

Water Heater

**Operating instructions
Installation instructions**

Thermo Top

Thermo Top

Thermo Top T

Tele Thermo Top

Thermo Top S

Thermo Top S

Tele Thermo Top S

BW 50

DW 50

Petrol

Diesel

8/1995

Webasto

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Versions

Thermo Top Petrol

type BW 50

Water heater for fuel "petrol"

Thermo Top Diesel

type DW 50

Water heater for fuel "Diesel/fuel oil EL"

Thermo Top S Petrol

type BW 50

Water heater for fuel "petrol" with metering pump

Thermo Top S Diesel

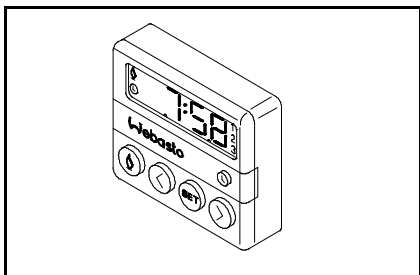
type DW 50

Water heater for fuel "Diesel/fuel oil EL" with metering pump

The water heaters *Thermo Top* are designed to operate on 12 volts.

Operating instructions

Optional Equipment

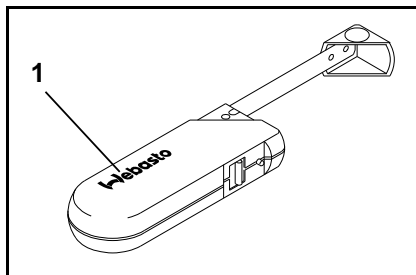


Digital Timer

For switching the heater on and off and preprogramming it.

Note:

- When the red display lamp is illuminated, the maximum operating time is 60 minutes.
- When the green display lamp is illuminated, the maximum operating time is 30 minutes.

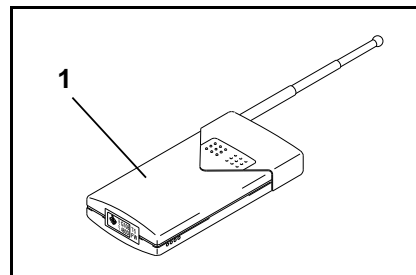


Telestart T6

For operating the heater by remote control (switching on and off)

Note:

- When the operation indicator light (LED) is red, the maximum operating time is 60 minutes.
- When the operation indicator light (LED) is green, the maximum operating time is 30 minutes.

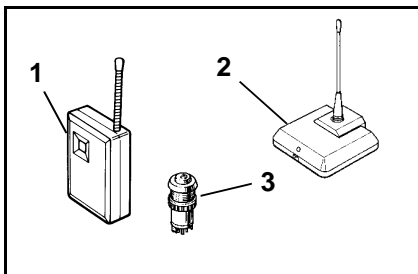


Telestart T60

For operating the heater by remote control (switching on and off)

Note:

- When the operation indicator light (LED) is red, the maximum operating time is 60 minutes.
- When the operation indicator light (LED) is green, the maximum operating time is 30 minutes.



Telestart T5

For operating the heater by remote control (switching on).

- 1 Transmitter
- 2 Receiver
- 3 Pushbutton with indicator lamp

Safety Information

1. Within the scope of the StVZO (Road Traffic Licensing Act) "General Design Approvals" laid down by the Federal Office for Motor Traffic exist for the *Thermo Top* water heater with the following official marks of conformity:

- ~ S238 for the *Thermo Top* Petrol heater type BW 50 and
- ~ S239 for the *Thermo Top* Diesel heater type DW 50.

2. Installation of the heater must be performed in accordance with the installation instructions and when retrofitted it is to be examined by an officially recognized expert or examiner (TÜV) in accordance with article 19 para. 2 StVZO upon presentation of the "Operating Instructions" and the "Installation Instructions". A new operating licence for the vehicle has to be applied for at the Motor Vehicle Registration Office on the basis of

the test report.

Modifications are subject to written approval by an officially recognized expert or examiner (TÜV).

The year of the initial start-up (commissioning) must be durably marked on the nameplate.

3. The heaters are approved for heating motor vehicle engines and driver's cabs. When using the heater in special vehicles that are not governed by the StVZO (e.g. ships) any existing local regulations are to be observed. Use in "Vehicles for the Transport of Dangerous Goods" (TRS) is not permissible.

4. Due to the danger of poisoning and suffocation, the heater must not be operated in closed

rooms, such as garages or workshops, without adequate exhaust extraction. This should be considered when presetting heater operating times or using the Telestart remote control.

