MH series water heater

MH 10/17

MH 15/23

MH 30/40

MH 10 micro

MH 20 micro L

Installation and maintenance instructions

Introduction

Dear customer,

thank you for choosing to install our MH-series into your vehicle.

With your purchase of the MH-series, you ensured for yourself, to have a heating system with currently the highest technological standard and lowest fuel consumption.

The innovative and award-winning technology of our products with the Blue Efficiency® burner, will provide you with an especially user and maintenance friendly operation. This system will give you comfort and highly reduced emissions.

The successfully proven blue-burner-system in “Duo-Block“ building technique, as well as the simple operation over the boiler control field, are very efficient and environmentally friendly.

Please contact us for any questions or further information you need.

Your SCHEER-team

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Note:

Always carefully follow SCHEER installation and repair instruction and heed all WARNINGS.

SCHEER rejects any liability for defects and damage, which are due to installation or repair by unauthorized and untrained persons.

table of contents

Legal requirements 4
Warning and safety instructions (explanation) 5
Installation 5
Initial commissioning 6
Identification plate 6
Technical data 7
Overview MH-series 7
Control box A 8
Heating controller 8
Interference lights 9
Pipe connection groups (examples) 9
Domestic hot water heating 9
Expansion tank 10
Hybrid electric heating (optional) 10
How electric heating works 10
Connection room thermostat 11
Overview of cable connections 12
Dimensions MH series 13
Water heater MH micro 14
Overview MH micro 14
Burner assembly MH micro 15
Hybrid electric heating 15
Dimensions of the MH micro 15
Control box MH micro 16
Warning lights 16
Oil supply / oil filter 17
Antifreeze liquid for heating water (BIO-GLYKOL) 17
Automatic venting for heating water 17
Combustion air supply 18
Exhaust pipe 18
Burner components 19
Pipe connection group components 21
Maintenance preparation 22
Set pump pressure 23
Change oil filter 23
Clean boiler 23
Mixing cartridge control 24
Oil pump motor 24
Electrical schematics of controller 25
Circuit diagram control box M 26
Room thermostat (optional) 27
Service record 31
Service kits 32

legal regulations governing installation

1.1. legal regulations governing installation.
The heaters of the MH-series are type-tested and approved in accordance with the ECE Directives ECE R122 with the EG permit number: 000517 (ECE R122).

Installation is governed above all by the provisions in Annex VII of the ECE Directives.

Note:
The provisions of these Directives are binding within the territory governed by ECE Directives and should similarly be observed in countries without specific regulations!
Extract from ECE Directives R122 Annex VII.

4. The heater must have a manufacturer's label showing the manufacturer's name, the model number and type together with its rated output in kilowatts. The fuel type must also be stated and, where relevant, the operating voltage and gas pressure.
7.1. A clearly visible indicator light within the operator's field of view shall inform when the combustion heater is switched on or off.

Extract from ECE Directives R122 - Part I:

5.3. Regulations for installing combustion heaters and electrical heaters in vehicles.
5.3.1. Scope
5.3.1.1. According to section 5.3.1.2. heaters must be installed by the requirements of section 5.3..
5.3.2. Location of the heater
5.3.2.1. Parts of the vehicles body and other components in the immediate vicinity of the heater must be protected against excessive heat and the danger of contamination by fuel and oil.
5.3.2.2. The internal combustion heater must not pose a fire hazard even when overheated. This requirement is deemed to have been met if care is taken during installation to ensure an adequate distance from all parts, as well as adequate ventilation and if fire-resistant materials or heat shields are used.
5.3.2.3. In class M2 and M3 vehicles must not be installed in the passenger cabin. A device in a sealed cover, which also meets the requirements set out in section 5.3.2.2, may be used, however.
5.3.2.4. The plate or a duplicate of the plate mentioned in Annex 7 section 4 must be still fitted in such way that it is still clearly legible when the heater has been installed in the vehicle.
5.3.2.5. When positioning the heater, all reasonable precautions must be taken to minimize the risk of personal injury or damage to items in the vehicle.

Disposal of old divices
The discarded device must be disposed of at the end of its service life in accordance with national regulations. It is recommended to contact a company specialized in disposal or to contact the disposal department of your municipality.

WARNUNG:
To prevent misuse and the associated hazards, render your old device unusable before disposing of it. To do this, disconnect the device from the mains supply and remove the mains connection cable from the device. For the disposal of the device, observe the regulations applicable in your country and in your municipality.

Warning and safety instructions (explanation)

The following table explains the used colors, words and their meaning used in this manual.

classification of the signal word according to ANSI Z535.4	
signal word	identification of hazard
NOTICE	Notice: [this header is] preferred to address practices not related to personal injury. Used for property damage.
CAUTION!	Caution: Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury.
WARNING!	Warning: Indicate[s] a hazardous situation which, if not avoided, could result in death or serious injury.
DANGER!	Danger: Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury.

Installation

WARNUNG:
Electric current hazard!
The device may only be operated on properly installed single sockets with protective contact.
Do not pull the power cord out of the socket by pulling the cable.
Always grasp the housing of the power plug.
The burner elements and connections have 230 V voltage.
The unit must be secured on the vehicle side with a protective contact plug.
The power supply must meet the requirements of the unit.

WARNUNG:
Switching on the heating system without heating water can destroy the heating system.

CAUTION:
To avoid frost damage, the heating system must be filled with an anti-freeze liquid.
The heating system must be drained of service water as necessary.

NOTICE:
The flow temperature of heated heating water can be freely set before commissioning.

Installation

DANGER: Death or serious injury due to improper installation or repair.

Improper installation or improper repair can cause a fire or the leakage of deadly carbon monoxide leading to serious injury or death.

The person to install and repair the heating system must have completed a SCHEER training course.

Always follow all installation and repair instruction.

Heed all warning and safety signs.

All required technical documentations, tools, and equipment must be available in the vehicle for installation and repair.

NOTICE: Cancelation of all warranty and liability claims!

Not following the required installation conditions will lead to the loss of all warranty and liability claims!

Installation must comply with governing statutory regulations listed on **page 4.**

If the water heater is to be operated in a separately installed heating system, prior to installation an installation planning report must always be submitted to SCHEER for approval. If this approval is not obtained, all warranty and liability claims will be void.

NOTICE:

SCHEER rejects any liability for defects and damage, which are due to installation or repair by unauthorized and untrained persons.

NOTICE: Check the installation situation of the relevant vehicle type.

Installation position:

The heater must be installed in as low a position as possible to allow the heater and circulating pump to be bled automatically. This is particularly important as the circulating pump is not self-priming.

The heater may also be installed in a box. The installation box must have sufficient external ventilation to ensure that a maximum temperature of 85 °C (185 °F) is not exceeded inside the box.

Keep in mind the space required for servicing accessibility (for instance for removing the combustion chamber)..

Initial commissioning

Refer to the safety instructions in the operating and maintenance manual!
Read and understand all operating and maintenance instructions before starting the heater.

After installing the heater bleed the water system and the fuel supply system carefully. Follow the instructions supplied by the vehicle manufacturer for this purpose.

Check the electrical connections for the correct polarity.
Conduct a test run of the heater to check all the water and fuel connections for leaks and ensure that they are tight and secure. In case of an error during the test run or normal operation refer to the trouble-shooting table and fix it.

