Carrier

United Technologies

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

Hybrid Air Terminal

36XB

ISO9001·ISO14001

Quality and Environment Management Systems Approval

Translation of original document

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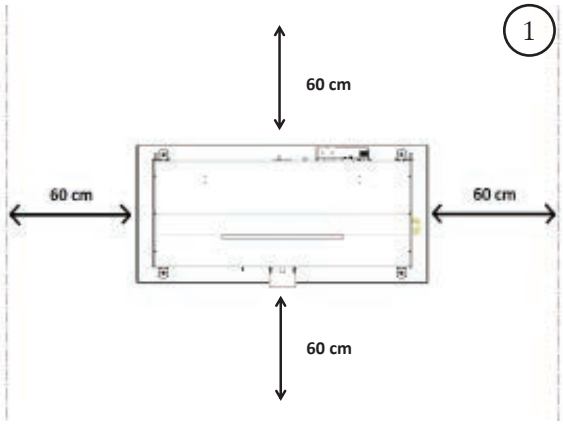

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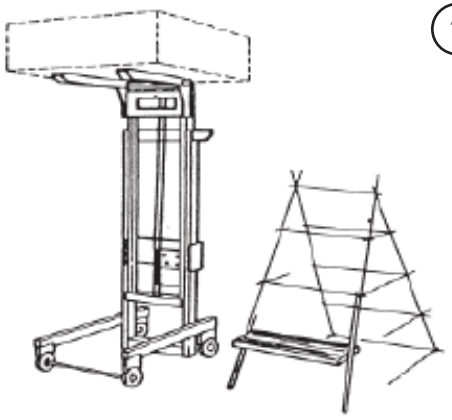

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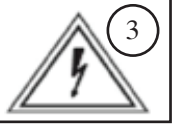

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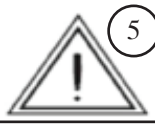

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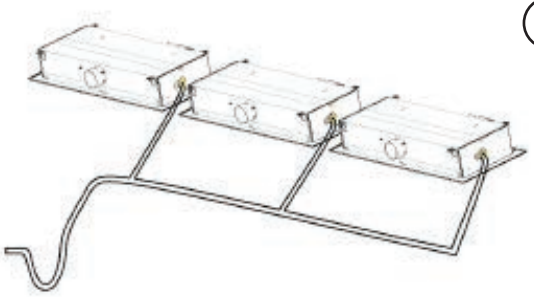

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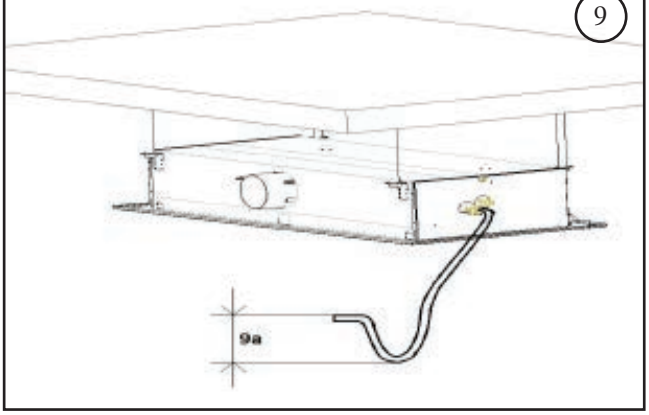

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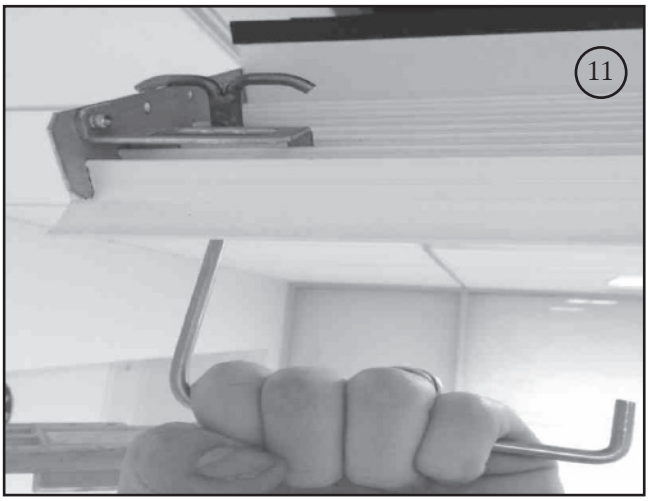

