



39 HQM Central Station Air Handling Units

Advance Installation, Operation and Maintenance

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1- SAFETY CONSIDERATIONS

1.1 – General

The 39HQM air handling units (AHUs) has been manufactured in Carrier factory in the Kingdom of Saudi Arabia, under the guidelines and policies of Global Carrier Corporation. In order to guarantee safe operation and use of the unit, please carefully read and observe the instructions in this document and pay special attention to the warnings that apply to this unit. Any modifications in the design and/or installation of the AHU that are carried out without discussion with Carrier Corporation and without advance written agreement will result in the loss of the right to any warranty claims and any claim for injury to personnel as a result of these modifications.

Maintenance procedures may only be carried out by qualified personnel.

1.2 – Applications

The AHU is designed for the movement and conditioning of air, unless otherwise agreed during the design stage.

1.3 - Instruction Types

The following warning labels and labels with text are used.

Lifting point



This label shows where the AHU must be lifted and is positioned on the support beam.

Forklift Handling

All sections are produced with a chassis and placed on a wooden skid put into position using a forklift.



- Place the forklift under the center of gravity of the section for equilibrium and maximum safety.
- Confirm that the forklift has adequate lifting capacity for each section to be moved.

Earthing



This label indicates where the AHU must be earthed and is on one of the support beams beneath the casing in the fan section.

- The electrical components in the AHU must be earthed, except for components with double insulation and/or components with a supply voltage below 50 V.
- The electrical components must be installed in accordance with national and local regulations.

Rotating parts



This label indicates that there are rotating parts behind this access cover, door or panel which may cause injury. The components that include rotating parts are the fan and heat recovery wheel. If there are special customer-specific components behind doors, access covers or panels that include rotating parts and pose a potential risk, this is also indicated by this label.

Hot surfaces



This label indicates that there are components behind this access cover, door or panel that can cause serious burns when touched.

The components that may have hot surfaces are the steam humidifier, steam heater and the electric heater. If there are special customer-specific components behind doors, access covers or panels that have hot surfaces and pose a potential risk, this is also indicated by this label.

Electrical voltage



This label indicates that there are electrical components behind this access cover, door or panel that may be dangerous for the user/installer. Only personnel qualified in accordance with NEN 3140 is permitted to carry out work on these components. The label is attached to the access cover for the electric heater control box.

Removal of transport brackets

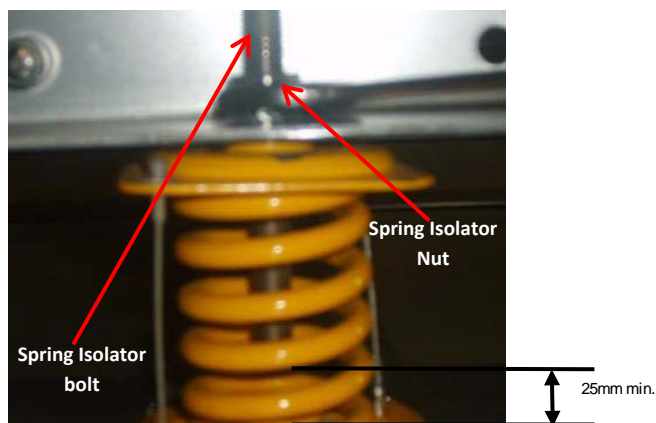
This label is located at the bottom of the fan section. It indicates that the transport brackets must be removed during commissioning before the fan is started up.



Before starting the unit removes the 4 fan shipping clamps.

Untighten spring isolator bolt

Partially un-tight (loose) the nut of spring isolator as shown below. Move up the isolator bolt min 25 mm, using Allen or vise grip, this will disconnect the spring bolt from bottom Spring Plate, Tighten again the nut for all spring isolators so that the Fan Motor Base is secured to the top spring isolator plate. Label is located at the inner skin of the access door of the fan section.



Central data



Sample of rating plate, above, contains the data for the AHU, such as Project Name, Section number, power

supply, air flow etc. the Rating Plate is normally located on the access cover or the door of the fan assembly.

Opening the fan door



Before opening doors, switch off and de-energize the fan, and ensure that it has stopped rotating. (Minimum of 2 minutes)

This label is positioned on the outside of the door or access cover of the fan assembly. This label warns that the fan must have been switched off and de-energized for a minimum of two minutes before the door or access cover is opened.

