# SILVEL

# INSTALLATION MANUAL

## DIESEL HEATER

If you have any trouble using it, please contact us at

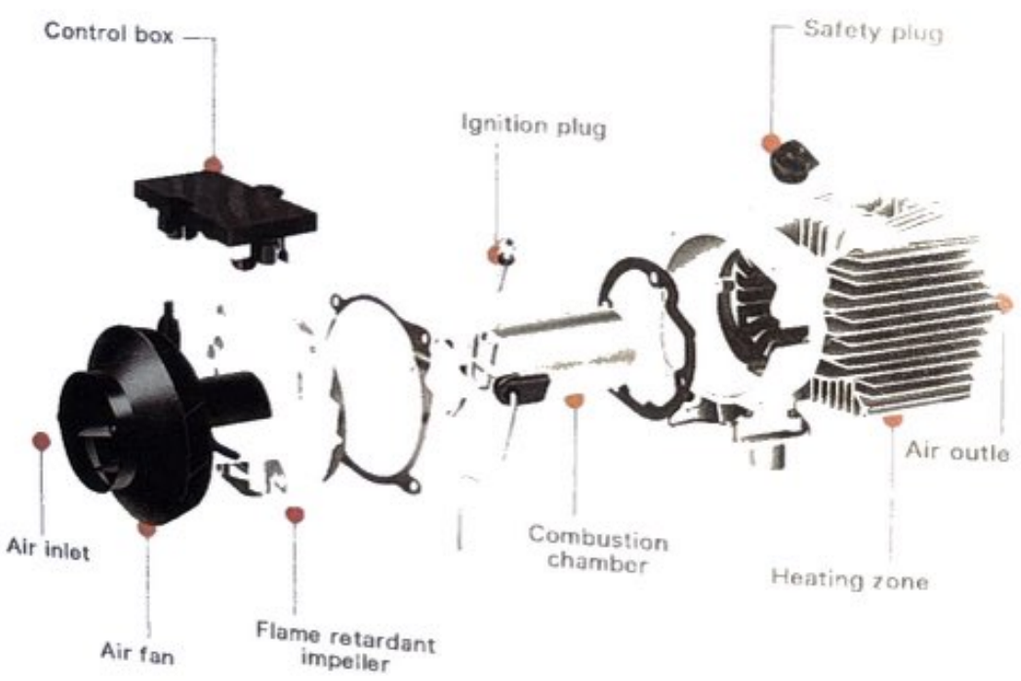
**SILVEL-BRAND@outlook.com**

# Contents

# PRODUCT FUNCTION

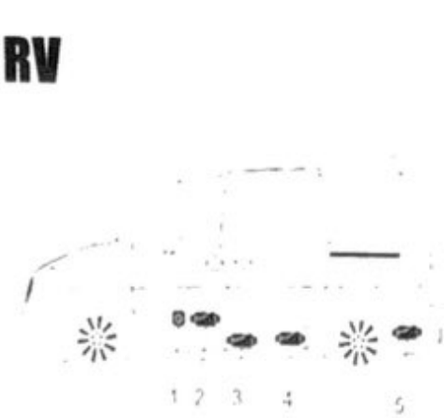
Get rid of damage to car causing by the sudden drop of temperature, improve the temperature inside the car, and preheat the engine coolan to avoid the engine wear at low temperature. Conducive to car interior thawing, car start, car glass defrost fog.

# Internal Structure

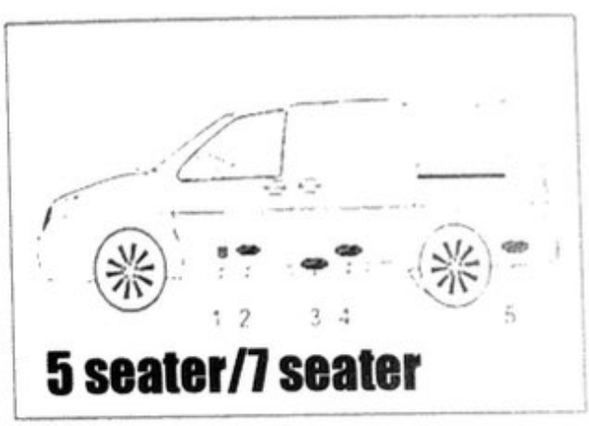


# Installation Position

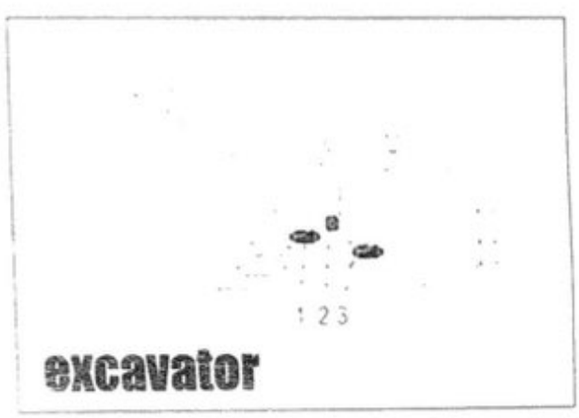

1. on the co-driver's legroom.
2. on the back wall of the cab
3. Driver's seat backrest