Tighten all pipe union connections after the first full heat up operation. Please send a copy of the start-up protocol to SCHEER.

identification plate

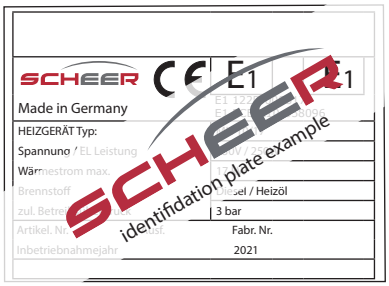


Fig. identifidation plate example

The model and identification plate must be protected from damage and must be clearly visible when the heater is installed (otherwise a dublicate model and identification plate must be used)

technical data

		MH 10 Micro Art. 0774820	MH 20 Micro L Art. 077480	MH 10/17 Art. 077482	MH 15/23 Art. 077484	MH 30/40 Art. 077486
operating power	kW	10	20	10/17	15/23	30/40
dimenensions (w / h / d) **	cm	46 / 30 / 60	46 / 30 / 74	38 / 44 / 59	41 / 38 / 64	49 / 44 / 70
weight	kg	38	55	55	60	95
efficiency	%	94	94	93	93	94
fresh water heating		integrated water heating		optional (combi) plate heat exchanger		
boiler volume	l	20	32	18	23	37
fuel		diesel / heating oil and GTL/BTL (DIN EN 15940)				
oil nozzle		0.18 / 80°SCD	0.30 / 60°SCD	0.30 / 60°SCD	0.35 / 60° SCD	0.65/ 60° SCD
rated voltage	V	230	230	230	230	230
Power consumption (operation)*	A	0,89	0,89	0,94	0,94	0,94
exhaust temperature	°C	170 - 210	170 - 220	150 - 210	145 - 205	145 - 205
Max. operating pressure	bar	0,5	0,5	3	3	3

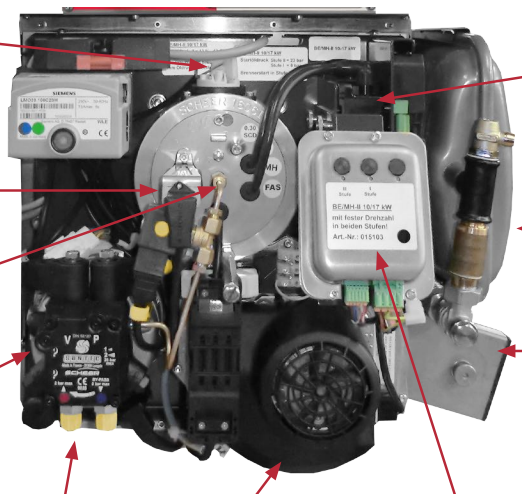
* assumption: 10 min. burner operation within one heating hour including boiler circulating pump. Without pumps for other heating circuits.
** dimensions without control box / pipe group / expansion tank

The MH water heaters are approved for the fuels „diesel“ and „heating oil“ as well as GTL/BTL. Other fuels must be approved by the manufacturer SCHEER before use. The heaters are designed for 230 volts.

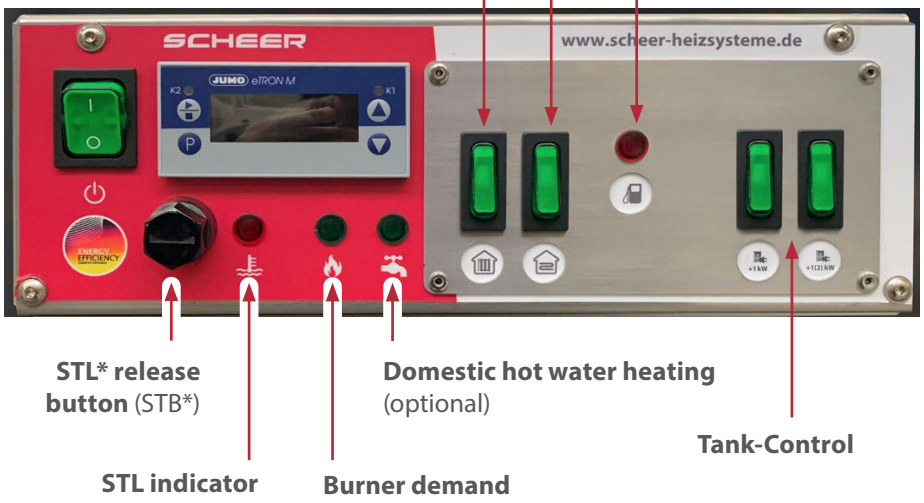
The connection in the vehicle is to be fed by the vehicle's battery via an inverter approved for road traffic within the scope of the ECE regulations.

Alternatively, the heater can also have a 230 V direct feed (e.g. direct feed from the campsite).

overview MH-series



control box A for MH-Series

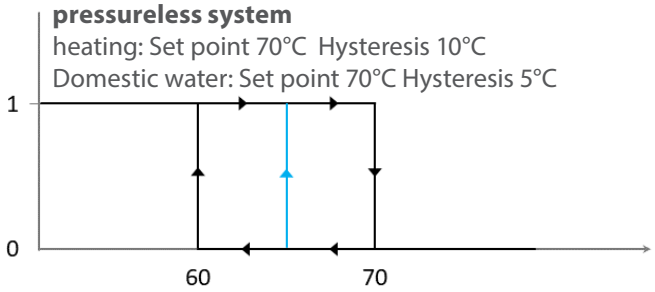


	Item No.
control box A	0754481

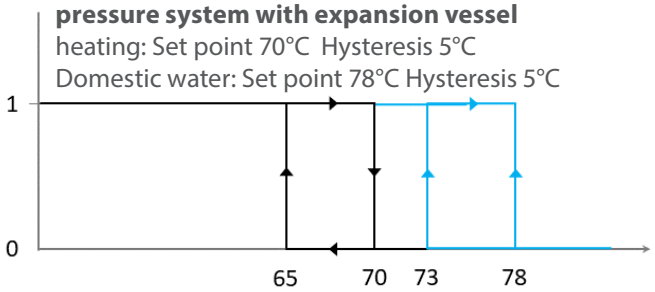
* Safety temperature limiter

Heating controller MH-Serie MH micro

pressureless system
heating: Set point 70°C Hysteresis 10°C
Domestic water: Set point 70°C Hysteresis 5°C



pressure system with expansion vessel
heating: Set point 70°C Hysteresis 5°C
Domestic water: Set point 78°C Hysteresis 5°C



Interference lights

NOTICE:

warning lamp: Safety temperature limiter (STL) trippingIf the STL fault light is on continuously, the STL has been tripped because the operating temperature is too high. Allow the heating system to cool down.Press the STB reset button fully (with a pointed object)The heating system will now restart. If the STB is triggered again, please have it repaired by your specialist company.

NOTICE:

warning lamp: burner

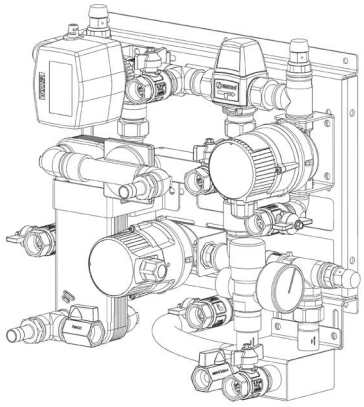
If the burner malfunction light is on continuously, a burner malfunction has occurred.

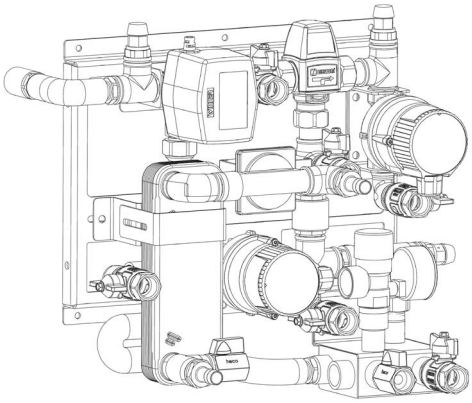
Press and hold the control unit's malfunction button for approx. 2 seconds, but not longer than 3 seconds, as this triggers the recall of the readout mode.

