

CF Range

HIGH EFFICIENCY HRU

Heat Recovery Ventilation Unit

Installation, Operation & Maintenance Instructions

RDM CONTROLS INTERFACE



Tel: 0161-425-8553
Fax: 0161-637-0232
Email: info@air-source.net

CONTENTS

Warranty	General	2
	Procedure	2
	Invalidation of warranty	2
Health and safety	Safety symbols	3
	General	3
	Cautionary notes	3
	Cover Panel Removal	3
	Water treatment	3
Delivery and installation	Unloading & Handling	4
	General	4
	Storage	4
	Model Range	5
	Model Identification	6
	General Installation	6
	Locating Equipment	6
	Electrical Connection	7
	Ductwork Connection	7
	Pipework Connections	8
	Water Coils, Steam Coils & DX Coils	8
	Condensate Drains	8
	General	9
	Air Balancing	9
Initial Set Up	Time Clock	9
	Network Connection	10
	General	10
	Safety Circuits	10
Operation	Unit Enable	10
	Shutdown	10
	Temperature	10
	Heating Mode	11
	Recovery Bypass	11
	Night Purge	11
	Coil Frost Protection (HW Models)	11
	Fault Strategy	11
	Network Communication Failure	11
	Alarms	11
	Fans	11
	Electric air heater batteries	12
	Heating & Cooling Coils	12
	Recuperators	12
Maintenance	Dampers	13
	Air Filters	13
	Routine maintenance schedule	13
	End of life disassembly	14
	Disassembly guide	14
Decommission and disposal		

WARRANTY

General

To be read in conjunction with Airsource Ltd standard Terms & Conditions of Sale.

The equipment is covered against defective parts and workmanship under the terms of the Airsource Ventilation Ltd. warranty for the period of 12 Months from the date of delivery and is restricted to installations within the UK only.

Any replacement parts supplied under the warranty shall be warranted for the unexpired period of the warranty or 3 months from delivery whichever period is the longer.

Procedure

In the event of component failure during the warranty period please notify our service department, the following details will be required to process any warranty claim:

- The unit serial number.
- Full commissioning documentation.
- Full description of the fault. Further details / checks may be required to be carried out prior to our engineer's attendance at site.
- A purchase order number in the event that the fault is not covered under the terms of the warranty.

An engineer will be scheduled to attend at the earliest availability to carry out an inspection / repair of the fault reported. Our response will depend on the availability of an engineer and the parts required to carry out the repair. Work outside of normal hours will not be covered under the terms of the warranty.

Any specific access equipment required for safe working is to be provided and erected for our use and any obstructions to the equipment are to be removed to enable a clear working area around the unit / faulty component. Sufficient space should be available for the removal of components if required – see installation requirements within this manual.

Invalidation of warranty

The warranty may be refused for the following reasons:

- Failure to install, set up, put to work or maintain any part of the equipment as specified in Airsource Ventilation Ltd. Installation, Operation and Maintenance Instructions.
- Misapplication of product or components.
- On receipt, failure to identify any damage to equipment on the delivery note & notify Airsource Ventilation Ltd. in writing within three (3) days.
- Modifications to designed arrangement or performances without the prior written approval of Airsource Ventilation Ltd.
- Damage caused to equipment on site through lack of adequate protection from the elements or misuse by other trades.
- Failure to observe all normally accepted engineering practices during installation, commissioning and subsequent operation of equipment.

HEALTH and SAFETY



Important information

This symbol is provided to highlight important additional information.



Caution

This symbol identifies potential situations which could lead to the damage of equipment.



Danger

This symbol indicates situations which present hazardous conditions, which without applying strict health and safety procedures can result in serious personal injury or even death.

General

This section deals with the hazards that could be encountered when any work is carried out on the equipment for which this manual is written. Therefore the following points should be observed to avoid any injuries or health hazards.



The installation of the unit shall be checked to ensure that:

- A suitable electrical supply is connected.
- Prior to entry to any section please ensure that the electrical supply is isolated either at the control panel or at the incoming mains. Please note that if the control panel isolator is switched off the incoming side of the electric supply will remain live. DO NOT enter the unit while the fans are running. After isolating the electrical supply wait 2 minutes for the fans to stop prior to removing fan covers.
- It is suitable for the atmosphere or the environment in which it is to be used. Coastal applications should be notified to the manufacturer prior to order.
- It is suitable for the working media, temperature and pressure for which it is to be used.
- Electrical equipment is earthed to comply with I.E.E. regulations and local by-laws.
- The procedure for removing and replacing filter media are fully carried out as set out in this manual

Cautionary notes

No part of the unit shall be dismantled until a careful study has been made of this manual. This manual deals in detail with erection, commissioning and servicing and shall be strictly adhered to. Wherever any maintenance or work is done within the unit, the interior shall be left clean and all access panels and guards shall be correctly fastened.

Cover Panel Removal

Caution! Access panels may be filled with a dense acoustic barrier which makes them much heavier than they appear, always use the grab handles provided. When removing cover panels from suspended units we recommend this to be a 2 person operation.