1. in front of the passenger seat
2. between the driver seat and passenger seat

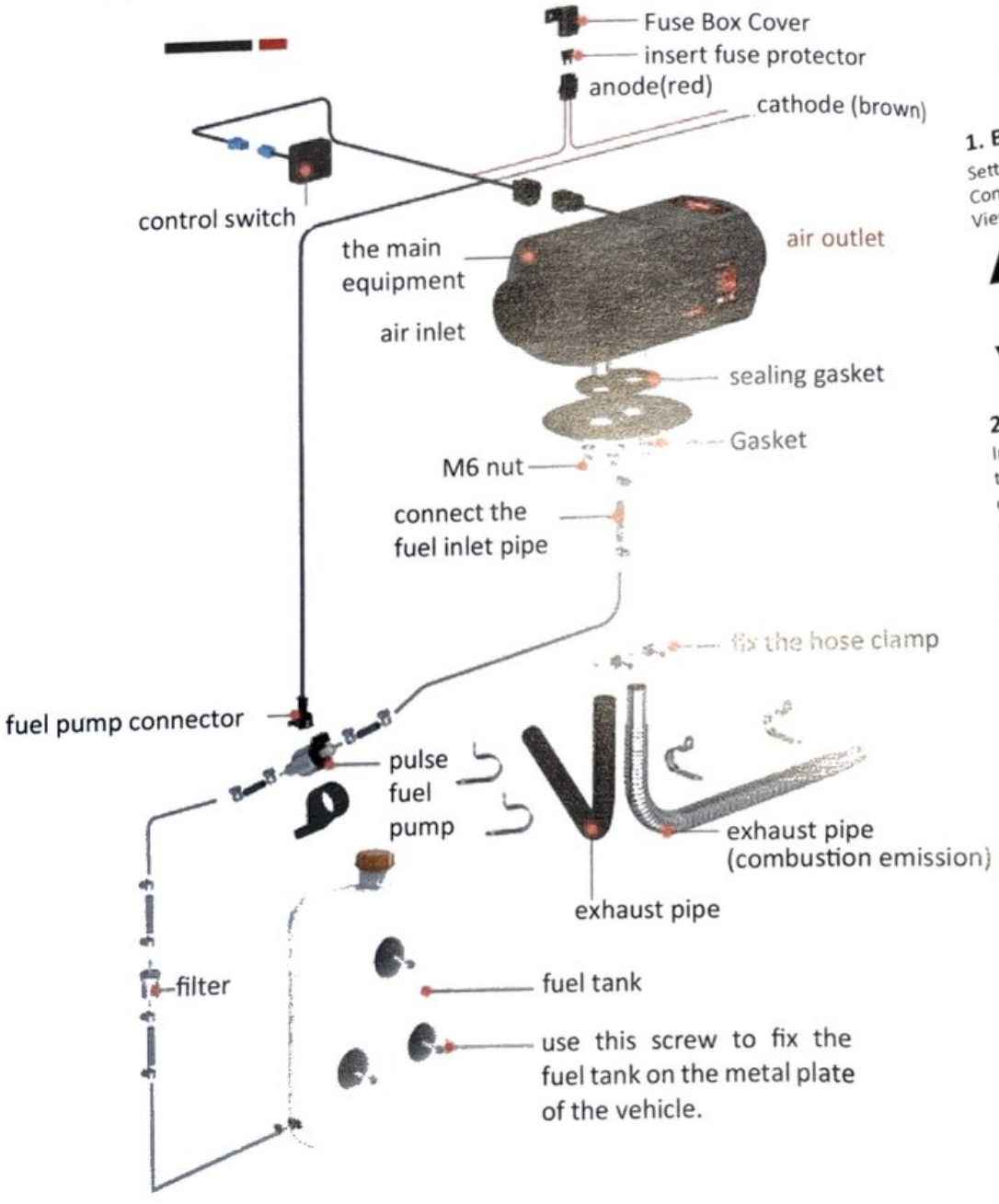



the heater is mainly installed in the passenger room or baggage room of the vehicle. If it cannot be installed, fix the heater under the underside of the vehicle,but beware of splashing.




1. beside the driver's seat.
2. on the back wall of the cab.
3. inside the protection box

# Installation details of parking heater




## 1. Button function

Setting->Enter the setting state, adjust setting para
Confirm-> OK-> Under the setting state, confirm th
View the machine state in the non-setting state.

▲ >In the setting state, increase the setting
increase the set working temperature.
On/Off> Short press the button to turn
Long press the button to turn off for 2 s

▼ >In the setting state, decrease the setti
the set working temperature.

## 2. Description of remote control cod

In non-setting state, press the up-regulation bu
than 3 seconds. Entering the remote control c
on the remote control to transmit the remote
the machine enters the start-up state. If the
It will exit the code matching state after over

## 3. Description of setting parameter corresponding to the display scree

(1)Time setting → Up-regulation down-regulati adjusting para

(2)Timing switch setting → It is closed by showingno 1 up-regulatio showing no

Inputting ... administ... passwo... → Press up-re appears, p press

(3)Se... pump ... → Pre and to

# Instructions for Use of 12V - 24V General LCD Panel



## 1. Button function

Setting->Enter the setting state, adjust setting parameters, and change the working status of the machine
Confirm-> OK-> Under the setting state, confirm the current setting value and enter the next parameter setting.
View the machine state in the non-setting state.

▲ >In the setting state, increase the setting parameter, and in the non-setting state, increase the set working temperature.
On/Off> Short press the button to turn on, and the status indicator light will always be on.
Long press the button to turn off for 2 seconds, and the status indicator light will flash.

▼ >In the setting state, decrease the setting parameter, and in the non-setting state, decrease the set working temperature.

## 2. Description of remote control code matching

In non-setting state, press the up-regulation button first and press confirm button at the same time for more than 3 seconds. Entering the remote control code matching interface, it displays HFA-. Press the open button on the remote control to transmit the remote control code, exit the code interface after code matching, and the machine enters the start-up state. If the code matching fails, the machine will not enter the start-up state. It will exit the code matching state after overtime code matching work.

## 3. Description of setting parameters (press the setting button to enter and the status icon corresponding to the display screen lit)

(1)Time setting → Up-regulation button and down-regulation button of adjusting parameters → Press confirm button to set the hours (24-hour system) and minutes in turn, and press confirm button to enter the next item.

↓

(2)Timing switch setting → It is closed by default, showingno 1-oF. Press the up-regulation button to start, showing no 1-on to enter → Press confirm button to set the start-up and shutdown time of the first group and the start-up and shutdown time of the second group in turn. After the adjustment, press confirm button to enter the next item.

↓

Inputting of administrative password → Press up-regulation button and down-regulation button. When the correct value appears, press confirm button to enter the next digit. After the 4-digit input is correct, press confirm button to enter the next item.

↓

(3)Setting of pump oil → Press up-regulation button and down-regulation button to → Modify setting with up regulation button and down-regulation button to meet the amount

→ modify the minimum pump oil amount to reach the required value, and then press confirm button. → requirements of maximum pump oil amount, and then press confirm button to enter the next item.

