



AND HITECH INDUSTRIES LTD



USER MANUAL CAB AC 1.5 TR



AND HITECH INDUSTRIES LTD

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Published by **And Hitech industries pvt ltd.**

Plot No. B-15, Ecotech-1 Extension, Greater Noida Gautam Buddha Nagar UP-201306

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About this manual

The aim of this Operation and Maintenance Manual is to present accurate and up to date information and a practical approach on the operation and maintenance of the AHIL make CAB HVAC Unit for the locomotives.

This manual is importance to anyone involved in the operation and maintenance of these CAB HVAC Units.

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Warnings

FOR YOUR PERSONAL SAFETY THIS MANUAL MUST BE READ COMPLETELY PRIOR TO COMMENCING WORK ON THE HVAC SYSTEM.

ENSURE THE HVAC POWER SUPPLY PLUGS ARE DISCONNECTED BEFORE WORKING ON THE SYSTEM.

TECHNICAL PERSONNEL WHO HAVE EXPERIENCE IN REFRIGERATION AND ELECTRICAL EQUIPMENT SHOULD MAINTAIN THE AIR-CONDITIONING SYSTEM. IT'S MANDATE THAT THE HVAC SERVICE SHOULD BE HANDLED BY TRAINED/CERTIFIED REFRIGERTION TECHNICIAN ONLY.

Throughout this manual, warnings, cautions, and notes are given. It is important that the significance of each category is thoroughly understood by the personnel using this manual.

Their definitions are as follows:

WARNING:	Indicates a procedure, practice, etc. that, if not strictly observed, could result in personnel injury or loss of life.
CAUTION:	Indicates a procedure, practice, etc. that, if not strictly observed, could result in damage or destruction of equipment
NOTE:	Indicates special details

REVISION LOG

Revision	Date (dd-mm-yyyy)	Description of Changes
00	12-05-2025	First Issue

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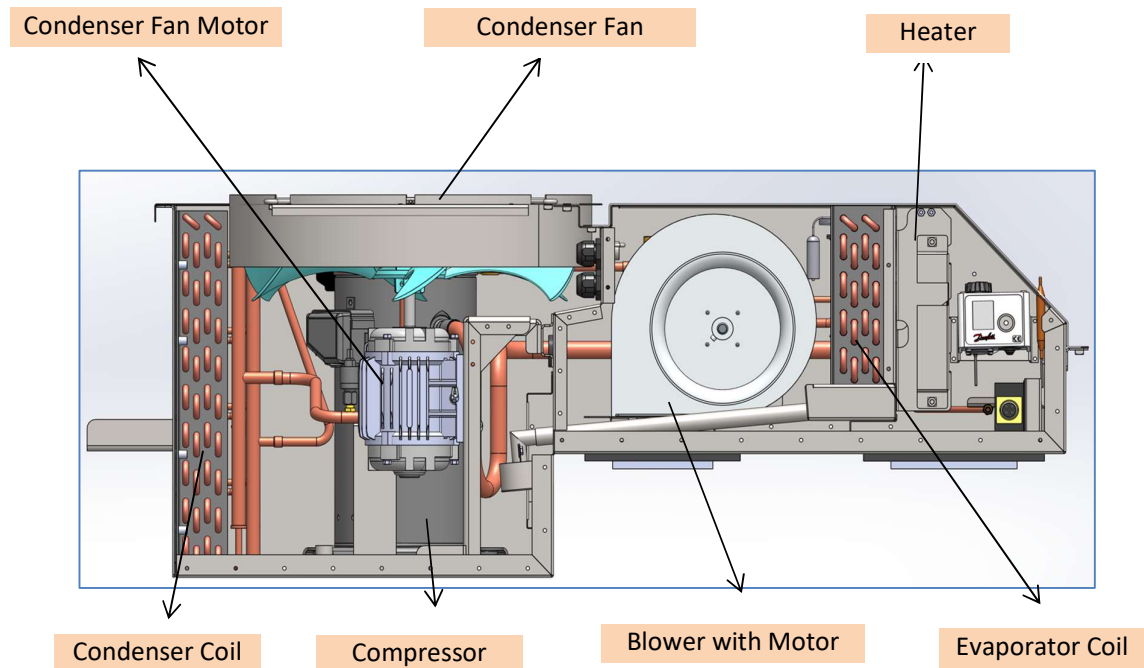
1. About Us

AHIL is an IRIS (International Railway Industry Standard) certified company compliant with ISO/TS 22163:2017, ISO 9001:2015, and ISO 14001:2015 standards. Its manufacturing unit is located in Kasna, Greater Noida, Uttar Pradesh. The company has state-of-the-art design and manufacturing facilities to ensure high product quality and enhanced customer satisfaction. AHIL is one of the leading manufacturers of rail coach components. It also provides PAN-India service support to Indian Railways for HVAC, mechanical, electromechanical, electrical, and electronic products.

