



K08F2

SERIES VEHICLE AIR-CONDITIONER

**INSTALLATION OPERATION
AND MAINTENANCE
MANUL**

USER INSTRUCTION

Respectfully user:

Thank you so much for you choosing Pure Air products. This instruction is **formulated for your using, maintaining this air-conditioner correctly and Troubleshooting timely.**

The main items include product features, unit component, working principle, operation ,daily check and maintain and etc.

Please contact our after-sale department if there is something wrong of your air-conditioner. Maintenance is forbidden by the unprofessional person who easily damages the unit. Please read the guarantee card for detailed data on repair and guarantee article.

This manual is the standard mode. We keep the right for continuous improving our products. Specifications and procedures are subject to change without notice. Please contact our after-sale department if there is something wrong of your air-conditioner. Thank you for your support and suggestion.

CONTENTS

Chapter 1. Operation Notice	01
Chapter 2. Product Features	01
Chapter 3. Unit Component and Working Principle	02
Chapter 4. Unit Installation	02
Chapter 5. Unit Operation	03
Chapter 6. Daily Check and Maintenance	08
Chapter 7. Trouble shooting	11
Chapter 8. Electric Schematic Diagram	12
Chapter 9. Electric Connection Diagram	13

CHAPTER 1. OPERATION NOTICE

- ◆ The service voltage is DC12V or DC24V. (Please check the label for the concrete voltage and parameter).
- ◆ Heat insulation, heat avoiding measures should be using together with the nice sealing to keep the air-conditioner effective.
 - ◆ When abnormal noise, vibration or smell happen, please stop the unit immediately and check. Forced running is not allowed.
 - ◆ Please close the door and window, reduce the door opening times when using the air-conditioner.
 - ◆ Prohibit touching each rotating position, such as the fan, motor and etc. when the air-conditioner is working.
 - ◆ The refrigerant should be R134a, other refrigerant like R12 is not allowed.
 - ◆ Clean the dust and oil stain of condensor every month to keep the refrigeration effect when the unit used in the bad environment.
 - ◆ Be sure that the installation and operation follow the instruction of this manual, the uncorrectly operation will cause inestimable damage.
 - ◆ The total power consumption in 24V system is 14A (environmental temperature 45°C), In normal working environmental temperature 35°C, the total power consumption is less than 12A. We suggest you consider the vehicle works load and the actual consumption, if necessary, please choose high capacity battery and high power generator.
- The total power consumption of the 12V system is 28A(environmental temperature 45°C). In normal working environmental temperature 35°C, the total power consumption is less than 24A. We suggest you consider the vehicle works load and the actual consumption, if necessary, please choose high capacity battery and high power generator.
- If the air-conditioner is used when the engine is working, the power from the vehicle generator can support the load of itself and the air-conditioner consumption. In this case, the air-conditioner can be used.
- If the air-conditioner should be use when the engine is not working, battery should be added.

CHAPTER 2. PRODUCT FEATURES

K08F1 vehicle air-conditioner is specifically designed for the engineering machinery, construction machinery, trucks, special application vehicles and etc. The product features are as followed:

- ◆ Economical: This air-conditioner driven by the vehicle-load (or add extra one) DC12/24V battery, no need to start the vehicle main engine, which is different from the air-conditioner driven by the engine belt.
- ◆ Environment protection: Using R134a-type environmental-friendly refrigerant, no pollution.
- ◆ Refrigeration steady: The compressor which driven by the engine can keep constant. Revolution, The system working state and refrigeration is steady.
- ◆ Low Noise: The noise is lower than the similar products, no vibration and noise of the main engine when truck stops.
- ◆ Easy operation: Intelligentized microcomputer control system, easy operation.
- ◆ High security: Multiterm self-protection functions, such as pressure error protection, power overvoltage or undervoltage protection, moter over-current or overload protection, moter over-temperature protection and failure

checking, which ensure the system safety and reliably.

◆ Self-develop compressor with compact structure, good looking, small volume, large refrigeration, long service life and etc.

◆ The unit cover adopt international popular Fiberglass material streamline design, super appearance with light body, high temperature resistant, high strength and little resistance in traveling crane.

Adopt advanced technology, compact structure, good looking and integrated with the vehicle cabin.

