ENGLISH USER'S GUIDE
ThermoCar
from 0,5 to 2 kW

The ThermoCar is a universal tank-style electric coolant heater to preheat engines. It is meant for either stationary (generating sets) or mobile applications (all types of vehicles). The choice of high-quality components and materials guarantees a long-term troublefree operation of the heater. The limited weight (less than 1600 grammes) and external dimensions make it very easy to install. The circulation of the coolant is made by natural convection (thermosiphon).

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The present user's guide contains instructions to be fulfilled during the mounting and the starting stage. Please read carefully for a correct installation and a proper use of the heater. Keep these instructions after installation.

1. IMPORTANT SAFETY INSTRUCTIONS

Qualified personnel

The mounting should be carried out by a qualified technician only.

Danger in case of non-compliance with the present guidelines

The non-compliance with present guidelines could have serious consequences for the safety of people and could damage the equipment, thus making the warranty void. The strictest rigor is required for the electrical and mechanical aspects of the mounting.

Safety measures meant for the user

Avoid any risks linked to the mains by strictly observing local safety instructions in force.

Check or have checked by an authorized technician that your electrical installation is protected by a differential current system and that the earthing is in compliance with the local safety prescriptions.

Modifications to the heater and use of unauthorized parts

Any modification to the heater will be made only in agreement with the manufacturer. The use of official spare parts and accessories guarantees your safety. The manufacturer disclaims any liability in case non-original parts are used.

Inappropriate use of the equipment

The equipment supplied with the present user guide is exclusively meant for the applications described in this user guide.

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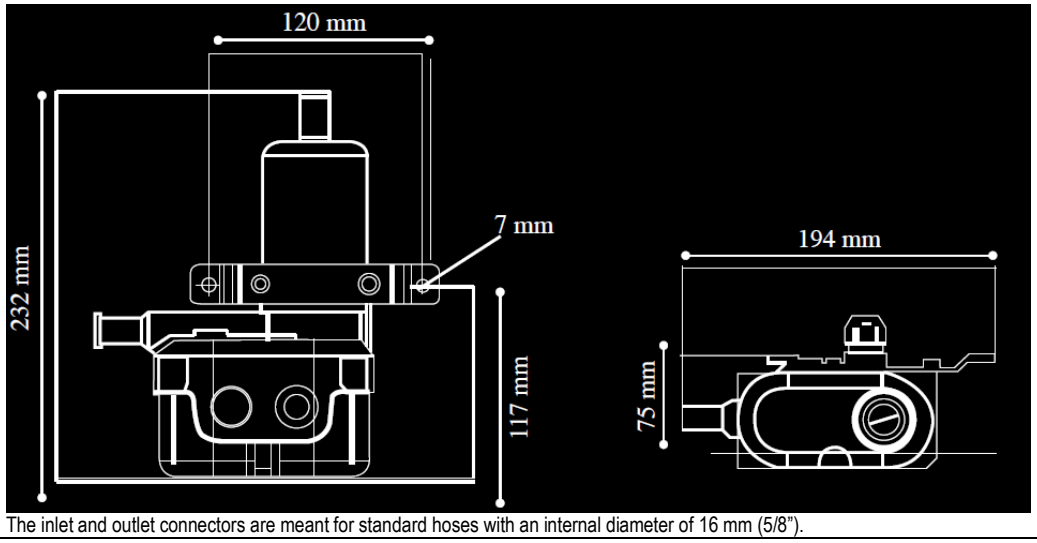
2. SPECIFICATIONS

Technical Characteristics

MODEL	**THC**
Description	The ThermoCar is a universal tank-style electric coolant heater to preheat engines. It is meant for either stationary (generating sets) or mobile applications (all types of vehicles). The circulation of the coolant is made by natural convection (thermosiphon).
Picture	
Components characteristics	
Heating body	Injected aluminium impregnated with resin
Heating element	INCOLOY 800 ® stainless steel protection sheat
Regulation thermostat	2 fixed temperature range available: 32°C to 40°C or 35°C to 50°C.
Safety thermostat (option)	Limit at 110°C (230°F) and manual reset.
Electrical characteristics	
Rated voltage and frequency	230V–50 Hz / 120V-60Hz
Power/Voltage	500W / 1000W / 1500W / 2000W (230V or 120V)
Amperage	From 4.35 to 16.66 Amp depending models
Working specifications	
Maximum working pressure	10 bars (150psi)
Ingress protection level	The complete heater is dust- and watertight.
Temperature range	Fixed from 32°C to 40°C (90° F to 104°F) or from 35°C to 50°C (95°F to 122°F).
General characteristics	
Weight in kg	1.6 kg
Dimensions in mm	 The inlet and outlet connectors are meant for standard hoses with an internal diameter of 16 mm (5/8").