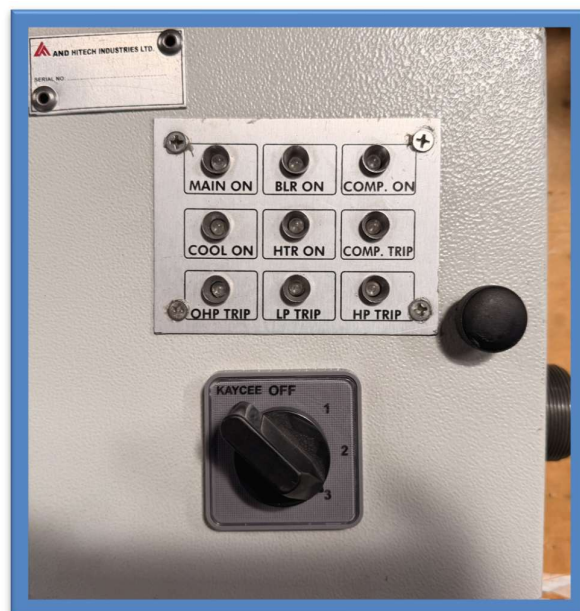
It has developed a Roof-Mounted Driver's Cab Air Conditioning Unit with a capacity of 1.5 TR as per the requirements of Indian Railways. The design of the Roof-Mounted Driver's Cab Air Conditioning Unit is reliable, ensuring low-maintenance operation and effective climate control within the driver's cab. Hence, this product serves as a long-term asset for Indian Railways.



2. Major Components and HVAC Specification:



Control Panel



Switch Board

HVAC Unit Specification

1. Unit Type : RMPU for Locomotive
2. Unit Model Name : CLW CAB HVAC
3. Cooling Capacity : 2.0 TR
(2.0 TR approx.) at 35 °C ambient
(1.50 TR approx.) at 50 °C ambient
4. Input Power Supply : 415V AC
5. Total Power Consumption : 3.5 KW
6. Full Load Current at Min. Volt. : 06 Amps
7. Refrigerant : R-407c, 1.4 KG
8. Dimensions : As per Spec.
9. Weight : 150 KG (Approx.)

3. Working Principle

When you switch ON a Roof Mounted Cab AC and set your desired temperature, the Solid-State Temperature Controller installed in it senses that there is a difference in the temperature of the Driver's Cab air and the temperature that you've chosen.

This warm air is drawn in through a grill at the front of unit, which then flows over some pipes through which the refrigerant (i.e., a coolant fluid) is flowing. The refrigerant liquid absorbs the heat and becomes a hot gas itself. This is how heat is removed from the air that falls on the evaporator coils. Note that the evaporator coil not only absorbs heat, but also wrings out moisture from the incoming air, which helps to dehumidify the Cabin.

This hot refrigerant gas is then passed on to the compressor located inside the unit. Being true to its name, the compressor compresses the gas so that it becomes hot, since compressing a gas increases its temperature.

This hot, high-pressure gas then travels to the third component – the condenser. The condenser condenses the hot gas so that it becomes a liquid.

The refrigerant reaches the condenser as a hot gas, but quickly becomes a cooler liquid because the heat of the 'hot gas' is dissipated to the surroundings through metal fins. So, as the refrigerant leaves the condenser, it loses its heat and becomes a cooler liquid. This flows through an expansion valve – a tiny hole in the system's copper tubing – which controls the flow of cool liquid refrigerant into the evaporator, so the refrigerant arrives at the point where its journey started.

Although all the components involved in the air-conditioning process in CAB AC are located inside the same metal box, the underlying process of cooling remains exactly the same.

The entire process is repeated over and over again until the desired temperature is attained. In a nutshell, a CAB AC unit keeps drawing in warm air and expelling it back into the Cabinet until there's no more warm air left to cool.

4. Interface Requirements

4.1 POWER SUPPLY

Auxiliary supply 415 Volts AC 50 Hz 3 phase and 110 volts ac single phase are available for the power and control supply feeding to air-conditioning unit.

5. Functional Description of CAB HVAC System

The Roof Mounted CAB HVAC units will be controlled by the Rotary Switches mounted in the switch panel & it will run in below listed Modes as per Rotary Switch position on behalf of Room Temperature.

