



# KTD-3

## PURE ELECTRIC VARIABLE FREQUENCY AIR-CONDITIONER OPERATION AND MAINTENANCE MANUAL



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## User Instruction

### Respectfully user:

Thank you so much for you choosing our 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.

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# KTD-3

Series Vehicle Air-conditioner

## Installation Operation And Maintenance Manual

## Chapter 1. Operation Notice

The service voltage is DC12V. (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 condenser 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 incorrectly operation will cause inestimable damage.

## Chapter 2. Product Features

KTD-3 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 product is powered by vehicle DC12V battery pack( or additional batteries), with a high-efficiency all electric variable-frequency fully enclosed compressor, using minimum current of 25A and a maximum current of not more than 50A, which is economical and energy-saving.

**Environment protection:** Using R134a-type environmental-friendly refrigerant, no pollution.

**Easy installation:** integrated structure designed, easy to install according to the installation manual.

**Refrigeration effect steady:** The compressor of air conditioning system adopts pure electric fully enclosed inverter compressor, the system works stably, the air conditioning unit is energy-efficient, and the refrigeration effect is strong.

In normal working environmental temperature 95°F, the total power consumption is less than 50A. We are 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.

**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 over voltage or undervoltage protection, motor over-current or overload protection, motor 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 fiber glass material streamline design, super appearance with light body, high temperature resistant, high strength and little resistance in travelling crane.

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

## Chapter 3. Unit Component And Working Principle

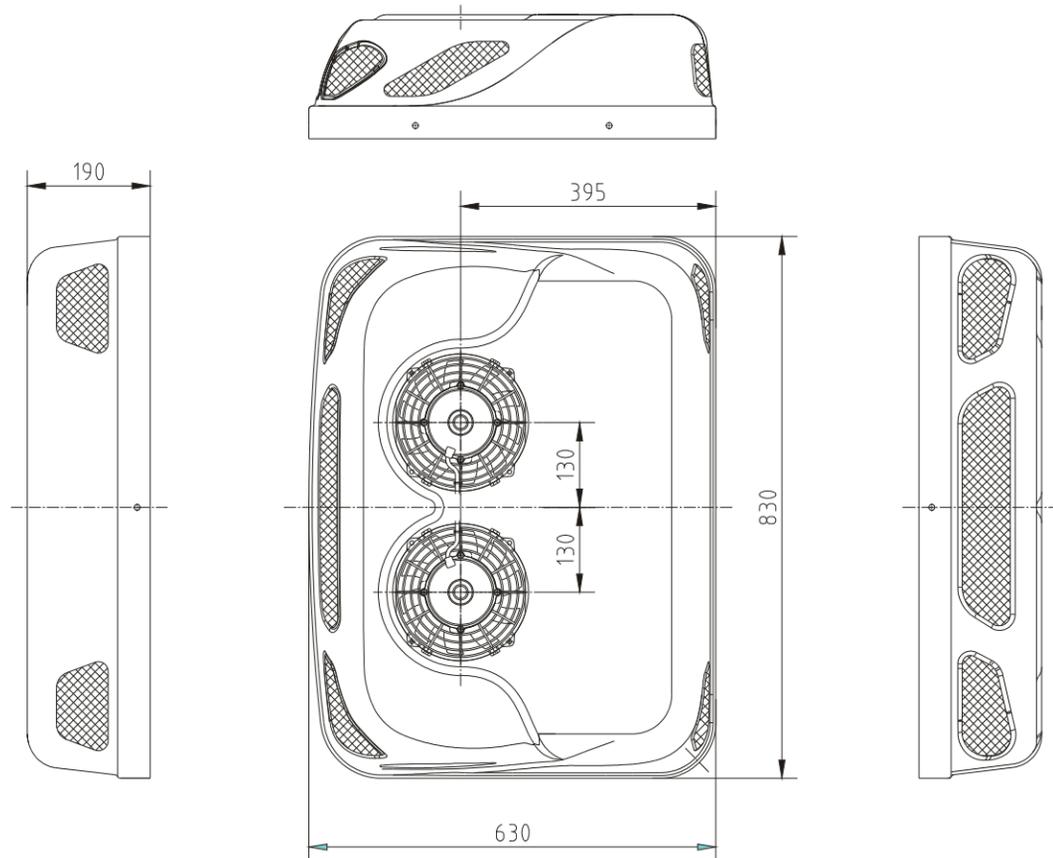
- The unit includes condenser assembly, evaporator assembly, compressor, motor, pipes, battery (optional), control system, safety system and etc.