CHAPTER 3. UNIT COMPONENT AND WORKING PRINCIPLE

The unit includes condenser assembly, evaporator assembly, compressor, motor, pipes, battery (optional), control system, safety system and ect.

Working principle: the refrigerant vapor(R134a)coming out from the evaporator with low temperature and low pressure is sucked into the compressor and is compressed into gases with high pressure and high temperature. The high temperature and high pressure gas will flow into the condenser via vent-pipe. The refrigerant vapor will be cooled down into liquid with normal temperature and high-pressure in the condenser. It will change into liquid and gas mixture with low temperature and low pressure and enter into the evaporator via thermo-expansion. In the evaporator, the refrigerant will absorb the heat inside air and be sucked into the compressor again, the cooled gas will be send into inner by the blower fan of evaporation to low the temper inside.

CHAPTER 4. UNIT INSTALLATION

Figure 1, K08F1 Condenser assembly outward appearance and the installation drawing:

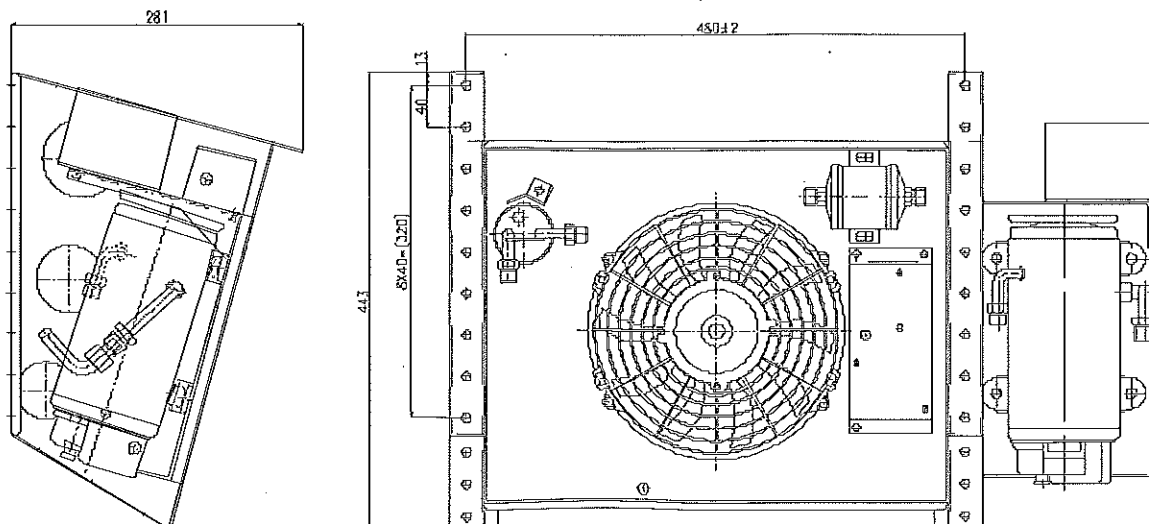
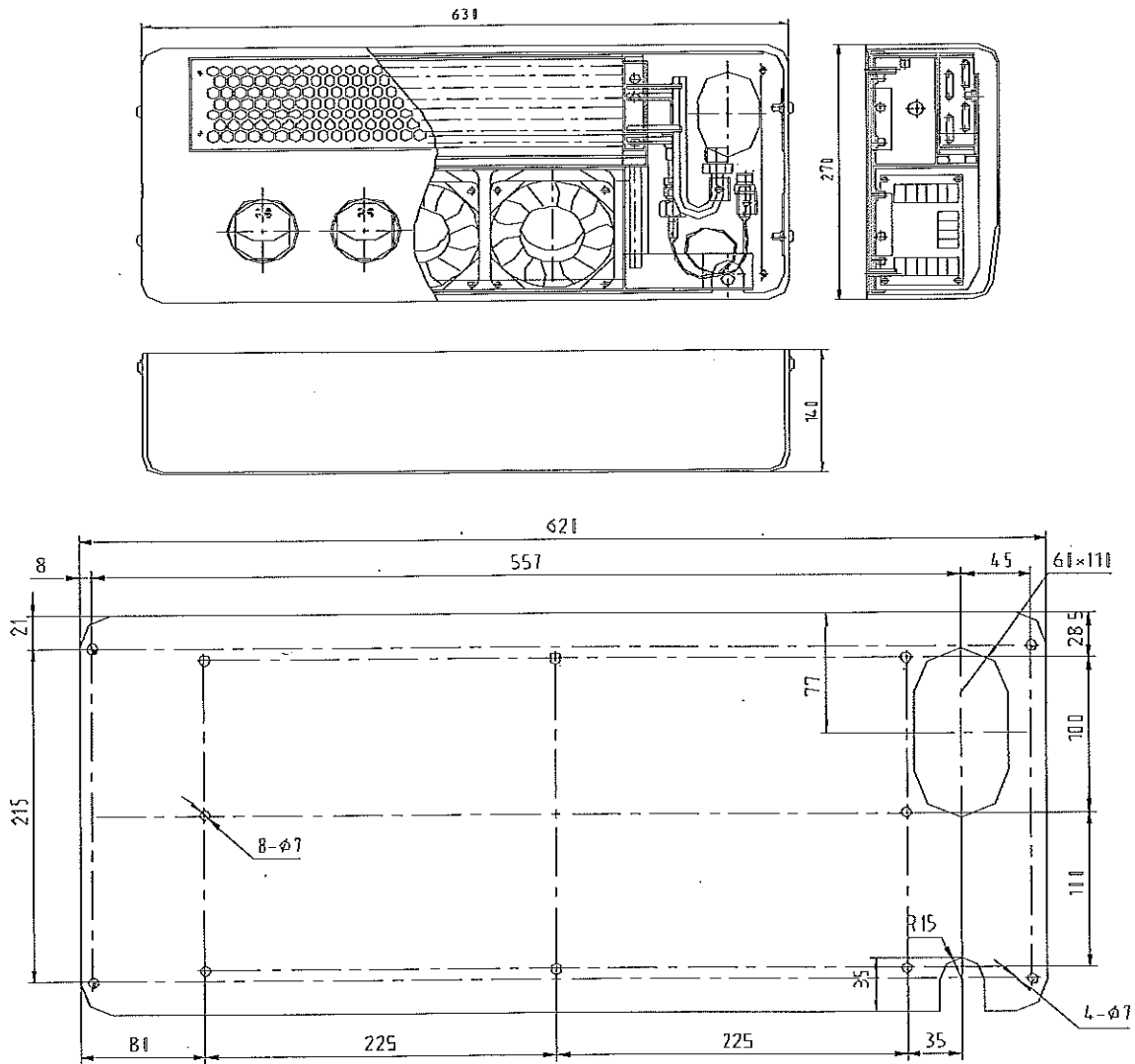
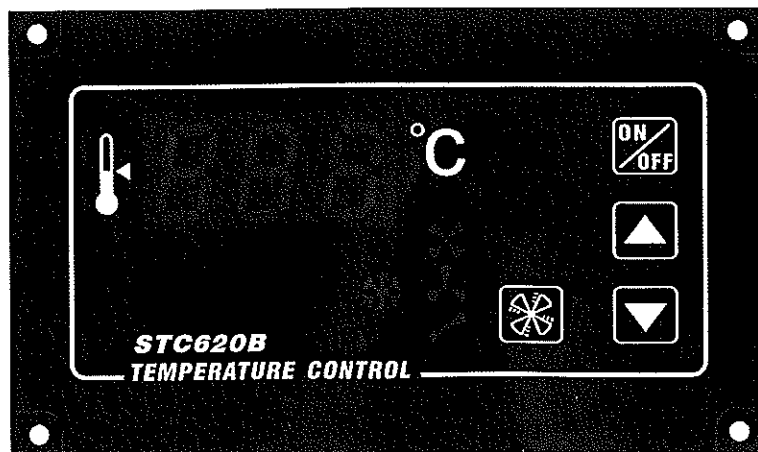


Figure 2, Slim Evaporator assembly outward appearance and the installation drawing:



CHAPTER 5. UNIT OPERATION

STC-620B Software Control Specification



Key instruction: key ▲ : up switch; Key ▼: down switch; Power switch key; fan change key