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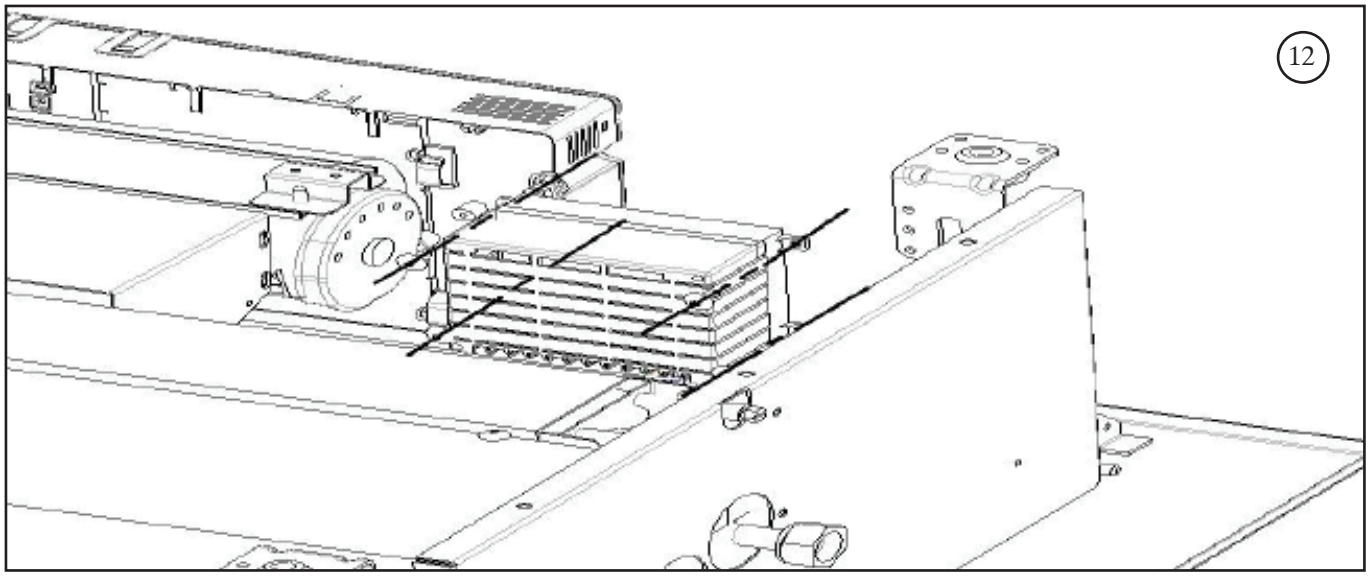

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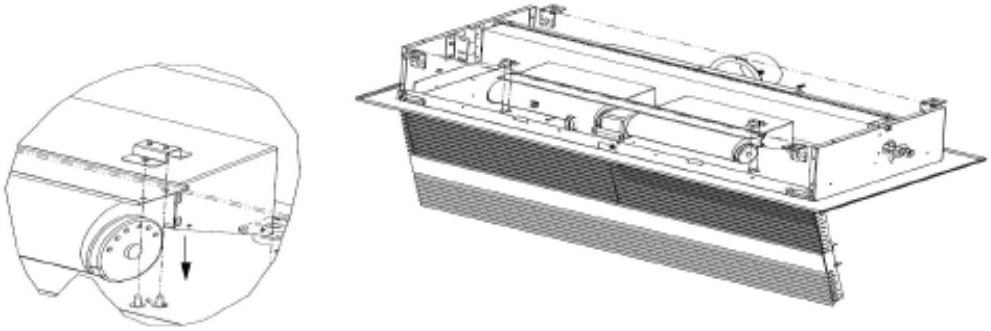