Caution: All doors and access covers must be closed before starting up the AHU.

1.4 - Disposal of Parts/Materials

- The packaging material must be disposed of in a responsible manner and in accordance with local regulations.
- Components that are replaced must be disposed of as described above.

2 - TRANSPORT AND LIFTING INSTRUCTIONS

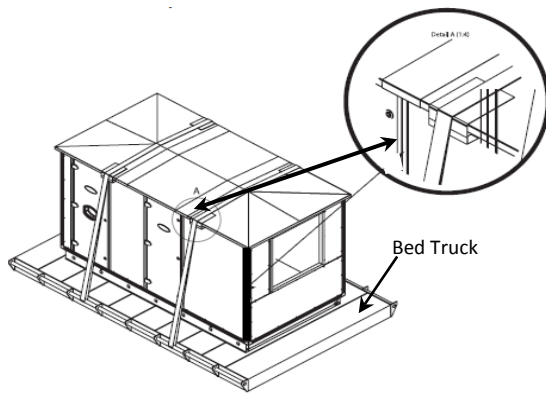
2.1 - General

Transport and lifting of the AHU must always be in accordance with the instructions below. If these instructions are not observed, irreparable damage may occur to the unit, and people in the immediate vicinity of the unit are also endangered. Carrier does not accept any responsibility if these instructions are not observed. Transport and lifting must be carried out by qualified personnel. Lifting must be carried out in accordance with local regulations and with the help of certified lifting aids.

2.2 - Transport and Storage

Lifting of the AHU is only permitted under the designated lifting points. Wooden skid is supplied with each section for lifting the AHU. This applies to transport as well as storage.

2.3 - Roof Edge Protection During Transport (Outside Installation)



Roof edge transport protection

During transport by truck the units are attached to the loading surface with tie ropes, pulled across the unit towards **the side edges of the truck**.

On external units, to protect the roof edge from distortion by the tie ropes protection plates are added.

2.4 – Offloading and Hoisting

Depending on the dimensions of the AHU and the situation on site, the AHUs are supplied in previously agreed transport sections.

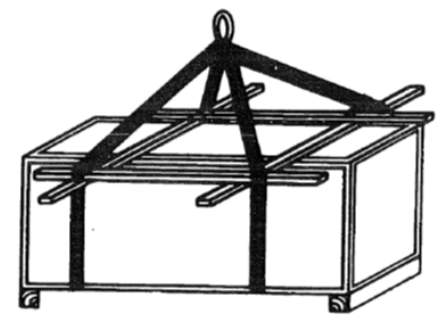
Before proceeding with the transport and installation of the casing sections, always consult the applicable dimensional drawing which shows the dimensions and weights of the sections, as well as the installation sequence.

The weight is given on each transport section. Each transport section is equipped with a sub frame with four lifting points. These points are marked by the label shown below.



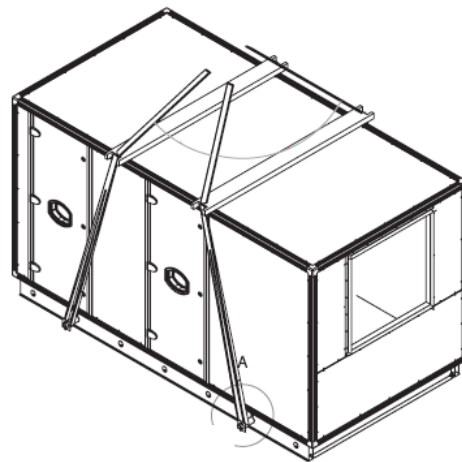
For offloading as well as hoisting lifting cables can be attached

- 1) Under the wooden skid OR



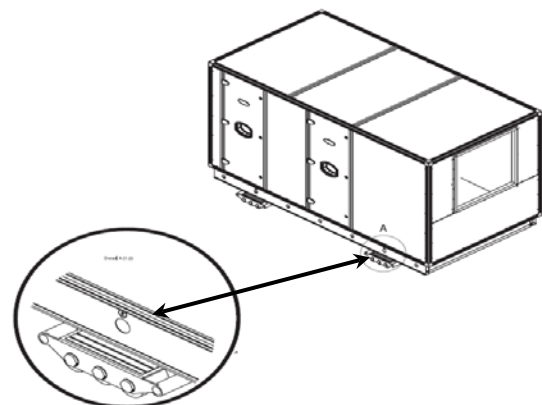
- 2) To the lifting bars. (Lifting bars are not supplied by factory)

Evenly positioned spacer bars should be used between the lifting cables to prevent damage to the top of the unit and ensure that no excess pressure is applied to the side panels. For hoisting please ensure that the weight is evenly distributed.