5.1 Operational Modes

Rotary Switch Description	Rotary Switch Position	Modes		What is ON/OFF
Rotary Switch 1 (RSW – 1)	Position 1	OFF		Complete unit will be OFF.
	Position 2	ON		HVAC Unit will be run according to Rotary Switch 2 positions.
Rotary Switch 1 (RSW – 2)	Position 1	AUTO	AUTO COOLING	Blower Motor + Both Condenser Fan Motors + Compressor will be ON according to Room Temperature.
			AUTO HEATING	Blower Motor + Heater will be ON according to Room Temperature.
	Position 2	MANUAL COOL		Blower Motor + Both Condenser Fan Motors + Compressor will be ON without any Temperature control.
	Position 3	Manual Heating		Blower Motor + Heater will on without any Temperature control with OHP protection.

5.2 Solid State Temperature Controller Temperature setting.

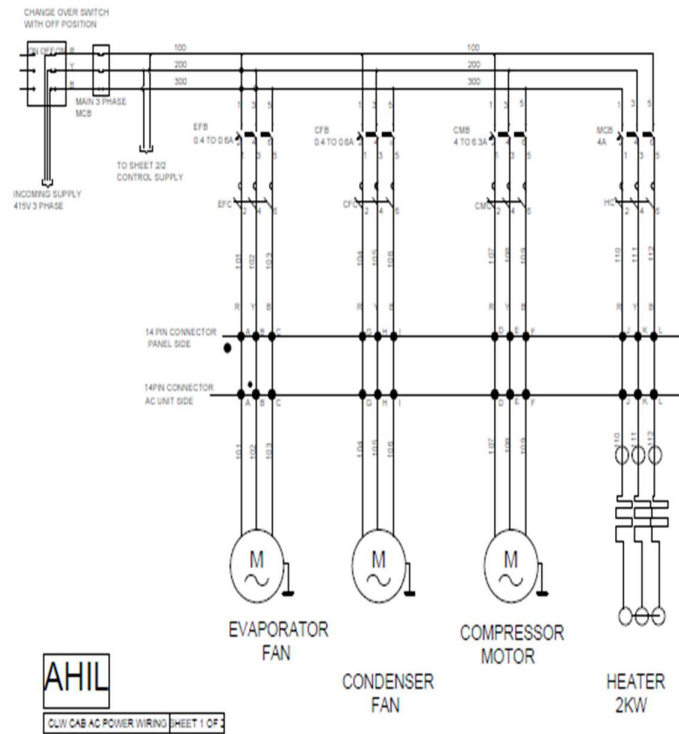
There are two Setting in Solid state Temperature Controller.

	Cut In	Cut Off
Cooling	26 °C	24 °C
Heating	19 °C	21 °C

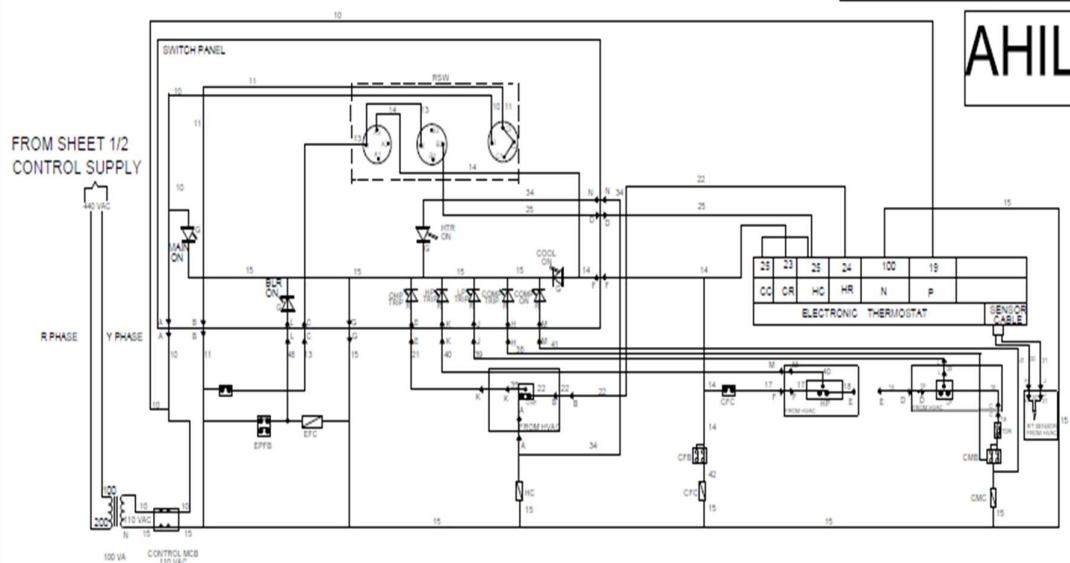


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6. Electrical Diagram :



