

# TECU - 5TON

## Portable Air Conditioner (Cooling & Heating)

ver.20240422



Read this manual before using this product. Failure to do so can result in serious injury.  
**SAVE THIS MANUAL**



### NOTICE

The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the user that common sense and caution are factors which cannot be built into this product, but must be supplied by the installer and/or user.

The unit includes mechanical and electrical parts and the unit is often placed in a rough environment where the components are exposed to different climate conditions. Therefore, the unit will need preventative maintenance on a regular basis.

### INTRODUCTION

This ECU (environmental control unit) is mobile and developed primarily to provide air conditioning in temporary or transportable buildings, tents, or similar fields. The unit is designed for outside installation with ducted supply and return air.



003-0158 REV A

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## Features

**1. Wheel kit:** A wheel kit is available as a basic add-on-solution which can be attached to the unit on site without using any tools. Easily accessible handles lift the unit to transport mode and the unit can be transported and moved to the optimal position by one person. On sites where no forklift is available, the wheel solution enables rapid and easy deployment of the unit.

**2. Flexible installation:** All mobile cooling units are easy to adapt to local conditions and specific site requirements. Setting these units on the shade side of a building or shelter with good ventilation will optimize the performance, as will reducing the length of the ducts used.

**3. Heating and cooling from the same unit:** All of the mobile cooling units are supplied with a built-in heat source. This makes these units dual purpose with heating and cooling in geographical areas with extreme differences in day time and night time temperatures, such as deserts.

**4. Useful Applications:** High temperature work zones, temporary buildings and shelters, relief camps, event tents, industrial oil and gas shelters, medical care shelters

## Specifications

The air conditioner has a maximum cooling capacity of 5 tons. The operating range is approximately between -10°C (14°F) and 55°C (131°F) and is controlled by the HP/LP pressure switch. In relatively dry locations, the air temperature drop will depend on the inlet conditions and operating environment.

Model No.		TECU - 5TON
Function		Cooling & Heating
Cooling capacity	tons	5
Heating capacity	kW	12kW
Electric source	PH-V-Hz	1PH,208~240V, 60Hz
Rated Cooling Power input	kW	9.0kW
Rated Heating Power input	kW	12.5kW
Rated Cooling Current input	A	41.8A
Rated Heating Current input	A	57.0A
Evaporator Fan Type		Direct Drive Centrifugal Fan
Evaporator Side Air flow volume	M3/h	3000m3/h
Static pressure	Pa	200
Refrigerant		R410A
Condenser Fan Type		Direct Drive Axial Fan
Condenser Side Air Flow Volume	M3/h	10000 m3/h
Noise	dB(A)	≤50 (internal) 65 (External)
Weight	kg / lbs	235 kg / 518 lbs
Net Dimension (L x W x H)	mm / in	1326×1062×608 / 52.2×41.8×23.9
Packing Dimension (L x W x H)	mm / in	1400x1116x770 / 55.1×43.9×30.3