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

carried out by your specialist company.

Pipe connection group (examples)





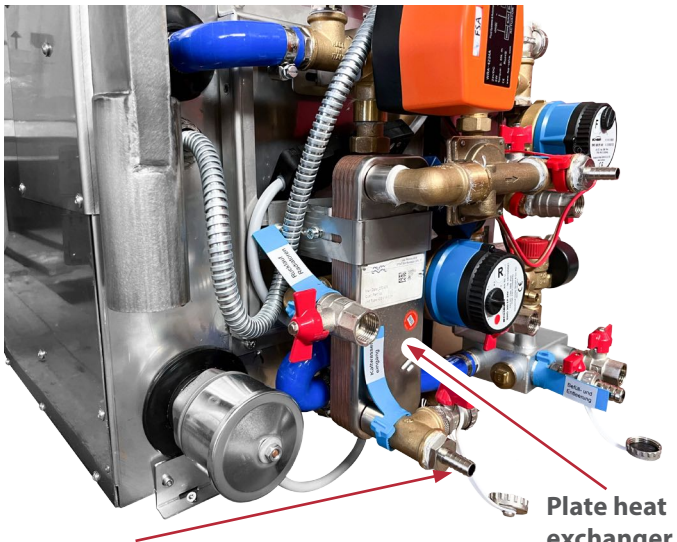
Domestic hot water heating

The materials used for the plate heat exchangers are defined by DIN 1988 and are therefore approved for the fresh water sector. The quality design Alloy 316 with copper solder material is used.
In order to minimise corrosion, we recommend that the following limit values are observed for fresh hot water:

pH value:	7 - 9	
electr. conduction:	50 - 600	µS/cm
Chloride:	< 50	ppm
Iron:	< 0,5	ppm
free Chlorine:	< 0,5	ppm
Manganese:	< 0,05	ppm
Carbon dioxide:	< 10	ppm
Sulfate:	< 100	ppm
Phosphor:	< 2	ppm
Ammonia:	< 0,5	ppm
max. particle size:	0,5 mm	

NOTICE:

The plate heat exchanger should be completely drained during longer downtimes or if there is a risk of frost.



expansion tank (optional)

expansion tank

	Item No.
electric power 2 kW	036385
electric power 3 kW	036386
cover cap	036388

hybrid-heating with electric power (optional)

Hybrid electric heating

The hot water heating can be operated hybrid as an alternative to the operation with electric energy.

When the „Electric heating“ switch is activated, the operation of the burner is suspended. All control and protection functions of the other hot water heating remain in place.

How electric heating works

Hybrid-Ablauf

The 230V power supply of the electric heater must be supplied with voltage. 1kW or 2kW (see labelling) are activated summarily up to 3kW per switch, the corresponding switch lights up. The electric heater is controlled by the heat request signal of the thermostat. The indicator LEDs above the switches show whether the electric cartridge is currently heating.

NOTICE:

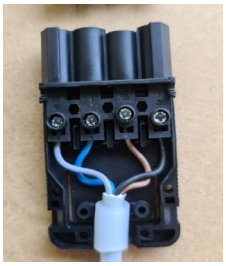
As long as the electric heater is switched on, the burner remains blocked, even if the voltage supply to the electric heater is interrupted. If the electric heater is switched on, the boiler thermostat indicates a heat request, but the indication LED is not lit, the voltage supply to the electric heater is interrupted.

Connection room thermostat with NO contact to MH series boiler

The most important facts in brief

- One thermostat can be connected per installed heating circuit
- The respective heating circuit pump is switched by a normally open contact in the thermostat.
- The 4-pole connection can be used to connect the 230V power supply of the thermostat in addition to the make contact.
- In the delivery state, the normally open contact is bridged (pump permanently on).

Contact assignment connector MH



1 & 2 - NO contact
N - Neutral 230V thermostat power supply

- Phase 230V thermostat power supply

Contact assignment room thermostat

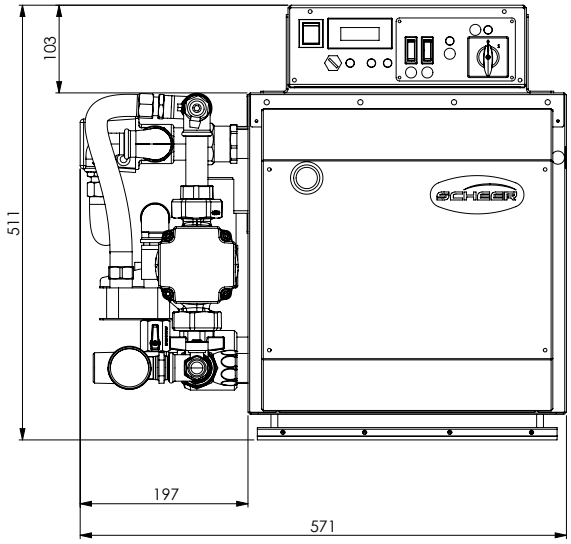
1 & 2 - Normally open contact
3 - Neutral 230V thermostat power supply
4 - Phase 230V thermostat power supply
5 & 6 - External temperature sensor connection

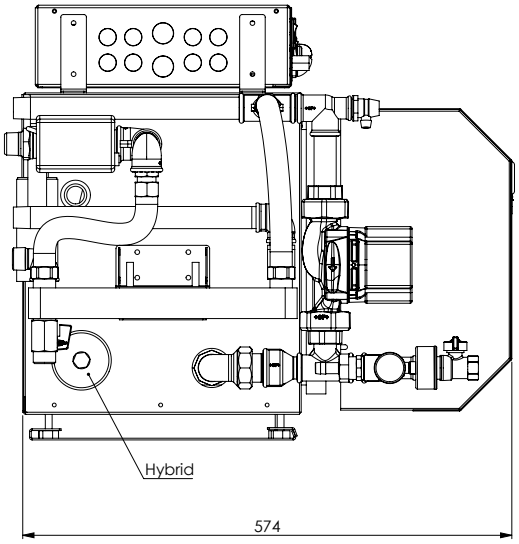
Overview of cable connections between components and control box

Colour marking / Connection type	Connected component
BLUE	Fault switch (2-pole)
WHITE	Electric heating (5-pole)
	Burner connection (7-pole)
	Request 2nd burner stage (4-pole)
	Connection to fresh water/radiators and pump
	Connection to floor heating circuit pump
	24V mains connection of the control box
	230V mains connection of the control box
	230V mains connection of the electric heater
BROWN	Radiator heating circuit Room thermostat (4-pole) for connecting the room thermostat
VIOLET	Floor heating circuit Room thermostat (4-pole) for connecting the room thermostat
YELLOW - RED	Tank sensor (3-pole)
 GREEN POINT	3-way valve (3-pole)