5. Due to the danger of explosion the heater must be switched off at filling stations and fuel depots.

6. In the vicinity of the heater a temperature of 120°C (storage temperature) must not be exceeded (e.g. when carrying out paint work on the vehicle). If the temperature is exceeded permanent damage to the electronics may be caused.

7. Checking the cooling water level is to be performed in accordance with vehicle manufacturer's instructions. The water contained

in the heating circuit of the heater must contain a minimum of 10% of a quality brand antifreeze.

8. The heater's "General Design Approval" and thus the General Operating Licence of the vehicle are void if the installation of a heater is not approved. The same applies to improperly performed repairs or those where others than genuine spare parts have been used.

Operation of the Heater

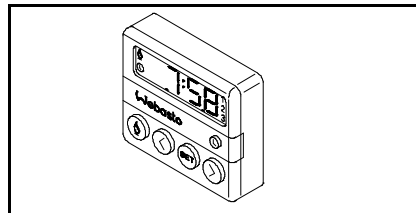
NOTE:

Prior to switching on the heater, the vehicle's heating system is to be turned to "warm".

In the case of 3-speed blower fans, the vehicle's blower fan is to be set to the 1st position, in the case of 4-speed blowers to the 2nd position. In the case infinitely variable fans adjust to at least 1/3 of the fan capacity.

Depending on the features fitted, the water heater can be activated by means of the following control elements:

Switching on by means of Digital timer:



manually: by pressing the "instant heat" button ⚡

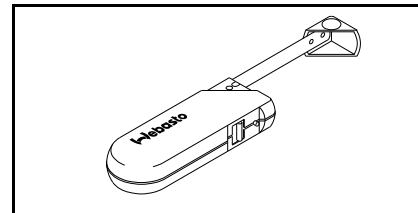
automatically: by presetting the start of the heating operation
On the display the symbol ⚡ appears and the display light is illuminated.

Switching off by means of Digital timer:

manually: by pressing the "instant heat" button ⚡

automatically: by presetting the end of operating time
The digital readout disappears.

Switching on by means of Telestart T6



by actuating the slide switch on the transmitter

The operation indicator light (LED) on the transmitter flashes

Switching off by means of Telestart T6:

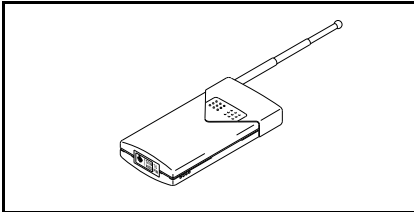
manually: by actuating the slide switch on the transmitter

automatically: by presetting the end of operating time

Switching on by means of Telestart , Switching off by means of Digital timer:

Press instant heat button twice

**Switching on by means of
Telestart T60**



by pressing the left side of the button on the transmitter
The operation indicator light (LED) on the transmitter flashes

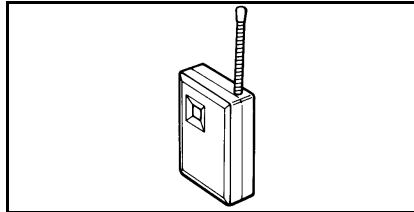
**Switching off by means of
Telestart T60:**

manually: by pressing the right side of the button on the transmitter
automatically: by presetting the end of operating time

Switching on by means of Telestart , Switching off by means of Digital timer:

Press instant heat button twice

Switching on by means of Telestart T5/pushbutton switch



by pressing the button on the Telestart device or by pressing the corresponding Telestart pushbutton switch provided in the vehicle
The green indicator light in the vehicle is illuminated.

Switching off by means of Telestart T5:

manually: by pressing the pushbutton switch in the vehicle
automatically: by presetting the end of operating time
The green indicator light in the vehicle goes off.