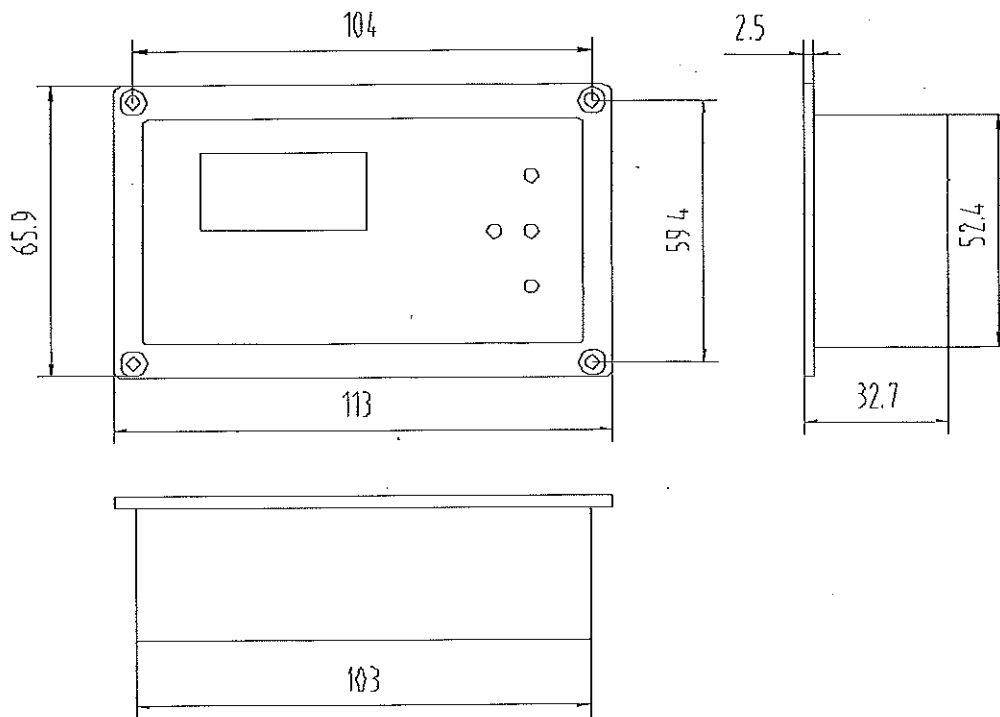
1. Indicator lamp and state instruction

INDICATOR LAMP	SIGN	STATE	FUNCTION
Refrigeration work	See the picture shown above	Flashing	Compressor relay time delay
Refrigeration work	See the picture shown above	Often bright	Compressor relay open
Refrigeration work	See the picture shown above	Off	Compressor indicator lamp off
Low speed fan work	See the picture shown above	On	(When low speed option) low speed fan relay actuation
Low speed fan work	See the picture shown above	Off	(When low speed option) low speed fan relay off
High speed fan work	See the picture shown above	On	(When high speed option) high speed, middle speed, low speed fan relay pull-in
High speed fan work	See the picture shown above	Off	(When high speed option) high speed, middle speed, low speed fan relay off
Middle speed fan work	See the picture shown above	On	(When middle speed option) middle speed, low speed fan relay pull-in
Middle speed fan work	See the picture shown above	Off	(When middle speed option) middle speed, low speed fan relay off.

2. Main technical parameter

- 1). Power: 9-32v.
- 2). Overall power consumption: less 3W.
- 3). The range of measurement: $-35\sim 70^{\circ}\text{C}$.
- 4). The range of control: $-35\sim 70^{\circ}\text{C}$.
- 5). Temperature resolution: 1°C .
- 6). Precision of measuring temperature: $\pm 1^{\circ}\text{C} \pm$ a half word.
- 7). Compressor, evaporator low speed, middle speed of fan, high speed of fan, power shortage protection five-way output, rated load current of each way 250MA, loading output voltage is the supply voltage of control panel, output loading can control the relevant electric relay.
- 8). Type of sensor: NTC sensor ($10\text{K}\Omega/25^{\circ}\text{C}$, $\text{B K}\Omega/3435\text{K}$), two stalk sensor, one voltage detection signal input :one switch digital quantity input.
- 9). The front board protection grade: IP*4.
- 10). Running environment temperature: $-35^{\circ}\text{C}\sim 70^{\circ}\text{C}$.
- 11). Storage temperature: $-35^{\circ}\text{C}\sim 75^{\circ}\text{C}$.
- 12) Relative humidity: 20~85% (non condensing).