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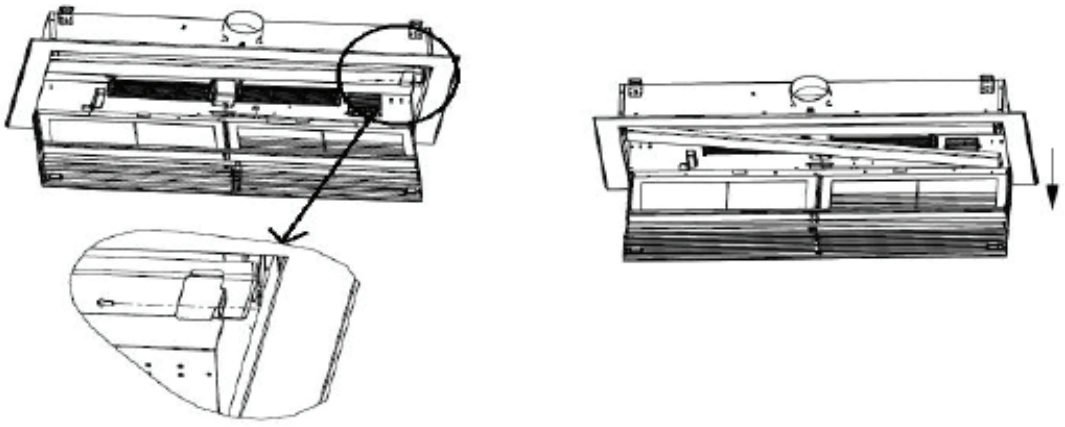

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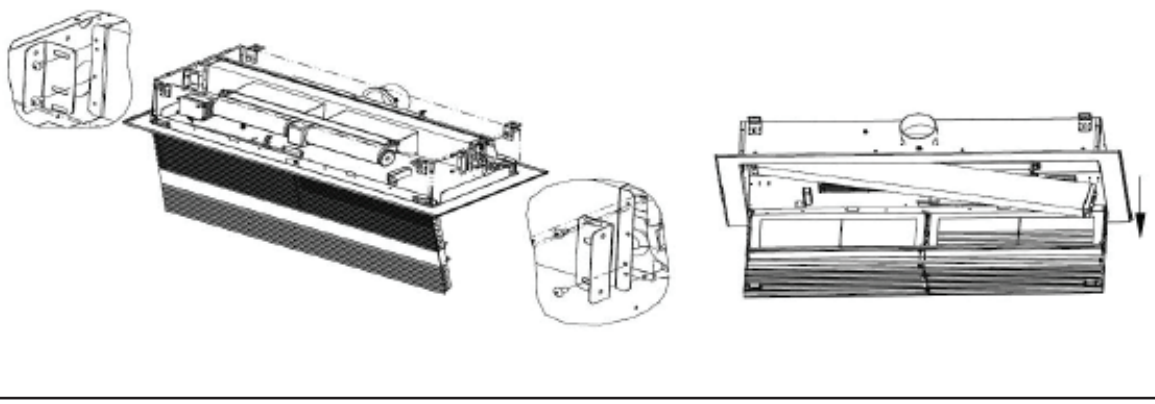

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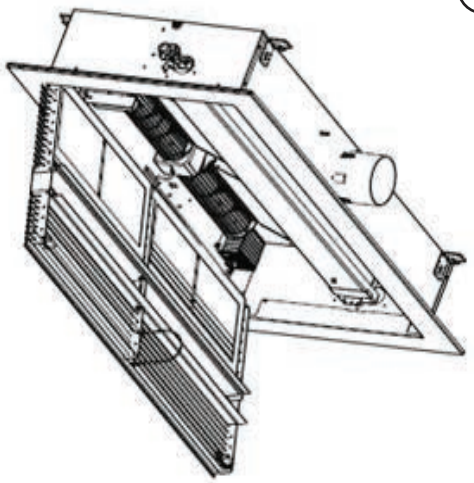

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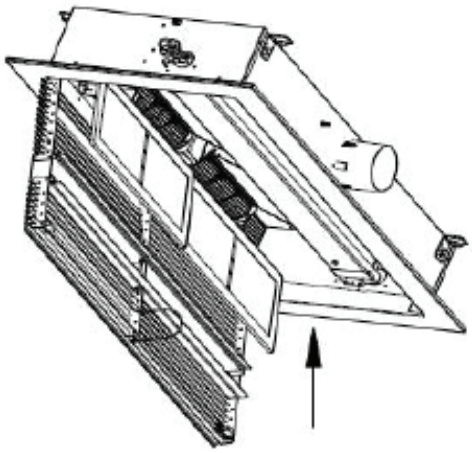