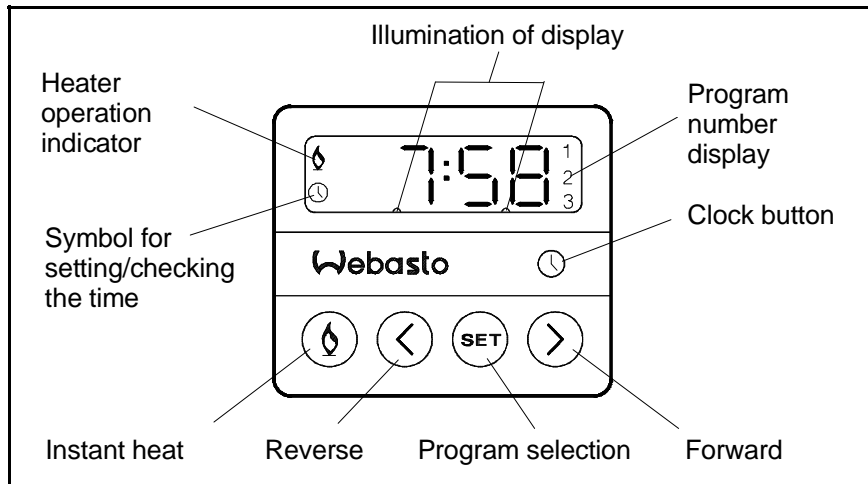
Digital Timer

Presetting the starting time of the heater:

Start of heating operation can be precisely preselected within a range between »1 minute« and »24 hours«.

Three starts may be programmed only one of which, however, can be activated.





If the red lamp on the display is illuminated, the operating time is 60 minutes, if the green lamp is illuminated it is 30 minutes



Setting the Digital Timer

Setting the Time



- Press "Clock"  and then "Forward"  or "Reverse"  buttons
- * During the adjustment, the symbols "." and  flash on the display and the display is illuminated.
- * After 10 seconds the readout disappears and the display illumination goes off

NOTE:

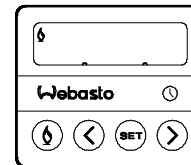
The longer the buttons are pressed the more rapidly the digits on the display will change.



Recalling time of the day





- Press "Clock"  button.
- * Time is displayed.

Switching heater on immediately

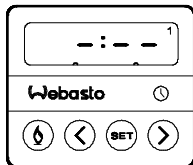


- Press "Instant heating"  button
- * The heating operation indicator  and the display illumination light up

Switching heater off

- Press "Instant heating"  button
- * The operation indicator  and the display illumination go off

Presetting heater start-up



- Press **SET** button
- * On the display the following appears for 10 seconds:
 - a program number
 - --:-- or a previously set start-up time
 - in addition, the display is lit up
- Within 10 seconds press "Forward" **➤** or "Reverse" **➤** button until the desired time for start-up of the heater appears on the display

- Each time a different program number is desired, the **SET** button must be pressed within 10 seconds

NOTE:

Heater start-up is programmed when the program number is displayed and the display is illuminated.

Cancelling preset time

- Momentarily press **SET** button
- Program number and display illumination disappear

Selecting a preset time



- Press **SET** button within 10 seconds until program number with the desired preset time assigned to it is displayed.
- * After 10 sec. the time display goes off.

Operation of Telestart T6

The wireless Webasto TELE-START T6 unit enables Webasto *Thermo Top* heating units to be switched on and off from a distance of up to 300 m. The TELE-START remote control makes use of UHF radio signals. The receiver limits the operating time after the heater has been switched on by the transmitter. Owing to the operating time presetting the heater is switched off automatically. Maximum range of remote control is obtained in open country. In built-up areas the reach is likely to be reduced. Transmitter and receiver of the Telestart T6 unit have not been tuned by the manufacturer.

Tuning of transmitter and receiver is carried out after installation.

The installer can allocate 2 transmitters to one receiver.

Note:

Tuning of Telestart T6 handheld transmitter and receiver is described on page 33.

Switching on

Pull out antenna of transmitter approx. 2 cm and then extend it as far as it will to.

Slide the switch on the transmitter to the "Start" position.

Operation indicator light on transmitter flashes.

Retract antenna.

Switching off



Pull out antenna of transmitter approx. 2 cm and then extend it completely.


Slide the switch on the transmitter to the "Off" position.


Operation indicator light on transmitter no longer flashes.

Retract antenna.

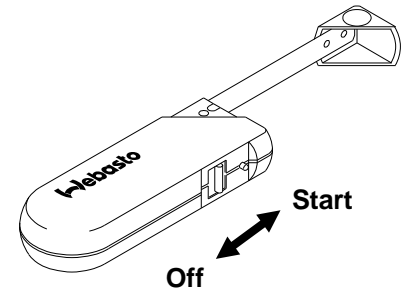
Switching on by means of Telestart and switching off by means of Digital Timer

Push  button on digital timer. The symbol  appears on the display of the timer.

To switch off, push the  button once more.

The  symbol of the timer disappears.