Water treatment

Check for any treatment that is required to the water supply for prevention of corrosion and scaling of equipment. Information regarding the necessary action to be taken can be obtained from the relevant Water Supply Authority, particulars of which can be found in the Water Engineers Handbook yearly edition.

DELIVERY

Unloading & Handling

Lifting points

Fork lift

If off-loading with a Manitou or Fork lift, use fork extensions as required to extend past the full width of the unit.



IMPORTANT: Ensure the forks extend beyond the casing of the unit.

General

Upon receipt of equipment a visual inspection should be made and any damage noted on the delivery form. Particulars of any damage or short delivery should be endorsed by the driver delivering the equipment. No responsibility can be held for damage sustained during the unloading from the delivery vehicle or on the site thereafter. **All claims for damage or short delivery should be advised to AirSource Ltd. in writing within three (3) days of receipt.**

Loose items

Any loose items supplied with the HRU will be detailed on the delivery note. These are required to achieve the correct operation of the HRU. Note that some items will require installation and wiring to the HRU at site.

Touch Screen

A touch screen controller will be supplied loose. It is important to ensure this is kept in a safe location as it will be required for air balancing and other functions as detailed in these instructions.

Storage

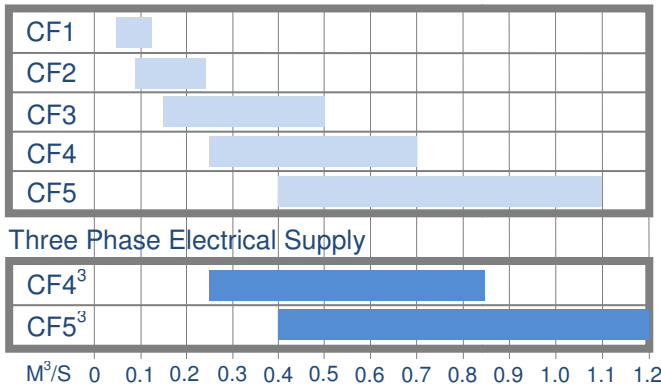
MAINTENANCE OF EQUIPMENT HELD IN STORAGE CONDITIONS FOR A PERIOD UP TO 2 YEARS

Interior	If ducting is not connected it is essential that all inlets and discharge openings are completely sealed
Exterior	The exterior shall be kept free from falling building materials, dampness or extreme cold or heat. The unit exterior surfaces should be inspected on a monthly basis and any sign of corrosion or scratches are to be treated immediately.
Static Indentation	Machines fitted with ball bearings may be damaged if left stationary for long periods. The balls and races may suffer damage by fretting corrosion (false brinelling, stationary vibration or static vibration marking).
Filters	All filters, whether in the form of bags or panels, must be suitably wrapped and sealed to prevent damp and ingress of dust or foreign bodies, and held in a dry store.

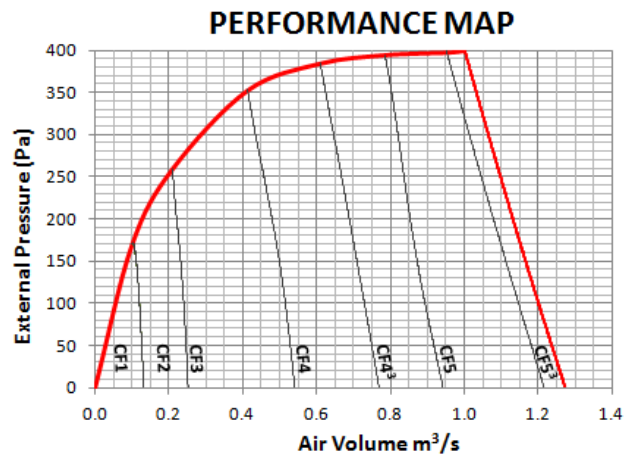
The above are intended to preserve the life of all static and moving parts of the equipment during the period of storage. It is advisable that regular attention of the equipment is maintained.

Model Range:

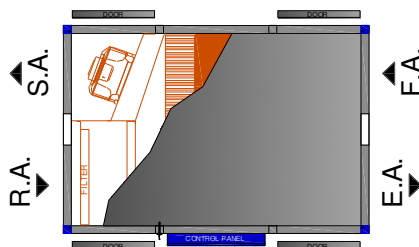
Single Phase Electrical Supply



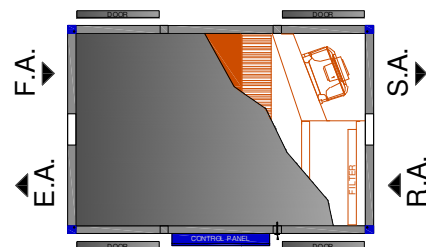
Handing options:



TYPE 1



TYPE 2



Heating options:

Heat Recovery only (HR):