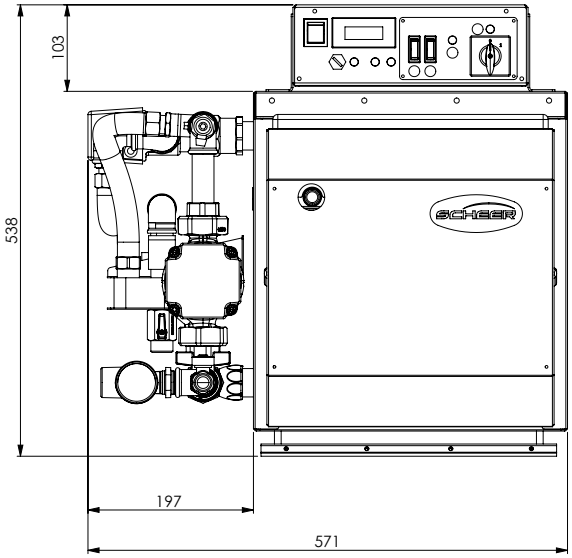
measurements in mm

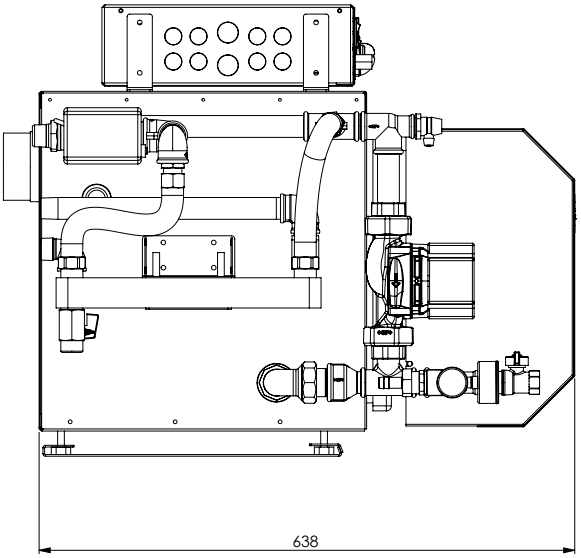
MH 10/17





MH 15/23





Caution:
It is essential to note the following for the MH micro variants:
Max. The maximum flow rate of heated domestic water must be set with the supplied key before commissioning. The opening must then be closed again.
The micro variants are intended exclusively for open (unpressurised) systems. An expansion vessel is not required.
The maximum operating pressure of 0.5 bar must be observed.
When heating the machine (optional), the user must ensure that no temperatures higher than 75°C occur in the heating system.
Potential equalisation 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.

overview MH Micro

Front view

control box →

Type / Model	Power	Item No.
MH 10 micro	10 kW	0774820
MH 20 micro L	20 kW	07480

Side view

Mixer for adjusting the flow temperature of the heating water
(oil filter and metal flap are to be dismantled)

air vent

heating water
(Entrance)

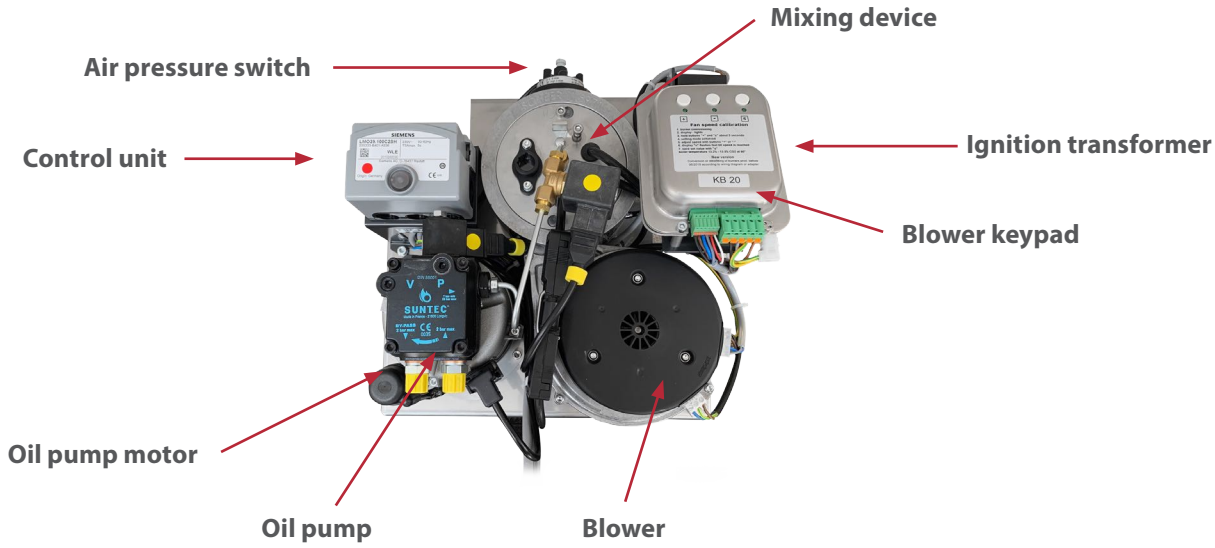
exhaust gas 35 mm

fresh air supply 75 mm

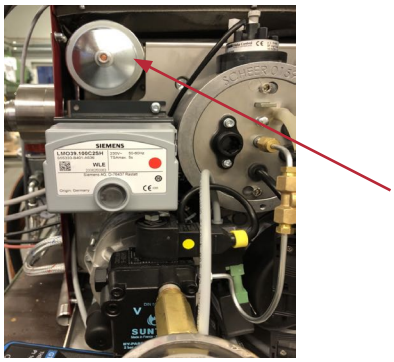
max. flow rate of heated domestic water must be set before commissioning

heating water | **oil filter** | **Output domestic water** | **Input domestic water**

Burner assembly MH micro



Hybrid electric heating

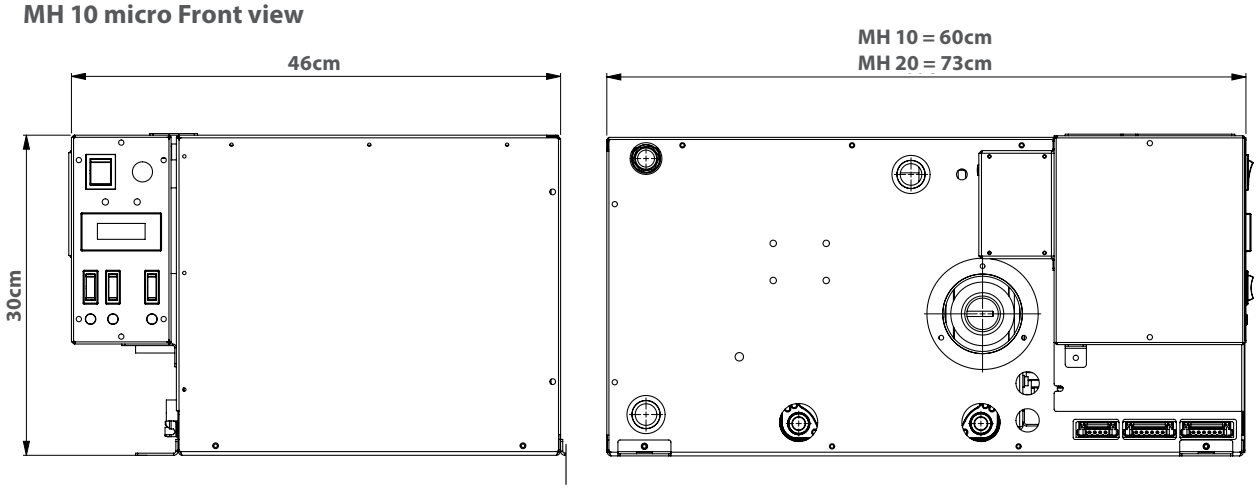


The hot water heating can alternatively be operated with hybrid electric energy.

Hybrid electric heating

Dimensions of MH micro

MH 10 micro Front view



NOTICE

During installation, make sure that the burner and its bonnet can be dismantled. This requires approx. 30 cm.

Burner assembly MH micro

Control box MH micro

On / Off switch

Polarity luminaire

STB lamp

Heating controller

Electric heating

Activate / lock burner

Electric heating active

Burner request active

	Item No.
Controlbox M (single stage)	0754486

Symbol for heat request

Actual value boiler temperature

NOTICE

Polarity: This lamp must light up green continuously. If not turn the powersupply plug and connect with the correct polarity. Reverse polarity protection prevents the DC voltage supply (exchange of negative and positive pole) or AC voltage supply (exchange of outer conductor and neutral conductor) of a device wrong polarity (reverse polarity) and can thereby minimize possible damage.

warning lights

NOTICE

Warning lamp: Safety temperature limiter (STB) tripping

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

Allow the heating system to cool down.