The operation indicator light incorporated in the transmitter continues to flash until the heater is switched off at the preset time or the switch on the Telestart transmitter is moved to the "Off" position.



Operation of Telestart T60

The wireless Webasto TELE-START T60 unit enables Webasto *Thermo Top* heating units to be switched on and off from a distance of up to 600 m. The TELE-START remote control makes use of UHF radio signals. The receiver limits the operating time after the heater has been switched on by the transmitter. Owing to the operating time presetting the heater is switched off automatically. Maximum range of remote control is obtained in open country. In built-up areas the reach is likely to be reduced. Transmitter and receiver of the Telestart T60 unit have not been tuned by the manufacturer.

Tuning of transmitter and receiver is carried out after installation.

The installer can allocate 2 transmitters to one receiver.

Note:

Tuning of Telestart T60 handheld transmitter and receiver is described on page 34.

Switching on

Pull out transmitter's antenna all the way.

Push switch on transmitter to "Start".

Operation indicator light on transmitter flashes.

Retract antenna.

Switching off


Pull out transmitter's antenna all the way.


Push switch on transmitter to "Off".


Operation indicator light on transmitter no longer flashes.


Retract antenna.

Switching on by means of Telestart and switching off by means of Digital Timer

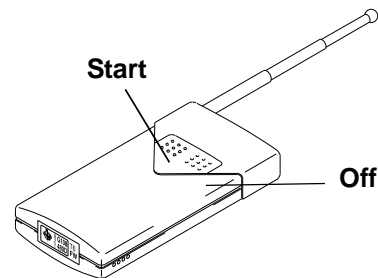
Push  button on digital timer.

The symbol  appears on the display of the timer.

To switch off, push the  button once more.

The  symbol of the timer disappears.

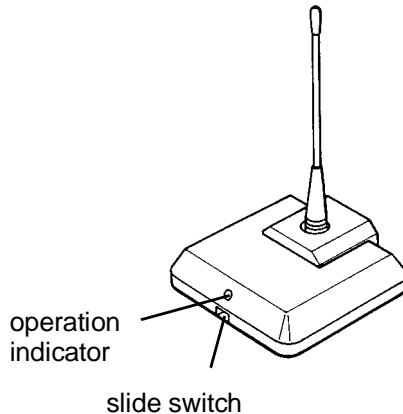
The operation indicator light incorporated in the transmitter continues to flash until the heater is switched off at the preset time or the switch on the Telestart transmitter is moved to the "Off" position.



Operation of Telestart T5

Switching on the Receiver

Actuate the slide switch at the base of the receiver. The operation indicator is illuminated. The receiver is ready for operation.



Start-up of the Heater Using Telestart

Press the button on the Telestart device for at least 2 seconds. When so doing, hold the transmitter with the antenna in upright position. While the button is pressed a tone sequence will be audible. The green indicator light in the pushbutton switch inside the vehicle is illuminated.

Switching the Heater Off

The heater switches itself automatically off after **30 minutes**. If heating operation is to be terminated prematurely: actuate the pushbutton switch inside the vehicle. The green indicator light in the pushbutton switch goes off.

CAUTION:

If the system is equipped with TELESTART **only**, **no** visual indication will occur in the event of a shutdown due to overheating.

Operation in Summer

If the heater is not used for an extended period of time, e.g. during the summer months, power supply can be interrupted by means of the slide switch at the base of the receiver. The 9V alkaline battery should be removed when the hand-held transmitter is not in use.

Summer/Winter Switch

(Option, applicable to Thermo Top S only)



The summer/winter switch enables normal heating operation during the cold months and provides ventilation during the warm period making use of the heater fan of the vehicle.

With the heater fan switched on (switch position identical to that required for heating), the ventilation switch positioned to fresh air setting and the summer/winter switch set to summer, only the heating fan of the vehicle is put into operation.

Maintenance of Heater

The heater should be checked at a Webasto service center at regular intervals, at the latest, however, at the beginning of the cold season (when the heater is used frequently due to weather conditions).

Maintenance of Telestart T6

Inserting the Batteries

Open battery compartment in the transmitter with a quick anti-clockwise rotation using a suitable object (e.g. a coin).

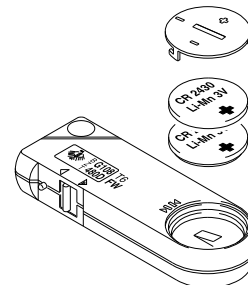
Place 2 batteries (CR 2430 button cells) - positive poles facing up - into the battery compartment. Close battery compartment by twisting it briefly clockwise.

