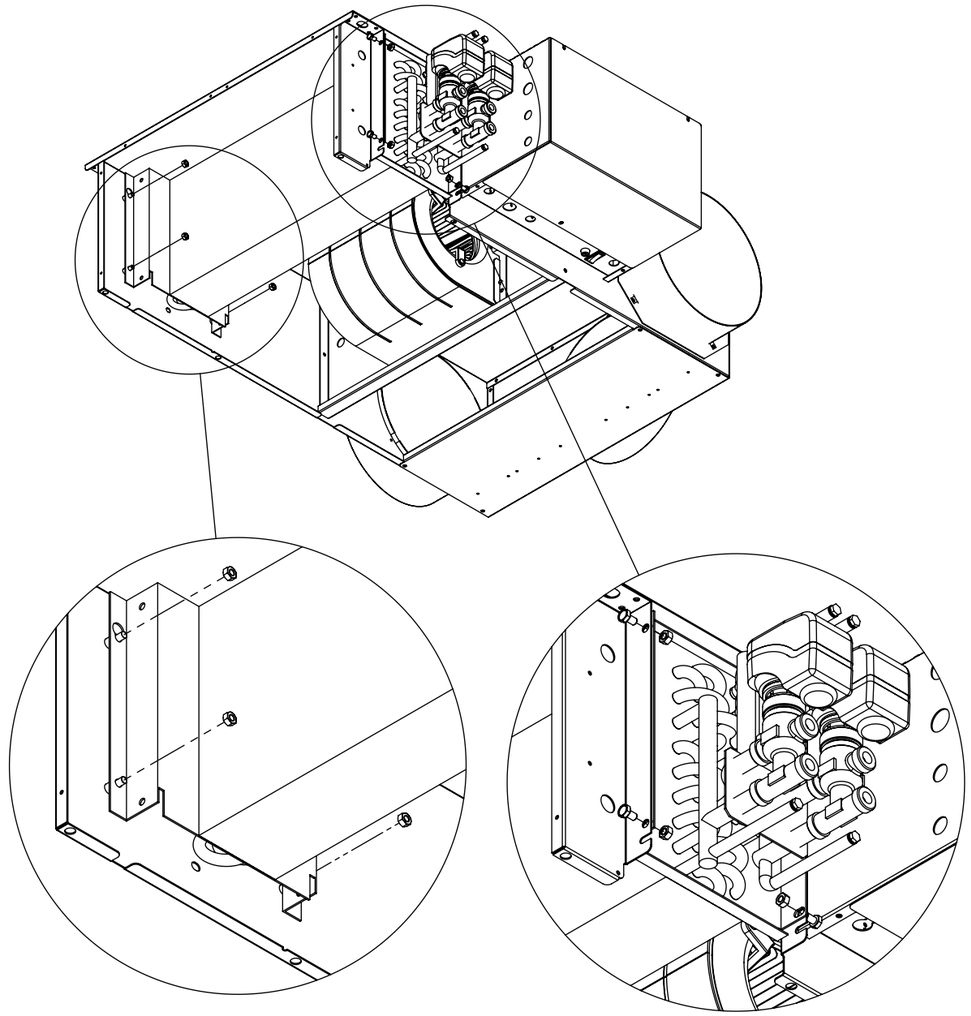


- Allow the rear end of the pan to drop slightly and pull the pan towards the tail end until the screws in the sides of the pan clear the slots in the chassis side. Lower con pan.

FAN COIL UNITS

- To remove drained coil, remove 4 off M6 nuts & bolts at pipework end tube sheet. Remove 4 off m6 nuts from return bend end tube sheet.



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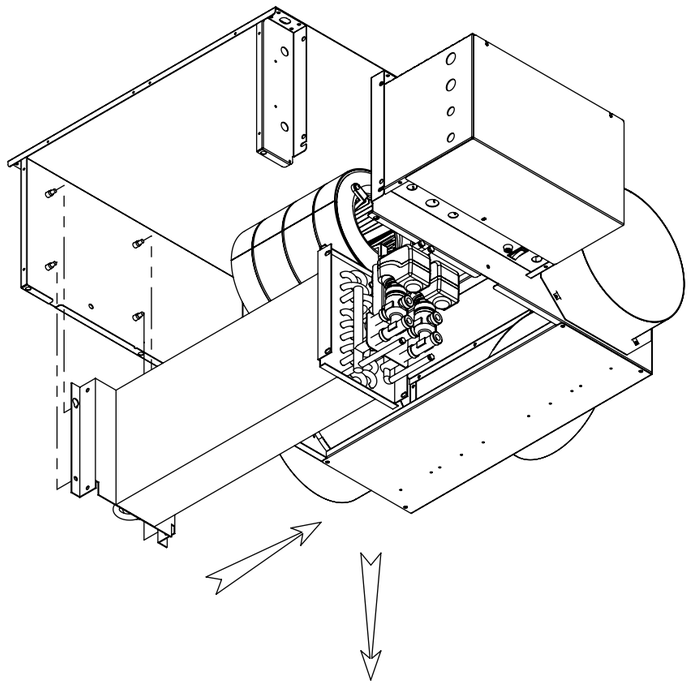