(4)Fan speed setting → Press up-regulation button and down-regulation button to then press confirm button. modify the minimum fan speed to reach the required value, and then press confirm button. → Modify setting with up-regulation button and down-regulation button to meet the requirements of maximum fan speed, and then press confirm button to enter the next item.

(5)Operating voltage setting → Only in the shutdown state can the main board operating voltage be selected Press the up-regulation button and down-regulation button to select the switching work voltage 12V system to be adjusted to display U-12, and 24V system to be adjusted to display U-24 to complete the selection. Before start-up, check whether the oil pump, motor and ignition plug of the machine are matched, thus avoiding damage.

(6)Selection of speed signal → Press up-regulation button and down-regulation button to set the speed signal. The polarity of the two magnets of the impeller is opposite or only one magnet is selected as 1. The polarity of the two magnets of the impeller is the same. Please select parameter 2. If this parameter is incorrectly selected, the speed difference will be about I times.

(7)Administrative password modification → After entering, oFF status will be displayed. If there is no need of modification, just press confirm button to skip the password modification, saving parameters and exiting automatically. Press up-regulation button and it will display "on", and then press confirm button to enter modification status. Input 4-digit new password and press confirm button to save the password and the adjusted setting parameters, exiting automatically.

Precautions: After all the parameters are set, you must press confirm button to exit [illegible] setting parameters. If you press confirm button to exit. the parameters will not he stored Please check each [illegible] word carefully and save it, through which you can enter to the parameter modification next time

## 4. Query machine status description

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↑ in non-setting state, press the confirm button to view it cyclically. →Display of history fault code →Display of supply voltage

## 5. Deseription of fuel filling in manual mode

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## 6. Timi

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## 7. Des

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In the non-setting state, press the down-regulation button first and then press confirm button to enter the manual pump interface. When it displays H-oF, release confirm button first and then release the down-regulation button. Press up-regulation button to start the manual pump oil and it displays the H-on. You can hear the working sound of the oil pump and the oil pump icon lit. Press down-regulation button or setting button to close and exit manual pump, and oil pump icon disappears.

## 6. Timing switch description

After the running time is set, press confirm button to enter the timing switch function setting, which defaults to "oF" off state, press up-regulation button to start "on" state, press confirm button to set the first group about the hours and minutes of start-up time, and then enter the setting of hours and minutes of shutdown time after confirmation. Press confirm button to enter the second group. The setting method is the same as above. Set the hours and minutes of start-up time, and then the hours and minutes of shutdown time. A time interval may be set between the two sets of timings. The timing function is only run once. After this time, the current timing will be turned off. Please turn it on again and set the time for the next time. The alarm clock icon lit up after the timing setting and disappear at the end of the timing.

## 7. Description of temperature control mode switching

In the non-setting state, press and hold the up-regulation button first and then press the setting button to display P-x. x (xx represents the pump oil amount), i.e., entering the manual temperature control mode. The pump oil amount is limited to the current setting-the initial pump oil amount. When you press the 2 button above, XX is displayed. C (xx stands for temperature value), that is, the automatic temperature control mode is entered, and the pump oil amount is controlled to run between the maximum pump oil amount - the initial pump oil amount. The automatic change of pump oil amount in two modes depends on the change of temperature. The difference between the two modes is that the pump oil amount in automatic mode can reach the maximum value in the parameter setting and the machine heat is high. The pump oil amount in manual mode is limited to the current setting value and will not reach the maximum value in the parameter setting The machine heat is limited to the range of choice, taking into account the usage habits of some old drivers.

## Survey

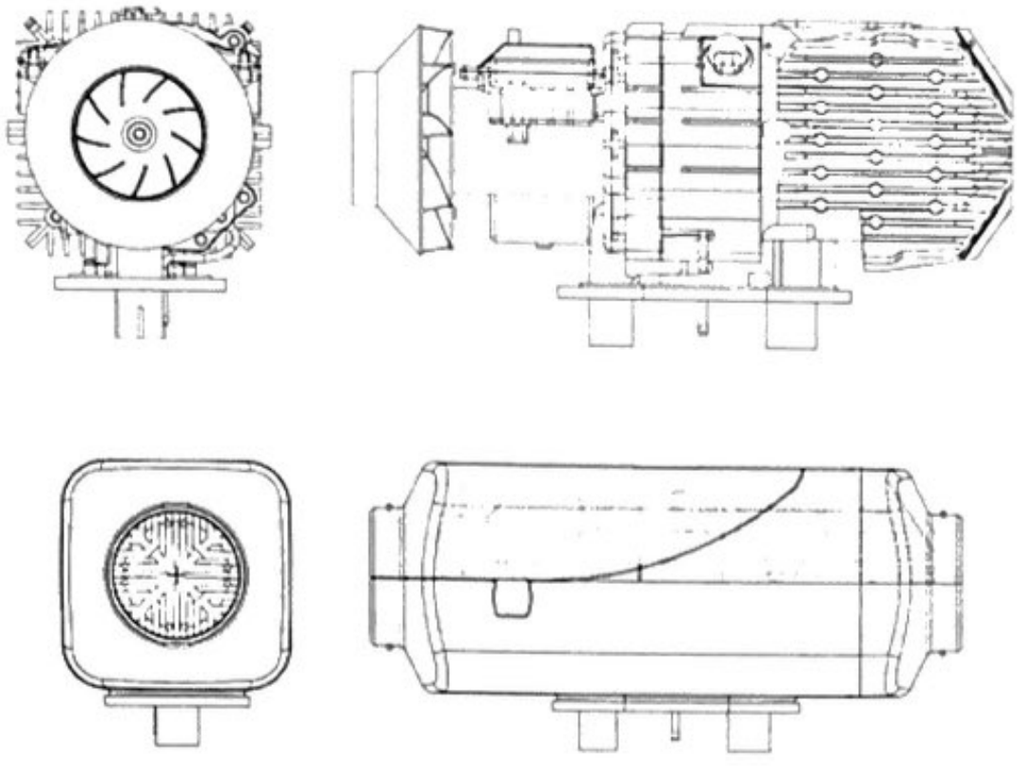
KW2.0 Air heater(hereinafter referredto as the heater)is independent to the original engine system it makes use of 12V or 24V direct current to drive. There are two kinds of control mo of the heater:Automatic control mode and Manual control mode. The heater adopts light diesel and gasoline which corresponds to the environmental temperature as fuel, and it can be started and operated normally at the temperature of above-40N. The inhaled fresh air is heated to hot air through heat exchanger by the energy which comes from fuel burning, then blown to where it is needed. This type of heater owns the advantage of compact structure, light weight, high thermal efficiency, economize on electricity and fuel, easy installation.