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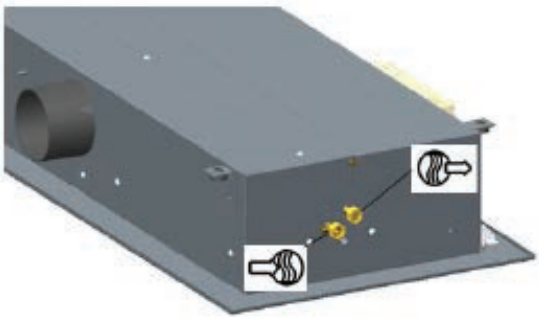

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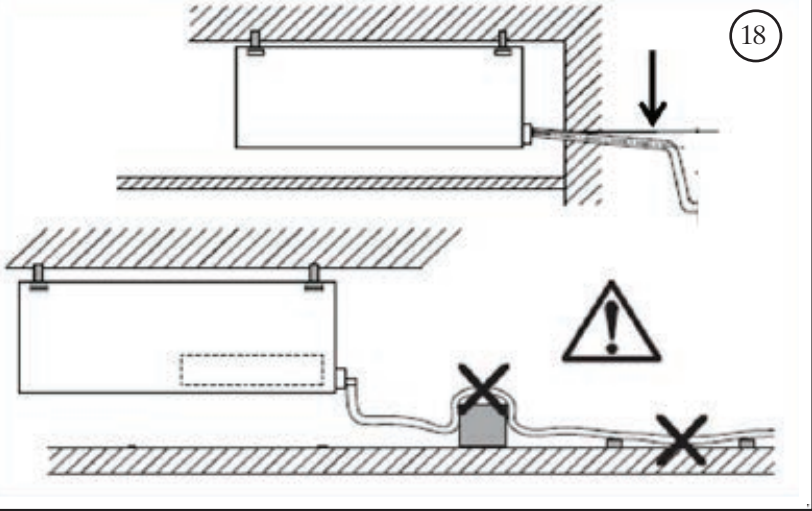

Figure titles and key:

1 Clearances for maintenance
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4 "Danger to hands" pictogram
5 "General danger" pictogram
6 Safety device (to prevent the grille falling)
7 Lifting and installation in the suspended ceiling
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1 - PRECAUTIONS

1.1 - Operating limits

1.1.1 - Cooling mode
The minimum recommended primary air supply temperature is 12°C when the unit is installed in a room with temperature 27°C (dry bulb) and 65% RH (relative humidity).

1.1.2 - Heating mode
Carrier recommends that the supply air temperature is kept below 35°C in order to avoid the risk of stratification.

1.1.3 - Operating environment
The hybrid 36XB Air Terminal has been designed to operate in an 'urban' indoor atmosphere, which is a non-corrosive, dust-free and non-marine environment. The chemical concentrations given below must not be exceeded in any circumstances:

- SO_2 < 0.02 ppm
- H_2S < 0.02 ppm
- NO, NO_2 < 1 ppm
- NH_3 < 6 ppm
- N_2O < 0.25 ppm

Do not install the unit in atmospheres which contain flammable gases, or acid or alkaline products. The copper/aluminium air coil and the internal components could suffer irreparable corrosion.

1.1.4 - Recommended water quality for water coils
Once installation is complete, then each year, it is recommend that the water is analysed for bacteria (detection of ferro-bacteria, H2S-producing and sulphate-reducing bacteria) and chemicals (in order to avoid problems due to corrosion and scaling).

The water circuit must include the elements required for water treatment: filters, additives, intermediate exchangers, purges, vents, isolation valve, etc., based on the results of the analysis.

The results of the analysis must correspond to the values given below:

- Total hardness in mmol/l: 1 < mmol/l < 1.5
- Chloride [CL^-] < 10 mg/litre
- Sulphate [SO_4^{2-}] < 30 mg/litre
- Nitrate [NO_3^-] = 0 mg/litre
- Dissolved iron: < 0.5 mg/litre
- Dissolved oxygen: 4 < [O_2] < 9 mg/litre
- Carbon dioxide [CO_2] < 30 mg/litre
- Resistivity 20 Ohm·m < Resistivity < 50 Ohm·m
- pH 6.9 < pH < 8

1.2 - Maintenance requirements

The installer must leave sufficient space around the unit to facilitate maintenance: Fig 1. The installer must also provide access to the control components, power connection and fresh air duct: Fig. 1.
Some components are accessed by opening the air diffusion grille.
During any intervention, it is essential that the safety system is put back in place: Fig. 6.