For hoisting please ensure that the weight is evenly distributed.

2.5 - Horizontal Transport



For horizontal movement pallet lifters or transport skids can be placed under the installation frame or under the lifting bars. It is important that these support the lifting points. At no time should the cross beams at the ends

of the unit sections be used for jacking or tracking the AHU. FOR HORIZONTAL TRANSPORT ALWAYS PROVIDE SUPPORT UNDER THE LIFTING POINTS.

- The use of bars / tubes as rollers can result in damage to the installation frame.
- Roller should be adequate to support the weight of the AHU section
- The roller used for AHU horizontal transport MUST BE FREE ROLLING.
- The rollers are not supplied by factory.

3 - AHU STORAGE REQUIREMENTS

3.1 – Short Term Storage

To properly store the AHU, it is critical to meeting the storage requirements as per the following;

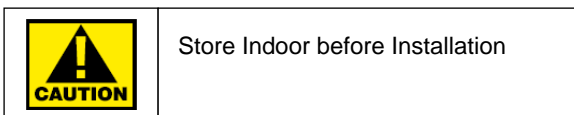
3.1.1 Indoor storage weather: < 70% RH, < 40° C, all AHUs sections are clearly label with sticker mentioning “STORE INDOOR”

3.1.2 Well ventilated store room precaution to prevent internal condensation that can lead to rust.

3.1.3 Clean and non-corrosive environment.

3.1.4 Storage platform to be smooth, minimum vibration and level.

3.1.5 Ensure properly packed or cover the AHU, ensure the openings of the AHUs like the damper, fan and coil opening are closed so that no dust, no external material or animal allow to enter the AHU.



3.2 – Long Term Storage

Storage period that took longer than 6 months inside the controlled environment, as explained above in Normal storage, less than 6 months; still require serious and proper preservation actions during the storage period

3.2.1 Belts to be removed and kept safe with proper tag of the AHU in conditioned space, belts shipped loose, as standard in production of 39HQM and packed in plastic bag placed inside fan section.

3.2.2 Filters to be removed and stored in a proper packed & conditioned space.

3.2.3 Periodically check fan bearing to see if re-lubricate is required

3.2.4 Periodically unload the bearing by turning the fan wheel by hand. This operation prevents bearing corrosion by redistributing the bearing grease.


After long term storage, grease should be purged from the bearing and fresh grease injected prior to start-up.

3.2.5 Motors should be stored in a clean, dry environment protected from moisture.

3.2.6 Periodically check of the AHU packing to ensure no sand/dust accumulation.

4 - CHECKLIST OF START-UP CHECK POINTS

The table below shows a general overview of the planning required to facilitate the installation of the AHU. The following pages give a more detailed description of the individual

	<p>Before starting up the AHU ensure that the components have the correct connection voltage and connect them in accordance with the regulations. The doors and access covers must be closed and the AHU must be earthed.</p>
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4.1 PRELIMINARY INFORMATION

MODEL NO.	JOB NAME
SERIAL NO.	START-UP DATE
AHU LOCATION Indoor () Outdoor ()	TECHNICIAN NAME
ADDITIONAL ACCESSORIES	

4.2 PRE-START-UP

PRE-START-UP Checklist	Yes	No	NA
Remove packaging and any construction debris.			
Internal and external panels are in good condition – no damage.			
Are damper operations correct?			
Are proper air filters in place?			
Is heating coil, if any, in correct connection side?			
Is cooling coil, if any, in correct connection side?			
Is there any leakage in the cooling coil?			
Is the droplet eliminator, if required, already installed?			
Has water been placed in drain pan to confirm proper drainage?			
Insure drain trap connections / dimensions are correct.			
Insure the heat wheel is rotating in correct direction.			
Insure the heat wheel sealing is correctly installed.			
Insure the heat wheel gasket is correctly installed.			
Remove fan transport brackets			
Untighten spring isolator bolt			
Check fan bearings and shaft(s) for tightness.			
Hand turn fan to ensure no rubbing with housing.			
Have fan and motor pulleys been checked for proper alignment?			
Do the fan belts have proper tension?			
Are all wiring terminals to fan motors and heaters tight?			
Is duct connected to unit in proper way? (straight duct after fan discharge is 2.5 fan diameter)			
Verify wiring is correct for application (voltage, etc.) per component label.			