3. Specification



- 1). The length of sensor line: 50cm (including the length of probe).
- 2). The length of load line: 30cm.

4. Main function.

- 1). Refrigeration, evaporator fan low speed, fan middle speed, fan high speed, power shortage protect circuit output. Used to controlling the relevant electric relay.
- 2). Refrigerating, centidegree, low speed of fan, middle speed of fan, high speed of fan, five status indicator lamp. Three figure nixie tube.
- 3). 12V/24V protect function of voltage abnormal.
- 4). Switch input function.
- 5). Power shortage of battery protection function.
- 6). The control function of remote controller, used to adjusting the setting temperature, wind speed switching, open/close machine, etc.

5. Key operation instruction

- 1). Modify the setting temperature

A. When open the power each time, after the nixie tube all display for one second it entering into stand-by mode, under stand-by mode, these isn't display and output. It will display the setting mode of the temperature untill the key start. Under the setting mode of the temperature, the nixie tube flashing show the setting temperature at present.

B. Under starting up working state, pressing key up and down can adjust the setting temperature, nixie tube flashing

showing the setting temperature at present. When setting end, it will stop flashing after three seconds, setting come into effect!

2). Power switching key

When controlling work, pressing power switching key exceed one second, it will access power off state. Under power off state, control panel relay all disconnect, nixie tube and indicator lamp do not display.

When close the control panel, pressing the power switch key exceed one second, the control panel will start, after nixie tube all display it accessing power on state, it can have temperature setting operation under the power on state. The temperature and mode can be memoried after each operation.

Under cooling mode: start-time delay two seconds- evaporator fan ten seconds- according to temperature condition judge whether meet the condition of opening the compressor.

3). Fan key

Under the normal working state: pressing the fan key can change fan's low speed, middle speed, high speed running state, when running on low speed, only the low speed fan relay pull-in, when running on middle speed, low speed and middle speed relay pull-in, when running on high speed, low speed, middle, high speed relay pull-in.

4). Defrosting running

a) Defrosting running is automatically run, defrosting sensor starts working (ON) from 2°C and stops working (OFF) at 8°C.

b) The compressor and the condenser fan stop working and the evaporator runs normally when defrosting is conducted.

c) Display space alternate displays the temperature at present and dFr under defrosting state.

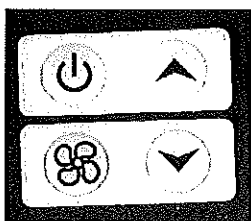
5). Refrigeration operation

When setting in the cooling mode:

When the temperature measured by the sensor turn out to be exceeds the sum of the setting temperature and the backlash, the compressor pull-in the relay.

When the temperature measured by the sensor turn out to be lower than the setting temperature, the compressor disconnects the relay.

6). Remote control



Remote control keys are: ▲ key: raised keys; ▼ keys: lower keys; Power switch keys; speed switch keys.

Remote control functions: In addition to enter the management menu and adjust menu parameters, can use to the other buttons to operate with the panel. Upward and downward by keys can be set to adjust the temperature, press the power key to switch machine to close.

6. Protect function

1). Power loss protection

When F2 to 0. When the voltage measurement value is greater than 12.5V, the relays will pull-in the loss power output. When the Voltage detection value is lower than the Ultra-minimum limit value 11.5V, the loss power output disconnects the relays; When F2 to 1. The voltage detection value is greater than 25V; the relays will pull-in the loss power output. When

the Voltage detection value is lower than the Ultra-minimum limit value 22.5V, the loss power output disconnect the relays; in the power loss protection mode, the digital tube display flashes FUD, the other relay output will not be affected.

After Power to the controller the initial boot, when the measured voltage at the power loss between the upper and lower limits. The power loss protection starts, only when the voltage value reached to the ultra-maximum limit value, the power loss protection cancel. In the subsequent restart, when the measured voltage at the power loss between the upper and lower limits, the power loss protection does not start. Until the value reaches to the ultra-minimum limit value, the protection only to start.

When power loss protection all over load are stoped.

