SCHEER

Water Heater

nano

Operating Manual

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Introduction

Dear customer,

Thank you for purchasing our nano water heater.

By purchasing the nano water heater, you have opted for the most future-proof and efficient heating technology currently available.

The innovative and award-winning technology of the appliance with its “Blue Efficiency®” burner offers you particularly user- and maintenance-friendly operation as well as maximum convenience and reduced emissions.

The use of the proven blue burner system in duo-block design and the simple control via the boiler control panel ensure very economical and ecological operation.

For further questions and information, please do not hesitate to contact us.

Your SCHEER team

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1 Safety

1.1 Intended Use

The nano water heater was developed to heat motorhomes with either one or several heating zones, so that one or different temperature ranges can be set in the vehicle.

The heating system is operated with diesel/heating oil/GtL/BtL as well as HVO and electricity.

1.2 Use and meaning of symbols and signal words

Staggering of signal words according to ANSI Z535.4	
Signal word	Danger severity
ATTENTION!*	The signal word indicates a potentially harmful situation. If it is not avoided, the product or something in the vicinity may be damaged.
CAUTION!	The signal word indicates a potentially dangerous situation. If it is not avoided, slight or minor injuries may result. May also be used to warn of material damage.
WARNUNG!	The signal word indicates a potentially dangerous situation. If it is not avoided, death or serious injury may result.
DANGER!	The signal word indicates an imminent danger. If it is not avoided. Death and the most serious injuries (crippling) are the result.
HINWEIS	The signal word indicates a special technical feature or (if ignored) possible damage to the product.

1.3 General safety instructions

1.3.1 Safety instructions for operation

DANGER!
Explosion hazard: In environments with flammable vapors, combustible dust and hazardous materials (e.g. petrol stations, tank systems, fuel, coal, wood or grain storage facilities)
> Do not switch on or operate the heater

DANGER!
Risk of suffocation: Operating the heater in a closed environment can lead to death or serious injury.
> Do not operate the heater in closed rooms (e.g. garage), not even with time preselection or telestart.

DANGER!
Improper installation or repair:
Improper installation or improper repair of the heating system can cause fire or lead to the escape of lethal carbon monoxide. This can result in serious or fatal injuries.
Only allow personnel trained by SCHEER to carry out installation or repairs.
Observe all warnings.
All necessary technical documentation, tools and equipment must be available.

ATTENTION!
Explosion hazard due to explosive and flammable hazardous goods
For installation and operation in hazardous goods vehicles (ADR), a shortened run-on time of max. 39 seconds must be set for the heating system!

- The heater must not be operated at loading points for hazardous goods.
- The heater must not be operated during the loading and unloading of hazardous goods.

1.3.2 Avoidance of material damage

DANGER!
Risk of injury due to defective appliance:
Do not operate a defective heater and put it out of operation by removing the fuse if:

- Prolonged heavy smoke development
- Unusual burner noises
- Smell of fuel
- Constant fault shutdowns with error messages
- Damaged heater

ATTENTION!
Malfunction or device damage possible due to heat!
Temperatures in excess of 110°C (ambient temperature) can cause permanent damage to the electronics
> Do not store or operate the heater in environments with temperatures in excess of 110°C.

ATTENTION!
Malfunctions or appliance damage possible due to frost!
If the fresh water in the heating system freezes, the appliance may be damaged.
If there is a risk of frost, the fresh water must be drained from a heating system with a plate heat exchanger. Never operate the heating system without a glycol mixture!

NOTE!
Improper handling:

- Protect the heater from mechanical stress (e.g. falling, knocks or blows)
- Do not step on the heater
- Do not place any objects on the heater.
- Avoid improperly switching off the heater during overrun. After being switched off via the control element, the heater fan continues to run.
- Always switch off the heater using the control element.
- Only disconnect the power supply after the overrun has been completed.
- The exhaust pipe must always be free of snow and ice!

WARNUNG!
Danger from electric current!
The appliance may only be operated on properly installed single sockets with earthing contact.
Do not pull the mains connection cable out of the socket by the cable, always hold it by the mains plug housing.
The burner elements and connections have 230 V voltage.
The appliance must be secured on the vehicle with an earthing contact plug. The power supply must meet the requirements of the appliance.