Model	H ₍₁₎	W ₍₂₎	L	Duct openings	Weight ₍₃₎			FLC (A)	Elec. Supply
					S	P	R		
CF1-HR	420	800	1455	320h x 300w	160	150	165	4.1	230v/1ph
CF2-HR	420	1050	1555	320h x 400w	220	210	230	5.4	230v/1ph
CF3-HR	500	1300	1830	400h x 500w	290	275	290	7.0	230v/1ph
CF4-HR	640	1550	2150	540h x 600w	480	470	485	9.2	230v/1ph
CF5-HR	780	1850	2290	680h x 750w	---	620	640	14.6	230v/1ph
CF4 ³ -HR	640	1550	2150	540h x 600w	480	470	485	5.8	400v/3ph
CF5 ³ -HR	780	1850	2290	680h x 750w	---	620	640	8.8	400v/3ph

Water Heating Coil (HW):

Model	H ₍₁₎	W ₍₂₎	L	Duct openings	Weight ₍₃₎			Heating (KW)	FLC (A)	Elec. Supply	Coil Conns
					S	P	R				
CF1-HW	420	800	1575	320h x 300w	180	170	185	1.5	4.1	230v/1ph	½” BSP(M)
CF2-HW	420	1050	1675	320h x 400w	240	230	250	2.5	5.4	230v/1ph	
CF3-HW	500	1300	1950	400h x 500w	330	315	335	4.0	7.0	230v/1ph	
CF4-HW	640	1550	2270	540h x 600w	530	520	540	10.0	9.2	230v/1ph	¾” BSP(M)
CF5-HW	780	1850	2410	680h x 750w	---	690	710	18.0	14.6	230v/1ph	
CF4 ³ -HW	640	1550	2270	540h x 600w	530	520	540	10.0	5.8	400v/3ph	
CF5 ³ -HW	780	1850	2410	680h x 750w	---	690	710	18.0	8.8	400v/3ph	

Electric Heating (EH):

Model	H ₍₁₎	W ₍₂₎	L	Duct openings	Weight ₍₃₎			Heating (KW)	FLC (A)	Elec. Supply
					S	P	R			
CF1-EH	420	800	1575	320h x 300w	180	170	185	1.0	8.4	230v/1ph
CF2-EH	420	1050	1675	320h x 400w	240	230	250	2.0	14.1	230v/1ph
CF3-EH	500	1300	1950	400h x 500w	330	315	335	4.0	24.4	230v/1ph
CF4-EH	640	1550	2270	540h x 600w	530	520	540	6.0	35.2	230v/1ph
CF5-EH	780	1850	2410	680h x 750w	---	690	710	6.0	40.6	230v/1ph
CF4 ³ -EH	640	1550	2270	540h x 600w	530	520	540	9.0	18.8	400v/3ph
CF5 ³ -EH	780	1850	2410	680h x 750w	---	690	710	12.0	26.2	400v/3ph

- (1) Height of unit not including baseframe or roof. See page 2 for details
- (2) Width of unit not including control panel, door furniture etc.
- (3) Weight for suspended unit inclusive of acoustic treatment. **Acoustic treatment not included on Plantroom or Roof units.**

Model Identification

Example of typical unit code:

CF3-1-HW-S-RB

Model size
Handling
Heating option
Location option
Control option

INSTALLATION

General Installation

Before mounting the unit into position it is advisable that consideration is given to the access requirements of the unit. A minimum access of 600mm is required at either side for service and maintenance purposes and for the removal of components.



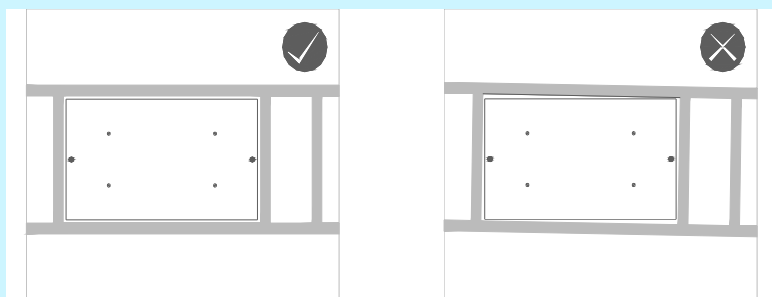
Flexible connections are NOT recommended for connecting ductwork to the unit, for noise sensitive applications we recommend that attenuators are fitted directly to the HRU casework.

Louvre's, ductwork and grilles are to be designed to suit and cater for the air volumes.

Installation must be in accordance with good engineering standards.

Failure to install the unit level will result in the following problems:

- An unlevel surface to the draintray causing potential drainage problems.
- The casework being distorted giving uneven gaps around panels, causing access doors to be wedged into place. All sections when installed are to be checked for level and that all access panels can be removed, see detail below.