CLW CAB AC WIRING SHEET 2 OF 2



7. Maintenance Schedule

Sr · N o.	Equipment /Fittings	Activities	Trip/Weekly	Monthly	Six Monthly	IOH 18 Months	POH 36 Months
1.	General	a) Check the log sheet maintained in each AC coach and attained the defects recorded by escorting staff during run.	√	√	√	√	√
		b) Clean all dust by vacuum or compressed air from the switch board cabinet and tighten the cable terminals, if found loose.	√	√	√	√	√
		c) Replace/connect defective/by passed components.	√	√	√	√	√
		d) Remove fresh and return air filters by opening the access doors of the unit. Clean these filters with vacuum or compressed air taking out the filters and place them gently in their place or replace with pre-cleaned/new filter/filter media and close the doors properly. A cleaning jig should be available with AMC holder/Railways for this activity. Note: After this activity, the service doors shall be latched properly in case of return air filter.	√	√	√	To be replaced	To be replaced
		e) Check working of rotary switches by rotating forward and backward, provided on switch panel for temperature selection and Air. Co. ON. Replace if required.	√	√	√	√	√
		f) Check working of set point generator rotary switch provided for temperature setting.	√	√	√	√	√
		g) Check the tripping of Heaters i.e., OHP. The OHP setting is 65°C. The testing of OHP setting shall be done by switching off the blower. During testing, the probe of digital thermometer shall be placed near the sensor of OHP & the display shall be kept outside. NOTE: It shall be checked twice a year. In addition, it shall also be checked as a pre-winter precaution before the onset of winter season.			√	√	√

Sr . N o.	Equipment /Fittings	Activities	Trip/Weekly	Monthly	Six Monthly	IOH 18 Months	POH 36 Months
		<p>h) Run the CAB AC for half an hour and then check the current drawn by various equipment's with the help of clamp tester (tongue tester) duly calibrated.</p> <p>Normal currents for various equipment's and mode of operation are as under:</p> <ul style="list-style-type: none"> CAB AC in cooling mode. 8.5 Amps Max. Compressor 7 Amps Max. Condenser fan motor 1.1 Amps Max. Blower motor 1.1 Amps Max. CAB AC in heating mode 1.4 Amps Max. <p>NOTE: The current also depends on the ambient temperature.</p>			√	√	√
		i) Check visually condenser fan blade and ensure that there is no crack on the blade or hub.		√	√	√	√
		j) Check and tighten mountings of blower, compressor and blower motor and ensure that they are in good condition.			√	√	√
		k) Ensure that no capillary tubes are in hanging position.		√	√	√	√
		l) Check capillary tubes provided for HP/LP cutout for proper support/clamping. Their nuts should be properly tightened.		√	√	√	√
		m) Check for proper tightening of cover provided over evaporator compartment.			√	√	√
		n) Check the earthing shunts in CAB AC are provided. Earthing shunts should be earthed with coach body.			√	√	To be replaced



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		o) Check anti-vibration mountings of compressor, condenser motor, blower motor and overall AC unit. Replace them, if required.			√	√	AVM for overall AC unit to be replaced
Sr . N O.	Equipment /Fittings	Activities	Trip/Weekly	Monthly	Six Monthly	IOH 18 Months	POH 36 Months
		p) If less cooling is noticed, check the leakage of refrigerant from the system by using soap solution or leak detector. If leak is detected, it should be attended and re-charging of refrigerant in the system shall be made as per RDSO SMI No. ELPS/AC/SMI/14. Filter drier must be replaced during this activity.	√	√	√	√	√
		q) Check insulation resistance of all the motors & compressors by the duly calibrated 1000 V megger, Attend the motors, if insulation resistance of motor is found less than 2 M ohm. IMPORTANT: Disconnect control devices during this activity.				√	√
		r) Check for physically damaged/jointed cables. Replaced if needed.				√	√
		s) Check for the physically damaged conduits. Replace them, if needed.				√	To be replaced
2.	Refrigerant pipe line/capillary checks	a) Check for proper clamping/support				√	√
		b) Rubbing of capillary with SS sheet/channel or other parts of CAB AC.				√	√
		c) Leakage from the flare nut of HP/LP conduits with soap solution			√	√	√
		d) Leakage from Feeler tube of OHP				√	√
3.	Compressor checks	a) Holding clamps from top are properly tightened.			√	√	√
		b) Mounting fasteners are properly tightened.			√	√	√
		c) Leakage from suction and discharge port.			√	√	√



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		d) Accumulators holding/mounting, if provided.			√	√	√
		e) Condensing area covers are properly tightened & not touching top of compressor body.			√	√	√