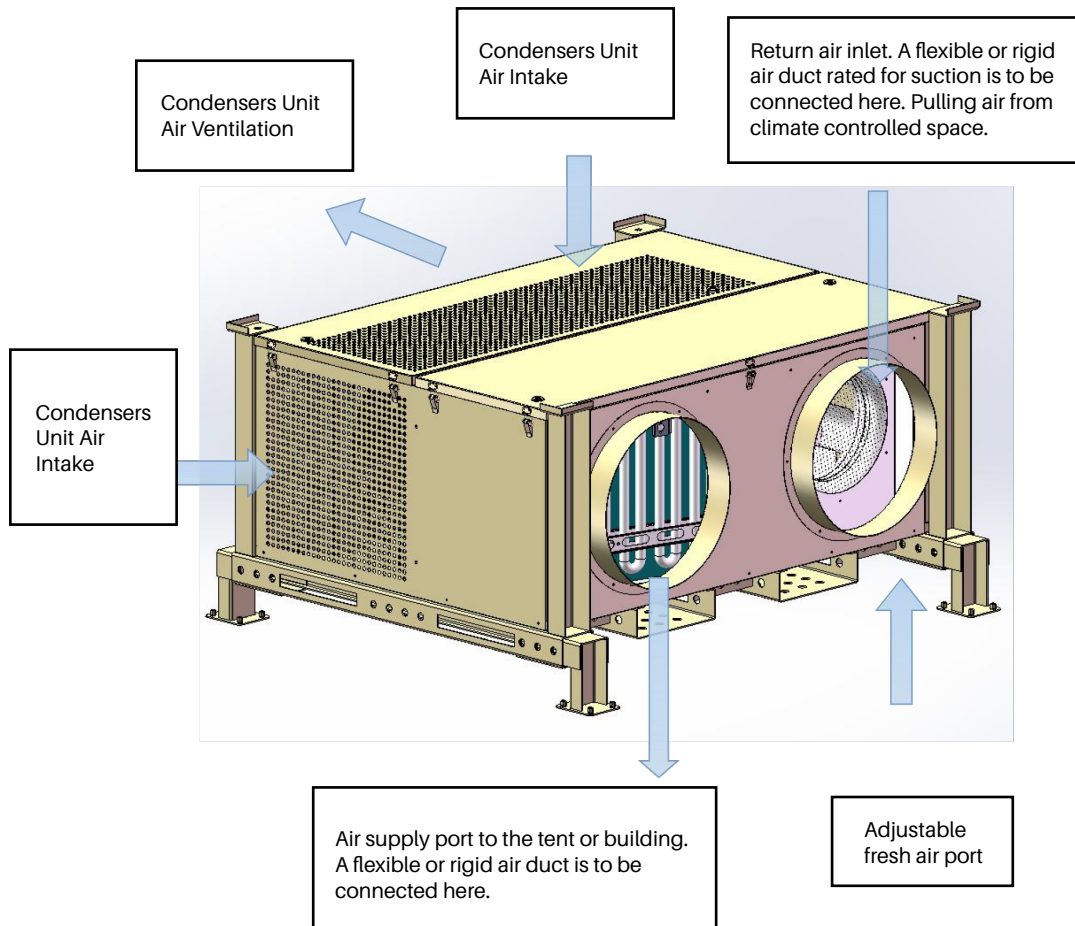


## CAUTION

- It is the responsibility of the operator to read and understand this service manual, and other information provided, to acknowledge the correct operating procedures.
- The unit is only to be installed and operated by qualified (trained) personnel.
- Repair of the cooling circuit or electrical system, is to be performed by skilled service.
- Read the entire manual prior to initial start of the unit. It is important to acknowledge the correct operating procedures for the air conditioner and all safety precautions.
- The unit must be grounded, through cables with earth wire and earthed power supply.
- Failure to do so can result in equipment damage, property damage or personal injury.