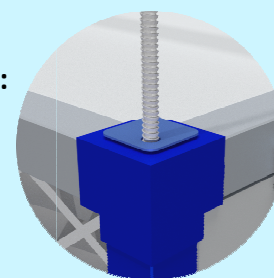
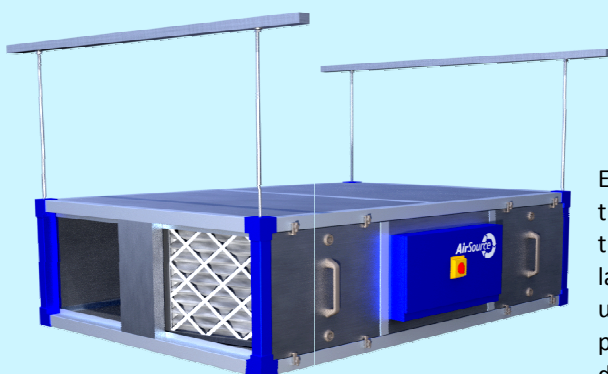


Locating Equipment

It is important to ensure that adequate access is provided around the perimeter of the AHU for maintenance. There are three possible arrangements as follows:



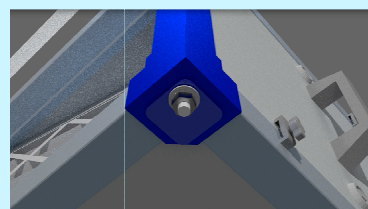
Location arrangement (S): Suitable for suspending from ceiling:



Each corner has a 13mm diameter hole for a threaded drop rod (maximum M10) to be inserted through the frame of the HRU, to be fixed with a large washer and lock nut on the underside of the unit. The top may be affixed to a stationary fixing point on the ceiling which is able to safely distribute the load.

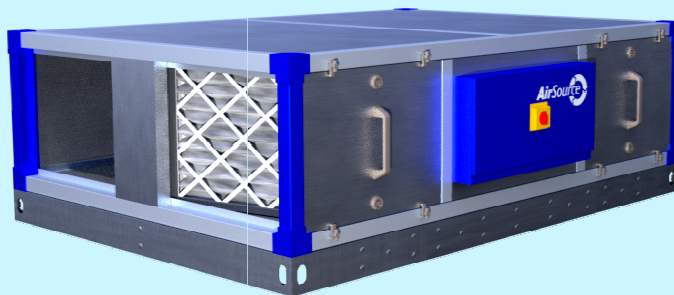
It is important to use all suspension points provided:
Models CF1,2&3 are supplied with 4 suspension points
Model CF4 is supplied with 6 suspension points

Note! This arrangement is not available in Model size



**Locating
Equipment
(continued...)**

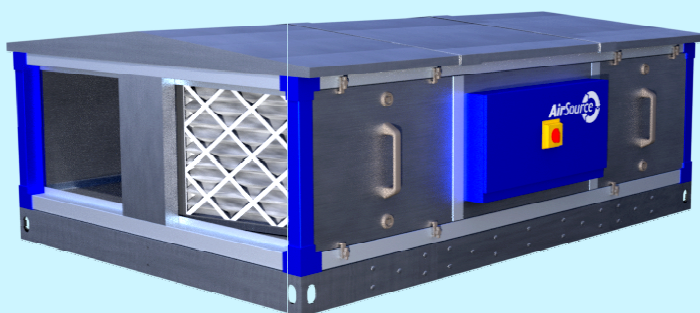
Location arrangement (P): Suitable for floor mounting internally in plantroom:



HRU supplied with a 100mm high baseframe for floor mounting. Installation must be in accordance with good engineering standards, upright and level on a prepared base. Fixing down of air handling units is at the discretion of the installer and dependant of the site conditions.

Note! This unit is not weatherproof and should not be installed outdoors.

Location arrangement (R): Suitable for External location



HRU supplied with a 100mm high baseframe and roof suitable for floor mounting. Installation must be in accordance with good engineering standards, upright and level on a prepared base. Fixing down of air handling units is at the discretion of the installer and dependant of the site conditions.

**Electrical
Connection**

Mains electrical power is required to the blue controls enclosure ensuring that the correct electrical supply is used. Outgoing terminals to remote sensors etc. are located in the lower right hand corner of the control enclosure.



Do not penetrate or obstruct the removal of any doors / access panels. Always use the cable entry positions as provided and tighten glands to provide an airtight seal.

**Ductwork
Connection**

Ensure that ductwork is adequately sealed to the A.H.U. to prevent air leakage which can generate noise. Adequate support should be provided to take the weight of attenuators and ductwork separately. In noise sensitive applications to reduce the risk of noise breakout through the ductwork we recommend that attenuators are fitted directly to the HRU casework.

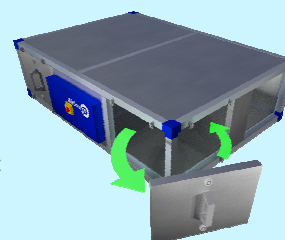
**Connection
Locations**

On some duct connections it is possible to swap the door and duct opening to move the intake / discharge through 90°. This can be achieved in the following locations.

Model	HR	HW	EH
CF1	F.A. / S.A. / E.A	F.A. / E.A.	F.A.
CF2	F.A. / S.A. / E.A	F.A. / E.A.	F.A.
CF3	F.A. / S.A. / E.A	F.A. / E.A.	F.A. / E.A.
CF4	F.A. / S.A. / E.A	F.A. / E.A.	F.A. / E.A.
CF5	NONE	NONE	NONE

F.A. = FRESH AIR
S.A. = SUPPLY AIR
E.A. = EXHAUST AIR

Note! Relocation is not possible for the Return air duct position.