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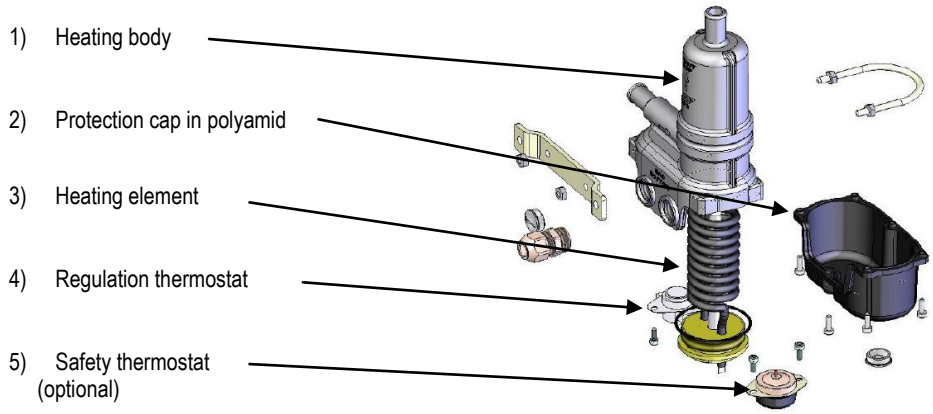
Exploded view ThermoCar



1. Heating body

Full injected aluminium construction impregnated with resin to prevent any leakage

2. Protection cap in polyamid (The complete heater is dust- and watertight)**.**

3. Immersed heating element

INCOLOY 800 ® stainless steel protection sheath and low watt density (max. 7.5 watts per cm2 / 1.16 watts per square inch) for increased reliability.
Element formed in spiral offers more compactness, while maintaining a low watt density and improving the heat exchange with water.
Available powers are: 500 -1000 – 1500 - 2000 Watts in 120 V or 230 V

The heating element is brazed on a brass threaded cap.Watertightness is guaranteed by a FPM DF801 « VITON » joint.
A thermo-well placed in the middle of the element contains the overheat thermostat sensor.

4. Regulation thermostat

The temperature regulating thermostat is placed at the entry of the heater. Cutting capacity: 25 amps (100.000 cycles).
The regulating thermostat has a fixed temperature range:
Available temperatures :

- ✓ ON 32°C. – OFF 40°C (ON 90° F. – OFF 104°F)
- ✓ ON 35°C. – OFF 50°C (ON 95°F.– OFF 122°F)

5. Overheat Thermostat (optional)

The overheat thermostat features a manual reset.
The contacts open at 110°C (230° F).
Cutting capacity : 25 amps (6000 cycles).
It guarantees a good protection against any overheat of the heating element in case of a lack of water or a failure of the regulating thermostat.

3. MOUNTING INSTRUCTIONS

Unpacking and installation preparation

Make sure you have the following components and accessories before disposing of the packaging material:
For a correct installation use the spare parts and accessories delivered with the ThermoCar.

1. **ThermoCar heater**

2. **Mounting kit**
   1 Mounting bracket
   1 Mounting clamp collar
   4 Nuts M6

3. **User's guide**

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Precautions

The installation has to be made by an authorized technician in strict compliance with the instructions of the manufacturer. Do not connect to the mains before having followed the present instructions. Do not connect the heater to the mains if you are not sure that it is filled with coolant.

Installation instructions

- ✓ The Thermocar can only be mounted in vertical position
- ✓ Fix the heater as low as possible. The heater should be below the lowest level of the water jacket and the coolant inlet must be below the point of removal of the coolant from the engine.
- ✓ Fix the ThermoCar to the chassis or any other suitable place with the fixation kit supplied with the heater. If you don't use fixation kit supplied, the support for the fixing of the heater should be rigid enough.
- ✓ Be careful not to mount the heater, the hoses or the power cord close to the engine exhaust.