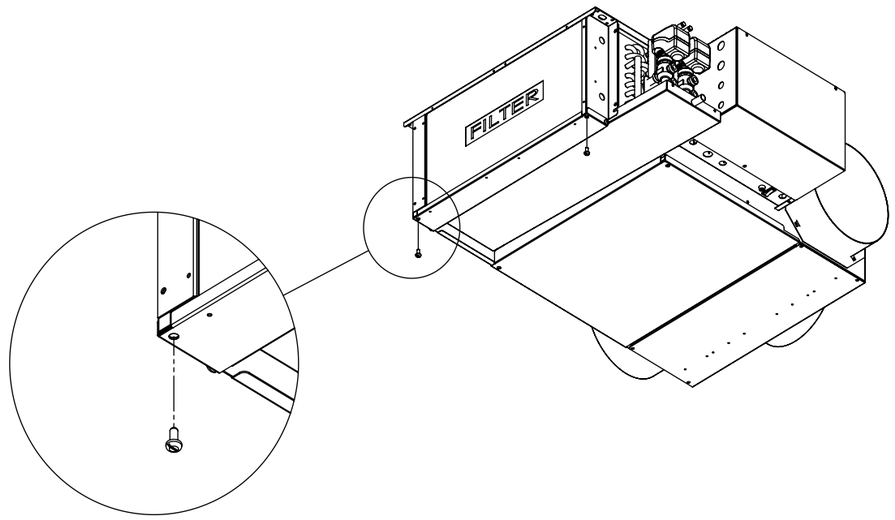
- Lower the coil from the Fan Coil
- Refitting is a reversal of removal method.

Important note:

Removal and refitting of water coils (especially on larger units) is a two man job. As fixings and panels are removed, they must be supported to prevent falling and damage. The coil must also be supported as it is removed.

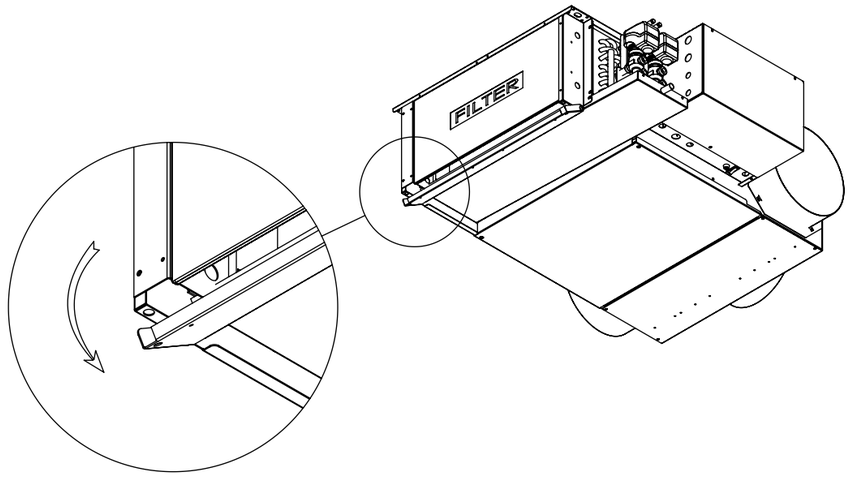
Remember also, the aluminium fins can present sharp edges, wear gloves.