4.3 START-UP

If this unit is used for construction conditioning without ductwork, ensure balancing is redone and filters replaced once construction is complete.

- Verify wiring is correct for application (voltage, etc.) per component label.
- Ensure correct fan rotation.
- Ensure all water inside air handler is in condensate pan.
- Check for vibration levels.
- After air and water balance and at least 10 minutes running time, record the following measurements:

Check indoor fan speed RPM		Entering / Leaving water temp.	
Air Entering Condition (DB / RH / WB)			
Air Leaving Condition (DB / RH / WB)			

NOTES:

5 – STARTUP INSTRUCTIONS

5.1 – Casing

A4 Sheet is attached to the unit for the unit data such as project name, section number etc. This usually located on the access cover or door of the fan compartment.

5.1.1 Casing Panels

Check the AHU panels for any damage. Any dirt or stains must be removed from the surface to prevent possible long-term damage. Building debris left on the roof must be removed. Dirt can be removed with water and a mild household soap solution. Damage can be repaired by thoroughly cleaning the affected surface, then treat and paint as necessary. If applicable check the sealing joints and repair if required.

5.1.2 - Doors and Access Covers

Check the operation of door handles, locks and movement of the hinges. For outside installation of the AHU check the storm cord.



Doors and access covers must always be closed before starting the unit.

5.1.3 - Flexible Connections

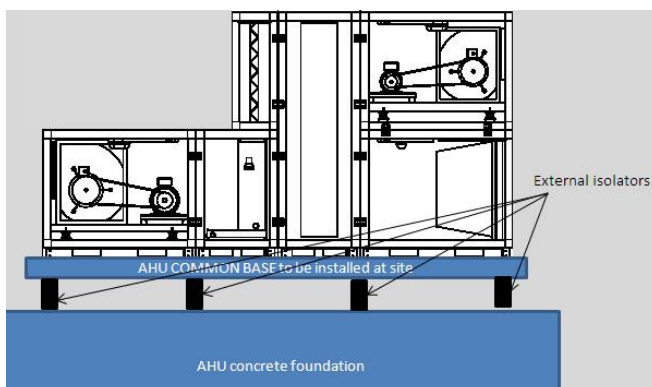
Check that all flexible connections are attached to the AHU. If necessary, tighten loose screws.

5.1.4 - Earthing

Ensure that the AHU has been earthed correctly and in accordance with local regulations. A label on the support frame indicates where the unit should be earthed.

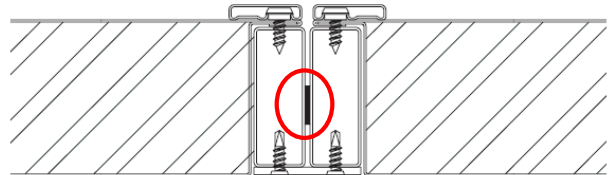
5.1.5 - AHU Installation and Connection

The floor in the room where the AHU is installed must be level and flat to prevent connection problems.



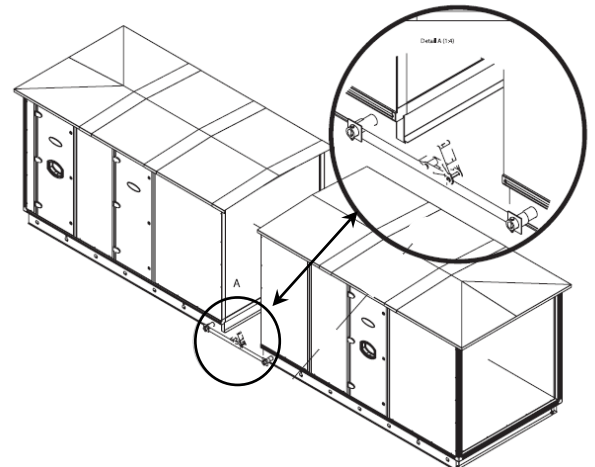
In case of multi section unit It is highly recommended to install common (single channel base through the AHU) base channel underneath the AHU. Rubber pads/ isolators will be installed underneath this single channel base.

Before the units are placed against or on top of each other, the sealing tape supplied must be attached between the casing sections.