- Working principle: the refrigerant (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

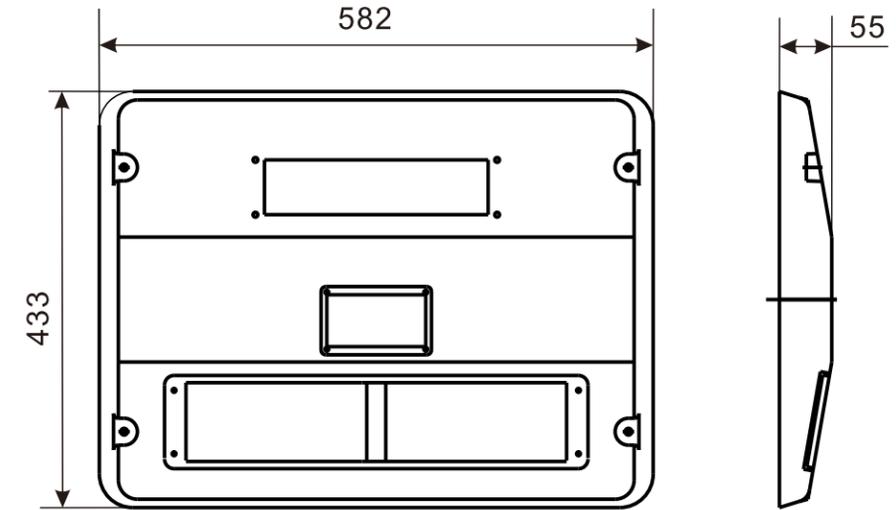
condenser via vent-pipe. The refrigerant will be cooled down into liquid with normal temperature and high-pressure in the condenser. It will change into liquid and gas mixture with low temperature and low pressure and enter into the evaporator via thermo-expansion. In the evaporator, the refrigerant 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

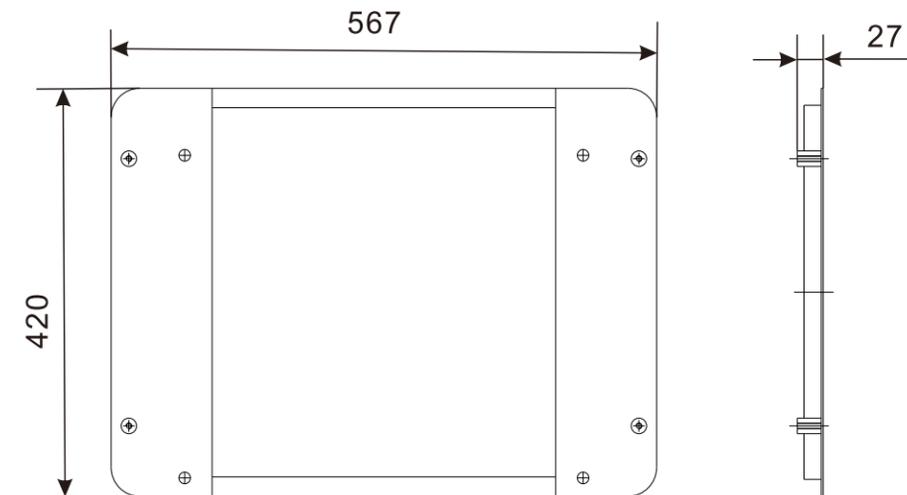
1. Air-conditioning assembly drawing



2. Air duct assembly drawing



3. Interior cover drawing



## Chapter 5. Truck Air-Conditioner Unit Installation Manual

### 1. Installation Tools



Spanner



#65 Tap Wrench



Phillips Screwdriver



#10 Drill Bit



Pencil

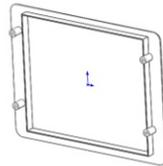
### 2. Parts List



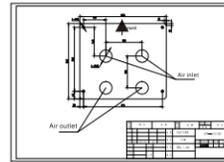
Unit Assembly×1



Inner Air Duct×1



Inner Air Duct Mounting Plate×1



Drawing×1



M8×70 Threaded Rods×4



#8 Big Flat Washer×8



#8 Spring Washer×8



M8 Nut×8



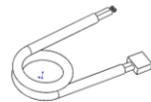
Black sealant×1



EVA Sealing Strip×1



PVC Sponge×5



Power Line×1



#25 Hose Clamp×8

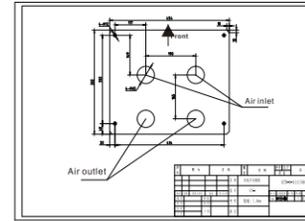


Black Ribbon×15

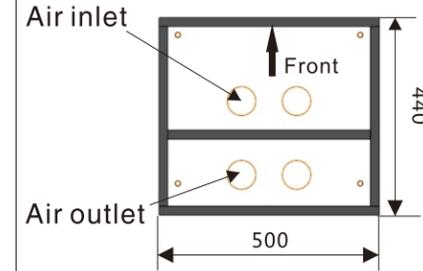


St5×35 Self-drilling screw×10

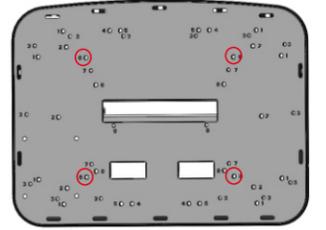
### 3. Installation Procedure



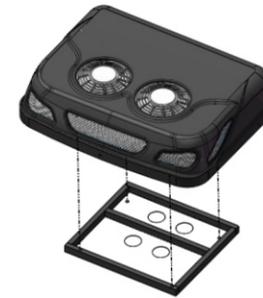
Step One: Mark the top of the car using the installation hole template drawing (positioned accordingly) and then use a drill gun to create an opening in the location of the holes (as shown in the figure).