2). Abnormal voltage protection

When the measured voltage detection voltage is lower than the effective range of the value of (F2 to 0, the effective threshold of voltage 10.25V; F2 to 1, the effective voltage threshold of 21V;), all working relays disconnected, digital display LUD. When the voltage up to the reset voltage, (F2 to 0, reset voltage threshold of 11V; F2 to 1, the reset voltage threshold of 21.8V), the output will be able to function properly.

When the measured voltage detection voltage is higher than the effective range of the value of (F2 to 0, the effective maximum voltage is 16V; F2 to 1, the effective maximum voltage is 32V;), all working relays disconnected, the digital displays PUD.

3). Fault protections function

When the protection switches for the disconnected, all working relays disconnected, the digital display fault code PrE.

When the measured voltage detection voltage is lower than the effective range of values, all working relays disconnected, the digital displays LUD.

When the measured voltage detection voltage is higher than the effective range of values, all working relays disconnected (loss power relay pull-in), the digital displays PUD.

When the temperature sensor short circuit or open circuit, all working relays disconnected, the digital control circuit shows that E2, showed that short-circuit E1.

When the defrosting sensor open circuit or short circuit, all working relays disconnected, the digital control circuit shows that E4, showed that short-circuit E3.

When the temperature sensors measured temperature exceeds the setting upper limit temperature super70, and set the duration of time over 15 minutes when the cycle of digital tube displays the current temperature and super-limit fault code Hr. The relays working as usual.

When the temperature sensor measured temperature lower than the minimum temperature super50, and set the duration of time over 15 minutes when the cycle of digital tube displays the current temperature and super-limit fault code Lr. The relays working as usual.

7. Fault code table

FAULT CODE	FAULT INFORMATION CONTENT
E—1	Inside temperature sensor short-circuit
E—2	Inside temperature sensor turn-out
E—3	Defrost temperature sensor short-circuit
E—4	Defrost temperature sensor turn-out
PrE	Compound pressure switch abnormal
PUD	The voltage of power is to high
LUD	The voltage of power is to low
FUD	Mian battery power loss protection
Hr	Temperature exceeds upper/limit alarm
Lr	Temperature exceeds lower limit alarm

- 1). The nixie tube show the fault code when it have faults.
- 2). When the fault remove, the system will quit protection and enter normal operation according to the mode before protection.

CHAPTER 6. DAILY CHECK AND MAINTENANCE

Checking and maintenance the air-conditioner properly and timely can keep the unit in in a good operating condition all the time, which can increase the service time and reduce the breakdown. We suggest you doing like the following items.

1. Daily Check and Maintenance

1). Check the refrigerant charge

This unit system is very small, so please add the accurate refrigerant charge, or that will made a great impact on the pressure of the whole system. Please add according to the nameplate.(R134a is only allowed)

2). Check the leakage of the cooling system

If oil pollution occurs to the joint or some part of the cooling system, it means refrigerant leakage happens to the part. If the pollution occurs to the joint, screw down the joint tightly. if any further leakage, please the nearest authorized maintenance station of PURE AIR Air Conditioner or the PURE AIR's after-sales service department.

3). Clean air filter net

Wash the evaporator filter net once in a week, take the air filter out and check the cleanness of it. First blow the air filter with the compressed air or wash it with the warm water which contains the neutral detergent, then wash it again with the clean water.

4). The air conditioner is forbidden for any usage when the failure light is on. That the failure light is on means some fault happens to the air conditioner. If the air conditioner is still used under such case, it's like the continuous work with sickness, which only makes the sickness more serious and cause damage to the air conditioner system or the components & parts.

5). Short connection on the pressure switch is not allowed under any condition. The air conditioner pressure protection fails if the pressure switch is connected short and damage to the components & parts of the air conditioner will be caused once abnormality occurs.

6). Vehicle heat load increases drastically under the sunlight insolation, which make the condensation and evaporation pressure of the unit raise, and the cooling speed will slow down.

7). Please set the normal rotation speed of the motor and compressor at 2200RPM, Do not too high or that will damage the compressor easily, and reduce the service time.