Connecting the coolant circuit

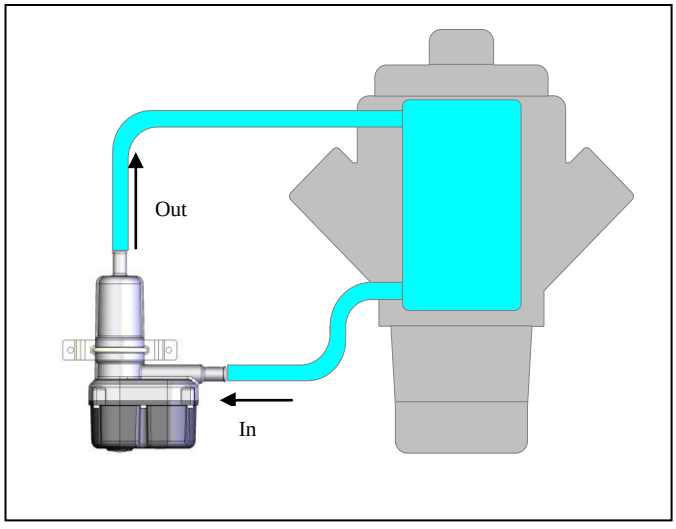
Drain off completely the coolant circuit.
Before placing the heater, it is imperative to drain the coolant circuit. Unscrew the drain plug or disconnect the lower hose in order to completely drain off the coolant circuit.

Connecting the heater inlet.
The heater inlet and outlet are meant for hoses (not supplied) with an internal diameter of 5/8" (16 mm). For engines equipped with a drain plug, replace the plug by a hose connector with an internal diameter of 16 mm in order to make the connection to the heater inlet. If the heater is connected to a rigid pipe, use a piece of flexible radiator hose that is long enough to prevent engine vibrations being transmitted to the heater.

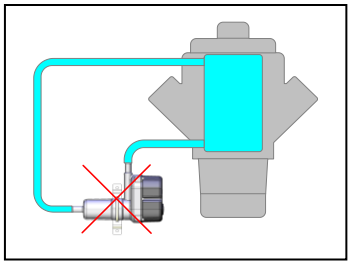
Connecting the heater outlet.
In order to guarantee an optimum heating of the engine the coolant return hose from the heater to the engine should be placed at the highest possible point on the engine and as far as possible from the suction port to enhance heat distribution throughout the engine. Use any available coolant jacket opening and install a connector for the outlet hose.

Checking and re-filling the coolant circuit
Make sure that the hose clamp collars are properly tightened. Fill the coolant circuit with a high quality and clean mixture glycol/water without impurities and without exceeding the recommended proportion 50% glycol / 50% water. It is necessary to check its quality frequently to ensure that the heater is not dirty, has no grimes and does not suffer from deterioration. The life and the proper functioning of the heater depend on it. In order to eliminate air pockets and obtain a good circulation, run the engine a few minutes. Then shut off the engine and check that the water circuit is properly flushed. Check that all connections are watertight and that hose clamps are properly tightened. When the engine has cooled down, check the level of coolant in the circuit and adjust if necessary