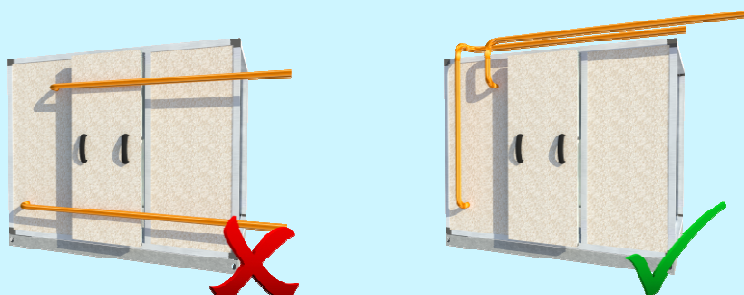
Pipework connection

The installer should ensure that all pipework is of the correct size and, if necessary, lagged. Pipework must not block or restrict access to any doors or access panels.



Care must be taken to ensure the following conditions are satisfied:-

- Water flow & return connections are correctly connected.
- All connecting Pipe work is independently supported with adequate mountings.
- Any pipe movement caused by expansion or contraction must be absorbed by flexible joints.
- Coils located at high points of the system should be regularly vented, otherwise coils may become air locked causing a reduction in duty.
- Any pipe movement caused by expansion or contraction must be absorbed by flexible joints.
- When connecting screwed fittings, it is necessary to restrain the back nut to avoid damage to the coil.



Water coils

General

Coils are designed as cartridge arrangement where they are fitted inside the casework of the air handling unit. All LPHW and chilled water coils are fitted with an air vent and drain plug on the header connections.

Drain Connections

All cooling coils include a condensate drain tray fitted with a drain connection to be connected to an appropriate trapping system. Care must be taken to ensure that the correct type of drain trap is used depending on positive / negative air pressure within the coil section (see condensate drains section). Drain lines from the trap must be pitched downwards, a slope of 1:25 is recommended.

Ensure that the water flow & return connections are correctly connected with the water entering the coil on the leaving-air side to give counterflow for improved performance.

Frost protection

Water systems should be provided with a suitable anti-freeze solution to prevent freezing. Fluid filters are also recommended.

DX coils

When brazing close to the A.H.U. casework, take care not to cause damage to the paint or pipework seals. Following completion of the refrigeration installation, a nitrogen pressure test should be carried out on the system. All refrigerant coils should be vacuum dehydrated after

Condensate drains

A condensate pump is fitted. Located in the recuperator drain tray the pump operates from float switch and discharges to a connection located at the top 100mm from the side of unit. The condensate connection is 6mm diameter push fit type which requires to be run to outside / drain with clear plastic tubing. The condensate tubing is to be fitted prior to final fixing / positioning of the unit to underside of the ceiling. **The Installer is to provide and fit tubing.**

The pump has a maximum head height of 5M & capable of horizontal distance of 20M.

In the event of a fault on the condensate pump the unit will display an alarm.

INITIAL SET UP

General



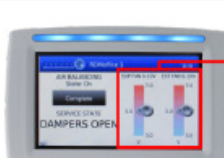

All units are supplied pre-commissioned at the factory but will require airside commissioning (by others).

Air Balancing

Air balancing mode can be enabled via an override switch on the touch screen display. When enabled, the unit operates on full recovery mode for accurate air balancing. The fans will start at the voltage last set during air balancing. Air Balancing will deactivate if other modes are turned on or through an 8 hour time out, the voltages will also be stored at this time.

AIR BALANCING MODE







- 1  Use the arrow in the bottom right corner of the screen to navigate to the Air Balancing Screen
- 2  Press the start button to bring Air Balancing Mode on. The service state will change to 'DAMPERS OPENING'.
- 3  Once open, the service state will change to 'DAMPERS OPEN' and the fans will come on at the voltage specified on the sliders on the right hand side of the screen. Use the sliders to increase / decrease the voltage to the fans until you get the required air volume.
- 4  When finished press complete to store the air balanced voltages into the units programme. When the unit is enabled, the fans will come on at the saved voltages.

The sliders have a 4 volt range for closer control on the touch screen. If the voltage you require does not fall within this range, please follow the instructions on the following page.

CHANGING THE SCALE OF THE SLIDERS



- 1  Touch the blue band at the top of the screen until a menu appears on the left hand side.
- 2  Press 'PARAMS' on the left hand side of the screen.
- 3  Select the fan design voltage to adjust and press 'EDIT'. Enter password '1234' if requested.
- 4  Enter the required voltage (between 2 and 8 volts) and press 'SET'. Press the blue band at the top of the screen and navigate back to the Air Balancing screen using the arrows in the bottom corners.



The slider on the Air Balancing screen will read 2 volts either side of the value entered (e.g. if 8 volts was entered, the slider would now read from 6-10 volts).