Push in the STB malfunction button. (There is a slight clicking sound).

The heating system will now restart.

If the STB is triggered again, please have it repaired by your specialist company.

NOTICE

warning LED: burner

If the lamp lights, it was triggered by a malfunction of the burner.

- Press and hold the burner suppressor button briefly for about 2 second, not longer than 3 seconds.
- The warning lamp of the burner will turn off and the burner is reset.

If the burner should switch to malfunction twice, please have a repair carried out by your specialist company.

Oil supply / oil filter for MH - series and MH micro

NOTICE:
Failure to observe the installation condition can lead to malfunction or damage of equipment.
- Automatic bleeders always have to be installed above the level of the oil pump.
- At least 50% of the length of the fuel line should be ascendingly mounted.

Do not interchange the feed and return connection!

Note:
To maintain warranty the fuel burner must be equipped with an oil filter for a one-pipe system with return line, an automatic bleeder, and a micro filter.
The supplied silicone hose for the ventilator leads the air to the burner for combustion. This avoids diesel odors.

The fuel is taken from the vehicle fuel tank or from a separate fuel tank.

Use fuel lines with a **internal diameter of 6 mm (max. 10 mm) for the connection between the fuel tank and the oil filter**.
Different diameters with the approval of the manufacturer only.

Unsupported fuel lines must be secured to prevent them from sagging.
An oil filter is included in all basic packages.

	Item No.
Ölfilter	0405200
Filterpatrone	040104

NOTICE:
Repeated emtying of fueltank can cause damage to the burner!
The **Tank Control option (Item no. 0170018/0170019)** is recommended as a preventive measure.

Antifreeze liquid for heating water (BIO-GLYKOL)

Ready-mix with minimum antifreeze -24°C
- Temperature stability 214°C
- Completely biodegradable
- Significantly longer shelf life than propylene glycol

Antifreeze components:
- 1.3 propanediol (100% plant derived)
- HTX1 approval for food related areas
- CO_2 reduced

	Item No.
30 liter canister	190090
1 liter bottle	190091

Automatic venting for heating water

with hose connection 22 mm
Item.-No.: 190088

with 1/2“ male thread
Item No.: 190089

Combustion air supply for MH - series and MH - micro

DANGER:
The air supplied to the combustion must never be taken from rooms where people are present. It must be arranged in such a way that it is not likely to become clogged with dirt, snow or water spray.

Permissible dimensions of the combustion air intake pipe:

- Inner diameter: 50 mm, from MH 30: 80 mm, micro: 35 mm
- Maximum permissible pipe length: 10 m
- Maximum permissible bends: 270 °

The combustion air intake must not be laid above the flue gas outlet and no closer than 50cm. Concentric air/flue gas system (LAS) is possible.

NOTE
If the burner is operated dependent on room air (e.g. in a vehicle accommodation box), a correspondingly sufficient supply of fresh air must be provided.

If the heater is located in a closed installation box, a ventilation opening of at least 50 cm² is required.

If the heater is installed near the vehicle tank in a common installation space, the combustion air must be drawn in from the open air and the exhaust gas must be led into the open air. The openings must be made splash-proof.

Exhaust pipe for MH series and MH-micro

The mouth of the exhaust pipe must not point in the direction of travel.
The exhaust pipe mouth must be arranged in such a way that clogging by snow and mud is not to be expected.

Flexible or rigid pipes made of alloyed heat- and acid-resistant stainless steel are to be used as exhaust pipes. The flue pipe is secured to the heater, e.g. with a clamp. For further regulations, see legal requirements.

exhaust pipe (flexible)	Item No.
Ø 35 mm	14-N000
Ø 50 mm	14-N246
Ø 80 mm	14-N078

Insulation hose	Item No.
Ø 35,50 mm	14-N176
Ø 80 mm	14-N177

Air intake hose	Item No.
MH micro DN 75	014120

Exhaust pipe end piece	Item No.
Ø 35 mm	0754695
Ø 50 mm	075469

CAUTION:
If the flue gas pipe is laid outside the installation box near temperature-sensitive parts, it must be insulated!
The flue gas outlet must not be laid below the combustion air inlet and no closer
closer than 50 cm to each other.

Burner components for MH series and MH micro

Oil pump motor

	Item No.
Oil pump motor	0151380
Condenser	010293

- Voltages below 200 V can cause the oil pump motor to stop!
- If the capacity of the capacitor deviates by more than 5 %, the capacitor must be replaced.

Radial fan

MH Serie

	Item No.
MH	015112
MH micro	018510

MH micro

Fan control

	Item No.
MH 10/17	016026
MH 15/23	016027
MH 30/40	016028
MH 10 micro	0160290
MH 20 micro L	0160291

The control board automatically adjusts the speed of the fan according to the atmospheric pressure (location of the vehicle) and thus sets an optimum combustion quality.

Oil pump

	Item No.
MH	011759
MH micro	011236

Two-stage oil pump (MH)

single-stage oil pump (MH micro)

Flame tube

	Item No.
MH micro	015118
MH 10/17	015110MH
MH 15/23	
MH 30/40	015114MH

Ignition electrodes

	Item No.
MH 10/17	015329
MH 15/23	
MH 30/40	015331
MH micro	015332

Air pressure switch

	Item No.
air pressure switch	015188

The air pressure switch controls the pressure of the burner fan and is connected to the solenoid valve of the oil pump. Only when there is sufficient air pressure does the solenoid valve open so that the burning process can start.

Ignition transformer

	Item No.
MH	010276
MH Micro	012100

Burner components for MH series and MH micro

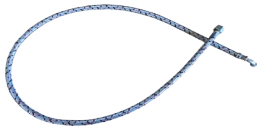
Flame detector
(This item is omitted for the Micro variants)

	Item No.
Flame detector	020064

The flame monitor evaluates the flame on the basis of its flicker frequency. This is done optically by the light tube end piece of the mixing device.

Display of the operating status:
LED off
Flame detector not active
LED flashes
Safety test carried out, flame monitor active, no flame present
LED lights up flickering
Safety test completed, flame monitor active, flame present

Oil hoses (pair)



	Item No.
MH	0414180
MH Micro	0414110

Control unit

	Item No.
MH 10/17	0201020
MH 15/23	
MH 30/40	0201026
MH micro	0201029

The release button is the central element for release, activation / deactivation and diagnosis.

The multi-coloured signal light in the release button is the central display element for visual diagnosis and interface diagnosis. During operation, the various states are displayed in the form of colour codes according to the colour code table.

Color code table for multicolor signal lamp (LED)

Status	Color code	Color
Waiting time, other waiting states	○.....	OFF
Waiting for release of prepurging / postpurging by oil pressure switch	●.....	Yellow
Ignition phase, ignition controlled	○●○●○●○●○●	Flashing yellow
Operation, flame o.k.	■.....	Green
Operation, flame not o.k.	○■○■○■○■○■	Flashing green
Extraneous light on burner startup	■▲■▲■▲■▲■▲	Green-red
Undervoltage	●▲●▲●▲●▲●▲	Yellow-red
Fault, alarm	▲.....	Red
Error code output (see Error code table)	○▲○▲○▲○▲○▲	Flashing red
Interface diagnostics	▲▲▲▲▲▲▲▲▲▲	Red flicker light