# STRUCTURE

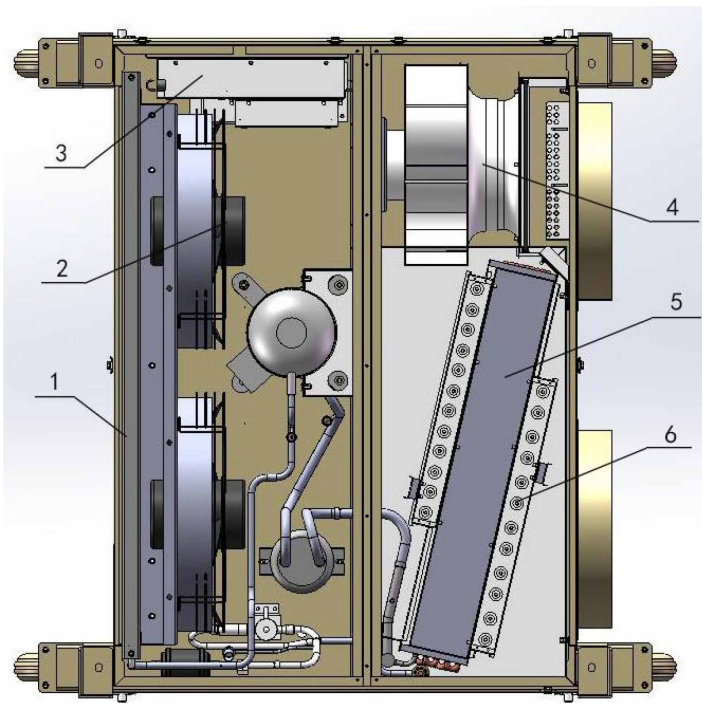
## 1. AIR FLOW THROUGH THE UNIT



## WARNING

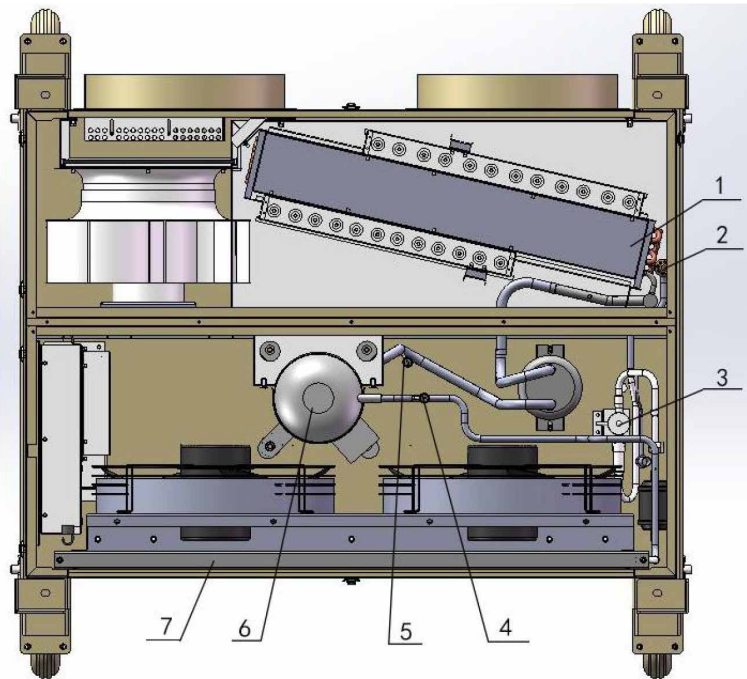
- Do not cover, block or obstruct any of the air openings. This may eventually cause malfunction!
- Do not operate the product outside the specified temperature range.

## 2. ILLUSTRATION OF THE UNIT



- 1. Condenser
- 2. Axial Fan
- 3. Electrical Control Box
- 4. Evaporator Fan
- 5. Evaporator
- 6. Electrical heating

## 3. COOLING CIRCUIT OF THE UNIT



SN	Part	Function
1	Evaporator	Evaporates the refrigerant resulting in a cold surface
2	Gas charge port	Vacuum and supplementary refrigerant from here
3	Expansion valve	Reduces the pressure of refrigerant going into the evaporator
4	HP switch	High pressure safety switch
5	LP switch	Low pressure safety switch
6	Compressor	Generates a high pressure to the refrigerant causes this to circulate in the system, alternately evaporate and condense
7	Condenser	Emits the excess heat initially absorbed by the evaporator to the surroundings