Time Clock

For units operating as stand alone (i.e. not through a BMS system) a seven day timer can be programmed to switch the HRU on and off as detailed below:

TIMER SETTING



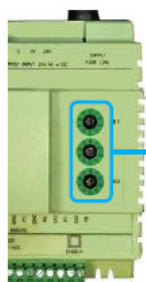
- 1  Touch the dark blue band at the top of the touch screen
- 2  Press 'Params' on the left hand side of the screen

- 3  Select the required setting to amend (e.g. 'MONDAY ON' then press 'Edit' on the left hand side (if required, enter the Login code '1234' then press 'Enter')
- 4  Delete the existing value, enter the required time between 00:00 and 23:59 and press 'Set'
- 5 Repeat the previous steps for each day

Network Connection

Where the HRU is required to be operated and monitored over a network use the following setup

DYNAMIC OR STATIC I.P. ADDRESS



Dynamic IP address:

With controller powered off, plug the Ethernet cable in and set the rotary switches on the right hand side of the controller to anything **except** 000. When the controller is powered on, the network router will assign an IP address for the controller.

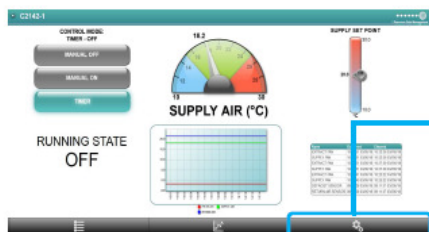
Static IP address:

With controller powered off, plug the Ethernet cable in and set the rotary switches on the right hand side of the controller to 000. When the controller is powered on, the I.P. Address and Netmask will be taken from the settings in the controller.

CHANGING I.P. ADDRESS VIA NETWORK

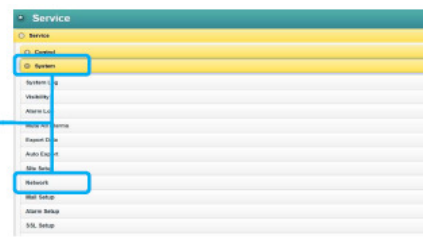
The unit will be supplied with a default I.P. Address (192.168.1.101) and Netmask (255.255.255.0) unless another address has been requested during manufacture. If more than 1 unit is supplied, their I.P. Address will go up sequentially (101, 102, 103 etc).

To change the I.P. Address, go to the controllers web interface through your web browser by typing in the controllers current I.P. Address (your computer will need to be connected to the controller via the Ethernet connection or put on the same network. It's I.P. range will need to be changed to match the controllers).



Click on the 'Cog' icon at the bottom of the screen. Enter the username 'install' and password '1234' to access the menu options.

On the menu screen, go to 'System' > 'Network'



Settings for interface eth0:
Address: 192.168.1.101
Netmask: 255.255.255.0
Default Gateway: 192.168.1.1
Name servers:
Coordinator name:
Networks to support: BACnet/IP

Enter the required I.P. Address and Netmask then press 'Set Network' at the bottom of the screen. Do not press enter until you have correctly inputted the required details as the address will change.

CHANGING I.P. ADDRESS VIA SERVICE PORT

If you are unable to connect to the controller via the network (unknown I.P. Address), the web interface can be connected to via the service port on the front of the unit.

A printer style cable (USB A to USB B) will be required and your computer setting up to be able to connect. If you require this method, contact the office and we can supply you with the driver and instructions for setting up.

Once done, you can connect to the web interface using I.P. Address 10.255.255.254 then following the same instructions as before.

OPERATION

General

The model range is available with a variety of control & software options dependant on the requirements. The software option will be selected and loaded prior to delivery. Options available are:

- Constant (fixed) airflow or Variable speed controlled by room CO₂ level.
- Tempered air or Space heating (HW or EH versions only).

Safety Circuits

The building fire detection system is to provide volt free contacts opening on fire detection. In the event of a fire being detected, all equipment being supplied or controlled from the control panel will shut down.

Unit Enable

The unit can be enabled via the touch screen display, the controllers web page or over BACnet. An override switch on the screen can be pressed to change the control type between "Manual On", "Manual Off" or "Timer" (This is a local timer option where times for each day of the week can be set in the parameters section of the touch screen as detailed on page 9). If using the touch screen timer or web browser timer, first set the option to 'ON' in parameters of the touch screen then follow the separate instructions. These timer options will not work if left 'OFF'. Leave them both 'OFF' if controlling via BACnet over a network. The unit will activate if it receives any enable signal. The touch screen display also has override button for Air Balancing mode. Selecting any of the unit enable modes will cancel the previous mode currently running. If the unit comes out of Air Balancing mode or loses power, the control mode reverts back to Timer.

Shutdown

When the unit loses its enable signal, power is removed from the start relay, cutting power to the fans and actuators. Dampers close on spring return.

Temperature

The unit will be supplied preset to a default temperature set point of 20°C which can be adjusted within the parameters tab.

Heating Mode

When in normal running mode, the Bypass Damper will modulate via a 0-10V control signal using the supply air temperature sensor to maintain set point. When at full recovery, if the temperature remains below the set point if the HRU has supplementary heating (LPHW or Electric) this will operate to maintain the set point temperature. **Note! This will depend on the HRU model selected (see page 5).**

Recovery Bypass

A fully modulating bypass arrangement is fitted to avoid heat recovery when not required, this will operate automatically.