Table 6: Error code table

Legend

..... Steady on
○ OFF

▲ Red
● Yellow
■ Green

Error code table of multicolor signal lamp (LED)		
Red blink code of signal lamp (LED)	**Alarm at terminal 10**	**Possible cause**
2 blinks	ON	No establishment of flame at the end of safety time - faulty or soiled fuel valves - faulty or soiled flame detector - poor adjustment of burner, no fuel - faulty ignition equipment
3 x blinks	ON	Free
4 blinks	ON	Extraneous light on burner startup
5 blinks	ON	Free
6 blinks	ON	Free
7 blinks	ON	Too many losses of flame during operation (limitation of repetitions) - faulty or soiled fuel valves - faulty or soiled flame detector - poor adjustment of burner
8 x blinks	ON	Time supervision oil preheater - oil preheater failed 5 times during prepurging
9 blinks	ON	Free
10 blinks	OFF	Wiring error or internal error, output contacts, other fault

Pipe connection group components

Plate heat exchanger
(This item is omitted for the Micro variants)

	Item No.
Plattenwärme-tauscher	036480

Circulating pump

	Item No.
MH	0753112
MH Micro	018604

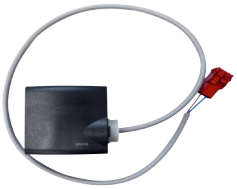
3-way zone valve
(This item is omitted for the Micro variants)

	Item No.
3-way zone valve	065511

Flow switch

	Item No.
Flow switch	0362990

Flow sensor
(This item is omitted for the Micro variants)



	Item No.
Vorlauffühler	0755130

Mixer

Automatic mixer for setting the flow temperatures

	Item No.
Automatic mixer micro (35°C - 60°C)	0304001
Automatic mixer MH series radiator heating circuit (50°C - 75°C)	030398
Automatic mixer MH series floor heating circuit (35°C - 60°C)	030400

Safety assembly
(This item is omitted for the Micro variants)

	Item No.
Safety group	0770650
Heating water pressure gauge	077066

Kettle door cord
(This item is omitted for the Micro variants)

	Item No.
	0770650

Door and boiler insulation
(This item is omitted for the Micro variants)

Door insulation

	Item No.
MH 10/17	44-003
MH 15/23	47-004
MH 30/40	49-004

Boiler insulation

	Item No.
MH 10/17	44-004
MH 15/23	47-005
MH 30/40	49-005

Maintenance preparation

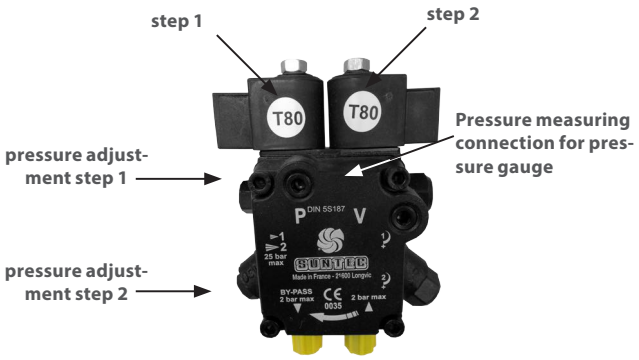
Prepare the maintenance work on the heating system as follows:

1. Cancel the heat request.
2. Wait 2 min. until the post-purge period is completed.
3. Switch off the water heater via the main switch on the control panel.
4. Unplug the connector from the 7-pin burner connector. The power supply to the burner is now interrupted.
5. Unplug the control panel connector from the socket. The power supply to the boiler is now interrupted.
6. Dismantle the burner from the boiler.
7. Carry out the steps for the maintenance work.
8. Reassemble all the dismantled parts after completing the maintenance work.

	maintenance interval
boiler cleaning	Optical inspection annually. When dirty clean with adequate cleaning kit. (non abrasive)
oil nozzle	Optical inspection annually. Use only genuine spare parts! Recommended exchange period: annually
ignition electrode	Optical inspection annually. Use only genuine spare parts! Recommended exchange period: annually
flame tube	Optical inspection annually. Use only genuine spare parts! Recommended exchange period: every threee years
burner door: gasket and insulation	Inspect gasket and insulation optically every three years. Tighten up door screws. Recommended exchange: when needed.
exhaust emission check	After first installation, major repairs or every three years, if exhaust system is longer than 1.5m.
oil filter	Recommended exchange: annually or when the negative pressure is less than -0,30 bar (e.g. -0,35 bar).
oil hoses	Exchange period: every five years
radial fan	Recommended cleaning period: every three years. (depends on environment)
plate heat exchanger for fresh water (if mounted)	Cleaning period: every two years. (to avoid or to clean deposition)

Set pump pressure

To set the pump pressure, a pressure gauge is plugged into the exhaust outlet.



Change oil filter

Change the filter cartridge of the oil filter (Item No. 040104) if the vacuum is too high and **less than -0.3 bar.**

ATTENTION:
Please dispose of the oil filter or filter cartridge in an environmentally friendly manner.

Clean boiler

ATTENTION:
Cleaning with liquids such as thinner or petrol and using brushes with metal bristles will cause corrosion.
Only use brushes or paintbrushes with plastic bristles for cleaning.
Do not use brushes or paintbrushes with metal bristles.
Sweep out and vacuum loose dust.

A well adjusted burner has soot-free combustion. This means that the boiler requires little cleaning.

A thin, light grey layer may be deposited in the combustion chamber. This is a sign of good combustion.
Do not remove this layer as it acts like a preservative for the combustion chamber.
After you have dismantled the burner from the boiler, please follow these steps for cleaning the boiler.

Remove the insulation on the front of the kettle.
Only use brushes with plastic bristles (do not use metal bristles! The surfaces will otherwise be scratched).
Sweep the combustion chamber with the cleaning brush.
Sweep the front of the boiler with the cleaning brush or a hand brush.

Vacuum up any loose dust with a hoover.
Refit the insulation.
Fit the burner to the boiler.

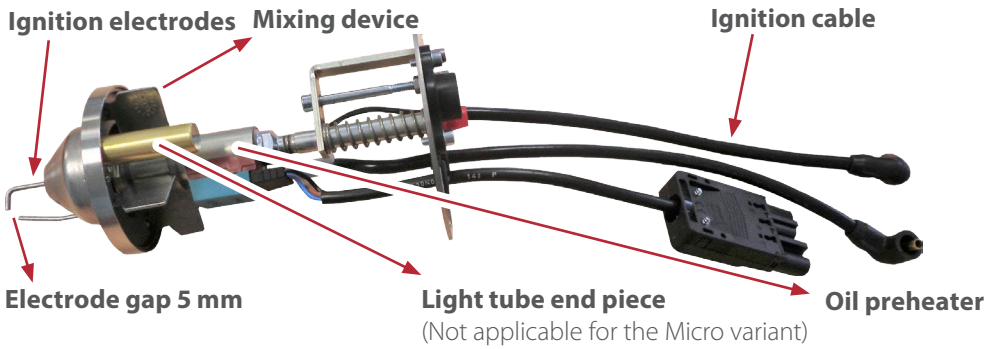
rush w. plastic bristles and cleaning brush

	Item No.
Cleaning set large	090327

mixing cartridge control

Mixing cartridge removal:

- Pull the plug of the flame detector. Pull the plug of the oil pre heater. Pull the two plugs of the ignition cable from the ignition transformer. The mixing cartridge is no longer connected to the burner.
- Loosen the mounting screws of the mixing cartridge. Due to the bayonet-mount it is not needed to remove the screws completely.
- Turn the mixing cartridge slightly to the left.
- Pull the mixing cartridge towards you and out of the burner.