## Technicalspccatn

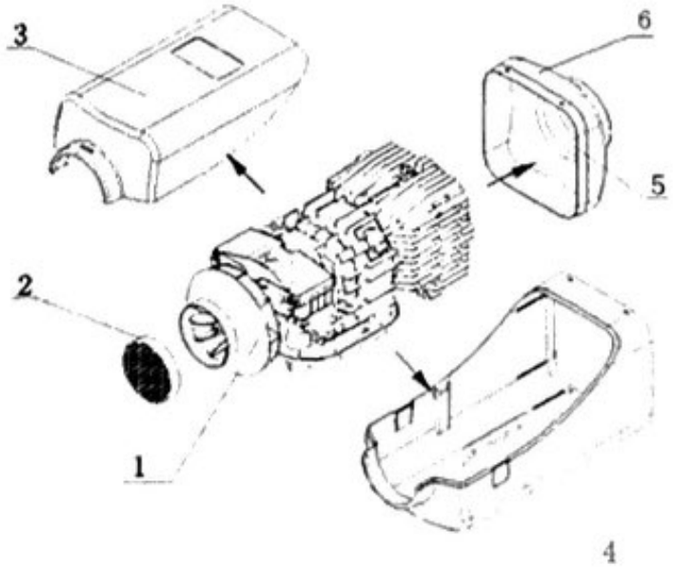
| Power ZWH | 2000 | 3000 | 5000 | 8000 |
|---|---|---|---|---|
| Heating medium | Air | | Air | |
| Fuel | Diesel | | Diesel | |
| Fuelconsumption Z l/hH | 0.12-0.24 | 0.15-0.40 | 0.18-0.48 | 0.20-0.50 |
| Rated voltageZVH | 12V/24V | | 12V/24V | |
| Workingtemperature ZNH | -50Ni 45N | | -50Ni 45N | |
| Weight ZKGH | 3.6 | 5.0 | 5.0 | 5.0 |

## Structural principle

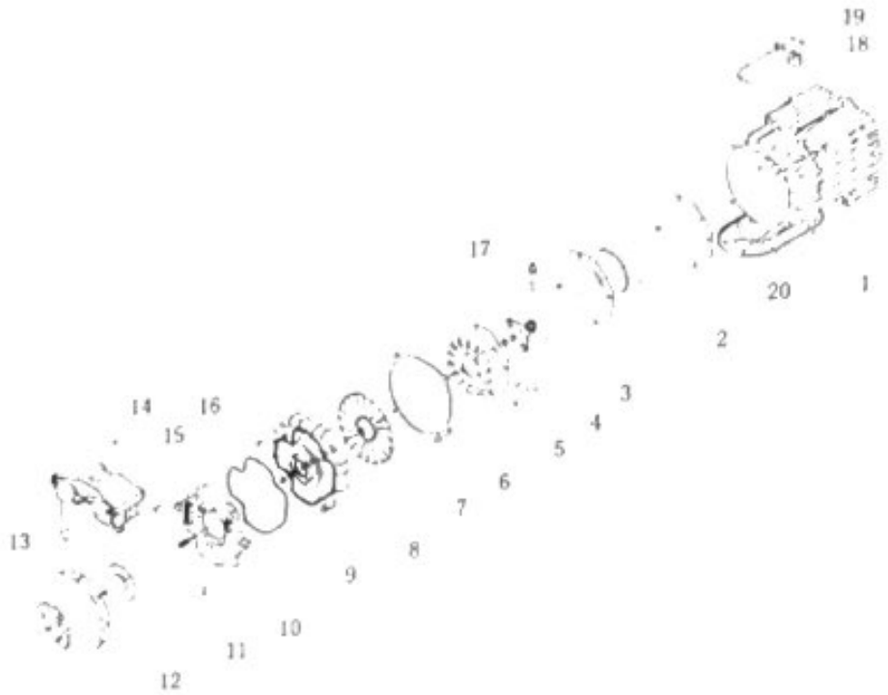
After the heater starts,the glow plug comes into operation, magnetic pump begins to supply fuel, combustion-supporting fan inhales combustion-supporting air from outside of car. The fuel generates the heat by burning in combustion chamber, which is taken by aluminum heat exchanger.The inner air pushed by the heat exchange fan brings heat to where it is needed through the surface of heat exchanger. And the combustion emissionis discharged through exhaust pipe.



## Structural principle




1-Main engine;2-Suction hood;3-Upper hood;4-Bottom-hood;5-Air outlet;
6-Rear hood {Hood: Case/Shelly}