Night Purge

Night Purge facility is available and can be enabled over BACnet, this will activate under the following conditions:

- 'NIGHT PURGE ENABLE' switched on.
- Room mounted temperature sensors reads 2°C above the set point.
- No other mode activated (normal running, air balancing, commissioning).
- Ambient temperature sensor reads 2°C below Room mounted temperature sensor (Ambient Temperature required over BACnet to point 'AMBIENT TEMPERATURE SENSOR'. Currently set to 0°C if not to be used / ignored).
- The night purge will Shut down when the temperature reaches set point.

Coil Frost Protection (HW Models)

If the temperature in the unit drops below 5°C when out of hours, the LPHW valve will open to allow water to circulate through coil. We would require pumps to be brought on and a minimum water temperature provided by the boilers as part of the building frost protection strategy with low ambient temperatures (by others).

Fault Strategy

If Fault Mode is activated, the unit shuts down and the fault count increases by 1. The unit stays off for 5 minutes before coming back on and going through its start up sequence. If the unit goes in to fault mode again, the unit goes through the same sequence. If the unit reaches 3 faults, the unit will no longer come on until the fault count is reset.

The fault count will reset in the following ways:

- The Fire Alarm is activated.
- Unit turns off from its current mode (time clock, manual or network).
- A different mode is turned on from the current one.
- 'RESET FAULT COUNT' is pressed on the touch screen.
- Fault reset over BACnet (fault should be investigated to avoid reoccurrence).

Network Comms Failure

A setting block ('COMMS HEARTBEAT') is available over Bacnet to receive a 'Heartbeat' signal from the network. If the unit does not see the signal change for 60 seconds (adjustable - 'COMMS HEARTBEAT TIMEOUT'), the unit will shut down until the signal changes. A setting block ('COMMS HEARTBEAT DISABLE') is available over Bacnet to turn the network monitoring function off if required.

Alarms

Alarm State	Unit operation
Fire Alarm	All components and fans switch off. Dampers close on spring return.
Fault Mode	All components and fans switch off. Dampers close on spring return. '3 strike' mode is activated.
Filter Dirty	Normal running.
Frost Stat*	All components and fans switch off. Dampers close on spring return. LPHW Valve opens

* Frost stat supplied as optional extra – HW models only.

MAINTENANCE

Fans

Due to the bearing type in EC fans, they are maintenance free. However, once the grease consumption period has expired (approximately 30000-40000 hours), it is necessary to replace the bearings.

Fans **(Continued)**

At least every 12 months a major inspection of the fan section should be carried out as follows, whilst observing all relevant safety regulations:



- Fully isolate electric supply to fan-motor.
- Do NOT continue until fan impeller has come to a standstill.
- Do NOT use a high-pressure jet or any aggressive, paint solvent cleaning agents when cleaning.
- Inspect and clean the fan if necessary to prevent imbalance due to ingress of dirt, using a moist (not soaking) cloth.
- Be careful to avoid using too much force and damaging the fan impeller.
- Keep the airways of the fan free to prevent danger due to flying objects.

Frequent inspection should be made of the fan. General inspection of the fan will depend on how essential the service, the application operating environment and number of hours run, but should not be more than three monthly intervals. On fans operating in dusty atmospheres or exposed to weather will need to be inspected and cleaned every 3 months.

If a fan is stationary for long periods in a humid atmosphere, it should be switched on for a minimum of two hours every month to remove any moisture that may have condensed within the motor.

Electric air **Heater** **Batteries**

Important! Ensure that the unit is switched off via the touch screen controller and then isolated.



Allow sufficient time for the heater elements to cool. Turning the unit off at the touch screen will allow the fan run on to cool the heating elements prior to isolation. Remove the access cover (adjacent to the supply duct) to reveal the heating elements, check that elements and fan inlet are clean and free from obstructions. Carry out a visual inspection of the area around the heater for signs of scorching, this would be an indication of low airflow. The thermal cutout operation can be tested by using a lighter to heat the tip of the copper sensor that is fitted close to the heater elements, this will cause the thermal cutout to trip. To reset this device open the electric heater junction box to reveal the thermal cutout, this is reset by pressing the red button.

In the event of a fault on the electric heater the touch screen will display 'Electric Heater Fault'. To reset this fault carry out a visual inspection as above. If all is clear then reset the thermal cutout if required. If this does not clear the fault then check the breakers within the blue control box and reset if required (Note! Ensure that incoming mains to the HRU is isolated prior to removing this cover).

Heating **and cooling** **coils**

Coils should be inspected every three (3) months to check for build-up of foreign matter between the fins and that coil and connections are free from leaks. Should any foreign matter be found, cleaning should be carried out with a high-pressure air line. Alternatively, the coil can be washed down with a mild solution of detergent and water, after which the coil should be thoroughly rinsed with clean water. Eliminators should be cleaned down using a soft brush and hot water, any sediment cleared out of drain tray and drain pipe, and if necessary repair any areas of corrosion.

Coils located at the high points of the system should be regularly vented.