1.2.1 – Procedure for opening the grille.
The grille is held in place at two points, at each end of the diffuser in the supply air zone: Fig 2

- Insert the special Carrier tool (ref: 36XB500085M-) in the third slot on the supply air side: Fig 10
- Pull downwards until the grille opens on the left-hand side and then carry out the same operation on the right-hand side: Fig 11
- Remove the safety device.

To close the grille, the safety device must be put back in place and the grille pushed fully back in.

Note: The grille must only be opened with the Carrier tool specially provided: Fig.10 and 11.
If this instruction is not observed, Carrier cannot be held liable for any damage to the unit or to its appearance or injury to persons caused by incorrect handling.

1.3 - Delivery

Once received, check the condition of the equipment; if any damage caused during transport is observed, the resulting claims must be sent to the shipping company in writing. Only unpack when final installation is to take place, and do so as close as possible to the installation location. Do not place heavy tools on the package whilst waiting.

1.4 - Storage

The units will be delivered on a pallet, and must be stored in a sheltered, dry location.

1.5 - Supply voltage 230 V ± 10% - 50 Hz

Check that the supply voltage and frequency match those on the unit nameplate.

CAUTION: Carrier will invalidate the warranty if these points are not respected, or if modifications have been made to the original electrical connections.

2 - SAFETY CONSIDERATIONS

NOTE: before performing any work on the unit, disconnect the power to the unit and to any accessories.

2.1 - General

Installing, commissioning and servicing of the various system components (unit, control system, hot and cold water system, air distribution system) can be dangerous unless certain aspects of the installation, such as the presence of mains electricity or the presence of hot or cold water in the air treatment equipment, are taken into account. Only appropriately trained and qualified technicians and installers are authorised to install and commission this equipment.

During servicing work, it is essential to apply all recommendations and instructions given in the maintenance manuals, on labels or in the instructions delivered with the equipment, and to comply with any other relevant instructions.

Definition of the pictograms used:
- Electrical hazard: Fig. 3
- Danger to hands: Fig. 4
- General danger: Fig. 5

Comply with all safety rules and regulations currently in force. Use safety goggles and safety gloves. Take care when moving or positioning the equipment.

2.2 - Protection against electrocution

Only electricians qualified to the level recommended by the IEC (International Electrotechnical Commission) in its standard IEC 364, corresponding to Europe HD 384, France NFC 15 100 and UK IEE Wiring Regulations, may access the electrical components. In particular, it is mandatory that all power supplies to the unit are switched off before any work is carried out. Switch off the main power supply using the disconnection device (not supplied by Carrier).

IMPORTANT: The constituent components of the various control systems available include electronics. As such, they may generate or be harmed by electromagnetic interference unless they are installed and used in accordance with these instructions. The components making up these control loops conform to the electromagnetic compatibility requirements for residential, commercial and light industrial environments. They also comply with the low-voltage directive.

2.3 - General recommendations for installation

IMPORTANT: controllers must have a disconnection device upstream (for example a double-pole circuit breaker). If necessary, an easily accessible emergency stop device (such as a punch-button switch) must cut off the power to all devices. They must be sized and installed as per the recommendations of IEC 364, corresponding to Europe HD 384, France NFC 15 100 and UK IEE Wiring Regulations. These devices are not supplied by Carrier.

As a general measure, the following rules must be applied:

Overcurrent protection upstream	
Device without electrical heater	T2A
Device with electrical heater <2000W	T10A
Device with electrical heater >2000W	T16A

- Units must be provided with earth leakage current protection upstream (not supplied by Carrier).
- A light-coloured marking must be made on the disconnect device to show the devices connected to it.
- The wiring of the components which make up the different control systems and the communication buses must be carried out in accordance with the latest rules and regulations by professional installers.
- The power supply cable must be double insulated and secured with a pull-out resistant fastener, or the cable tie supplied with the Carrier digital controller. The power supply cable must be clamped on the outer insulation.
- The constituent components of these various control loops must be installed in an environment which complies with their index of protection (IP).
- The maximum level of pollution is normally pollutant (level 2) and installation category II.
- The low-voltage wiring (communication bus) must be kept physically separate from the power wiring.
- In order to avoid interference with the communication links:
  - Keep low-voltage wiring away from power cables and avoid using the same cable run (a maximum of 300 mm must be shared with the 230 VAC, 30 A cable).
  - Do not pass low-voltage wires through loops in the power cables.
  - Do not connect heavy inductive loads to the same electrical supply (circuit breaker) used by controller or power module equipment.
  - Use the screened cable type recommended by Carrier and make sure all cables are connected to the controllers and power modules.