Sr . N O.	Equipment /Fittings	Activities	Trip/Weekly	Monthly	Six Monthly	IOH 18 Months	POH 36 Months
		f) Electrical terminal box is properly tightened & cables are terminated with lugs.			√	√	√
4.	Condenser fans motor/blades and Blower motor/impeller checks	a) Mounting fasteners are properly tightened.			√	√	√
		b) Electrical terminal box of motors is properly tightened & cables are terminated with lugs.			√	√	√
		c) Double earthing shunts are provided.			√	√	To be replaced during POH
		d) Condition of blade for its fixing/cracking/damage or touching with its cover. Rectify/replace, if needed.			√	√	√
		e) Ensure proper clamping of cable conduits.			√	√	√
		f) Overhauling of Blower and condenser fan motors shall include the following during POH. <ul style="list-style-type: none"> The incoming motors shall be checked for abnormal noise and vibration. Check bearing make and replace with specified make, if found defective. The IR value of Motor stator shall be measured between motor terminal and frame before and after overhauling. The value of IR shall not be less than 10 M ohm, when measured with 1000-volt megger. Winding resistance of motors shall be measured between RY, YB & BR phases. The winding resistance shall be $\pm 10\%$ of resistance declared by OEM in cold condition. 					√



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		<ul style="list-style-type: none"> • Check closely terminal block and connecting lead for any physical damage or any flash mark over it. Replace the same, if not satisfactory. • Perform HV (Di-electric test) on stator by applying 1.5 kV ac supply for one minute. During test the leakage current shall not be more than 1.0 mA. • Run motor on no load for 15 minutes and check for following: <ul style="list-style-type: none"> I. Bearing noise – Normal noise 					
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Sr · N O.	Equipment /Fittings	Activities	Trip/Weekly	Monthly	Six Monthly	IOH 18 Months	POH 36 Months
		II. Bearing temperature rise above ambient - 10°C III. SPM reading - 20 dBN max. (Green zone) <ul style="list-style-type: none"> • Measure starting current of motors on no load. It shall not be more than 10 times of normal running current. Similarly, the running current of motors shall be measured and it shall not be more than 1.1 A. 					√
		<ul style="list-style-type: none"> • Ensure that impellers are properly tightened. 			√	√	√
		<ul style="list-style-type: none"> • Electrical terminal box is properly tightened & cables are terminated with lugs. 			√	√	√
5.	A) Return Air filters	a) Ensure that filters are not damaged.	√	√	√	√	√
		b) Ensure that there is a provision to avoid wrong fitment in the filter as well as in CAB AC.				√	√
	B) HP/LP/OHP cutout switch	a) Check that the mounting fasteners are properly tightened.			√	√	√
		b) Ensure proper clamping/support of capillary tube connected to HP/LP/OHP cutout switch.			√	√	√
		c) Ensure that flare nuts are properly tightened.			√	√	√



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		d) Ensure that control wires to HP/LP/OHP cutout switches are properly clamped.			√	√	√
		e) Ensure that covers of these HP/LP/OHP cutouts switches are properly screwed.	√	√	√	√	√
		f) Ensure proper clamping of feeler tube of OHP switch.				√	√
		g) Remove the accumulated dust over feeler tube of OHP switch.			√	√	√
		h) There should be cover (canopy) on top HP/LP switch (provided with capillary tubes) to prevent water entry.		√	√	√	√
Sr . N o.	Equipment /Fittings	Activities	Trip/Weekly	Monthly	Six Monthly	IOH 18 Months	POH 36 Months
	C) Heater	a) Ensure proper mounting of heater.			√	√	√
		b) Ensure proper clamping of electrical wires to heater.			√		√
		c) Check dust accumulation on heating element. Remove gently, if required.			√	√	√
	D) NTC sensors	a) Ensure that the sensors provided at return air path and supply air are firmly mounted.			√	√	√
		b) Ensure sensor wires are properly clamped.			√	√	
		c) Remove the dust accumulated over sensor gently.			√	√	√
	E) Expansion Valve/capillary tubes	a) Ensure that the bulb is mounted in the suction line just after evaporator coil and in a position corresponding to between 1 O'clock and 4 O'clock. Ensure that it is properly insulated.		√	√	√	√
		b) Ensure that the equalizing line is connected in the suction line immediately after the bulb.			√	√	√
		c) Ensure that the bulb is not connected at the bottom of the pipeline.			√	√	√
		d) Ensure that bulb/equalizing line/capillary tubes are not choked.		√	√	√	√
		a) Ensure that there is no damage to fins.				√	√