Place the casing sections as close as possible together before assembly. Pull the casing sections towards each other by placing the lifting bars first in one and then in the other casing section. Then pull both parts towards each other using pull ropes.

The casing sections are connected with the frames and fixing elements supplied. If the AHU is installed outside, the roof connecting plate provided must be installed on the roof and sealed.



5.1.5.1 - Unit Joining With Half Mullion (For units up to 16 widths)



Use the pre-mounted corners for the final positioning of the sections and secure the corners with a bolt. The sections must be fully aligned.



Remove the first two corners and mount the GI connection strip to the base. Remove the next two corners and mount the connection strip against the side wall. Repeat this for the other AHU corners.

5.1.5.2 - Unit Joining Corner Posts With Coupling Profile

Ensure Coupling profile will be using for units for sections that end with corner posts.



Ensure that the sealing tape supplied is fixed to one of the two sections, before moving the sections against each other.

Link the sections by connecting the pre-mounted corner posts with bolts and nuts (M6).



If there are more than two sections, repeat the procedure above. For an outdoor installation all external joints should be sealed.

5.2 - Dampers

- Check if the actuator motor is installed in accordance with the supplier's instructions.
- Check if the correct angle has been set.
- Check if the dampers close properly.
- Check if the damper can open to the required angle.
- Check operation after the power has been restored following a power cut. Some dampers must be open, others must be closed.



5.3 - Air Filters

- Check if the correct filters have been installed.
- Check if the filters have been installed correctly.
- Absolute filters are supplied separately, to prevent contamination during transport and start-up. Insert the absolute filters only after the unit has been cleaned.
- Set pressure switches or filter indicators, if used.
- Close the inspection door.



Filter row can be completely pulled out in one move

5.4 – Electric Heaters

- Ensure that the heater has been connected in accordance with the instructions of the supplier. The diagram is located on the inside of the connection module.
- Check the heater current.
- Check if the safety devices shown in the wiring diagram have been installed.
- Check if the heater has been earthed in accordance with local instructions.
- The electric heater will be switched on if there is no air flow rate across the heater exists.
- Ensure that no objects have been left in the heater section.
- The following warning labels are attached to the panel: electrical voltage and hot surface.



5.5 – Cooling Coil

When calculating trap depth on draw-thru or blow-thru applications, remember that it is not the total static pressure but the upstream or downstream static resistance that is trapped against.

When calculating the trap depth for a cooling coil condensate pan on the draw-thru side, trap against the coil pressure drop in that coil section and any other pressure drops upstream of it (Negative Static Pressure).

NSP = Negative Static Pressure (in Pa) L = Overall trap height $A = (NSP/250 \times 25.4) + 50$ (mm) B = NSP $L = A + B + \text{Pipe diameter}$	
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Condensate Drain, Draw-Thru Trapping

To determine the trap dimensions for blow-thru units, find the coils maximum positive pressure and add 1/2 inch. This figure is normally the fan total static pressure.

TSP = Total Static Pressure (in Pa) A = 50 mm (minimum) $B = (TSP/250 \times 25.4) + 50$ (mm) $L = A + B + \text{Pipe diameter}$	
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Condensate Drain, Blow-Thru Trapping

- Check the connections in accordance with the dimensional drawing.
- Control the connections for leaks.

- Check U- trap dimension according to above details.
- Insure no damage in fins. Correctly straighten the fins
- After several days of cooling operation check the condensate drain and operation of the U trap, if necessary clean it.

5.6 - Heat Recovery Wheel

- Check that the wheel is rotating in the correct direction. This is indicated by an arrow on the casing.
- Check if the wheel seals are fitting correctly.
- Check if belt tension is correct.
- Check if the motor has been correctly connected.
- Check if the controller has been correctly connected and set in accordance with the instructions of the supplier if any.
- Check if the rotor speed has been set correctly.
- The following warning label is attached to the panel: rotating parts.



5.7 - Plate Heat Exchanger

Used if dampers are installed.


- Check if the actuator motor has been installed in accordance with the instructions of the supplier.
- Check if the correct angle has been set.
- Check if the dampers close correctly.
- Check if the damper can open to the correct position.
- Check operation after the power has been restored following a power cut. Some dampers must be open, others must be closed.
- Insure no damage in fins. Correctly straighten the fins.