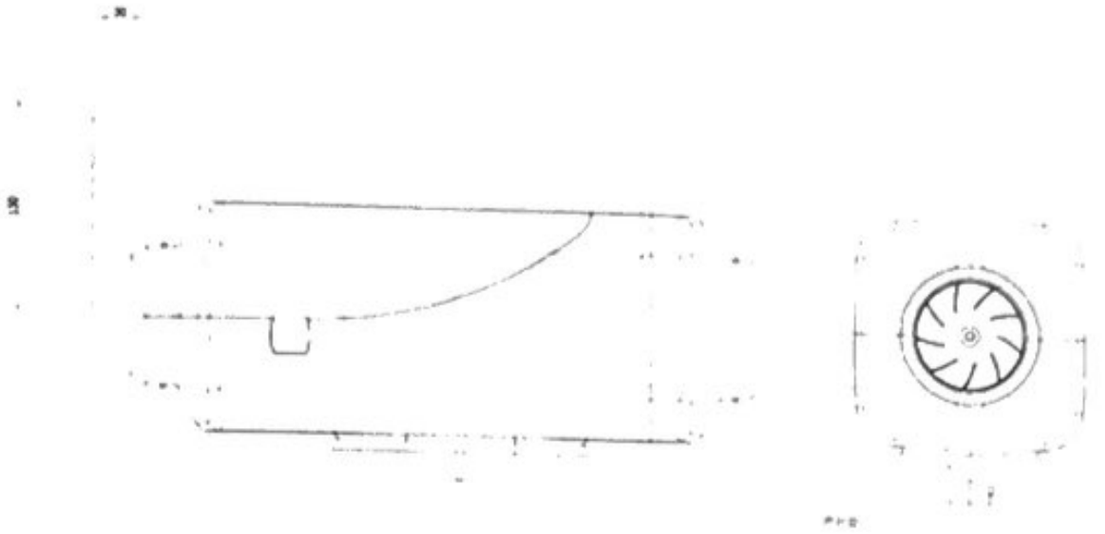

1.Exhaust tube 2.Combustion pipe 3.Combustor 4.Fuel tube 5.Air inlet distributer
6.Gasket 7.Combustion supporting fan blades 8.Bracket of fan motor 9.Gasket
10.Combustion supporting air inlet 11.Fan motor 12. Blade wheel of heating fan
13 Main control panel 14 Fixing screw 15.Fixing screw 16.Fixing screw 17 ignitor
18. heat sensor 19. Sensor Fixed bracket

# Installation

Only special-purpose parts can be used for installation of the heater. Following picture is the diagram for installation. The positions and ways of fixing of various parts may vary from one automobile model to another, but the general principles must be followed in conformity with the requirements of this chapter. Otherwise the heater may not work normally or safety problems my occur.

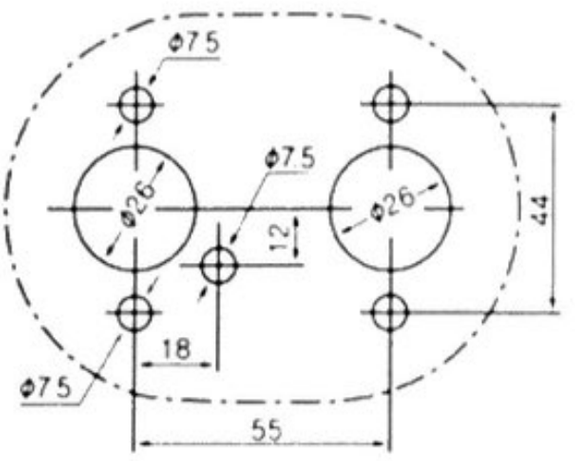
## Main heaterinstallation

The main heater could be installed both inside and outside of the vehicle. If the heater is installed outside the vehicle, measures must be taken to avoid splashing water onto the heat Enough space must be provided for installation for the convenience of heating airflow and installation,maintenance of the main heater.

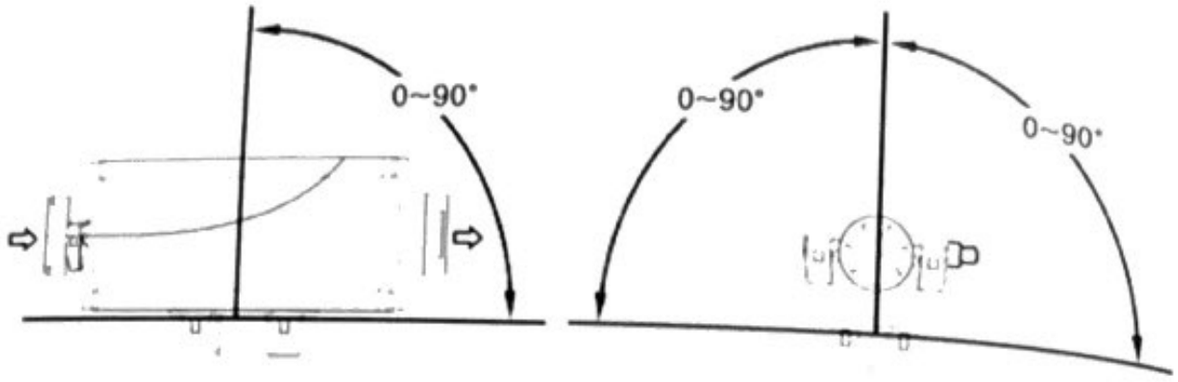


Good sealing is necessary between the main heater and the installation surface on the vehicle.The special gasket supplied by the manufacturer must inserted in.And the installation surface must be even.Its parts at the installation bases of the main heater should have uneveness less than1mm. After drilling installation holes, eveness must be improved according to this requirement. Atinstallation , please rotate the four M6 nuts tight, which are provided by the manufacturer.

For re-installation of the main heater,a new gasket must be used to replace the old one.




Attention must be paid to that the inclination angle shall not exceed the limit, or normal operation will be affected. Direction for installation of the main heater is shown in the following picture.




After installation of the main heater,please check and make sure that there is no contactor friction between the blade wheel of fan and other nearby parts to avoid unsmooth operation

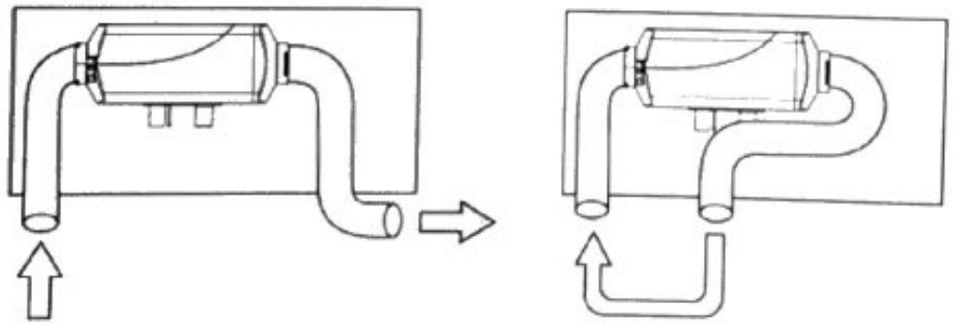
## Installation of Air Heating System

The air heating system of the heater should not be connected with the air channel of the vehicle. Either independent outer circulation or inner circulation mode can be adopted.

