



HEATING SYSTEMS

THERMO E+ 120/200/320

12/24V

Operating and service instructions



NOTE: Subject to modification. In multilingual versions the German language is binding. The latest version of this document is provided for download on www.spheros.com.

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SPHEROS

Operating and service instructions

General Information

Dear Customer,

We assume that the operation and function of your new heater will have been explained to you properly and to your complete satisfaction by the installing workshop / service outlet.

This owner's handbook is designed to give you a brief summary of how to use the Thermo E+ 120/200/320 heaters.

The heaters are set at the factory and can be used without any changes in the CO₂ setting for unrestricted heating operation up to 1,000 m above sea level, up to 2,000 m above sea level (Thermo E + 120: up to 1,500 m) even for short stays (pass crossings, breaks).

An operating voltage of at least 13 V / 26 V must be ensured for the parking heating mode at these altitudes.

With continuous use over 1,500 m (Thermo E + 120: 1,000 m), the CO₂ setting must be readjusted because the lower air density leads to a negative change in the exhaust gas values.

The CO₂ value is to be readjusted in accordance with the specified technical data if this is necessary for applications on the intake or exhaust side, or the predominantly intended operating altitude of the heater.

Service and safety instructions

For the heater exist type approvals according to ECE Regulations R122 (Heater) and R10 (EMC).

The heaters must be installed as described in the appropriate installation instructions. The installation must be checked pursuant to the statutory regulations governing installation work. Further details are given in the installation instructions.

The year in which the heater is used for the first time must be permanently marked on the heater's model plate by removing the inapplicable year numbers.

Ensure that the existing shut-off devices in the fuel lines are open and the fuel system, including the fuel filter, is carefully pre-filled and bled prior to starting the heater.

When the coolant used in the vehicle's engine is renewed, after bleeding the vehicle's cooling system, pay attention to bleeding the heater carefully. Top up the coolant as described in the instructions supplied by the vehicle manufacturer.

Check the openings of the combustion air intake and exhaust outlet periodically and clean them if necessary.



WARNING!

Risk of fire, explosion, poisoning and asphyxiation!

The heater **must not be operated:**

- at filling stations and other refueling points.
- if the heater or its exhaust outlet is in locations where inflammable vapors or dust may form (e.g. close to fuel, plastic, coal, wood dust or cereal storage facilities).
- if the heater or its exhaust outlet is located close to inflammable materials for example dry grass and leaves, cartons, paper etc.
- in enclosed areas (e.g. garages, hall without a suck off facility), not even if the pre-selection timer or a remote control is used.
- if the exhaust outlet of the heater is partial or fully obstructed (e.g. by soil or snow, as it may occur while move the vehicle backwards).

The heater **must:**

- be shut down and the fuse shall be removed in the event of extensive smoke development, unusual combustion noises or fuel odors. The heater must not be used again until personnel trained by Spheros have examined it.

ATTENTION:

The heater **must not:**

- be exposed to temperatures exceeding 90 °C (storage temperature). Exceeding this temperature may result in permanent damages.
- be operated without at least 30 % of a brand name anti-freeze in the heating system water. An up-to-date list of anti-freeze approved by Spheros can be found on the Spheros website.

The heater **must:**

- with a diesel fuel approved by Spheros in accordance with DIN EN 590 (see Fuels under Service / Technical Updates on the Spheros website for more information) and the rated voltage shown on the model plate.
- be operated at least once per month for 10 minutes when the engine is cold. At the latest when the cold weather season starts the heater must be inspected by an expert.

Operating and service instructions

Liability claims

Failure to follow the installation instructions and the notes contained therein will lead to all liability being refused by Spheros. The same applies if repairs are carried out incorrectly or with the use of parts other than genuine spare parts.

This will result in the expiry of the ECE type approval of the heater and thus the general operating permit.

Liability claims can only be made if the claimant has verifiably considered all the servicing and safety instructions.

Heater operation

The heater can be operated according to the installed equipment using the Spheros control elements switch or pre-selection timer. All information about the Spheros pre-selection timer SC Preheater can be found on the Spheros website.

In addition, control via the vehicle's own climate control is possible.

Before you switch on the heater set the vehicle's heating system to "Warm".

Malfunctions

During all active operating phases of the heater, all electric components, the operating voltage and functional irregularities are monitored and recorded.

In the event of faults always first check the following:

- Is the fuel supply ok?
- Is a sufficient amount of fuel in the tank?
- Are the fuses ok?
- Are the electrical connections and cables in order?
- Are the combustion- and exhaust air ways free of obstructions?

A malfunction causes the heater to terminate its operation by a fault shut-off and to go into the fault lock-out mode to prevent the heater from an automatic combustion restart. At the same time the operation indicator begins to flash with a specific code (see below).

The fault lock-out occurs:

- low voltage during a defined period
- if combustion was not established during start-up
- if the flame extinguishes during operation
- extrinsic light
- if the control device itself has failed or peripheral components are defective

Variants to reset the heater after a fault lock-out:

1. Switch off the heater and then turn it on again
2. Reset the control device, e.g. through disconnecting it from the power supply
3. „Off“ and „On“ switching“ via the S-Bus diagnostic interface
4. Erase the data in the fault memory by means of the diagnostic tool.

Additional to the fault lock-out a heater lock-out occurs if safety related components are affected. The fault code 12 will be displayed (see para. "Flash code").

If a heater lock-out has occurred, the heater must be maintained and released by Spheros trained personnel.

Flash code

The kind of malfunction is indicated from the operating indication light through a flash code or if the pre-selection timer is used in the display (operation display). The flash code is immediately generated after detection of the malfunction and will be kept until the heater is freed.

The flash code comprises of a burst (sequence) of 5 short flashes depicting the break and a defined number of long pulses corresponding to the malfunction number, which are to be counted. After that the cycle starts with 5 short flashes again and so on.

The meaning of the number of long pulses is shown in the table below.

Table: Flash codes

No. of long pulses	Description of malfunction
0	Control device defective
1	No start within the safety time
2	Flame interruption, restart failed
3	Low voltage / overvoltage
4	Extrinsic light before starting or within the purge cycle
5	Flame guard defective
6	Temperature sensor / overheat protection defective
7	Solenoid valve defective
8	Combustion air fan motor / nozzle block pre-heater defective
9	Circulating pump defective
10	Overheat protection has been triggered
11	Electronic ignition unit defective
12	Heater lock-out activated

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