5.8 – Fan and Motor




- Remove the transport brackets. This is indicated by a label on the fan access door.
- Untighten spring isolator bolt
- Check if the fan can move freely without obstructing the frame, flexible connection or wiring.
- Insure power connection is star / Delta for motors above 5.5 kW
- Check and/or connect the motor in accordance with local instructions and the data of the supplier.
- Check the direction of rotation of the impeller. The direction is indicated on the fan casing by an arrow.
- Separately measure the current draw of the electric motor for all phases. The current draw of all phases must be approximately the same and agree with the

data on the motor name plate. Set the motor protection device to the nominal value.


	<p>The air flow may cause stationary parts to move (even a fan that is switched off)</p>
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- If used check the pressure switch and set the correct pressure.

	<p>While working on the fan the switch has to be locked open.</p>
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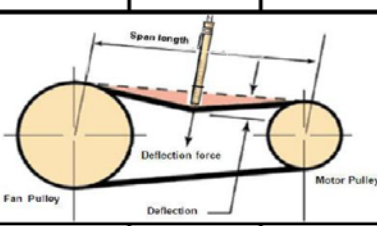
- Check the operation of the main switch.
 - The warning label on rotating parts, electrical voltage and opening doors are attached to the door. The label to remove the transport brackets is located on the floor of the fan section.



	<p>Before opening doors, switch off and de-energize the fan, and ensure that it has stopped rotating. (Minimum of 2 minutes)</p>
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5.9 – Drive Package

The data for the belt type, belt tension, number of belts, size and type of pulley is indicated on a label attached to access door. Belt is not factory installed, supplied loose for site installation.

Span length (mm)	Belt Tension Force (Kg)	Belt Deflection (mm)
		
Fan Pulley	Motor Pulley	Belt

5.9.1 – Alignment

Make sure that fan shafts and motor shafts are parallel and level. The most common causes of misalignment are nonparallel shafts and improperly located sheaves. Where shafts are not parallel, belts on one side are drawn tighter and pull more than their share of the

load. As a result, these belts wear out faster, requiring the entire set to be replaced before it has given maximum service. If misalignment is in the sheave, belts enter and leave the grooves at an angle, causing excessive belt and sheave wear.

5.9.1.1 Shaft Alignment:

Shaft alignment can be checked by measuring the distance between the shafts at 3 or more locations. If the distances are equal, then the shafts are parallel.

5.9.1.2 Sheave Alignment:

Fixed sheaves: To check the location of the fixed sheaves on the shafts, a straightedge or laser guide device.




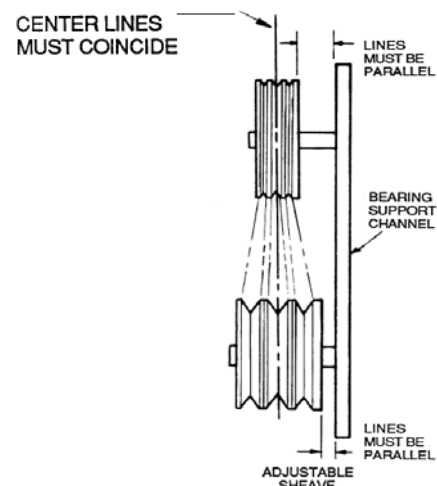
Straightedge must make contact at 4 distinct points along the outside perimeter of both pulleys



Laser guide device

Adjustable sheaves: To check the location of adjustable sheave on shaft, make sure that the centerlines of both sheaves are in line and parallel with the bearing support channel. Adjustable pitch drives are installed on the motor shaft. Carrier recommends that adjustable sheaves should only be used for initial balancing and be replaced with fixed pitch sheaves by the air balancer prior to the final system air balance.

	<p>Do not exceed maximum fan speed with adjustable sheave</p>
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6 - MAINTENANCE CHECKLIST

6.1 - Checklist for check points and maintenance intervals

The checklist contains a general overview of the planning that facilitates the inspections and maintenance of the AHU. On the following pages there is a more detailed description of the individual components.



Remember to de-energies all components and to ensure that the fan has stopped rotating, before the doors and access covers are opened before inspections and maintenance take place.