# THERMOSTAT

## WIRE CONTROLLER

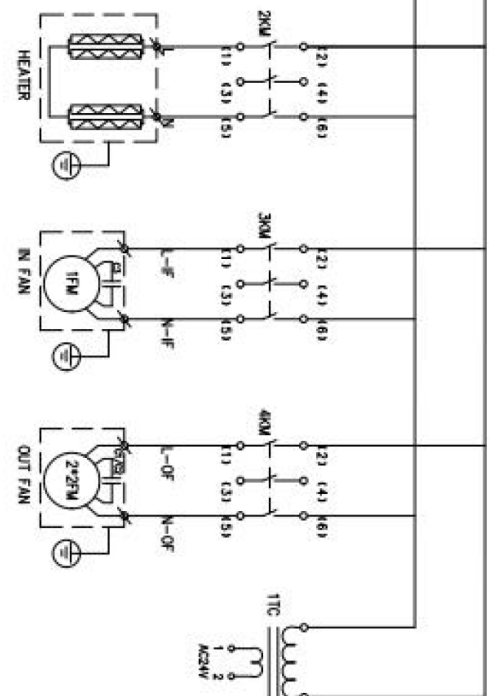
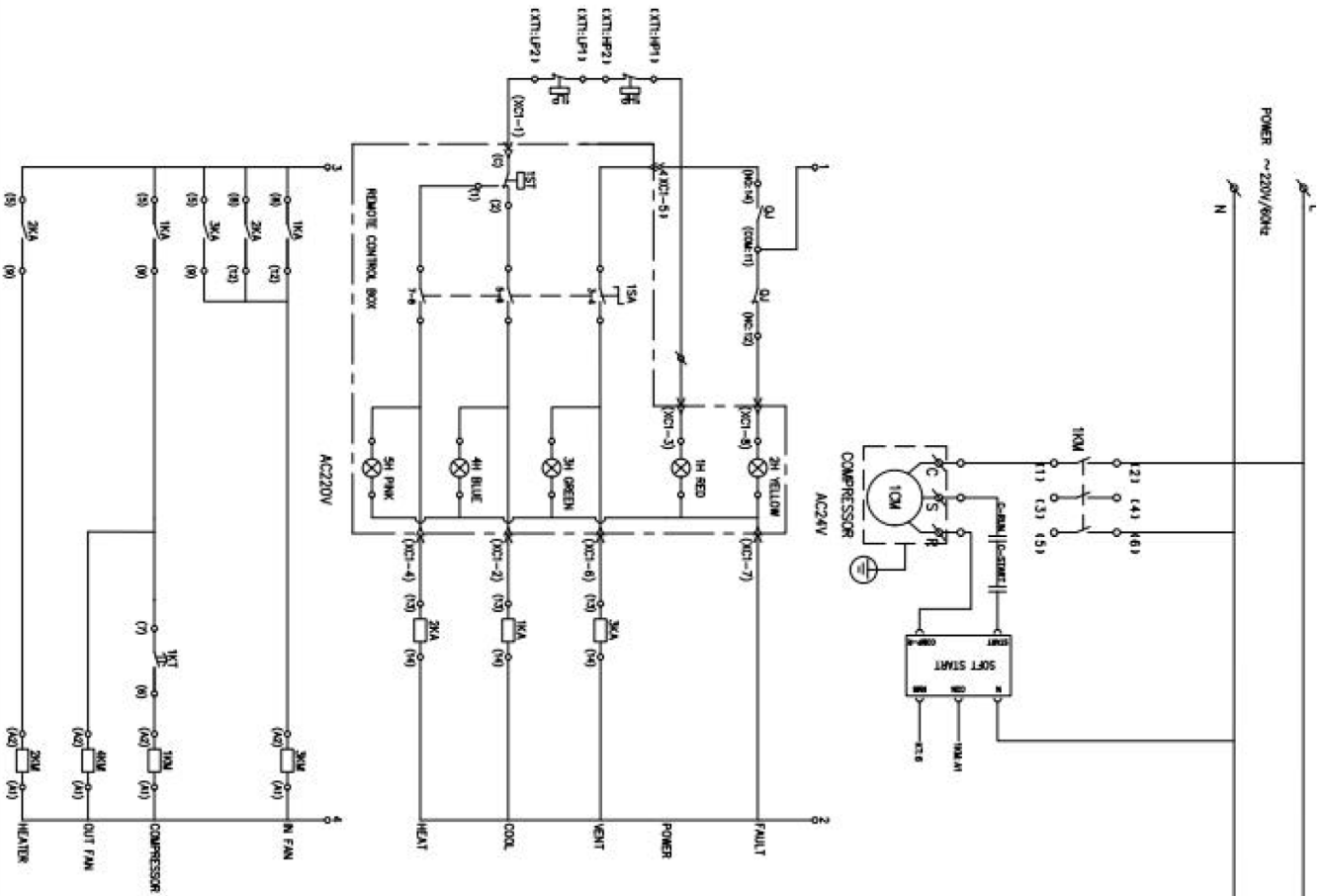
The control panel on the front contains all the controls required for normal operation.



### Description Of Rotary Switches And Mechanical thermostat

Gear	Operation Instruction
OFF	Power off
VENT	The indoor fan starts, and the unit enters the ventilation operation state
COOL	When the set temperature of the mechanical thermostat is lower than the ambient temperature, the unit enters the cooling state, the blue running indicator lights, the indoor fan starts first, and the compressor and outdoor fan start after 3 minutes delay.
HEAT	When the set temperature of the mechanical thermostat is higher than the ambient temperature, the indoor fan and electric heating start at the same time.

# ELECTRICAL WIRING DIAGRAM



1SA SWITCH ON DIAGRAM

1SA	OFF	HEAT	COOL	HEAT
1-2	✓	✓	✓	✓
3-4	✓	✓	✓	✓
5-6	✓	✓	✓	✓
7-8	✓	✓	✓	✓

Symbol	Description	Quantity	Part Number
C-start	compressor start capacitor	1	10UF
C-run	compressor run capacitor	1	10UF
C3	Indoor fan capacitor2	1	10UF
C2	Outdoor fan capacitor2	1	16UF
C1	Outdoor fan capacitor1	1	16UF
XCI	Aviation plug	1	WF20-9
K1	Time relay	1	JSZ3 A-B
ISA	Rotary switch	1	LWR26-20/2
1ST	The thermostat	1	TS-05058
1-5H	Indicator light	5	24V M22
1UP	Low-tension switch	1	YK-0.2-0.3
1HP	High-tension switch	1	YK-4.6-0.3
1KA/2KA/3KA	intermediate relay	3	INDIRECT ACN SHUNT/2K
4KM	Ac contactor	1	LC1D12M7C AC220V
3KM	Ac contactor	1	LC1D12M7C AC220V
2KM	Ac contactor	1	LC1D65M7C AC220V
1KM	Ac contactor	1	LC1D65M7C AC220V
1TC	Transformer	1	AA04505-50N-AS00
2FM	Outdoor fan	1	PA0400-185A-AS00
1FM	Indoor fan	1	PA0400-185A-AS00
1EH	Electrical heating	1	ZR77KCE-1F5-522
1CM	Compressor	1	ZR77KCE-1F5-522

# WORKING PRINCIPLE

## REFRIGERANT

The cooling circuit is sealed and filled with refrigerant type R410A.