Checking the Batteries

Push switch on transmitter to "Start".

Batteries okay:

Operation indicator is flashing. Subsequently, switch to "Off" again.



Maintenance of Telestart T60

Inserting the Batteries

Open the battery compartment in the transmitter.

Insert two batteries (1.5 V LR1 alkaline) into the battery compartment as shown on this page.

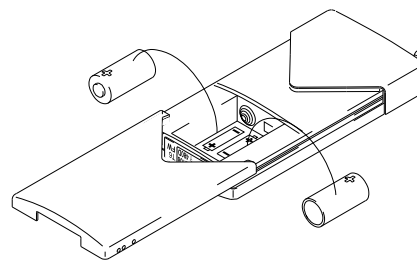
Close the battery compartment.

Checking the Batteries

Push the switch on the transmitter to the "Off" position.

Batteries are okay:

Operation indicator is flashing three times.



Maintenance of Telestart T5

Loading battery in Telestart transmitter

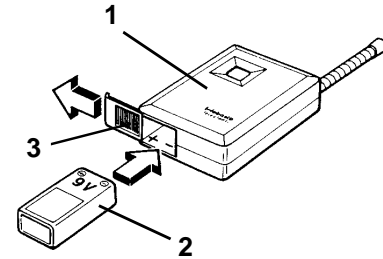
Slide 9-volt battery (2) (Webasto ordering no. 436704) - only alkaline batteries to be used - into the battery compartment at the base of the hand-held transmitter (1) ensuring that polarities are aligned correctly.

Close lid (3). The hand-held transmitter (1) is ready for operation.

Checking the battery

Press green button on transmitter. A "tone sequence" becomes audible.

If no tone sequence can be heard
- the battery is either too cold and must be warmed
or the battery is too weak and must be replaced.



Troubleshooting

In the event of a malfunction the fuses and plug connections are to be checked for proper condition and security of attachment.

If the malfunction cannot be remedied by these measures, please consult a Webasto service center.

Malfunction (Telestart)

Telestart T6/60: After the start-up, the operation indicator does not flash

Telestart T60: The operation indicator does not flash three times after the heater has been switched off

Telestart T5: There is no signal emitted when the button on the Telestart transmitter is pressed.

Cause

Transmitter battery colder than -20°C

No contact at battery
Oxidized contacts

Battery discharged

Remedy

Allow battery to warm up (holding it in your hand)

Check contact springs
Carefully clean contacts

Replace battery

Telestart receiver fails to switch on heater

Defective vehicle fuse

Replace fuse

Weather-related problems
Radio interference
Insufficient range

Actuate switch on transmitter repeatedly
Extend antenna completely

Telestart T5 only:
No voltage present at receiver

Telestart T5 only:
Check slide switch and leads

Malfunction (Heater)

Heater turns itself off automatically (= shut-down on fault)

Cause

No combustion took place after start-up and repeated start-up.

Flame goes out during operation.

Remedy

Switch off heater and switch on again.

If heater fails to operate again, consult a Webasto service center.

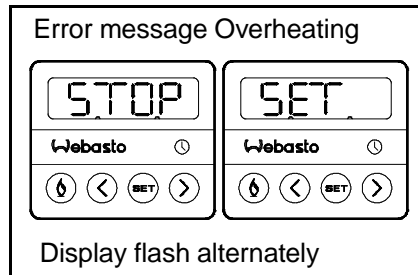
Heater is overheating due to lack or loss of coolant

Top up coolant as directed by vehicle manufacturer

subsequently it is automatically shut down by temperature limit switches

***Thermo Top S* only:**

Prior to switching the heater on again, pull heater fuse (15A) out of fuse holder and put it back in again (power-ON Reset). The fuse is not destroyed by overheating.



CAUTION:

On *Thermo Top S* and *Tele Thermo Top* heaters no message occurs when a shutdown due to overheating occurs.

CAUTION:

With the heater *Thermo Top S* no indication is given in the event of a shutdown due to overheating.

Unique to *Thermo Top* and *Thermo Top T* equipped with

Digital Timer: Press the presetting button "Set" prior to switching on.

Telestart T5:


Prior to switching on, switch off summer/winter switch on Telestart receiver and switch on again.

Functional Description

The interior of the vehicle is supplied with fresh air.