2.4 - Recommendation relating to the 36XB Hybrid Air Terminal control

IMPORTANT: It is not permitted to connect several 36XB units to the same control device (wall thermostat, electronic NTC, etc.).

2.5 - Conformity

This equipment has been declared compliant with the essential requirements of the following directives:
- Electromagnetic compatibility: 2004/108/EEC
- Low-voltage directive: 2006/95/EEC.

3 - INSTALLATION OF THE UNIT

3.1 - Coordination between the unit and suspended ceiling

The positioning must not create an obstacle that may lead to an unequal distribution and/or return flow of the air. The ceiling must be sufficiently even to allow simple installation of the unit, with no risks.

The supporting structure must be able to bear the weight of the unit and prevent deformation, failure or vibrations during operation.

INSTALLATION PRECAUTIONS: When installing the unit, check that no construction debris remains in the ducts as this could cause damage to the unit.

3.2 - Installation procedure

- Place the 36XB on the ground, in the location where it is to be installed in the suspended ceiling. For installation in the suspended ceiling, a folding ladder and a lifting platform will facilitate installation of the units: Fig.7.
- Check that the clearances around the unit are sufficient to allow easy maintenance. Refer to the plans under “Maintenance requirements”.
- Mark the position of the threaded rods in the ceiling (it may be a good idea to create a drilling template if there are several units to be installed). The method for securing the threaded rods, not supplied by Carrier, depends on the type of ceiling (maximum diameter of the threaded rod = 10 mm). Once the threaded rods are anchored to the ceiling, screw in the first nuts.

ATTENTION: Never lift the unit using the coil connections, the valves/hoses, wiring harnesses, or the condensate pan.

Lift the unit and engage the threaded rods, fit the nuts and tighten them securely.

NOTE: Do not fully tighten the nuts at this stage and do not lock the device against the tile (leave a space between the tile and the device). The nuts will be adjusted after the hose or pipe system has been connected and the unit levelled.

At this point, adjust the position of the device; the device must be perfectly level.

Condensate drain pipe: Fig. 9.
Use a hose with an interior ø of 16 mm and create a slope to ensure that the condensate pan can always drain freely, with no obstacles on the route: Fig.18. Provide a siphon of at least 50 mm (9a) to prevent gas or drain odours seeping into the suspended ceiling.

If multiple units are connected to the same manifold, a siphon should be used, see Figure 8. Before starting up the unit, check that the water flows correctly from the internal condensate pan by pouring water into it. If it does not, check that the pipe is tilted at the correct angle and look for potential causes of the problem encountered.

When the installation is ready (when the 36XB unit is secured to the ceiling, the air connections complete, the piping manifolds with isolation valves ready, and the electrical installation prepared), connect the piping (Carrier recommends using the flexible hoses which can be provided as accessories). Each hose is fitted with a 1/2” gas union nut, depending on the model. Remember to fit a gasket between the union nut and the stop valve (gasket not supplied by Carrier).

When all units are installed, open the isolating valves on the manifolds, and purge and then pressurise the circuits. To purge the coils, slightly undo the purge screws. The installation is now operational.

ATTENTION: All valves and components connected to the unit on which condensation may form must be insulated (not supplied by Carrier).

NOTE: Only power up when all units are connected and earthed.

3.3 - Removal procedure

Disconnect the power for the device, using the circuit breaker (not supplied by Carrier) fitted for this purpose during installation.

- Disconnect the power supply and connection cables.
- Close the isolation valve on the manifolds.
- Drain the isolated unit using the purge device provided.
- Disconnect the hydraulic hoses by unscrewing the union nuts.

ATTENTION: As the hydraulic hoses are not fitted with valves, ensure a container is provided for draining the coil.

- Disconnect the fresh air intake duct.
- Disconnect the condensate drain hose and drain the siphon into a container.
- Gently raise the unit, and unscrew the 4 nuts on the threaded rods Lower the unit.

4 - COMPONENTS

4.1 - Fan motor assemblies

4.1.1 - Removal procedure for the fan assembly

CAUTION: Before any work on this product, it is essential that the power supply to the unit is disconnected.