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	H) Evaporator coil	b) Ensure that capillaries of distributors to evaporator coil are not having any sharp bend or kinks. They should also be clamped properly.				√	√
		c) Ensure that air passes only through evaporator coils and no air is bypassed directly to blower chamber.				√	√
		d) Clean the coil, if found dirty.				√	√
		e) Check that the mounting fasteners are properly tightened.				√	√
	I) Filter drier & sight glass	a) Ensure that drier is installed with flow in the direction of the arrow marked on the filter drier label.			√	√	√
Sr . N O.	Equipment /Fittings	Activities	Trip/Weekly	Monthly	Six Monthly	IOH 18 Months	POH 36 Months
		NOTE: 1) Never use 'antifreeze liquids like methyl alcohol together with a filter drier. Such liquid can damage the filter. 2) Never re-use a filter drier. 3) To avoid chances of moisture ingress in the system. Filter drier & compressor should be installed immediately after evacuation and charging the system.			√	√	√
	J) Access Doors	a) Insulate service doors, lower portion and side wall from inside of the evaporator compartment.				√	√
		b) Ensure that latches to lock the service doors are not defective/damaged.	√	√	√	√	√
	K) Drip tray	a) Ensure that there is no leakage of condensate water from drip tray to electrical box & blower housing area.			√	√	√
		b) Ensure free flow of condensate water		√	√	√	√
	L) Condenser area	a) Clean the condenser coil from inside with compressed air/water jet after opening the cover of condenser area.		√	√	√	√

		b) Ensure that there is no damage to fins			✓	✓	✓
		c) Check that the mounting fasteners are properly tightened.				✓	✓
		d) Provide fire retardant thermal insulation over suction line.				✓	✓
		e) Ensure that there is no damage/crack in structure frame of RMPU.				✓	✓
		f) Ensure proper clamping of electrical conduit.				✓	✓

8. Faults



Abbreviations: -

- | | |
|-----------------|---------------------------|
| 1. BLR ON – | Blower ON |
| 2. COMP. ON – | Compressor ON |
| 3. HTR ON - | Heater ON |
| 4. COOL ON - | Cooling ON |
| 5. HP TRIP - | High Pressure Trip |
| 6. LP TRIP - | Low Pressure Trip |
| 7. OHP TRIP - | Over Heat Protection Trip |
| 8. COMP. TRIP - | Compressor Trip |

As shown in above picture of 2 TR CAB AC display, four types of faults show in the display with blinked indicator are as under: -

1. HP TRIP
2. LP TRIP
3. OHP TRIP
4. COMP. TRIP

9. Maintenance Procedure

Maintenance work on the refrigerating circuit should be completed before the summer season.

Caution

Before starting any inspection or maintenance work on components working with power supply, turn off the main power supply and ensure again turning on once the maintenance is done.

Caution

If the coach is running in servicing areas with heavy air pollution, the filter requires more frequent inspection and cleaning.

Most components of the compact air conditioner unit will be replaced when defective.

Sr. No.	Equipment	Maintenance Procedure
1	Condenser fan motor	<ul style="list-style-type: none"> - Open Top Cover. - Removed CD fan blade. - Remove electrical connection. - Open mounting nuts & bolts. - Change motor with same rating.

2	Compressor	<ul style="list-style-type: none"> Open Top Cover. Loosen compressor clamp. Remove power connection Drain refrigerant. -Debraz refrigerant piping and cap them properly to avoid moisture and foreign particles inside the system. Open mounting base nut. Change compressor as per recommended procedure. - Use same rating of compressor.
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Sr. No.	Equipment	Maintenance Procedure
3	Filter Drier	<ul style="list-style-type: none"> Open Top Cover. -Pump down system using service valve provided in liquid line of Refrigeration circuit. - DE braze filter drier and cap refrigerant pipelines properly to avoid Entering of moisture and foreign particles inside the system. - Change filter drier with same size.
4	Hand Shut Off Valve	<ul style="list-style-type: none"> Open Top Cover. Remove Hand shut off valve. Drain refrigerant. DE braze Hand shut off valve and cap refrigerant pipelines properly to Avoid entering of moisture and foreign particles inside the system. - Change Hand shut off Valve with same size.
5	Return air filter	<ul style="list-style-type: none"> Open Top Cover. Take out filter. Clean filter media, replace if necessary.
6	Blower motor	<ul style="list-style-type: none"> - Open Top Cover. - Remove blower runners. - Open electrical connections. - Open mounting base nut & bolts. - Change blower motor with same rating.
7	Heater	<ul style="list-style-type: none"> - Open Top Cover. - Take out heater bank. - Inspect the safety element.

8	Evaporator Coil	<ul style="list-style-type: none"> - Open Top cover. - De-Braze evaporator coil from the refrigerant line. - Avoid entering of moisture and foreign particles inside the system. - Remove Evaporator coil from the unit carefully. - Change Evaporator coil with same specifications. - After proper Brazing and leak testing, close all the covers of the unit.
9	Condenser Coil	<ul style="list-style-type: none"> - Open Top cover. - De-Braze Condenser coil from the refrigerant line. - Avoid moisture and foreign particles inside the system. - Remove Condenser coil from back side after loosen the nut bolts. - Change Condenser coil with same specifications. - After proper Brazing and leak testing, close all the covers of the unit

Sr. No.	Equipment	Maintenance Procedure
10	Blower Fan	<ul style="list-style-type: none"> - Open Top cover. - Loosen nut bolts and remove Blower fan. - Replace the Blower fan with new one having same model/specifications.
11	Condenser Fan	<ul style="list-style-type: none"> - Open Top Cover. - Loosen nut bolts and remove Condenser fan. - Replace with new one having same model.