This refrigerant enables the unit to operate within an ambient temperature range of -10°C (14°F) to 55°C (131°F).

## LIQUID

Liquid refrigerant from the receiver flows under high pressure through the liquid line to the thermostatic expansion valve, which then leads it into the evaporator. There, it evaporates under low pressure and low temperatures. The resulting vapor is drawn back to the compressor, compressed, and directed to the condensers. In the condensers, the vapor is cooled below the dew point and condensed back into liquid refrigerant.

## DESCRIPTION

Condensers, featuring copper tubes and aluminum-coated surfaces, and evaporator heat exchangers, utilizing Micro-channel technology, are integral to the cooling system. During operation, air flows over the evaporator, absorbing heat into the cooling circuit, which is then released in the condenser along with the compressor's electric energy consumption. To prevent ice formation on the evaporator when room temperatures drop below 20°C (68°F), the low-pressure (LP) safety switch is activated, halting the compressor and fans. In high ambient temperatures exceeding 55°C (131°F), the condenser's cooling capacity diminishes, prompting the high-pressure (HP) switch to trigger and deactivate the system.

# PREVENTIVE MAINTENANCE

## INTRODUCTION

In order to gain the best possible operation and long lifetime of the air conditioner it has to be maintained properly within defined guide lines. This section contains the description of daily, monthly and annual maintenance.

## CAUTION

Before doing any maintenance, be sure that the air conditioner has been shut down and that the power cable is disconnected from the unit.

### 1) DAILY PREVENTIVE MAINTENANCE

Preventive maintenance to be carried out daily or every 8 hours of operation. After shutdown each day or after every eight hours of operation perform the Following preventive maintenance procedures:

Step	Action
1	Inspect electrical cables for damage or loose connections.
2	Inspect the surface of the evaporator and remove possible debris, accumulated on the surface of the evaporator. Use vacuum clean or compressed air.
3	Inspect air ducts for damages or sharp bends and correct if needed.

### 2) MONTHLY PREVENTIVE MAINTENANCE

Please follow this procedure to carry out preventive maintenance monthly or every 200 hours of operation:

Step	Action
1	Perform daily maintenance.
2	Remove evaporator and condensers top cover, Vacuum clean or use compressed air, to clean the units inside.
3	Inspect the evaporator and condenser elements. Clean with compressed air or wash with warm soapy water if necessary.
4	Check that the water drains in the evaporator section isn't blocked.
5	Inspect and if necessary clean the two fans.

# PREVENTIVE MAINTENANCE

## 3) ANNUAL PREVENTIVE MAINTENANCE

Follow this procedure to carry out the annual preventive maintenance:

Step	Action
1	Perform the daily and monthly maintenance.
2	Let a trained refrigerant technician check the cooling circuit and all electrical functions. This control must follow national rules for control of cooling equipment.

### WARNING

Do not try to restart the compressor several times within a short period. This will overheat and may damage the compressor. The internal compressor thermostatic protection may also cut out.

### HIGH AMBIENT TEMPERATURE

If the surrounding temperature is higher than the maximum working temperature, the condenser will not be cooled enough, resulting in a too high pressure in the cooling circuit and thereby operating the pressure switch (HP). Allow some time for cooling of the system. When triggered on The blue cooling operation indicator goes out, and the compressor and indoor and outdoor fans stop working.

### LOW AMBIENT TEMPERATURE

If the air conditioner is operating below 20°C (68°F), the humidity in the airflow can cause ice to form on the evaporator element. As ice acts as an insulator, it can lead to a decrease in pressure within the cooling circuit, triggering the low-pressure (LP) switch to activate as a preventative measure against freezing. When the LP switch triggers, the blue cooling operation indicator turns off, and both the compressor and indoor and outdoor fans stop working.

### REDUCED AIRFLOW

A reduced airflow can be caused by dirty evaporator. This can result in the activation of the pressure switch (LP), causing the blue cooling operation indicator to go out, and the compressor and indoor and outdoor fans stop working.

## 4) FAILURE TYPE & CODE

Indicator Color	Indicator Status	Operating Mode	Failure Type
Blue	Extinguish	Cooling	Low pressure protection
Blue	Extinguish	Cooling	High pressure protection
Yellow	Bright	After turning on the power	Phase sequence protection

# SUPPORT

**For technical questions or replacement parts, please contact:**

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