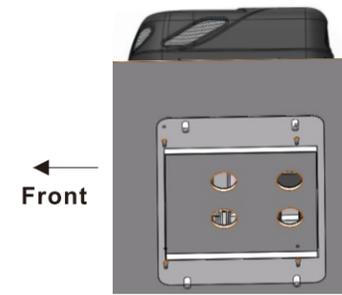
Step Two: Stick the EVA seal strip around the holes, apply sealant around the EVA seal adhesive strip to prevent rain from seeping into the car (as shown in the figure).



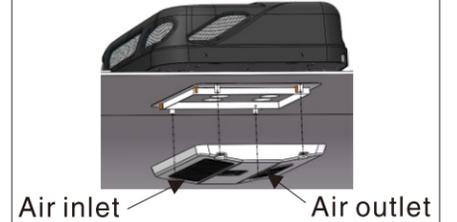
Step Three: Install the four M8x70 Threaded Rods at No.6 nut hole (as marked in red circles). The Threaded Rods rotate in 10mm and locked with provided M8 nut. (as shown in the figure)



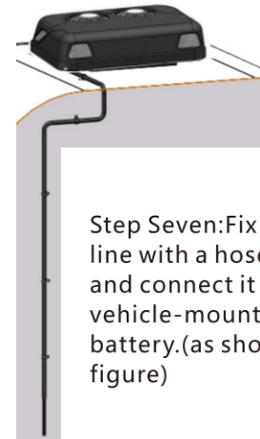
Step Four: Install the unit on the top of the vehicle by securing the four threaded rods into the four mounting holes on the top of the vehicle (as shown in the figure).



Step Five: Install the inner air duct mounting plate inside the vehicle. Make sure to the front direction when installing the mounting plate of inner air duct (as shown in the figure).



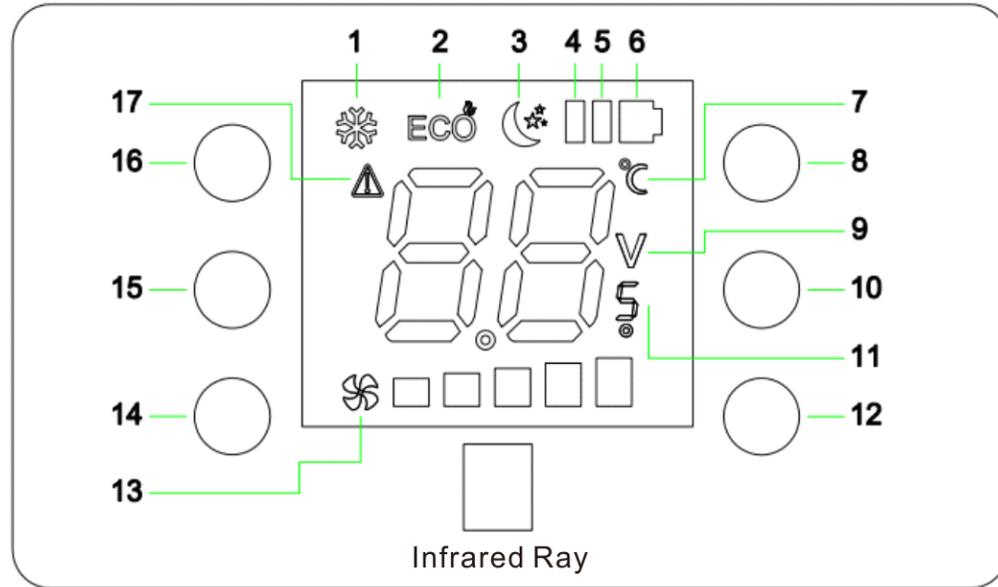
Step Six: Connect and plug the panel line and the control line from the return air port, then install the inner air duct with the Allen wrench and seal it with the sponge strip according to the



Step Seven: Fix the power line with a hose clamp and connect it to the vehicle-mounted battery. (as shown in the figure)

**Notice: After the installation of the unit, please wait patiently for at least 4 hours before starting it up! This is to allow the compressor oil to flow back to the compressor (the unit may have been inverted during the transport process). Our company is not responsible for any changes to your car body during the unit installation.**