9.1 SAFETY DEVICES

All current-carrying components such as Motors, Heaters and Compressor etc should be positively earthed.

9.2 Overload and Short Circuit protection of Motors

Power Supply provided to all Motors and Compressor through suitable Amperage Motor protection Circuit Breaker (MPCB) according to device power ratings, for protection against Overload, short circuit and grounding. (Kindly refer to Electrical Diagram for proper ratings of MPCB)

9.3 Thermal protection for Heaters

The electric heaters are protected with OHP against over temperature. If the supply air temperatures reach 65°C, O.H.P. switches Off the Heater via control Circuit.

9.4 Cooling circuit pressure protection

To prevent from High pressure or Low pressure in the refrigerant circuits of an air conditioning unit-, High- and Low-pressure switches are used.

9.4.1 Cause of HP tripping in refrigeration circuit. (Higher Activ. pressure [psi] 450±15)

1. Condenser motor defective / not working.
2. Condenser fan motor running in reverse direction. Air should be sucked through condenser coils.
3. Condenser fan blade defective / broken.
4. Condenser coil clogged with dirt & dust.

9.4.2 Cause of LP tripping in refrigeration circuit. (Lower Activ. Pressure [psi] 30±5)

1. Blower motor defective / not working.
2. Blower motor running in reverses direction. Air should be sucked through Evaporator coils.
3. Blower runner defective / broken.
4. Evaporator coil clogged with dirt & dust.
5. Air filters clogged with dirt, dust or any other obstructions in evaporator Section.
6. Less refrigerant or leakage in the refrigeration circuit.
7. Drier filter or Capillary choked.

10. Problems Faced

10.1	Filters	One of the typical reasons air conditioners don't work properly is a clogged or dirty filter. Follow the manufacturer's suggestions as to how often to change your air filter. Some are monthly, others every three months, while some are reusable and should be cleaned when they are dirty. One way to determine if a filter needs to be cleaned is to check if any light passes through it. If not, it's time to clean it. Dirty filters not only reduce the flow of air but can also cause the AC unit to freeze.
10.2	Solid State Temperature Controller	Another easy fix is to make sure your Solid-state temperature controller (which controls the temperature setting in your CAB area) is turned on, the inside is clean, its level, it's not being affected by sunlight, and it's on the correct setting. If problems persist, there may be another issue.
10.3	Refrigerant Leaks	When the coolant starts leaking in the air conditioner, the unit will not perform correctly, and the temperature will fluctuate. The location of the leak will affect the cost of the repair so having this examined yearly by a trained AC technician is advised.
10.4	Drainage	Like the filter, the drain line can become clogged with dirt, dust, and lint. If it becomes clogged, the drain pan will fill up, and water will leak out potentially causing damage to the AC unit or whatever is around your pan.
10.5	Circuit Breakers	The breakers and fuses safeguard the AC unit's motor or compressor from overheating. Often when a motor dies, one of the first parts the HVAC technician checks is the breaker.
10.6	Compressor	The compressor applies energy to the refrigerant and propels it through the coils to carry out heat exchange. If the compressor is not working, the AC unit will not cool your house. If there's not enough refrigerant, the compressor will run hot and eventually

		seize. If there's too much, the refrigerant will return to the compressor, which can cause it to fail.
10.7	Evaporator Coils	Evaporator coils absorb heat in the air and send it back into the cabinet as cold air using a blower fan. Coils can become corroded, but if they are located inside, they typically only require maintenance every three years.
10.8	Condenser Coils	Condenser coils are located with the compressor so they can become dirty due to the elements. They can usually be cleaned with a water hose once a year, but if they get too dirty, an HVAC technician will have to clean them with a chemical cleaner.
10.9	Worn Contactor	In a CAB AC unit, there are contactors for the compressor, the blower motor, and the condenser fan motor. They make an electrical connection that starts the motors and compressor. If there's arcing and pitting on the contactor, it becomes difficult for electric current to start the motors.

11. Installation

11.1 Transportation / shipment

1.5 TR CAB Air Conditioners are supplied preassembled on truck frame. The air conditioning units are fastened with bolts to the truck frame. All assemblies are carefully tested and packed prior to shipment (With refrigerant charged)

Caution

For loading and unloading, overhead crane shall be used. It enables the unit to be transported safely.

