

Thermo 90 S

Thermo 90 S-ADR

(Transport of hazardous goods)

Thermo 90 ST

Thermo 90 ST-ADR

(Transport of hazardous goods)

2.3 Temperature sensor

The temperature sensor records the coolant temperature at the coolant outlet of the heater as an electrical resistance. This signal is fed to the control unit where it is processed.

2.4 Temperature limiter

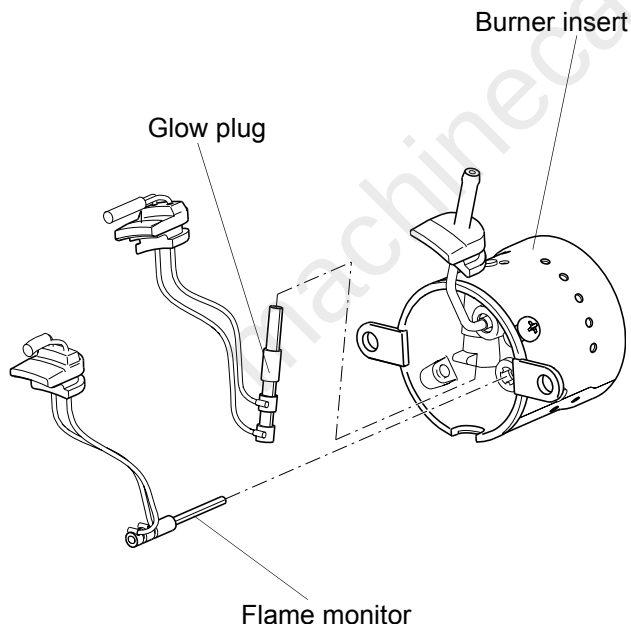
The overheating guard circuit (bimetallic) protects the heater against impermissibly high operating temperatures. The overheating guard circuit trips if the heat exchanger temperature exceeds $127 \pm 7^\circ\text{C}$ and switches off the heater.

2.5 Burner insert

The fuel is distributed over the burner cross-section in the combustion pipe in the burner insert.

2.6 Glow plug

The mixture of fuel and air is ignited by the glow plug when the heater is started. The glow plug takes the form of an electrical resistor and is positioned in the burner insert on the side away from the flame.

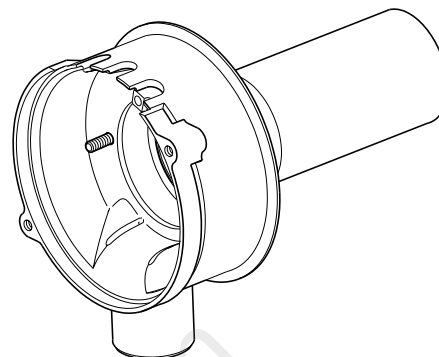


2.7 Flame monitor

The flame monitor is a low-ohm PTC resistor, which changes its resistance depending on the heat emitted by the flame. The signals are fed to the control unit where they are processed. The flame status is monitored by the flame monitor whenever the heater is operating.

2.8 Combustion pipe

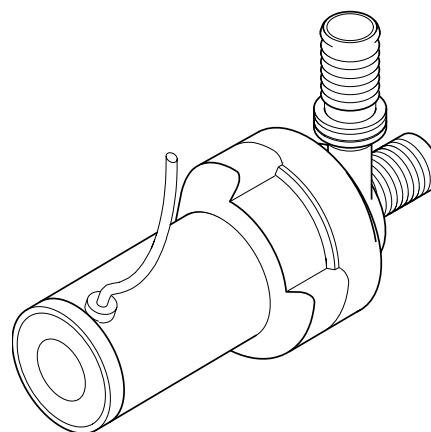
The mixture of fuel and air burns in the combustion pipe, thus causing the heat exchanger to become hot.



Combustion pipe

2.9 Circulating pump

The circulating pump ensures that coolant is pumped through the vehicle and heater circuits. The pump is switched on by the control unit and it runs throughout operation of the heater (including in the control pause).



Circulating pump

2.10 Control unit

The control unit is the central component. It guarantees the sequence of functions and monitoring of combustion mode. It is flange-mounted on the combustion air fan, although in the case of the Thermo 90 S it may be installed externally in the vehicle.

2.11 Metering pump

The fuel supply and metering for the heater is assured by an external metering pump. In addition, it serves as a shut-off element when the heater is switched off. The solenoid coil of the metering pump receives its pulses from the microprocessor in the control unit.

4 Technical data

Except where limit values are specified, the technical data below refer to the usual heater tolerances of $\pm 10\%$ at an ambient temperature of $+20\text{ }^{\circ}\text{C}$ and at the rated voltage.

Electrical components

The control unit, motors for combustion air fan and circulating pump, glow plug, switch and digital timer (no timer for ADR mode) are designed for either 12 volts or 24 volts.

The temperature limiter, temperature sensor and flame monitor are identical on 12 V and 24 V heaters.

Fuel for Thermo 90 S / Thermo 90 ST petrol:

The fuel specified by the manufacturer must be used. Both leaded and unleaded fuel may be used.