	Item No.
MH 10/17	0155517
MH 15/23	0155518
MH 30/40	0155515
MH 10 micro	0155550
MH 20 micro L	0155551

Mixing cartridge control:

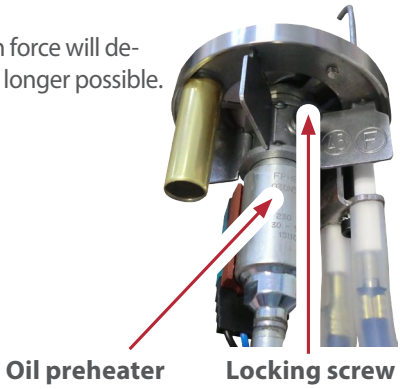
1. Check glass of the **flame detector tube** at the front end. Through this glass the flame detector monitors the condition of the burner flame. Clean the glass surface with burner cleaner and a soft cloth, if needed.
2. Check the **ignition electrodes**. If these are burned or not anymore properly placed in their holder replaced them with genuine SCHEER ignition electrodes.
3. Check for the correct distance of the ignition electrodes. The **distance between the two ignition eletrodes must be 5 mm**. If the distance is greater or smaller than specified, they have to be replaced with genuine SCHEER ignition electrodes. (Do not bend the used electrodes they could break! Unused electrodes can slightly be bend to the correct distance.)
4. Check the **oil nozzle**. If the nozzle is damaged or deposits are present, it must be replaced. How to replace the nozzle is described in the next section.
5. Reinstall of the mixing cartridge in the reverse order of its removal.

Oil pump motor

Note: Only take the oil nozzle out of the packaging directly before inserting it!
The nozzle could otherwise be damaged.

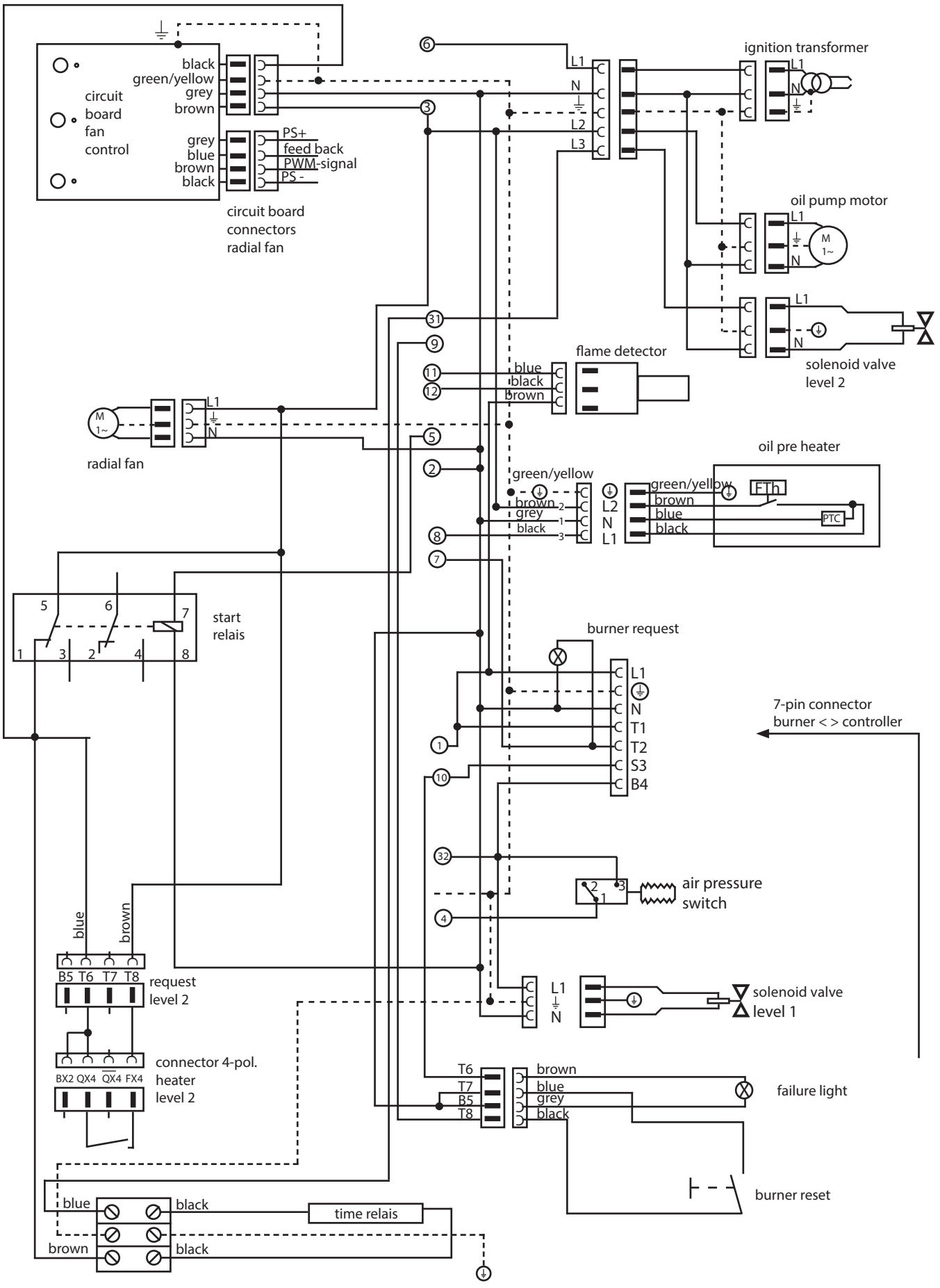
Replace the oil nozzle in the following steps:

1. Loosen the set screw of the mixing device. Pull off the mixing device from the oil pre heater. The oil nozzle is now exposed.
2. Loosen the old oil nozzle with a 16 mm box-end wrench while holding the oil pre heater with a 16 mm open-end wrench. Do not use an open ended wrench for the nozzle to avoid damage.
3. Take the new nozzle out of the package. Hold the nozzle only by the sides of its hexagon and screw it by hand.
4. Hand tighten the oil nozzle with a 16 mm box-end wrench while holding the oil pre heater with a 16 mm open-end wrench. Do not use excessive force or an open-end wrench to avoid damage to the nozzles hexagon.
5. Slide the mixing device back over the oil pre heater. The oil nozzles and the air bushing must be at the same height level. Use a plane non-metal surface to align the position of the nozzle with the height of the air bushing. Do not use a metal surface to avoid damage to the nozzle. **If the oil nozzle is not on the same level with the air bushing the burner will not work correctly.**
6. Make sure that the light detector tube and the flame detector are in line with each other. An axial rotation will lead to no flame detection and malfunction shut down.
7. Now hand-tight the set screw of the mixing device. Do not use excessive force! Too much force will deform the surface of the nozzle holder and an exact positioning of the mixing device is no longer possible.
8. Remount the mixing cartridge in the reverse order.



	Oil nozzle	Item No.
MH 10 / 17	0.30/60° SCD	022380
MH 15 / 23	0.35/60° SCD	022378
MH 30 / 40	0.65/60° SCD	022377
MH 10 micro	0.18/80° SCD	022379
MH 20 micro L	0.30/60° SCD	022380