11.2 Storage

The Roof Mounted CAB AC units shall be stored in their undamaged transport skids. Do not store them in open. Make sure that units are not damaged.

11.3 Installation

Install Roof Mounted CAB AC on the Cabin of the Driver's CAB.

Caution

For transporting the air conditioning unit to the Driver's Cabin for the purpose of Installation, overhead crane shall be used.

Installing the Roof Mounted CAB air conditioning unit

Caution

Lift the air conditioner for the specified lifting points gently.

Sr. No.	Component	Activity
1	AC UNIT	Remove Packing
		Perform visual check for any transit damage.
		Undo transport screws used for fixing unit to frame
		Lift unit with crane onto Driver CAB.
		Lower down unit on the installation trough
		Tighten fastening screws
		Connect earthing connections
		Establish plug-and-socket connections for power supply

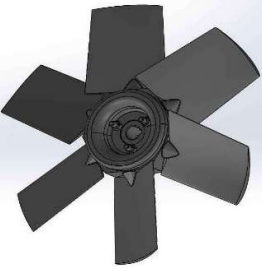
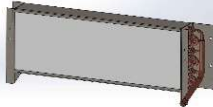
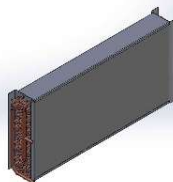
12. Instructions to Users

Instructions for Installations

SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components and equipment location. Only trained, qualified installers and service technicians should install, start up, and service this equipment. When working on air-conditioning equipment, observe precautions in the literature, on tags, stickers, and labels attached to the equipment. Follow all safety codes. Wear safety glasses and work gloves. Use care in handling equipment.

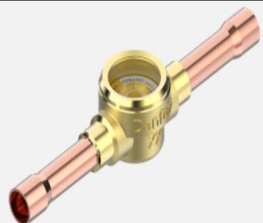
12. Spare Part List

Sr. No.	Name	Description	MAKE CONSIDERED	Component Photograph
1	Compressor	Compressor ZR28KTE-TFD-522, Make - Emerson	Make - Emerson	
2	CONDENSER MOTOR	CONDENSER MOTOR (CLW)0.15 KW,1360RPM,3PH, 50 Hz, IP 55, MAKE- LHP/ CGL	Make: LHP/ CGL	
3	BLOWER MOTOR	BLOWER MOTOR (CLW)0.12KW,1325 RPM,3PH, 50 Hz, IP 555, Make- LHP/ CGL	Make: LHP/ CGL	
4	CONDENSER FAN	CONDENSER FAN FOR CLW, SIZE - 405 MM, FRP BLADE, NO. OF BLADE- 6 NOS	Multi wing	
5	EVAPORATOR COIL	EVAPORATOR COIL FOR CLW (232X725MM)	And Hitech make	
6	Condenser COIL	Condenser COIL FOR CLW (390X837MM)	And Hitech make	



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Sr. No.	Name	Description	MAKE CONSIDERED	Component Photograph
7	FILTER DRIER	FILTER DRIER FOR 1.5TR AC, (MAKE- DANFOSS, MODEL NO. - DML053s, 3/8" X 3/8")	Danfoss	
8	EXPANSION VALVE	EXPANSION VALVE FOR 1.5 TR AC (MAKE- DANFOSS, TUBE - 7, MODEL NO. - 068U1937)	Danfoss	
9	Heater	Heater 700 W 230v Daspas/Theeta for CLW	As per RDSO approved sources	
10	RETURN AIR FILTER	RETURN AIR FILTER 662*152*12MM, MAKE- PUROMATIC	USHA	
11	HIGH PRESSURE SWITCH (AUTO)	HIGH PRESSURE SWITCH (AUTO) 061F9053	Danfoss	
12	LOW PRES. CUTOUT SWITCH	LOW PRES. CUTOUT SWITCH, DANFOSS PART NO.- 061F9124	Danfoss	

Sr. No.	Name	Description	MAKE CONSIDERED	Component Photograph
13	THERMOSTAT SWITCH (OHP)	LHB THERMOSTAT SWITCH (OHP) KP-79, RG 50 TO 100 DANFOSS PART NO. - 060L112666	Danfoss	
14	Distributor	Distributor 3 Way, Make Danfoss	Danfoss	
15	Refrigerant Sight Glass	SIGHT GLASS FOR 1.5 TR AC (MAKE- DANFOSS, MODELNO. - SGN 10s, CODE- 014-0182,3/8"X3/8")	Danfoss	
16	BLOWER RUNNER	SS304 BLOWER RUNNER (1.5 TR), SIZE - (200 X 150) MM	Blow tech	

14. Technical Query & Support

For technical enquiry or technical support, kindly contact or write a mail.

Office

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