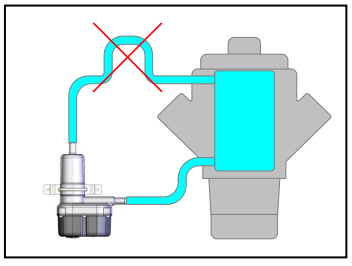
Examples of Correct Mounting



Incorrect mounting



Horizontal position is not right



Curve into the tubing

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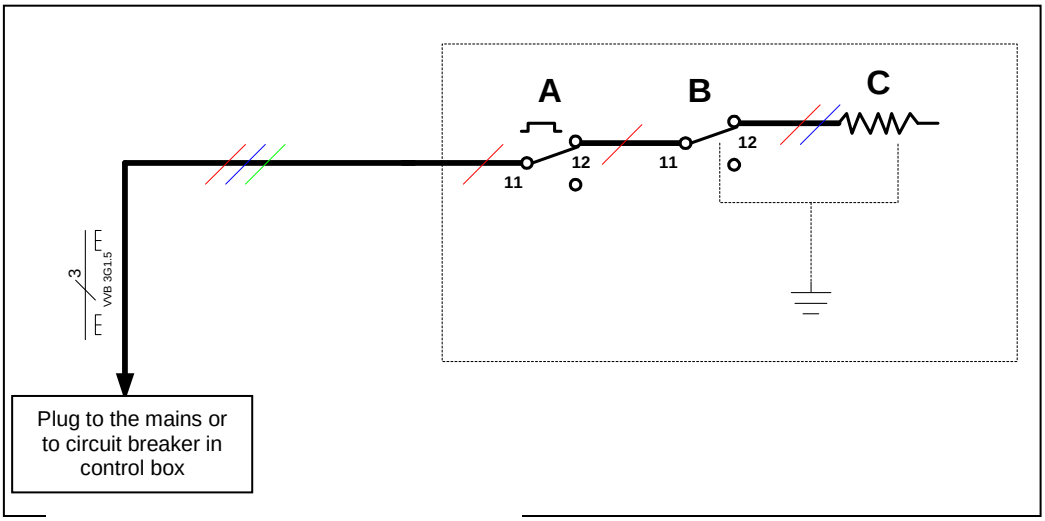
Electrical connections

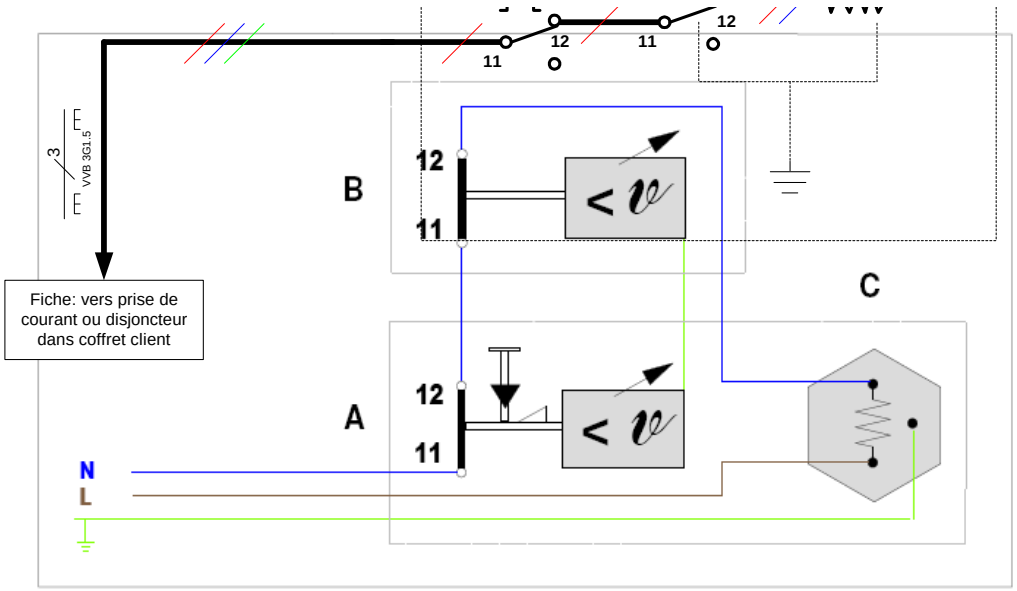
Fixing the power supply cord.
Fix the cord with clamp collars in order to avoid any contact with hot or moving parts. It is recommended to use a protection sheath for the cord.

Checking the installation before connecting the heater to electricity.
Check the information regarding voltage and power on the heater label before connecting the heater to electricity. An improper connection to the mains could irremediably damage your heater. Make sure that the voltage is correct and the earthing is in compliance with local rules.