General AHU Maintenance Check List				Interval Month			
Components		Check Points	Recommended Maintenance Operations	1	3	6	12
CASING	Panels	Contamination	Remove contamination with water and mild house hold soap				
		Damage	Remove rust and touch-up with anti-rust primer and paint				
	Doors	Operation of Hinges & Locks	Check locks and hinges operational function				
		Door Seals	Check for seal span and crack				
DAMPER	Actuator	Installation	Check if correctly installed to the damper shaft				
	Blades	Seal and contamination	Check seal integrity, remove dirt with compressed air				
		Fitting	Check blades and rod bolts are tight				
		Opening	Check if blades can open and close to require angle				
	Rotation	Bushing and Linkage	Remove dirt from bushing and linkage rod with compressed air				
		Operational	Check damper operational once power supply restored				
FILTER	Flat Pre-filter	Physical condition and seal pressure drop	Check filter sitting (rail) correctly each other.				
	Metallic filter		Check filter clip (frame) correctly installed.				
	Vee filter		Check and remove pollution and dirt				
	Bag filter		Filter replacement depend to degree of contamination				
ELECTRIC HEATER	Control	All electrical connection	Clean dirt with compressed air and check connection in control box				
		Flow and thermostat sensor	Check the operational of flow and thermostat sensors				
COIL	Fins	Contamination	Clean dirt with compressed air				
		Damage	Check fin alignment and comb fins				
	Coil Frames	Air by-pass	Check gap and seal with silicon sealant to avoid fresh air by-pass				
	Headers	Seal	Check gap and seal with silicon sealant to avoid fresh air by-pass				
		Water leakage	Incase tube leak, braze leak point				
	Eliminators	Contamination	Clean dirt with compressed air				
	Drain pan	Contamination	Clean dirt with vacuum cleaner				
		Water Flooding	Check and clean U-trap				
FAN	Fan housing	Contamination	Check and remove dirt with compressed air				
	Bearing	Lubrication (re-grease type)	Check oil and re-grease every 6 months.				
		Wear	Check if physical bearing is good or replace with new bearing				
	Blower	Contamination	Check and remove dirt with compressed air				
	Motor	Lubrication (re-grease type)	Check oil and re-grease every 6 months.				
	Drive (Pulleys & Belts)	Fitting	Weekly check pulley fitting tightness to the shaft				
		Belt tensioning	Weekly check tensioning and tighten the belt if required				
		Wear	Check if belt in good condition or replace with good belts				
		Alignment	Weekly check pulley and belt alignment				
	Isolators	Fixing	Check all bolts not loose, tighten the bolts if required				
		Contamination	For spring isolators, check if rusted and touch-up with anti-rust				
	Flexible connection	Crack and leak	Check if any damage or air leakage, replace new flexible connector if required				
HEAT WHEEL	Rotor	Contamination	Check and remove dirt with compressed air				
		Operational	Check rotor rotation				
	Motor and Drive	Operational	Check rotor speed and verify with design rpm				
		Wear and tear	Check if belts with enough tension				

7 - MAINTENANCE AND OPERATING INSTRUCTIONS

7.1 - General

The AHU(s) require little maintenance. The smooth inside and outside finish of the panels makes maintenance very simple.

For dry sections: once a year thoroughly check the inside and outside of the AHU casing. For maintenance of wet sections (coolers and humidifiers) please refer to the air handling section concerned.

7.2 – Casing Panels

7.2.1 - Inside Installation

a) Internal inspection of the casing of double-skin panels and of all dry parts.

Remove contamination with water and a mild household soap solution. Where damage of the paint finish has occurred, if necessary remove rust and touch up with good quality anti-corrosive primer and paint. The outside air intake sections can show signs of corrosion as they contain wet parts and are affected by mist, rain and air pollutants.

b) Outside inspection of the coating.

If damage to the paint treatment has occurred, remove the rust (if necessary), and touch up with good quality anticorrosive primer and paint.

7.2.2 - Outside Installation

Check the sealed joints of AHUs installed outside and if required seal again with a UV-resistant and paintable kit. Treat damage as for inside installation.

7.3 - Doors and Access Covers

Check locks and hinges of all doors and access covers. For outside installation check the storm cord.

7.4 - Flexible Connections

Check the flexible connections for damage.

7.5 - Earthing

Ensure that the unit is earthed and installed in the correct manner.

7.6 - Dampers

Remove excess contamination by cleaning it with compressed air. Check adjusting bolts and linkage and if necessary tighten. Ensure that the damper blades run free of the casing.

7.7 - Outside Air Intake

Especially the outside air intake is contaminated by pollution taken in with the air. The maintenance interval must be observed, as irreparable damage of the panels might otherwise occur. Clean the outside air intake well and repair damage as described in point 7.2.1.