The Webasto water heater *Thermo Top* is designed for the following uses:



- heating of the interior of the cab,
- de-icing the vehicle's windows as well as
- preheating water-cooled engines.

Upon actuation of the "Instant heat" button the symbol  appears on the display of the timer, or the operation indicator on the transmitter flashes when the slide switch on the Telestart transmitter is actuated. The recirculating pump, pencil-type glow plug, combustion air fan and vehicle heater fan (does not apply to *Thermo Top S* heaters) are put into operation. After 32 seconds the solenoid valve opens (*Thermo Top S*: the fuel metering pump is connected

to the system) and combustion starts under starting load condition. After flames have formed, the pencil-type glow plug is deactivated, and at the same time the fuel pump and the combustion air fan are switched to partial load for 20 seconds to reach the required stabilisation. Thereafter, the system is brought up to full load by continuous control.

The automatically controlled heating operation now starts. After the temperature has increased to 30°C, the vehicle heater fan (applies to *Thermo Top S* heaters only) and the recirculating pump control are switched on in order to obtain a higher water outlet temperature during the heat-up phase. When the temperature has increased to 78°C, the heater switches to energy-saving partial-load operation. If the temperature of the

coolant continues to rise to 85°C, the heater switches to the control idle mode. The circulating pump, the vehicle heating fan and the operation indicator continue to operate during the control idle period. When the coolant has cooled to 75°C, the heater resumes operation.

Switching off: The vehicle fan is switched off (On the *Thermo Top*, *Thermo Top T* and *Tele Thermo Top* heaters, the vehicle's fan is switched off after the after-run) either by pressing the "Instant heat" button  ( on the display disappears), or by actuating the slide switch on the Telestart remote control (flashing signal on hand-held transmitter goes off). The combustion process is terminated and the after-run period starts. However, the circulating pump and the combustion air fan

continue to operate in order to cool the heater (after-running) and are switched off automatically. After-run time is 120 seconds. Restarting the heater during the after-run period is permissible.

**Applicable to *Thermo Top*,
Thermo Top T and *Tele Thermo Top* only**

After a combustion period of 30 minutes the fuel supply in the heater is consumed. Allowing the vehicle engine to run for 2 minutes will replenish the fuel supply.

Applicable to *Thermo Top T* only

An additional thermostat control is provided in order to reach a higher outlet temperature during the heating-up phase.

Application: on vehicles with a cubic capacity of more than 1800cc.

Technical Data

Unless limit values are indicated, the technical data shown in the Table on the right apply with the usual $\pm 10\%$ tolerances for heaters at an ambient temperature of $+20^{\circ}\text{C}$ and at rated voltage.

Fuel for *Thermo Top* (Petrol) type BW 50:

The type of fuel prescribed by the manufacturer of the vehicle may be used.

Both leaded and unleaded fuel can be used.

Fuel for *Thermo Top* (Diesel/fuel oil EL) type DW 50:

The Diesel fuel recommended for use by the vehicle manufacturer is suitable as fuel for the heater.

When changing to cold-resistant fuels, the heater must be operated for approx. 5 minutes (*Thermo Top S* approx. 15 minutes) to ensure that the fuel line and the fuel pump

Heater	Operation	Petrol type BW 50	Diesel type DW 50
Mark of conformity		_S238	_S239
Type		Water heater with vaporizing-type burner	
Heat output	full load part load	5,0 kW 2,5 kW	
Fuel		Petrol	Diesel/EL fuel oil
Fuel consumption	full load part load	0,50 kg/h 0,25 kg /h	
Rated voltage		12 Volt	12 Volt
Operating voltage range		10 ... 14 Volt	
Rated power consumption with circulation pump (without vehicle fan)	full load part load	44 W 27 W	44 W 27 W
Max. ambient temperature: Heater: - operation - storage Metering pump: - operation		-40°... +60°C -40°... +120°C -40°... +20°C	-40°... +80°C -40°... +120°C -40°... +20°C
Max. allow. working pressure (heat transfer medium)		0,4 ... 2,0 bar	
Heat exchanger capacity		0,15 l	
Min. cooling system capacity		4,00 l	
Flow rate of circulating pump at roughly 0,1 bar		500 l/h	
CO ₂ content in exhaust gas (perm. operating range)		9,5 ... 12,0 Vol. -%	
Dimensions of heater		Length 240 mm Width 103 mm Height 168 mm	
Weight		4.3 kg	

are also filled with the new type of fuel.

Any negative effect caused by additives is not known.