Electrical diagrams Thermocar single-phase 120V– 230V 50 / 60 Hz



A. Overheat thermostat with manual reset (option)
B. Fixed temperature regulating thermostat
C. Heating element



4. DIRECTIONS FOR USE

Putting the heater into service

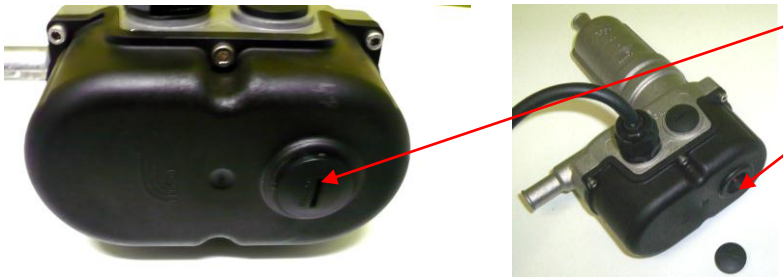
BEWARE: DON'T START THE HEATER IF NOT FILLED WITH COOLANT

Follow the procedure described hereafter:

- Connect the plug.
- The regulating thermostat will adjust the temperature in the range from 32°C to 40°C (90° F to 104°F) or from 35°C to 50°C (95°F to 122°F).
- Touch the heater inlet and outlet hoses at regular intervals during one hour. If the heater works correctly, the outlet hose should be warm and the inlet hose relatively cold. If the inlet hose becomes very hot before the outlet hose, the circulation is not good.

Resetting the overheat thermostat (optional)

In case of overheating (due for example to a lack of water in the circuit), the overheat thermostat (option) is activated and cuts the power supply to the heating element. After having the system checked, the overheat thermostat has to be manually reset. In order to do this, unscrew the protection cap of the heater and push the reset button.



5. TROUBLESHOOTING

Before contacting the technical service, please check the following table for causes and remedies:

- *Contaminated cooling circuit*
- *Air pocket caused by a curve in the hoses*
- *Engine temperature higher than the thermostat set temperature.*

Type of problem	Possible causes	Control and remedies
The heating body of the ThermoCar and the engine remain cold	The ThermoCar is not connected to the mains.	1. Check that the supplying cable is connected to the mains. 2. Check that the supply to the mains is correct. 3. Check the fuses in the mains distribution box.
The connection to the mains is correct. The ThermoCar and the engine remain cold.	The overheat thermostat has been switched on. ⇨ Lack of water into the heater	1. Disconnect the supplying cable from the mains. 2. Reset the overheat thermostat (see above) 3. Check the level of water in the circuit. 4. Adjust the level if necessary. 5. Turn the engine on for 10 minutes. 6. Reconnect the supplying cable to the mains
The level of coolant is correct. The circuit is properly purged. The ThermoCar is hot but the engine remains cold.	Bad circulation.	1. Check the installation. The heater is mounted too high or there is a curve into the pipe.
The fuse or the circuit breaker in the distribution box is engaged.	Electrical breakdown.	1. Take off the supplying cable. 2. Put the ThermoCar out of service and call the technical service.

6. INSTRUCTIONS FOR THE PROTECTION OF THE ENVIRONMENT

Recuperation of raw materials rather that elimination of waste. Machines, as well as their accessories and packaging, should be recycled in an appropriate way. Our spare parts can be recycled selectively depending on the type of material. Carlor Engineering S.A. commits itself to recycle the different components of the ThermoCar. Each ThermoCar will be either reconditioned or recycled selectively at the Customer's request.

7. TOTAL QUALITY

Each ThermoCar assembled by Carlor Engineering is controlled and tested before leaving the factory.

Carlor Engineering runs the following test on each ThermoCar:

- Measurement of the resistance value of the heating element;
- Electrical insulation of heating element;
- Heating test;
- Test of electrical insulation of complete heater.

8. WARRANTY

All our devices ThermoCar are guaranteed against all manufacturing errors over a 2 years period, starting at the invoice date and following general sales conditions. This warranty is voided in each of the following situations:

- The device was transformed or modified without permission of Carlor Engineering
- Installation und use are against the guidelines of ThermoCar
- The heater is damaged by impurities or grimes.

Our warranty covers exclusively the changing of the standard installation or replacement of the damaged parts. Are not taken under warranty: wrong installation or use, costs for assembling and disassembling the heater, costs for assembling or disassembling the installation, shipment costs.

Manufactured in Belgium by:

Carlor Engineering S.A.
Avenue Albert 1er, 87
B-4030 Grivegnée
Belgique
Tel : +32 4 384 01 97 Fax : +32 4 367 16 66
info@carlor.com www.carlor.com