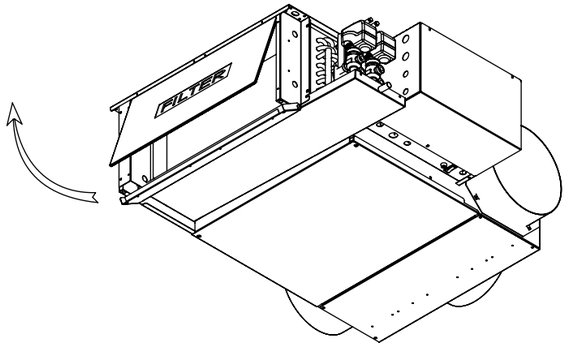
FAN COIL UNITS

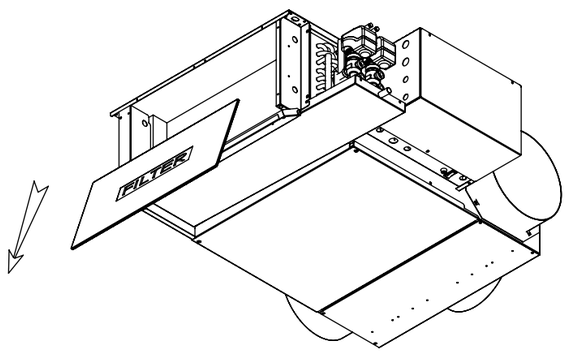


- Sometimes, removing the filter can be eased by twisting the rear access panel out of the way.
- Remove the rearmost two screws holding the rear access panel to the unit.
- Swing the rear side of the access panel downwards.
- Remove filter - clean as described earlier.

FAN COIL UNITS







Specification

FAN COIL UNITS

> Casings
Chassis panel work is all 'In House' manufactured from nominally 1.2mm galvanised steel. Where at all possible, flanges are formed inward facing to prevent exposure to bare metal edges. Sufficient forms and folds are incorporated to provide a vibration free, robust structure. The panel work is jointed throughout using 3/16"'Polygrip' self adjusting and 'air tight' rivets.

> Access
Access is provided through a single panel. This covers the fan/motor sets together with the coil and condensate tray. The fan access hooks in place on a front lip and swings closed. This is then retained by machine screws into captive 'Nutserts"' The coil / condensate tray assembly is retained again by Machine Screws into 'Nutserts'.

> Fans
Fans are of the direct drive, forward curved, double inlet centrifugal type. Both the impellers and impeller housings are of galvanised steel. Fan and motor assemblies are mounted separately to the fan deck assembly using M6 Machine screws into captive 'Nutserts' and can be removed individually for non routine servicing or replacement. Each fan is connected to the fan wiring loom by a Quick connector. Motor and impeller assemblies are statically and dynamically balanced in twin planes.

> Coils
Coils are manufactured from seamless 3/8" copper tube, mechanically expanded onto aluminium fins. Fins are punched with die to form collars to afford maximum heat transfer surface in contact with the tubes. All coils are contra circuited for maximum output and bottom to top, to ensure free venting and draining. Vents and drains are slotted type. Coils are handed for maximum efficiency and the handing is notated against direction of airflow through the unit. Coil terminations are 15mm dia' plain copper at 40mm centres through a copper support plate for rigidity. Every coil is leak tested using dry air under water to 15 bar pressure. When valves are fitted, these are again tested by pressurising the coil / valve assembly to 6 bar and applying leak detection.

> Condensate Tray
The Condensate Tray covers the entire coil and valve assembly area and has a positive fall to the 15mm drain point. The pan is manufactured from galvanised steel, corners are brazed and the termination is silver soldered into position. Each pan additionally incorporates a pressure normalising external cover. Stainless steel pans are available as an option. All con pans are covered with 3mm closed cell, class 'O' insulation to prevent condensation.

> Insulation
Insulation is used throughout for both thermal and acoustic damping. Insulation is open cell, class 'O', CFC and HFC free expanded foam. Foam complies with CAA airport and London Borough flammability and toxicity requirements. Adhesive has light, ageing and temperature tolerance.

> Spigots
Spigots as standard, are either circular or rectangular, manufactured from galvanised steel. These are screw fixed to the front of the fan coil unit in the positions indicated. Unused spigot positions are blanked off but remain available for use if layout changes occur.

Specification

FAN COIL UNITS

> Controls Enclosure
All controls are, as standard, fitted to a control back plate which is located on the side of the fan coil. The electrical cover then encloses the controls and gives access from both the side and below. The whole electrical assembly, including switches, is mounted on the side of the fan coil unit alongside the coil terminations and valve assembly.

> Filter
Filters are EU2 or EU3 media secured to a wire metal frame, easily removable for routine maintenance, cleaning or replacement.

> Ancillaries
Inlet plenums, electric heating, stepped outlet plenums, other spigot sizes, side spigots, condensate pumps, fresh air connections and control packages are all available on request.