## Chapter 6. Unit Operation



### 1、 Key Function:

1. 16 Power switch: Press this key to boot, long press 3 seconds to shut down; In the shutdown state, press and hold for 10 seconds to restore all settings to the factory settings, and switch between Fahrenheit and Celsius display .
2. 15 Wind speed+ : Increase the air volume and increase the low-voltage protection value.
3. 14 Wind speed-: Reduce he air volume and reduce the low-voltage protection value.
4. 8 Mode key: Cyclic switching four modes: air supply, strong, energy saving and sleep; Power on state, press and hold for 6 seconds to enter the voltage setting.
5. 10 Temperature+: rise temperature, increase the low- voltage protection recovery value.
6. 12 Temperature-: lower temperature, reduce the low- voltage protection recovery value.

### 2、 Instruction:

1.Strong cold mode	2.ECO cold mode	3.Sleep mode
4.Hight battery power	5.Mid battery power	6.Low battery power
7.Temperature icon	9.Voltage icon	11.Radix point icon
13.Wind speed icon	17.Malfunction icon	

### 3、 Operating instructions:

- 1.Press “power switch” for short time, panel power on., long press “power switch”, panel power off.
- 2.Press “Wind speed+” to increase the air volume; Press “Wind speed-” to reduce the air volume;
- 3.Press “Temperature+” to rise setting temperature value; Press “Temperature-” to lower setting temperature value;
- 4.Press “Mode key”, Cyclic switching four modes: air supply, strong, energy saving and sleep.
- 5.Undervoltage and recovery value adjustment: long press “mode key”, enter into undervoltage mode setting. Press “Wind speed+” increase low-voltage protection value, press “Wind speed-” to reduce low-voltage protection value;
- Press “Temperature+” to increase low-voltage protection recovery value, press “Wind speed-” to reduce low-voltage protection recovery value;

#### 4、 Working mode:

1. Air supply mode: The wind speed is adjustable from 1 to 5 speed, and the temperature is not adjustable.
2. Strong mode: press the strong icon of the remote control, the wind speed is fixed at 5 speed, and the setting is 62.6 °F. The remote control wind speed is adjustable from 1 to 5, and the temperature is 62.6 °F - 86 °F, display and control the indoor temperature.
3. ECO mode: The wind speed is adjustable from 1 to 5 speed, temperature 62.6 °F - 86 °F adjustable, display and control the indoor temperature.
4. Sleep mode: The wind speed is adjustable from 1 to 5 speed, temperature setting 75.2 °F, display and control the indoor temperature. If there is no fault, the screen will be turned off after 5 seconds. Press any key to turn off the screen.

#### 5、 Fault code:

1. Under-voltage protection, supply voltage under setting value (default: 9.5V), speed control line stop output, low battery, the red light is on.
2. Over-voltage protection, supply voltage exceeds 17V, speed control line stop output, high battery, the red light is on.

When the panel receives a fault from the controller, the red fault light flashes and displays the fault code as follows:

EC	temperature probe open circuit or short circuit
EF	internal fan short circuit or open circuit
E1	software error
E2	running high current protection
E3	compressor reverses
E4	low voltage protection
E7	the compressor default phase
E8	compressor temperature protection
E9	system pressure protection

## Chapter 7. Daily Check and Maintenance

Checking and maintenance the air-conditioner properly and timely can keep the unit 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 go to the nearest authorized maintenance station or contact with our 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). Shot 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 drastic 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 3000RPM, 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								
		Every Day	Every Week	Every Month	Every Season	Every Half Year	Every Year	5,000 Hours	10,000 Hours	
Cooling Circulate	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 over tension		★						
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 8. Trouble Shooting

1. 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 refrigerator 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
Abnormal noise in the air conditioner system	Overmuch or deficient refrigerant in the system	Add or reduce the refrigerant as per the specified charge

**2. 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: 0.15-0.38 Mpa; on the high-pressure side: 0.8-1.9 Mpa.

Phenomenon	Failure Cause	Troubleshooting Method	
System running abnormal	Over high for the high pressure and low pressure	Too much refrigerant charge	Discharge the redundant refrigerant slowly
		Non-condensable gas enters the cooling circulation	Let out the refrigerant and vacuum again, add refrigerant
		The fuse of the condenser fan breaks or the relay is damaged	Maintain and replace
		The condenser fan damaged	Maintain and replace
		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	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	Over environment temperature	None
		Over inner temp.	None
		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	Refrigerant charge is not enough	Check and maintain the leak add refrigerant charge
Capillary is jammed by the dirt		Clean the filter or change the capillary	
The evaporator Air-return filter or the evaporator fin is jammed by the dirt (Evaporator exist frost)		Clean the filter or the evaporator fin	

**Chapter 9. Electric Schematic Diagram**