When an external heating air tubeis attached to the heater, the tube diameter should not be smaller than 85mm. Its material should be capabletoresist temperature of 130NE

The maximum pressure drop between the air inlet side and outlet side of the air heating system should not be higher than 0.15 kPa. The hot air from the heating system should not erupt on to such parts which are unable to resist heat. In passenger vehicles,the hot air vent should not be blocked by passengers. A self-provided protective net can be installed if necessary.

For heater working in external circulation mode,the position of air inlet port should be proper to guaranteed that under normal operation no splash of water can be sucked into the heater the no exhaust from the engine can be sucked in. For heater working in internal circulation, measures should be taken to avoid re-entering of the supplied hot air into the air inlet port. If no air inlet tube is attached in this mode,an air inlet hood with grids must be installed at the air inlet port of the main heater. The inlet air should be drawn from the cold area of the compartment,such asunder the seats or berths.



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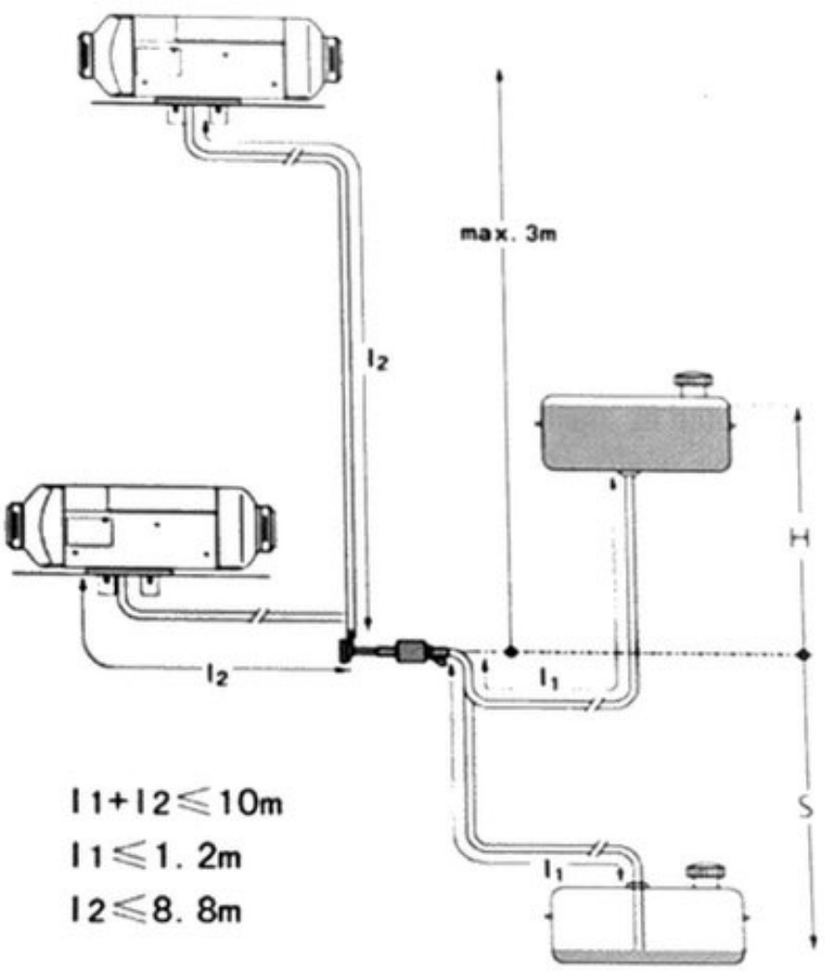
## Installation of Air Heating System

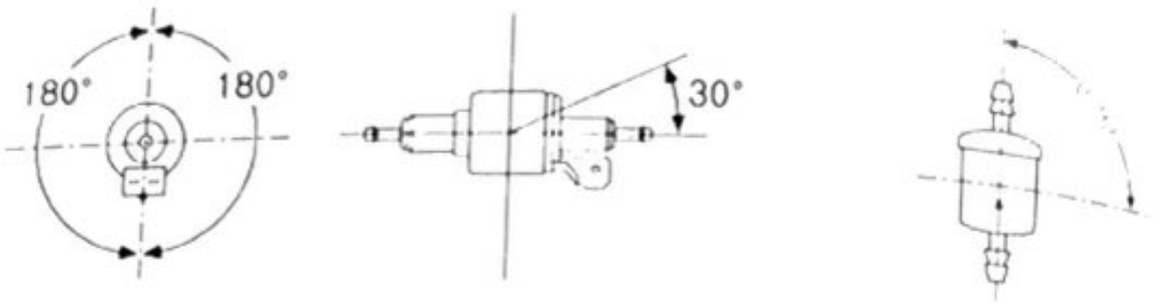
Fuel for the heater can be supplied from the fuel tank of the vehicle or an additional independent fuel tank. It is not allowed to install the fuel tank in the cab or passenger compartment or any region that is possibly to cause fire if an independent fuel tank is used.

The elevation difference between the heater and fuel pump, and between the fuel pump and the fuel pump produces pressure from fuel to the fuel pump. The inner diameter and length of the fuel tube is related to the resistance of the fuel route. Please consider such factors for installation.




## Fuel pump installation

The fuel pump should be installed in places that can avoid heat radiant from the vehicle parts that can emit heat and in places with cool air. Its ambient tempera ture should not exceed 20N. Directions of installation of the fuel pump are shown in the following picture. When installing the fuel pump, please use the fuel pump holder supplied with the heater to hold the pump tight. The pump is fixed with the shock-reducing tightening piece.




## Fuel Filter installation

The fuel filter should be installed before the fuel inlet port.Please make sure that the fuel flo is correctly followed. Its position shall be in conformity with the above picture.