If the fan motor assembly is not functioning correctly, the entire fan motor assembly must be removed and replaced:
- Open the grille: Fig. 10-11
- Remove the safety device: Fig 6
- Disconnect the fan motor assembly electrical connections (power and control for variable speed motor).
- Remove the electronic control unit from the fan (secured by screws): Fig. 12
- Remove the 4 screws supporting the fan: Fig. 13
- Detach the complete fan motor assembly.
- Once work is complete, refit the assembly in the reverse order to removal.

NOTE: Ensure that the fan wheels are not damaged when removing/replacing the fan motor assembly, as this can affect balance.

For a variable speed motor, ensure that the power cable is separated from the control cable, and keep them as far apart as possible.

4.2 - Water coil

4.2.1 - Removal procedure for the water coil

CAUTION: Before any work, it is essential that the power supply to the device is disconnected.

- Close the isolation valves on the manifolds.
- Drain the isolated unit using the purge device provided.
- Disconnect the hydraulic hoses by unscrewing the union nuts.
- Remove the actuators, taking care to mark the cold valve and hot valve.
- Disconnect the condensate drain hose held in place by a collar (not supplied by Carrier).
- Remove the water flow control valve bodies. Depending on the configuration of the 36XB, the valve coupling may be fitted with a hot/cold changeover switch which must not be removed.
- Open the grille: Fig. 10-11.
- Remove the safety device: Fig 6.
- Remove the bracket for the condensate pan, then the pan itself:
  Fig. 14.
- Remove the four retaining screws for the water coil: Fig. 15.
- After work on the pan/coil assembly is complete, refit the assembly in the reverse order to removal, ensuring that all the gaskets are replaced (new gaskets fitted) and that the coil inlet/outlet connections have been made water-tight using a suitable sealing compound.
- Purge all air from the coil during refilling.

ATTENTION: It is recommended that the valve bodies are tightened on the coils with great care (25 N·m is sufficient) to ensure no damage is caused.

4.2.2 - Water inlet/outlet positions

Water inlets/outlets, all sizes: Fig. 17
Left-hand connections: Fig 17a
Right-hand connections: Fig 17b.

ATTENTION: Ensure the flow direction indicated by an arrow on the valves is observed, based on the connection and type of valve.

4.3 - Condensate pan

4.3.1 - Removal procedure for the condensate pan:

CAUTION: Before any work, it is essential that the power supply to the device is disconnected.

- Open the grille: Fig. 10-11
- Remove the safety device: Fig 6
- Remove the condensate drain piping
- Remove the bracket for the condensate pan, then the pan itself:
  Fig. 14.
- Once work on the assembly is complete, refit the assembly in the reverse order to removal.

Note: To clean the condensate pan, refer to the relevant local legislation.

4.4 - Fresh air connection spigot

This is fitted in place from inside the unit. The duct must be attached to the spigot using a clamp or adhesive; it must not be screwed in or riveted.

ATTENTION: When the fresh air duct is fitted, make sure the spigot is fully inserted to ensure the best possible seal.

Ensure that the maximum supply air temperature does not exceed 60°C.
Ensure that the device is not lifted using the spigot. Do not place any loads on this component, and take care not to damage it using tools or during installation.

4.5 - Air filter option and access

4.5.1 - Description

The Carrier Hybrid Air Terminal can be equipped with a disposable filter as per standard EN 779.
Fire classification for the medium is M1, metal wire frame.

The filter must be released when the grille is opened:

- Open the grille: Fig. 10-11
- Remove the safety device: Fig 6
- Remove the filters and replace them: Fig. 16
- Once work is complete, refit the assembly in the reverse order to removal.

4.5.2 - Air filter replacement

The filter must be replaced regularly. The service life of a filter depends on the level of clogging, which varies according to its conditions of use.

If a clogged filter is not replaced, the pressure drop increases and it may start to release its stored dust, adversely affecting the performance of the unit (reduction of the air flow rate).

4.6 - Fresh air flow controller option

The 36XB Hybrid Air terminal can be equipped (as an option) with a fresh air flow controller with a variable flow rate from 0 to 41.6 l/s (0 to 150 m^3/h).

This is connected to the Carrier digital controller and can adjust the fresh air intake flow rate in two ways

- Either to a fixed flow rate set by the installer, which can be reconfigured as required
- Or based on the CO_2 rate; in this case, it is connected to a CO_2 sensor via the Carrier digital controller (the CO_2 sensor is located on the air return).