2. Care & Maintenance Cycle

ITEMS		METHOD	INTERVAL OF THE CARE & MAINTENANCE							5,000 HOURS	10,000 HOURS
			EVERY DAY	EVERY WEEK	EVERY MONTH	EVERY SEASON	EVERY HALF YEAR	EVERY YEAR			
Cooling Circulation	Refrigerant charge	Check the pressure is normal or not	★								
	Tube	Check any leakage at the joint		★							
		Check the hose clamp and hoop falls off or not			★						
		Check any jam to the discharged tube			★						
Compressor	Abnormal noise	Check eccentricity to the compressor and motor direct drive or not		★							◆
	Compressor over-temp	Check the motor over rotating or oil lean.		★							
Motor	Current and voltage	Check the current & voltage are high to heat the motor and increase the battery consumption or not	★								
	Over temp	Check the motor over rotating or the overtension		★							
Condenser	Condenser fin	Clean with the compressed air or water		★							
	Condenser fan	Check the running condition			★					◆	◆
	Air-inlet filter	Blow off the dust on the filter with compressed air			★						
Evaporator assembly	Evaporator fin	Blow off the dust on the fin with compressed air			★						
	Evaporating fan	Check the running condition			★					◆	◆
	Dry filter	Check the jamming					★				
	Air-return filter	Clean with the compressed air or water			★						
	Electric switch	Check the working condition			★						
	Cable	Check any damage or not		★							
	Wiring connection	Check any loose or not		★							
Remark: ★ means check, maintain or replace if necessary and ◆ states means need to change or replace.											

CHAPTER 7. TROUBLE SHOOTING

1. Bad running

When the air conditioner doesn't make good cooling effect, check the pressure on the air conditioner's high and low pressure sides with manifold and conduct the trouble shooting based on the result of deviation from the normal pressure or not.

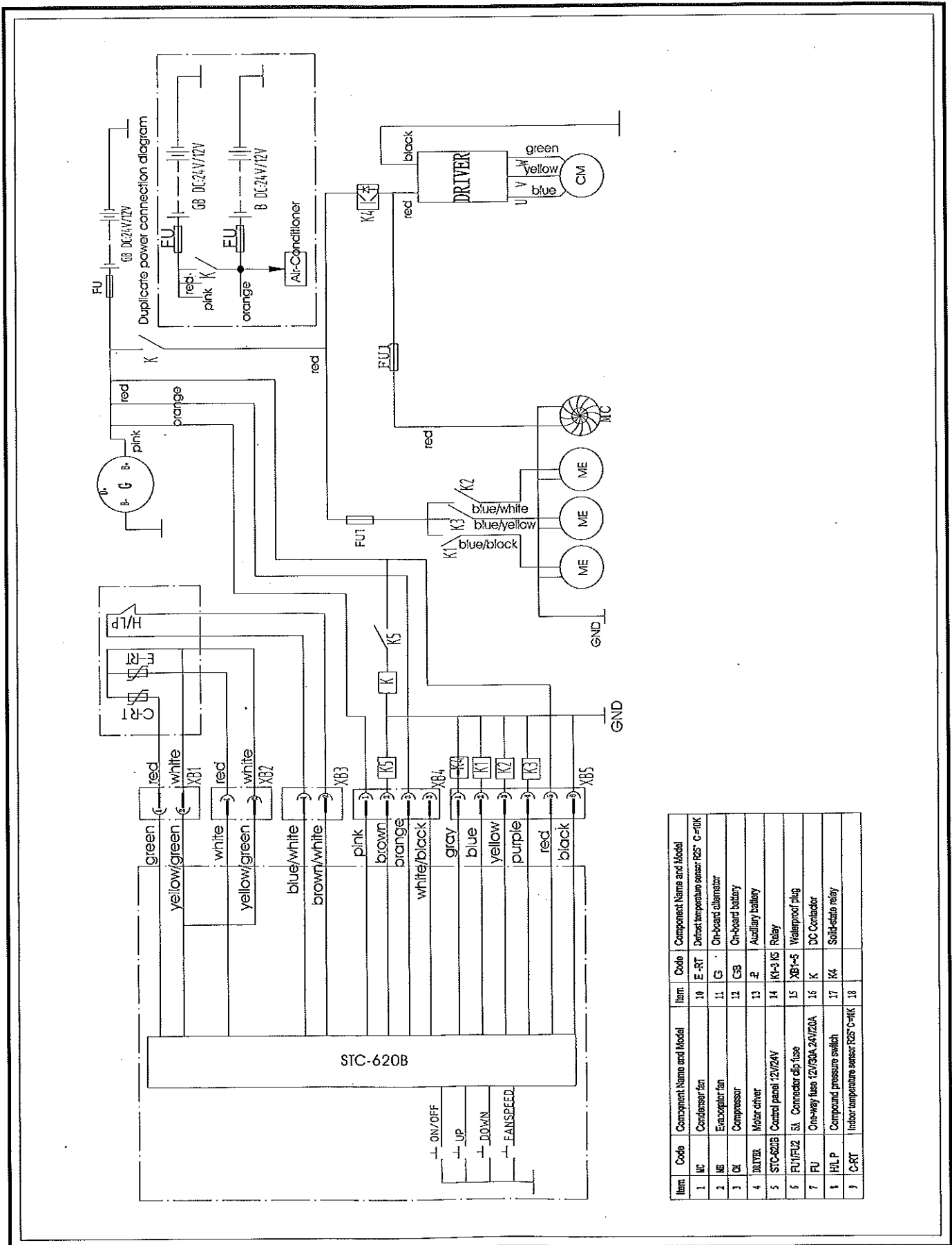
Normal working pressure (readings in the manifold): on the low-pressure side: 0.2-0.36Mpa; on the high-pressure side: 1.1-1.75Mpa