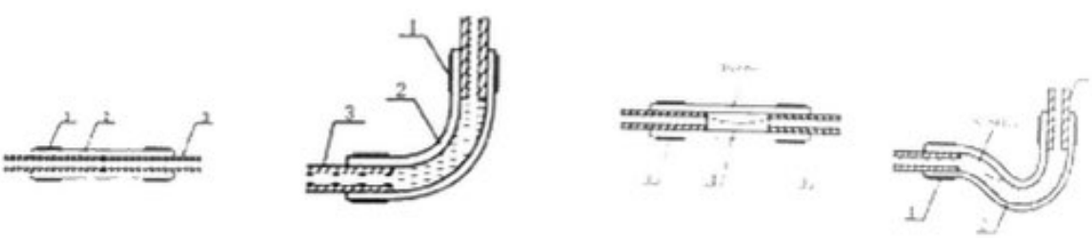
## Installation of Fuel Tube

Only the flexible nylon tube, which has good light-resistance and thermal stability, supplied with the heater can be used as the fuel tube. The inner diameter of the tube is 2mm.

The position of fuel tube should be against flying stones and be away from any heat emitting parts of the vehicle. Protective device can bin stalled if necessary.

The fuel tube from the fuel pump to the main heater should be in any directions other than down ward direction. The fuel tube shall be tied in some proper location to make it fixed. The distance between two ties shall be less than 50cm.

The fuel tube fittings supplied with the heater should be used for connections between fuel tube and fuel pump,fuel tube and heater,fuel tube and sucking tube of fuel tank and fuel tub and reducing T.The fuel tube should tie with fuel tube clamps. Bubbles should be eliminated from the connecting places.

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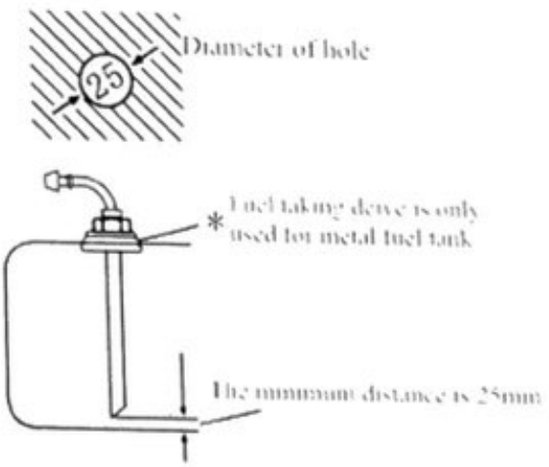
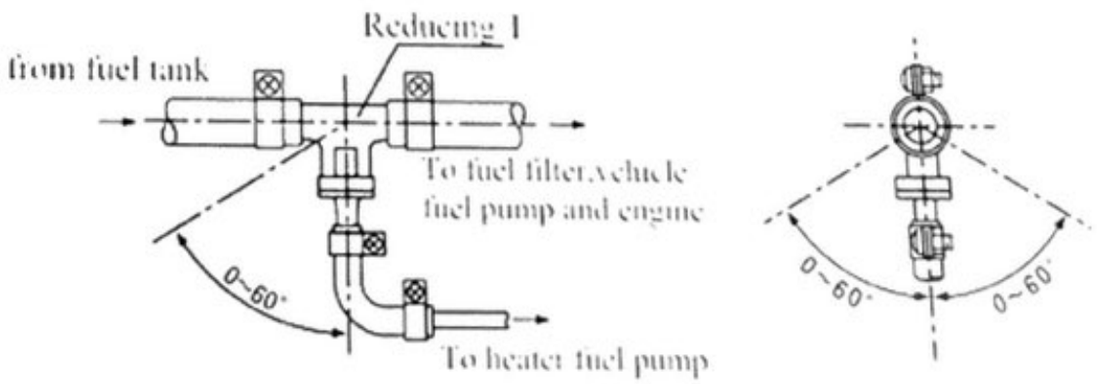
1-Fueltubeclamp;2-Fueltubefitting; 3-Fueltube.

## Installation of Fuel Taking Device

The openings on the fuel tank (or tank cover)for installation should be appropriate in size, with trimmed brim and with good eveness around the opening. Good sealing is necessary for the base of the fuel taking tube. The bottom end of the fuel taking tube should be 30mm 40mm from the bottom of fuel tank to suck enough fuel and at the same time to avoid sucking in impurities sediment on the bottom of fuel tank.




fuel is taken from the fuel pipe to the engine,the fuel pipe from the fuel tank to the fuel lter should be disconnected and re-connected with the thicker pipes of the reducing T.And he thinner pipe of the reducing T should connect the fuel pump of the heater via fuel tube itting and tube. The angle of installation must in conformity with following picture, or normal vork of the heater will be affected. After installation, the vehicle engine shall be started and hen turned off after one minuteô s work to eliminate air trapped in the fuel sucking pipe.



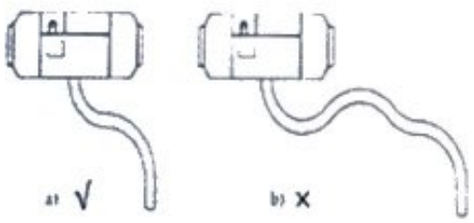

## nstallation of Combustion Supporting Air Sucking Tube and Exhaust Discharge Tube

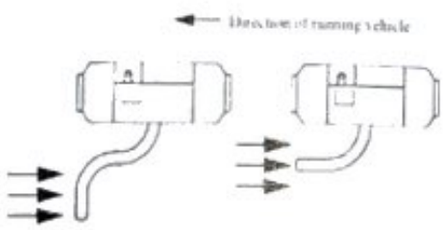
he combustion supporting air must be sucked in from external fresh air outside the vehicle. he exhaust from combustion must be discharged into the air through exhaust tube. Measures nust be taken to avoid the exhaust from re-entering he vehicle.

The tubes go through the outer wall or holes on the bottom of vehicle. Measures must be taken to prevent entering of splash water. The tubes must be protected and can resist shock permanently.

Only the air inlet tube and exhaust tube provided with the heater can be used. The air inlet tube is a corrugate pipe made of a aluminum tube that it as surfaceis covered by plastic and paper: The exhaust tube is corrugated stainless steel tube. Please identify them and do not make mistakest installation. To connect them with heater, please use the supplied clamps to fix them tightly on the combustion supporting air inlet and exhaust tube vent respectively. The protective hood on the vents of the air inlet tube and exhaust tube must be kept in good condition. Do not damage them or remove them.