Fuel for Thermo 90 S / Thermo 90 ST and Thermo 90 S-ADR / Thermo 90 ST-ADR (diesel):

The diesel fuel specified by the manufacturer must be used.

We know of no negative influences due to additives. If fuel is extracted from the vehicle's tank, follow the additive instructions issued by the vehicle manufacturer.

If you change to low-temperature fuel, the heater must be operated for approx. 15 minutes so that the fuel line and fuel pump are filled with the new fuel.

Heater	Operation	Thermo 90 S Petrol	Thermo 90 ST Petrol	Thermo 90 S diesel Thermo 90 S-ADR	Thermo 90 ST diesel Thermo 90 ST-ADR
EC licensing symbol		~S299		~S298	
Model		Water heater with Ferro-Tec technology			
Heat output	Max. regulating range	2.0 kW – 7.6 kW		9.1 kW 1.8 kW – 7.6 kW	
Fuel		Petrol		Diesel	
Fuel consumption	Max. regulating range	0.25 l/h – 1.0 l/h		1.1 l/h 0.19 l/h – 0.9 l/h	
Rated voltage		12 volts		12 or 24 volts	
Operating voltage range		10 ... 15 volts		10 ... 15 or 20 ... 30 volts	
Nominal power consumption with circulating pump (without vehicle fan)	Max. regulating range	37 W – 83 W		90 W 37 W – 83 W	
Max. ambient temperature: Heater: - Operation - Storage Control unit: - Operation - Storage Metering pump: - Operation - Storage Permitted operating pressure (heat carrier)	Max.	-40 ... +110 °C (90 °C with control unit installed on heater) -40 ... +110 °C (90 °C with control unit installed on heater) -40 ... +75 °C -40 ... +85 °C -40 ... +75 °C -40 ... +85 °C -40 ... +85 °C -40 ... +20 °C -40 ... +40 °C -40 ... +85 °C 2.0 bar			
Capacity of the heat exchanger		0.15 l			
Max. combustion air intake temperature		+40 °C			
Minimum capacity of the circuit		6.00 l			
Delivery rate of the circulating pump against 0.15 bar		1650 l/h			
CO ₂ in exhaust fumes (permitted function range)	Max.	10 ... 12.0% by volume			
CO ₂ adjustment values at approx. +20 °C and geographic altitude above sea level	Max.	0 m 500 m 1000 m 10% 10.6% 11.3%			
Heater dimensions (tolerance ± 3 mm) * Control unit installed on the heater		L 310 (355*) mm W 131 mm H 232 mm	L 307 (352*) mm W 131 mm H 232 mm	L 310 (355*) mm W 131 mm H 232 mm	L 307 (352*) mm W 131 mm H 232 mm
Weight		4.8 kg			

8 Service work

8.1 General

This section describes the service work that can be carried out on the heater when it is installed.

8.2 Work on the heater

Disconnect the main power cable from the vehicle's battery before carrying out any work on the heater. The main battery power must not be disconnected whilst the heater is operating or running on as a result of the risk of the heater overheating and the overheating guard circuit thus being tripped.

If you wish to carry out extensive repair work on the heater, it may be a good idea to remove it completely. After working on the heating circuit, top up with a coolant mixture of water and antifreeze according to the manufacturer's instructions and carefully bleed the heating circuit.

Refer to the relevant installation instructions and the installation proposal for the heater for the specific vehicle for repairs that necessitate the installation position being changed.

8.3 Work on the vehicle

CAUTION

A temperature of 90 °C must not be exceeded in the vicinity of the heater in any circumstances (for example when completing painting work on the vehicle). See section 4.

8.7.2 Changing the circulating pump**NOTE**

The process for changing the circulating pump is the same irrespective of whether the heater is installed or removed.

Change as described in 9.2.2.

8.7.3 Changing the temperature limiter**NOTE**

The process for changing the temperature limiter is the same irrespective of whether the heater is installed or removed.

Change as described in 9.2.3.

8.7.4 Changing the temperature sensor**NOTE**

The process for changing the temperature sensor is the same irrespective of whether the heater is installed or removed.

Change as described in 9.2.4.

8.7.5 Changing the combustion air fan**NOTE**

The process for changing the combustion air fan is the same irrespective of whether the heater is installed or removed.

Change as described in 9.2.5.

8.8 Start-up

After you have installed the heater, bleed the coolant circuit and the fuel supply system carefully. Comply with the instructions given by the vehicle manufacturer when doing this. During the trial run, check all coolant and fuel connections for leaks and to ensure that they are secure. If the heater suffers a fault during operation, the fault must be located and remedied (see section 5).

Full Version Available

Webasto Thermo 90 S-ADR Heater Service Manual

Webasto Thermo 90 S-ADR heater service manual with repair procedures, function tests and fault indications. 55-page English PDF. Instant PDF download.

VIEW THE FULL MANUAL

<https://machinecatalogic.com/webasto-thermo-90-s-adr-heater-service-manual/>

File Pages: 55 · File Count: 1 · File Language: English