PHENOMENON		FAILURE CAUSE	TROUBLESHOOTING METHOD
System running abnormal	Over high for the high pressure and low pressure	1. Too much refrigerant charge	Discharge the redundant refrigerant slowly
		2. Non-condensable gas enters the cooling circulation	Let out the refrigerant and vacuumization again, add refrigerant
		3. The fuse of the condenser fan breaks or the relay is damaged	Maintain and replace
		4. The condenser fan damaged	Maintain and replace
		5. The condenser fin is jammed by the dirt	Clean the condenser fin
	Low value for the high pressure and over high value for the low pressure	1. The interior valve plate of the compressor damaged	Maintain and replace the compressor
	High value for the high pressure and over high value for the low pressure	1. Over environment temperature	None
		2. Over inner temp.	None
		3. The evaporator fin is jammed by the dirt	Clean the evaporator fin
	Low value for the high pressure and over low value for the low pressure	1. Refrigerant charge is not enough	check and maintain the leakage part. Add refrigerant charge
		2. Capillary is jammed by the dirt	Clean the filter or change the capillary
		3. The eva.air-return filter or the eva. fin is jammed by the dirt.(Evaporator exist frost)	Clean the filter or the evaporator fin

2. Loud noise

PHENOMENON	FAILURE CAUSE	TROUBLESHOOTING METHOD
the motor and compressor Loose coupling	Coupling loose	Tighten
	Overmuch wearing	Replace
	Wearing and damage to the interior parts & components	Maintain or replace
	Over low oil level and poor lubrication	Add refrigerant oil
	Too much liquid return of the refrigerant makes liquid pressure	Eliminate the air conditioner's system failure
Abnormal noise of the fan	The fan or the fan motor loose and wear	Maintain or replace
Abnormal noise in the air conditioner system	Overmuch or deficient refrigerant in the system	Add or reduce the refrigerant as per the specified charge

CHAPTER 8. ELECTRIC SCHEMATIC DIAGRAM



Item	Code	Component Name and Model	Item	Code	Component Name and Model
1	MC	Condenser fan	10	E-RT	Defrost temperature sensor: P25 C-10K
2	ME	Evaporator fan	11	C	On-board thermostat
3	CM	Compressor	12	CSB	On-board battery
4	DRIVER	Motor driver	13	E	Auxiliary battery
5	STC-620B	Control panel: 12V/24V	14	K1-3 K5	Relay
6	FU1/FU2	5A Connector dip fuse	15	XB1-5	Waterproof plug
7	FU	One-way fuse: 12V/50A, 24V/20A	16	K	DC Contactor
8	H/LP	Compound pressure switch	17	K4	Solid-state relay
9	C-RT	Indoor temperature sensor: P25 C-10K	18		

CHAPTER 9. ELECTRIC CONNECTION DIAGRAM