Both the air inlet tube the exhaust tube should come out ward sand down wards from the heater,other wisea i 4mm hole shall be prepared at the bottom of the tube for discharge of condensation water. If the tube need curve,the radius can not be smaller than 50mm. Also, the sum of all curve angles for each tube shall not exceed 270N.

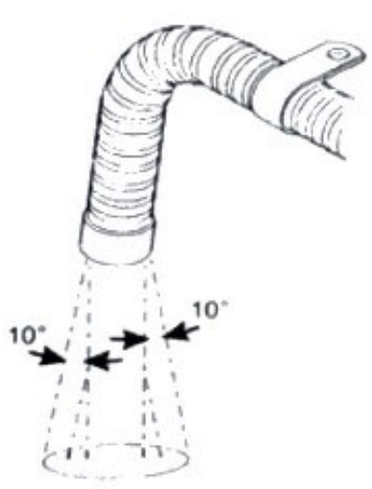


The opening of the tubes should not be opposite to the direction of the running vehicle.

The tube openings should not be blocked by slurry,rain and snow or other dirt.

The exhaust tube should be installed in far distance from the plastic parts or other objects with poor thermal resistance of the vehicle body. The exhaust tube should be properly fixed. The exhaust vent should be downwards,perpendicular to road surface with angle of 90£-10£ To ensure such an angle,the fixing clip for the exhaust tube should be within 150mm from the tube end.

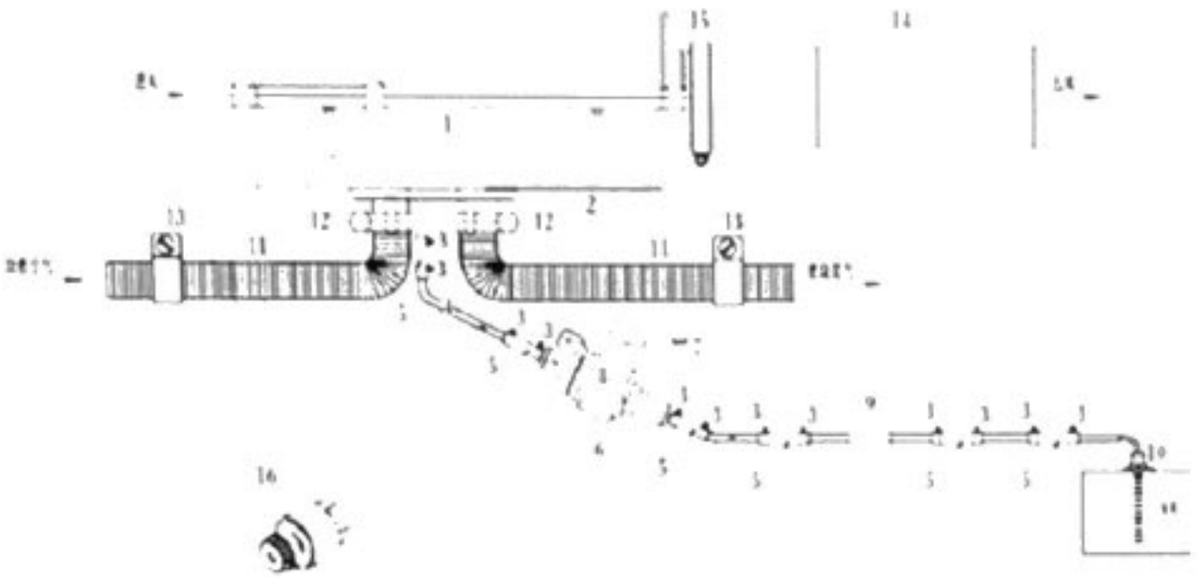


**Warning: Violation against the above requirements may cause fire.**

f the section of the exhaust tube inside the vehicle may be . touched by passenger,a protective cover has to be installed to prevent human contact and scald.

# Operation and Control

After the installation, the heater shall be turned on repeatedly for a few times to make the fuel tube full-filled, so as to avoid staring failure due to lacking fuel.



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# Maintenance

During the running of heater, it tests and checks the operating state and fault in the whole course,and the controller shows fault codes on the LCD/LED constantly.

# The fault codeof LCD screen

## 2018 Main Board Fault Code Description

| Machine fault | LCD panel display | Digital panel display | Knob panel display | Handling method |
|---|---|---|---|---|
| Power supply under voltage |  | E-01 | 1 indicator light flash | Boost supply voltage |
| Power supply with over pressure |  | E-02 | 2 indicator lights flash | Reduce supply voltage |
| Ignition plug fault |  | E-03 | 3 indicator lights flash | Check whether the ignition plug is open circuit or short circuit. |
| Oil pump fault |  | E-04 | 4 indicator lights flash | Check whether the oil pump is disconnected. |
| The machine is overheating. |  | E-05 | 5 indicator lights flash | Check the temperature sensor on the shell or whether the fan has the abnormal rotative speed. |
| Motor fault |  | E-06 | 6 indicator lights flash | Check the magnet polarity, the Hall sensor location or the looseness conditions of wiring terminal. |
| Broken connection fault |  | E-07 | 7 indicator lights flash | Check the connecting plug of the panel, and whether the blue harness connection has become loose or disconnected. |
| The flame is extinguished. |  | E-08 | 8 indicator lights flash | Check whether the oil circuit has air or gas blockage, resulting in poor oil supply. |
| Sensor fault |  | E-09 | 9 indicator lights flash | Check whether the sensor plug is loose, open or in short circuit. |
| Failure in ignition |  | E-10 | 10 indicator lights flash. | Check whether the oil circuit is blocked, or the oil transportation is not smooth, the oil pump is worn, the volatilization net is blocked due to the oil product problem, and other reasons that cause that the ignition fails to burn normally. |

The LCD panel fault display is that graphics and numbers are displayed at the same time, numeral number is same as the digital panel class content.

# Tips:

**seconds.**

1).The fuel pipe should be 1.5 meter- 2 ml eters.

2). The voltage would be better, if 11. 5 V-12.8 volts.