ATTENTION!
Switching on the heating system without heating water can destroy the heating system.

CAUTION!
Potentialausgleich ist mit einer Verbindung zwischen Heizsystem und Fahrzeugkarosserie herzustellen. Die Verbindung muss durch eine Kabelverbindung an der am Heizsystem gekennzeichneten Schraube und ein Kabel von mind. 4 mm2 erfolgen.

ATTENTION!
Pay attention to the installation conditions of the specific vehicle type. Install the heater as low as possible to ensure automatic venting of both the heater and the circulation pump. The heater may also be mounted inside a box, which must be adequately ventilated from the outside.

Legal Requirements

1.1. Legal Requirements for Installation

For installation, the provisions of Annex 7 of ECE Regulation R122 must be observed as a priority.

Note:
The provisions of these regulations are binding within the scope of the ECE Regulations and should also be observed in countries where no specific national rules exist!
Excerpt from ECE Regulation R122 – Annex 7:

4. The heater must carry a nameplate showing the manufacturer's name, the model number and type designation, and the rated heat output in kilowatts. In addition, the operating voltage and electrical power must be indicated.

7.1. A clearly visible control lamp within the operator's field of vision must indicate whether the heater is switched on or off.

Excerpt from ECE Regulation R122 – Part I

5.3. Regulations for the installation of combustion heaters and electric heaters in vehicles
5.3.1. Scope
5.3.1.1. In accordance with paragraph 5.3.1.2, heaters shall be installed in compliance with the provisions of paragraph 5.3.
5.3.2. Arrangement of the heater
5.3.2.1. Parts of the vehicle body and other components in the vicinity of the heater must be protected

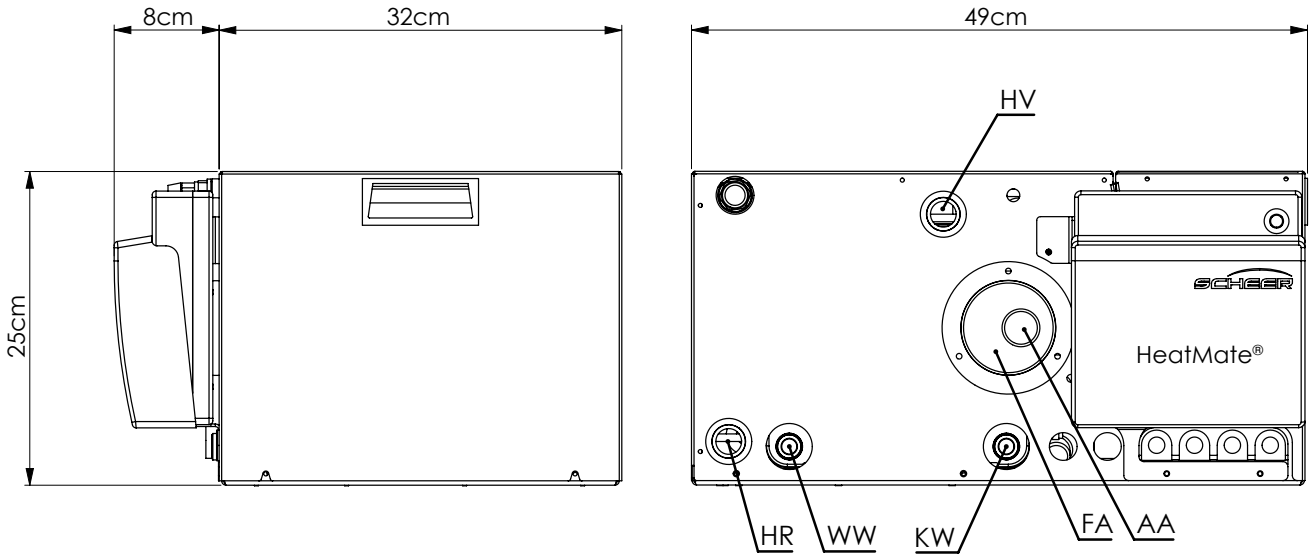
against excessive heating and possible contamination by fuel or oil.
5.3.2.2 The heater must not pose a fire hazard even when overheated. This regulation is deemed to have been complied with if an appropriate distance to all parts was maintained during installation and adequate ventilation was ensured or fire-resistant materials or heat shields were used.
5.3.2.3 In vehicles of categories M2 and M3, the heater must not be located in the passenger compartment. However, installation in the passenger compartment is permitted if it is located in an effectively sealed housing which also complies with the requirements of paragraph 5.3.2.2.
5.3.2.4 The plate referred to in paragraph 4 of Annex 7 or a duplicate shall be affixed in such a way that it is still easily legible when the heater is installed in the vehicle.
5.3.2.5 The location of the heater shall be such as to minimize the risk of injury to persons and damage to property carried.