7.8 - Filters

The filters must be inspected once a month for excess pollution, pressure loss, damage and seating of the slide-in filters or built-in frames. With slide-in filters ensure that the filters have been correctly positioned and have been pushed well against each other from below. When replacing built-in filters you must ensure that the filter has been pushed well against the sealant and that the clips have been correctly installed. Filters must be replaced at the required intervals. The timing of the replacement depends on the type of filter, quality and the degree of contamination of the air. The pressure loss across the contaminated filter can be measured with a pressure differential gauge. Maintenance instructions of special filters are available on request.

7.9 - Electric Heaters

Check once a year for contamination, and if necessary clean with compressed air. Check the connections in the control box. Check the operation of the thermostat. The following warning label is located on the panel: electrical voltage and hot surface.



7.10 – Cooling Coil

Check once a year for contamination and if necessary clean with compressed air against the direction of the air flow or clean with a vacuum cleaner. Check for leakage. Check the fins of the droplet eliminator after the coil. Clean the siphon and check its operation. Check the condensate pan for contamination and clean if necessary.

7.11 - Heat Recovery Wheel

Check the rotor once a year for contamination, and if necessary clean with compressed air. Check the rotor speed and compare it with the design data.

Check the rotation of the rotor. Depending on the rotor material the wheel can absorb moisture. When stationary the wheel will become moist on one side and thus heavier. The rotor speed can be set to intermittent in the controller so that the wheel will rotate “x” times per time unit.

The rotor bearings are lubricated for life and do not require maintenance. The drive motor is accessible.

The belt is automatically tensioned by a spring-loaded rocking base on which the motor is installed. New belts expand a lot in the beginning. Check after two days if the belt still has enough tension. After this check the belt tension weekly during the first month and then check it once a month.

For further operation and maintenance details on the heat recovery wheel/controller refer to the documentation provided by the supplier.

The following warning label is located on the panel: rotating parts.



7.12 - Plate Heat Exchanger

Check the plate heat exchanger once a year for contamination and if necessary clean with compressed air against the direction of the air flow. If dampers are used, follow the instructions in section 7.6

Check condensate pan for contamination and clean if necessary.

7.13 - Fan

7.13.1 – General



The air flow may cause stationary parts to move (even a fan that is switched off)



While working on the fan the switch has to be locked open.

The data for the belt type, belt tension, and number of belts, size and type of pulley is indicated on a label attached to the fan access door.

7.13.2 - Bearings

The bearings of the smaller fan types cannot be lubricated. If the larger fans are of the re-lubricated type, then they should be lubricated every six months. For higher temperatures and increased contamination the lubrication interval should be adjusted as required. The standard lubricant is Shell Alvania R3. For higher temperatures and a higher degree of humidity use a lubricant recommended by the supplier.

The electric motors are equipped with roller bearings. Depending on the motor size the bearings are lubricated for life or are equipped with a grease nipple. The lubrication interval and type of lubricant are as above.

7.13.3 - Transmission

After starting up the unit, but also after replacing the belts the belt tension has to be checked within one week and then after two weeks and further tensioned if required. After that check the belt tension and inspect the condition of the belts every three months.

The Correct Belt Tension depends on:

- The belt type.
- Power to be transmitted.
- Belt velocity.

The belt tension is calculated for each transmission. If the belt tension is too high this can result in bearing wear and vibration, if it is too low this can result in belt slippage and belt wear.

Sequence for installation of new belts:

- Ensure that the pulleys are correctly aligned. If necessary re-align.
- Position all belts loosely on the pulleys; do not pull tensioned belts over the pulleys.
- Tension the belts and check the tension with a Sonic Tension Meter.
- Re-check the alignment.

If the fan speed changes or if a motor with different power specifications and/or speed is installed, the manufacturer must be informed. The supplier must re-calculate the bearing load as well as the impeller load. If this is not done, irreparable damage to the fan may incur. The supplier does not accept any responsibility for modifications that have not been approved. See chapter 1.1.

- The warning pictograms indicating rotating parts, electrical voltage and opening of doors are attached to the door.



7.14 - Sound Attenuator

Under normal conditions the sound dampers are maintenance-free. Nevertheless it is recommended to check the attenuators once a year for possible damage and loose fibers, in order to prevent further contamination of the system.

Notes:

