Motor pre-heater

Version 08/12

CE

OWL-1 Item no. 85 74 90

OWL-2 Item no. 84 18 43

The product meets the requirements of the current European and National guidelines.

The engine preheater must under no circumstances (not even for testing purposes) be connected to the power supply prior to installation in the vehicle. This also applies to test assemblies for testing purposes.

Due to the lack of ventilation, it is inevitable that the product would be destroyed immediately.

The warranty becomes null and void in the event of improper use.

In addition, improper use poses a danger to life!

Intended use

The motor pre-heater is used to pre-heat the cooling water and thus, also the motor components of a vehicle prior to a cold-start. This allows to achieve a low wear and reduced fuel consumption during the cold-start phase.

The product is only to be powered by a proper 220-240V AC/50Hz mains Schuko (earthed safety socket) socket of the public power grid. Never connect the device to any other power supply.

Any other use than that described above, could lead to damage to this product and involves the risk of short circuits, fire, electric shock, etc.

No part of the product should be modified or reassembled.

Always observe the safety instructions.

Safety Instructions

The warranty will be void in the event of damage caused by failure to observe these safety instructions! We do not assume liability for any resulting damage.

We do not assume any liability for material and personal damage caused by improper use, wrong installation, unauthorised opening of the housing or non-compliance with the safety instructions. The warranty will be null and void in such cases.

An exclamation mark inside a triangle indicates important instructions in the operating manual. Please read all of the operating instructions completely before installing or using the device for the first time; they contain important information on its correct operation.

The "hand" symbol indicates special information and advice on operating the device.

- For safety reasons, unauthorised conversion and/or modifications to the product are not permitted.
- Check the product for any damage before using it. If the device is damaged, do not put it into use.
- As source of voltage only an approved mains socket (230 V~/50 Hz) in Schuko design connected to the national grid system may be used. The installation of this mains socket must comply with the applicable safety regulations and an earth leakage circuit breaker (GFCI/RCD) must be connected upstream.
- Extra care should be taken when mounting and using the product for the first time. Therefore, please follow the operating instructions carefully. In case of doubt, let a specialised workshop carry out the installation.
- If you have doubts about how the equipment should be operated or how to safely connect it, consult a trained technician.
- Check the product and the connections from time to time for damages. An expert must repair the product in case the device or the connection cables are damaged.
- The product has no place in the hands of children! Children do not understand how dangerous electrical devices can be. Keep the device out of the reach of children.
- Do not leave packaging material lying around carelessly. It may become a dangerous plaything for children.
- Please read this manual carefully prior to the installation. In cases of doubts or questions please contact our technical service or another expert.
- Please, also observe the additional safety instructions in each individual section of these instructions.

Functional Description

Explanation of the cooling system

The cooling system for combustion engines consists of a thermostat, water pump, heat exchanger, cooling unit and different hoses. In principle, the design is similar for all motors.

The thermostat controls the circulation of the cooling agent. If the motor is cool, the cooling agent circulates via a so-called "small cooling circuit" (a bypass-line). If the heat regulator is turned to the "heating/warm" position, the coolant circulates through the heating distance "motor to the interior" and the interior is being heated.

When the motor has reached its operating temperature, the "large cooling circuit" is opened by the thermostat and in addition, the flow to the cooling unit is released.

Short description of the functioning of the motor pre-heater

The motor pre-heater is integrated in the vehicle's cooling circuit.

It heats up the cooling water of the vehicle. By means of the inbuilt pump the cooling water circulates and heats up all components automatically so that e.g. a temperature of approx. 30-50°C is reached on the motor's cylinder liners.

This affects the start-behaviour in a positive way and reduces the cold-start wear as well as the fuel/diesel consumption during the warm-up phase.

Installation

Caution, risk of injury while working in the engine compartment

Motor components may be hot even though the motor is not running; cooling ventilators may start up even when the motor is not running.

The installation must be carried out by a specialist or expert.

Modifications to the vehicle which are made necessary through the installation of the device must always be carried out in such a manner that neither the traffic safety nor the designed stability of the car is impaired. If you are in doubt, when selecting a place for installation, consult your car dealer.

Prior to installation check that the pre-heater can be build in and that the cooling agent flows through the heating system while the ignition is being switched off and thus, the cooling system is not being blocked.

The pre-heater and its connecting cable must not come in contact with hot or moving components; the connecting cable must not be squeezed, overstrained or bent strongly.

The pre-heater must be mounted freely and must not touch any motor components.

While mounting the pre-heater the connecting cable must not be connected to a mains socket.

The connecting cable remains in the vehicle and is to be laid on a suitable position and secured with a cable tie. The connection plug must be placed at a location that is protected from humidity or otherwise protected from moisture (e.g. with a cover), in order to avoid short-circuits or risks of electric shock when connected to the power supply.

Identification of the connections:

- The inlet of the motor pre-heater is the connection which is secured laterally by screws and which is, as a delivery setting, slightly inclined upwards.
- The outlet is the other connection which is fixed to the housing (not rotatable).
- The pre-heater does not require a mounting support, but is fastened and carried by the coolant hoses.
- Search for the return flow hose from the indoor heat exchanger to the motor. If it is not clear which of the two hoses is the correct one (usually there are two hoses), let the motor run for a short time, while the heater is turned off, so that the motor gets lukewarm. Turn the motor off and touch both hoses. The hose that is cold is the return flow hose you are searching for.

Make sure you are not getting injured or come into contact with hot components! If available, use e.g. an infrared thermometer.

- Check if the installation is possible and sufficient space is available. The pre-heater must always be mounted vertically (hose connection on top, power connection on the bottom).
- Make sure the installation position of the pre-heater is below the height of the cooling water compensation tank. The pre-heater is not self-priming!
- Drain off the cooling agent into a clean container. It might be enough to drain only so much that the hose, to which the pre-heater shall be mounted, is not filled any longer.

If you do not replace the cooling agent by a new one, avoid any type of soiling! The latter may block the pump of the pre-heater and thus, damage the device.

Caution! Depending on the coolant used or the additives used in the coolant, the disposal instructions of the manufacturer are to be observed. The cooling agent must be disposed of in a professional manner and it must not enter the soil or the normal sewer. Consult the manufacturer or a specialised workshop regarding the professional disposal and handling of the coolant.

Cooling agents contain glycol/ethanediol and are detrimental to your health if swallowed. Contact with skin and eyes. Must not get into the hands of children. If swallowed, consult a doctor immediately and show package or label.

- The pre-heater's inlet connecting piece "Cold" can be rotated as required so that it points in the opposite direction (when delivered, the connecting piece points upwards). For this purpose, untighten the screws which are located on the left and right on the connecting piece insertion and slowly pull out the insertion. Make sure the components inside the device do not change their position! Rotate the nozzle/insertion so that it points in the opposite direction. Pay attention that the sealing located on the insertion nozzle does not turn out of position and is mounted in the correct position. In some cases, an additional sealing of the insertion nozzle with sealing agent (e.g. silicon) might be required. Apply the sealing agent only on the sealing surface, and not on the housing! Insert the nozzle carefully in the desired position and press it tightly on the housing. Tighten the two fastening screws on the left and right side.
- Let the sealing agent bond in accordance with the manufacturer's instructions. Observe all safety instructions of the manufacturer.
- After observing and considering all previous points, you can now disconnect the selected coolant hose at a suitable position.
- If there is no non-return valve built-in the cooling circuit, the pre-heater can be installed so that either the motor or the indoor heat exchanger are preheated first, as required (the outlet connecting piece "warm" is the nozzle that is fixed to the housing).
- Lay the coolant hoses to the nozzles of the pre-heater and secure them using the hose clamps included in the delivery.
- Lay the electric connection cable as desired complying with the safety instructions described above.
- It is possible to lay the connection plug until the radiator grill of the vehicle so that the device can be operated without previously opening of the engine bonnet. In this case please cover the connection plug with a cover plug if the device is not to be operated.
- An alternative would be the laying into the vehicle's interior.

Getting started

The pre-heater may only be operated on a Schuko socket with GFCI (earth leakage circuit breaker) (30mA) connected upstream. For more information you may contact a certified electrician in your vicinity.

Normally, an earth leakage circuit breaker is integrated in the standard domestic installation.

Observe the safety instructions for the handling of cooling agents.

The first two warm-up circles after the start-up must be performed under supervision.

The device must not be operated without water or with frozen cooling water.

Operating the motor pre-heater is prohibited if persons are inside the vehicle.

Prior to each use of the motor pre-heater, make sure there are no leakages and there is no humidity in the electric connection plug.

If the motor pre-heater remains installed in the vehicle throughout the whole year and is not used during summer, it is required to perform a warm-up phase three times per month, in order to avoid deposits in the device.

Do not touch the appliance when in use. Remove the mains plug before working on the device.

The operation of the motor pre-heater is only allowed with the original mains cable contained in the delivery.

- Fill in the cooling agent and pay attention if there are potential leakages.
- Ventilation work might be required. In this regard, contact the manufacturer of the vehicle.
- Mix the coolant as described on the package or as stipulated by the manufacturer if it is to be replaced.
- Fill up the cooling agent compensation tank so much that the level of the cooling agent is between the minimum and maximum marking. Wait a few minutes and screw down the lid of the compensation tank.
- Start the engine and set the indoor heater/air conditioning to maximum heat.
- Let the motor heat up to lukewarm temperature. Pay attention that everything is leak-proof and the cooling water level does not go down below the minimum. If required, turn the engine off, refill the cooling agent and repeat the previous steps.

Caution, the compensation tank may be under pressure! Risk of scalding!

- If the cooling water level remains constant, let the motor run until it reaches the operating temperature. If you notice any leakages turn the engine off immediately, let it cool down and seal the leakage.
- Once the motor has reached the operating temperature, turn it off and let it cool down.
- Check the pre-heater for leak tightness; no coolant must leak at any place.
- If everything is leak-proof, the pre-heater can be put into operation by connecting the connection cable to a mains socket.

The indoor heater must be set to maximum “Warm”!

If you hear any noises, except for a “low buzzing” during the operation of the pre-heater, there is air in the cooling circuit. This may destroy the pump unit. In this case, remove the air from the cooling system again.

- If all conditions are met, you can operate the pre-heater.

Always make sure you set the indoor heater to “warm” before operating the pre-heater.

Function of and securing the motor pre-heater

The motor pre-heater heats up the motor or the coolant in intervals of approx. 15 minutes.

Once the preset temperature is reached, the device switches off automatically. If the temperature of the cooling water then drops to a value of approx. 10-15°C below the pre-heating temperature, the device turns on automatically and starts the cycle again.

If the pump is blocked, e.g. through soiling, the device turns off automatically. If the device fails to switch off or the air is not functioning in the cooling water circuit, the device turns off automatically at 145°C by destroying the integrated safety fuse. After that, the pre-heater must not be used any longer.

In the event of residual currents or humidity in the connection system the RCD-switch connected upstream turns off automatically.

Questions and answers

Which vehicle engines is the motor pre-heater suitable for?

The motor pre-heater is suitable for all liquid-cooled combustion engines. For motors with a large volume (e.g. trucks, construction machines or transporters) the heater is less suited due to its heating and pump capacity. The same applies to systems where the motor and heat radiator are located from each other in a distance of more than 80 cm. If the heater is to be used for such motors/systems, we recommend the use of 2 heaters in parallel operation.

Can the pre-heater be used for LPG (liquefied petroleum gas) / vegetable oil fuel - vehicles?

Vehicles with bivalent fuel (LPG/fuel) are always started up with fuel in the cold-start. A swapping to LPG is only possible after the motor has given off enough heat to the cooling agent. The reason is that the LPG vaporiser requires heat in order not to freeze. During the operation in short distances the vehicle thus is operated by fuel and not by gas. The pre-heater supplies the LPG vaporiser with warm coolant too, and the vehicle therefore can be switched faster to operation by gas. A similar function is available for vehicles operated by vegetable oil fuel.

Is it possible to use the pre-heater as indoor heater?

The primary goal is to preheat the motor and thus reduce wear, emissions and fuel consumption. Depending on the assembly type (return flow of the heat radiator), the indoor heater is also supplied with warm coolant. However, the heat emission in the interior is low since here only

convection heat is released. Only after the start of the engine and with switched-on ventilation system, useful heat will be available. However, turning on the ventilation system is possible to heat up the vehicle’s interior.

What is the difference to other pre-heaters?

Most pre-heaters work according to the convection principle. These heaters are directly inserted in the motor or the freeze plugs (partly, several heaters are even inserted at the same time). Each motor type requires specific heaters. A heating up of the motor is only possible individually and in intervals, and the heating-up times are up to three hours. This motor pre-heater is a universal pump pre-heater with the smallest design, which also fits into the most modern and narrow engine compartments. By means of the integrated pump the coolant is continuously transported and circulated. Thus, the generated heat is distributed evenly and quickly. Thereby, higher temperatures can be generated with the same capacity than with pre-heaters that are not operated by pumps. The heating up times are reduced considerably.

Trouble-shooting

The heater does not start:

- Connection to the mains is interrupted.
- Internal safety fuse has been triggered as a consequence of over-heating by air in the system.

The heater does only start briefly:

- Pump is overloaded, circulation is blocked, heater regulator is closed, pump height was exceeded. Coolant is not or not sufficiently circulated.
- Air in the heater, thermostat switch interrupts the power supply.

The pump does not start up, however, the device gets hot:

- Pump is blocked, polluted or outdated cooling agent, deposits on the pump rotor. In order to avoid deposits, the heater should be turned on at least 2 to 3 times per month.

The RCD switch is activated:

- Internal safety fuse has been triggered.
- Humidity in the connection plug, hose connections/sealing might be leaky.

Maintenance and Care

Always separate the pre-heater from the power supply before cleaning it. Always let the pre-heater dry well before you put it into operation again.

The outside of the pre-heater should only be cleaned with moist cloth or sponge.

Never use caustic cleaning agents or chemical solutions as the surface of the case could be damaged.

Disposal

Please dispose of the product, when it is no longer of use, according to the current statutory requirements.

Technical Data

Operating voltage	220-240V~/50Hz
Power consumption	1240 W
Pump capacity	max. 5-7l/min
Pump height	max. 50cm
Hose connections	suitable for 16-20mm cooling water hoses
Switching-off temperature	Model OWL-1: 75°C
	Model OWL-2: 60°C
Safety fuse at	145°C
Dimensions	110 x 60 x 60mm
Weight	380g

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