Recuperators

Recuperators have no moving parts, hence mechanical maintenance is unnecessary.

When dealing with dusty and polluted air, filters should be regularly checked and replaced when necessary. It is possible to clean the unit with compressed air (in case of dust deposit) or by spraying it with a detergent solution in case of any greasy deposits. In order to remove greasy deposits, a water-detergent solution such as DECADE, ND-150, CHEM ZYME, PRIMASEPT, POLY-DET, oakite 86m or similar should be used, following the manufacturer's instructions.

Strongly alkaline or any products that may be aggressive to aluminium should be avoided.

Dampers

At six (6) month intervals disconnect actuator and check for freedom of movement.

Air filters

COSHH Regulations

The components of filters are inherently safe, but changing air filters could expose operators to a 'Nuisance Dust' hazard. We would therefore recommend that filter changing be carried out by maintenance personnel wearing simple dust masks, eye protection, overalls or protective clothing & gloves. Dirty filters should be sealed into plastic bags for disposal.



Disposable Filters

These are supplied in the forms of panel & bag filters and are fitted into steel frames. Panel filters are removed through the access door. Ensure that replacement filters are fitted the correct way around (the wire mesh should be on the leaving air side of the filter).

ROUTINE MAINTENANCE SCHEDULE

	Monthly	3 Monthly	6 Monthly	Annually
Fan Shaft Bearings				
Motors				
Electric Heater Battery				
Coils & eliminators				
Dampers				
Panel & Bag Filters				
Recuperator				
External Surfaces				

DECOMMISSIONING and DISPOSAL

End of life

Disassembly

Before starting disassembly, the AHU and all built-in components must be disconnected from the mains and all live connections removed by a qualified electrician. Additionally, all media-bearing components must be completely emptied. This must be conducted by a specialized company which can carry out the professional disposal of water with antifreeze, and refrigerants.

The AHU can then be dismantled on-site into individual unit modules or into its component parts. It is advisable for this to be carried out by a specialized company, familiar with the environmentally friendly disposal of all component parts.

Disassembly Guide

Doors/Panels: All exterior panels and doors are constructed using plastisol and/or galvanised steel as an exterior surface, containing fibre glass insulation within, along with a polymerised acoustic barrier (if applicable) which must both be removed from the steel casing before recycling. Removal of the rivets for each door/panel can be performed by drilling. Once the two shells of the panel have been separated, other plastic components can be removed, such as door handles and locks, for separate recycling.

Once all panels and doors have been disassembled and sorted for recycling, large components can be removed, such as fans and recuperators.

Disassembly Guide (continued) **Fans:** To remove the fans, remove all fixings from where the fan flange meets the fan plate. Dispose of the fan impeller as relevant. The motor will contain copper windings and electrical circuit boards which must be disposed of according to the WEEE (Waste Electrical and Electronic Equipment) directive inside Europe, or relevant RoHS directives.

Recuperators: To access the recuperator remove the top panels of the HRU. This will reveal the move recuperator, remove all fixings and slice all seals. The recuperator should now lift out of the HRU. Recuperators are predominantly made from aluminium.

Filters: Filters can be removed by loosening the fixings as per the normal maintenance process then recycled. Panel filters are comprised of paper cardboard, synthetic felt polymer and steel wire frame. Bag filters have a steel frame, with felt polymer comprising the main body of the filter and thus must be additionally separated into individual components for most recycling centres.

Coils: When removing coils, care needs to be taken that the coils have been isolated from the main circuit and purged properly by the relevant professionals (for coils containing refrigerants). Once the inlet and outlet pipes have been disconnected and drained, remove the fixings holding the coil into place on the access side. Coil pipes are manufactured from copper, fixed onto a steel casing and contain aluminium fins, and are widely recyclable. All pipes connecting to the coils are manufactured from copper and can be cut out with pipe cutting equipment. (IMPORTANT: Pipes must be purged thoroughly before removal).

Dampers: Dampers blades are predominantly aluminium with some plastic components, contained within an aluminium housing which includes some plastic gears.

Frame/Other fittings: The main frame body for the AHU consists of aluminium beams which can be removed and recycled. All other sheet metal parts are made from galvanised steel, stainless steel, or plastisol coated steel. Other fittings which may be recycled are the stadium knobs for holding panels, which are made from plastic. All self tapping screws and rivets are steel and Aluminium.

Sensors/cables: All cables are copper with plastic sleeve and are widely recyclable, some sensors may contain circuit boards which must be disposed of according to the WEEE (Waste Electrical and Electronic Equipment) directive inside Europe, or relevant RoHS directives.

Control panel: Within the United Kingdom and Europe, the majority of electronic components within the control panel will be required to be sent to an accredited waste handling centre with facilities for electrical and electronic equipment in order to safely recycle and manage electronic waste, under the terms of the WEEE (Waste Electrical and Electronic Equipment) 2012/19/EU directive which prohibits municipal disposal of some electrical and electronic components which may contain hazardous materials, such as lead and polychlorinated biphenyls. Outside Europe, please refer to local official guidelines on the correct process for handling electronic waste.