NOTE: For a fresh air flow controller with a variable flow rate, the upstream pressure in the fresh air duct must be at least 180 Pa.

4.7 - Water flow control valves option

The bodies of the valves are designed to withstand an operating pressure of 16 bar.

4.7.1 - Valve actuator

Carrier offers several types of actuator as a standard or special option:

- On/Off 230 VAC.
- 3-Point 230 VAC.
- On/Off 24 VAC.
- 3-Point 24 VAC.
- 0-10 VDC, supplied with 24 VAC.

To enable the installation to be filled with water, the pipework to be hydraulically balanced and the units to be purged, the actuators must be powered so that valve opening can be requested, either via the wall thermostats, or by the BMS.

4.7.2 - Replacement procedure for the actuators

The valve actuators on both the chilled water and/or hot water valves may be replaced if any fault is observed.

- Before any work, it is essential that the power supply to the device is disconnected.
- Disconnect the actuator power supply cable:
  - Actuator used with the digital controller Carrier:
    Disconnect the power supply cable from the actuator equipped with a quick connector
  - Actuator used with the electronic thermostat:
    Remove the protective plastic cover held in place by 2 screws.
    Disconnect the power supply cable from the actuator connected to the quick connector; to do so, press the tab on the terminal in question with a screwdriver and pull out the wire.
- Remove the actuator and then refit in the reverse order.

ATTENTION: Tighten the actuator on the valve body using a maximum torque of 25 N·m.

4.7.3 - Replacement procedure for the valve bodies

CAUTION: Before any work, it is essential that the power supply to the device is disconnected.

- Close the isolation valves in the pipework.
- Drain the isolated unit using the purge device provided.
- Disconnect the hydraulic hoses by unscrewing the union nuts.
- Uncouple the actuators, taking care to mark the cold valve and hot valve.
- Disconnect the condensate drain hose held in place by a collar (not supplied by Carrier).
- Remove the water flow control valve bodies.
  Depending on the configuration of the device, the valve coupling may be fitted with a hot/cold changeover switch which must not be removed.
- Fit the new valve body to the coil (fit new gaskets).
- Refit the condensate pan/coil assembly.
- Refit the actuators, taking care to ensure that they are correctly secured to the valve body.
- Reconnect the flexible hoses by screwing the union nuts back on. Tighten all the hydraulic connections ensuring that all the gaskets have been replaced and refitted (tightening torque: 20 Nm).
- Check that the water purge for the coil is in the closed position.
- Open the isolation valve on the manifolds and purge the coil.
- Power up the device once it has been confirmed that no leaks have occurred.

ATTENTION: When fitting the new valve body, check that the fluid flow is in the direction shown by the arrow on the valve body. If fitted in the reverse direction, the valve body will be damaged.

4.8 - Hose option

Ensure the following bend radii are respected:

- Non-insulated hose: 72 mm,
- Insulated hose: 106 mm.

4.9 - CO_2 sensors option

4.9.1 - Removal procedure for the CO_2 sensor

CAUTION: Before any work, it is essential that the power supply to the device is disconnected.

- Open the grille: Fig. 10-11
- Remove the safety device: Fig 6
- Disconnect the cable from the sensor
- Remove the rivets holding the sensor in place.
- Replace the sensor
- Once work is complete, refit the assembly in the reverse order to removal.

4.10 - Return air sensors option

4.10.1 - Removal procedure for the return air sensor

CAUTION: Before any work, it is essential that the power supply to the device is disconnected.

- Open the grille: Fig. 10-11
- Remove the safety device: Fig 6
- Cut the cable ties securing the sensor in place
- Disconnect the sensor
- Replace the sensor
- Once work is complete, refit the assembly in the reverse order to removal.

4.11 - Supply air sensors option

4.11.1 - Removal procedure for the supply air sensor

CAUTION: Before any work, it is essential that the power supply to the device is disconnected.

- Open the grille: Fig. 10-11
- Remove the safety device: Fig 6
- Cut the cable ties securing the sensor in place
- Disconnect the sensor
- Replace the sensor
- Once work is complete, refit the assembly in the reverse order to removal.

No.10005, 09.2014 - Replace No.: New.
The manufacturer reserves the right to change the product specifications without notice.

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