Disposal of old appliances
The end-of-life appliance must be disposed of in accordance with national regulations. It is recommended to contact a company specializing in disposal or to get in touch with your local municipal waste-management department.

WARNUNG!
To prevent misuse and the associated hazards, render your old unit inoperable before disposal. To do so, disconnect the appliance from the mains supply and remove the power-supply cable from the unit. When disposing of the appliance, observe the regulations applicable in your country and local municipality.

2 Model overview

2.1 nano



Abbreviation	Description	Connection
HV	Heating water – supply	G1/2" female thread
HR	Heating water – return	G1/2" female thread
KW	Fresh water – inlet	G1/2" female thread
WW	Fresh water – outlet	G1/2" female thread
AA	Exhaust connection	Ø35mm
FA	Combustion fresh-air inlet	Ø75mm

3 General operating instructions

NOTE!
The disused appliance must be disposed of at the end of its service life in accordance with national regulations.
We recommend that you contact a company specializing in waste disposal or contact the waste disposal department of your local authority.

3.1 Compressive strength

NOTE!
The nano water heater is suitable for both non-pressurized and pressurized installation.
An expansion vessel must be installed for pressure-resistant installation, and the installation material used (convectors, piping, transitions, etc.) must also be suitable for pressure-resistant installation.
An expansion tank must be installed for non-pressurized installation.

3.2 Fuels

Blue Efficiency® burners from SCHEER can be operated with all conventional liquid fuels in accordance with DIN EN 590, such as diesel, heating oil or gas oil. They can also be operated with alternative fuels in accordance with DIN EN 15940 GTL or HVO.

3.3 Electric heating

The heating systems are equipped with a 3 kW electric hybrid connection (power levels: 1, 2 & 3 kW). This enables your caravan to be heated without fossil fuels. This hybrid solution is integrated on the boiler side. You do not need any additional space for this option.

3.4 Heating water

The heating system must only be filled with a suitable glycol mixture (antifreeze).
Recommended glycol mixture: Ecological antifreeze SCHEER article no. 190094

3.5 Convectors / radiators

NOTE!
For optimum use of water-based heating, it is important that the air can circulate freely around the installed convectors. For this purpose, convectors must have air inlets under the furniture and air outlets behind the furniture.

3.6 Heating zones

The nano water heater can be used to create any number of heating zones with individually adjustable room temperatures. This requires one room thermostat per heating zone.

3.7 Fresh water heating

Fresh water is heated by the integrated plate heat exchanger.
Please ensure that the fresh water is free of any contaminants.
The materials used in the plate heat exchanger are specified by DIN 1988 and thus approved for potable-water service. The construction uses the Alloy 316 grade with copper brazing material.

NOTE!
To minimize signs of corrosion, we recommend the following limit values for fresh hot water:

pH-Value:	7 - 9	
Electrical conductivity:	50 - 600	µS/cm
Chlorides:	< 50	ppm
Iron:	< 0,5	ppm
Free chlorine:	< 0,5	ppm
Manganese:	< 0,05	ppm
Carbon dioxide:	< 10	ppm
Sulphate:	< 100	ppm
Phosphate:	< 2	ppm
Ammonia:	< 0,5	ppm
Max. particle size:	0,5	mm

3.8 Use of engine heat and machine heating

NOTE!
When heating the machine (optional), the user must ensure that no temperatures higher than 75°C occur in the heating system. Equipotential bonding must be established with a connection between the heating system and the vehicle body. The connection must be made using a cable connection at the screw marked on the heating system and a cable of at least 4 mm^2.

3.9 Assembly room

NOTE!
When installing, the space required for maintenance accessibility (e.g. removal of the burner) should be taken into account.

3.10 Fuel supply / fuel filter

ATTENTION!
Failure to observe the installation conditions can lead to malfunction or damage to the appliance.
Automatic fuel filters must always be installed above the level of the oil pump.
The hoses should be routed vertically.
Do not swap the supply and return lines!

The use of a fuel filter, an automatic breather and a fine filter insert is mandatory for operation. (included in the scope of delivery) The silicone hose supplied for the breather guides the air to the combustion process. This prevents diesel odors.

Use a fuel line with an internal diameter of 6 mm (max. 10 mm) between the fuel tank and the fuel filter. Other dimensions only after consultation with the manufacturer. Free-hanging fuel lines must be secured to prevent them from sagging.

ATTENTION!
Repeated running out of fuel in the system can lead to damage to the appliance!
The "**Auto Tank Control (art. no. 0170018 / 0170019)**" option is recommended as a preventative measure.

3.11 Exhaust pipe

CAUTION!
If the exhaust duct is routed outside the installation box near heat-sensitive parts, it must be insulated.
The exhaust outlet must not be positioned below the combustion-air inlet or closer than 50 cm to it.

4 Startup

Ensure the heating system is filled with a glycol mixture and vented before commissioning.
Ensure the fuel supply system is thoroughly vented. Observe the vehicle manufacturer's instructions.

Heating On/Off: To switch the heating system on or off, press and hold the Power button on the HeatMate® for 2 seconds.

All functions of the heating system can be controlled via the HeatMate® control unit. Please read the control unit's operating manual in full.

Room-temperature regulation or control in a heating zone is performed via a room thermostat. Please read the room thermostat's operating manual in full.

During a test run of the heater, check all water and fuel connections for tightness and secure fit.

The nameplate must be protected from damage and remain clearly visible when the heater is installed (use a duplicate nameplate if necessary).

4.1 Commissioning log with type plate

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info@scheer-heizsysteme.de

Here is space for your SCHEER type plate:

The warranty is only valid if the complete protocol is filled out!
to info@scheer-heizsysteme.de or by post at:
SCHEER Heizsysteme & Produktionstechnik GmbH | Chausseestraße 16 | D-25797 Wöhrden

Customer : .....
Street : .....
Zip code : ..... Place : .....
Phonenumber : Land : .....
E-Mail : .....

Burner protocol	Yes	No	Comment:
Fuel line checked for leaks	☐	☐	
Supply and return of the oil hoses checked	☐	☐	
Fuel withdrawal directly from the tank (without distributor/connector etc.)	☐	☐	
Internal diameter of the fuel line (min. 6 - max. 10mm)	☐	☐	
Heater installed and secured	☐	☐	
Vent valves present in the system	☐	☐	
Water pressure in the system set to approx. 1.5 bar (max. 0.5 bar for unpressurized installation)	☐	☐	
Expansion tank / expansion vessel present (min. 10% water capacity)	☐	☐	

Date / place : .....
Name : .....

Customer

Signature : .....

Service staff

Compacy : .....
Phonenumber : .....
E-Mail : .....
Signature : .....
Name : .....

5 Fault messages

5.1 Safety temperature limiter (STB)

If the fault light of the STB (overheating) lights up continuously, it has been triggered because the operating temperature is too high.

- Allow the heating system to cool down
- Press in the STB fault clearance button (a slight clicking sound is heard)
- The heating system will now restart

DANGER!
If the STB trips again, please have it repaired by your specialist company.

5.2 Burner failure

If a fault message is reported for the burner, please proceed as follows.

- Disable the burner via the HeatMate® control unit
- The fault message disappears and the burner is disabled.

DANGER!
If the burner switches to fault twice again, please have it repaired by your specialist company.

6 Service Protocols

Service Protocols for Boiler no.: _____ Burner no.: _____

with art. no.: _____

Date / place	Service employee (name, company, telephone number, e-mail)	Signature	Comments

7 Technical Data

		nano
Dimensions *(W / H / D)*	cm	32 / 25 / 49
Weight	kg	30
Efficiency	%	94
Boiler Water Volume	l	8
Fuel		Diesel / Heizöl und GTL / BTL / HVO nach CEN EN 15940
Power Supply	V	230
Current Draw *(Burner Operation, 12V)*	A	6,4

Water Heater

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