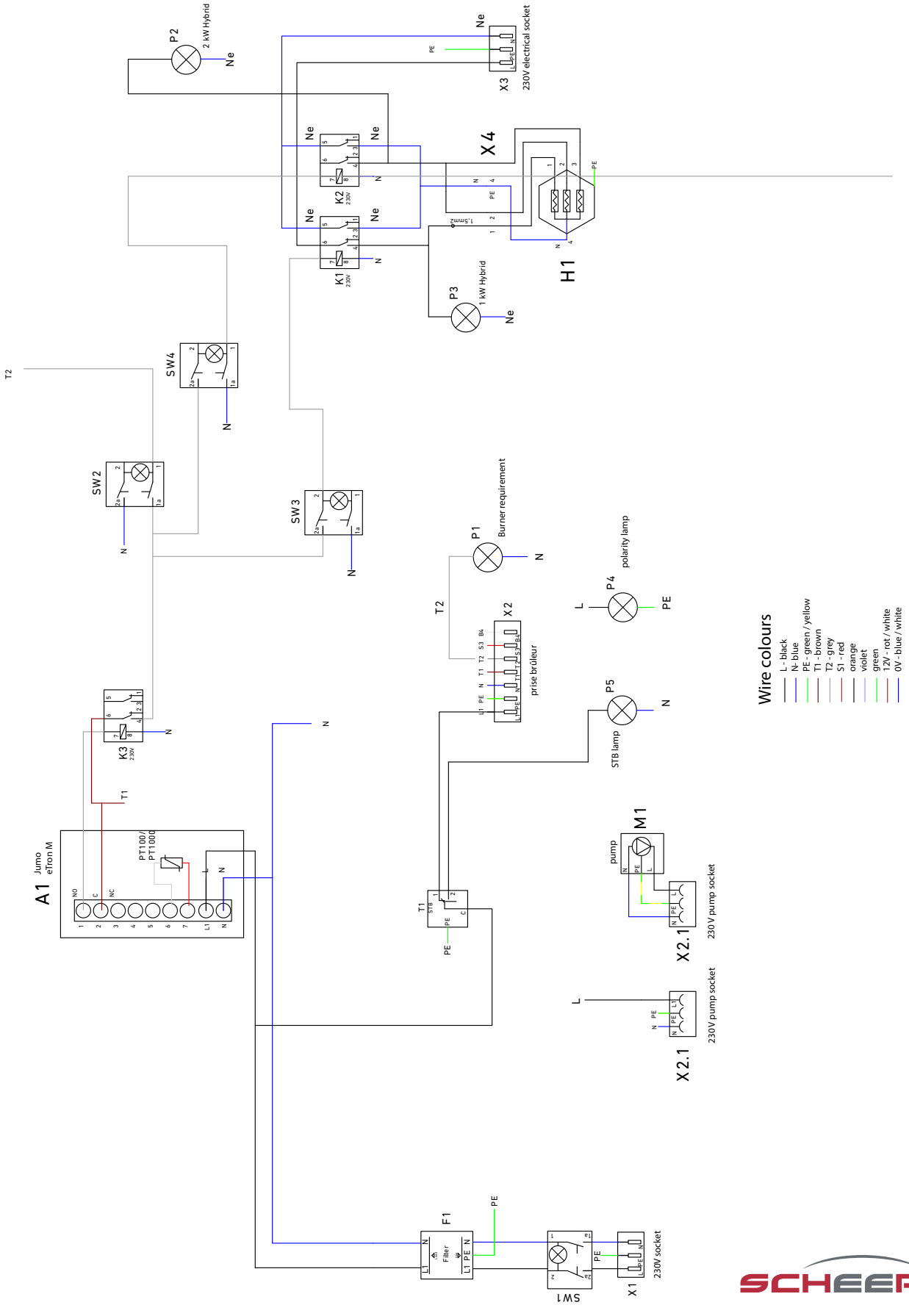
Electrical schematics of controller



Electrical schematics of controller box A 2-steps

Please contact info@scheer-heizsysteme.de to obtain the circuit diagram of the device with your configuration.

Circuit diagram control box M



Room thermostat - WLAN *(optional)*

Room thermostat

Please read these operating instructions for all information on the installation and operation of your thermostat. Ensure that the thermostat is installed and connected by a professionally qualified person and that it complies with all regional regulations.

In the box you will find:

1x Thermostat
1x QC Passed
2x Screws
1x external Floor Sensor (2.5m)

Room thermostat	Item No.
incl. WLAN connection	0170106

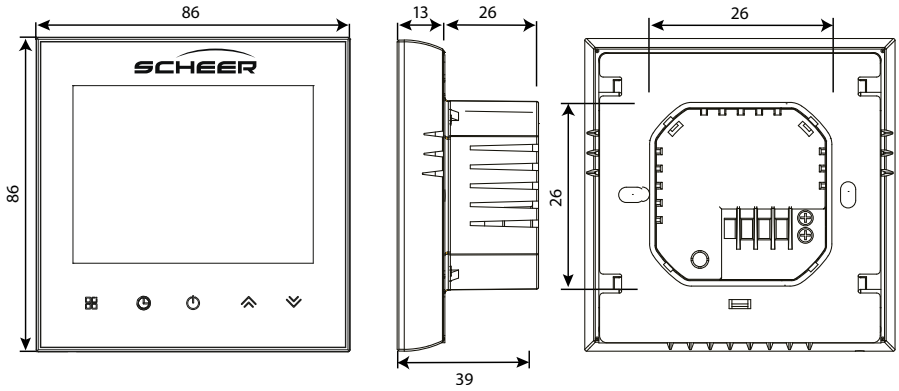
About the thermostat

The thermostat has been developed to control industrial, commercial,, civil or domestic hot water heating systems, such as radiators or underfloor heating.

functions

- Networking through Modbus and WLAN
- 0.5 ° C given
- Short-term memory in the event of a power failure
- 5 + 1 + 1 weekly program with 6 periods comprehensive time program
- Controllable by Amazon Echo, Google Home, Tmall Genie

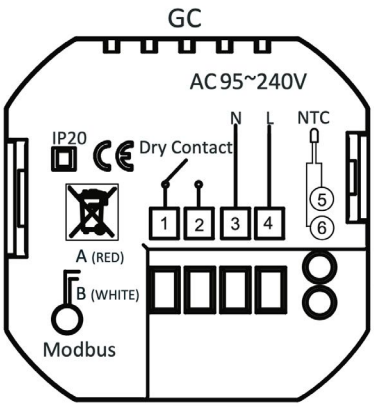
Dimensions



Technical Data			
Power Supply	95~240VAC, 50~60Hz	Timing error	<1%
Current Load max	5A	Shell Material	PC + ABS (fire proof)
Sensor	NTC3950, 10k	Installation Box	86x86mm square/ Europ. 60mm round
Accuracy	±0,5°C	Wire Terminals	2*1,5mm² / 1x2,5mm²
Set Temp. Range:	5-35°C	Protection Class	IP20
Display Temp. Range	5~99°C	Storage Temp	-5~45°C
Ambient Temp.:	0~45°C	Power Consumption	<1,5W
Ambient Humidity:	5~95% RH (not condensing)		

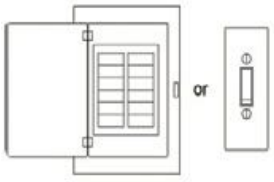
Installation

NOTICE
Before starting the installation, make sure that the power supply and all other connecting cables are voltage-free!

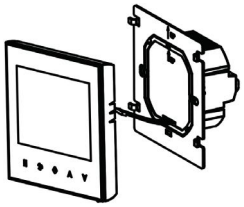


Your thermostat is suitable for installation inside a standard 86 mm junction box or a European 60 mm junction box.

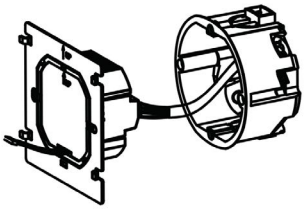
Step 1
Keep power off.



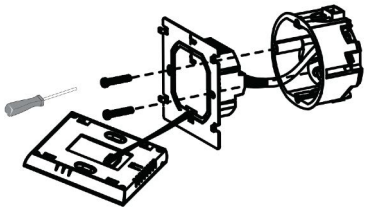
Step 2
Remove the mounting Plate by rotating the LCD part.



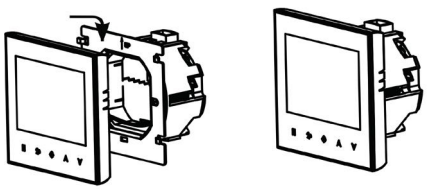
Step 3
Connect the power supply to the corresponding terminals of the thermostat (L - phase; N - neutral); connect the switching contacts to terminals 1 and 2.



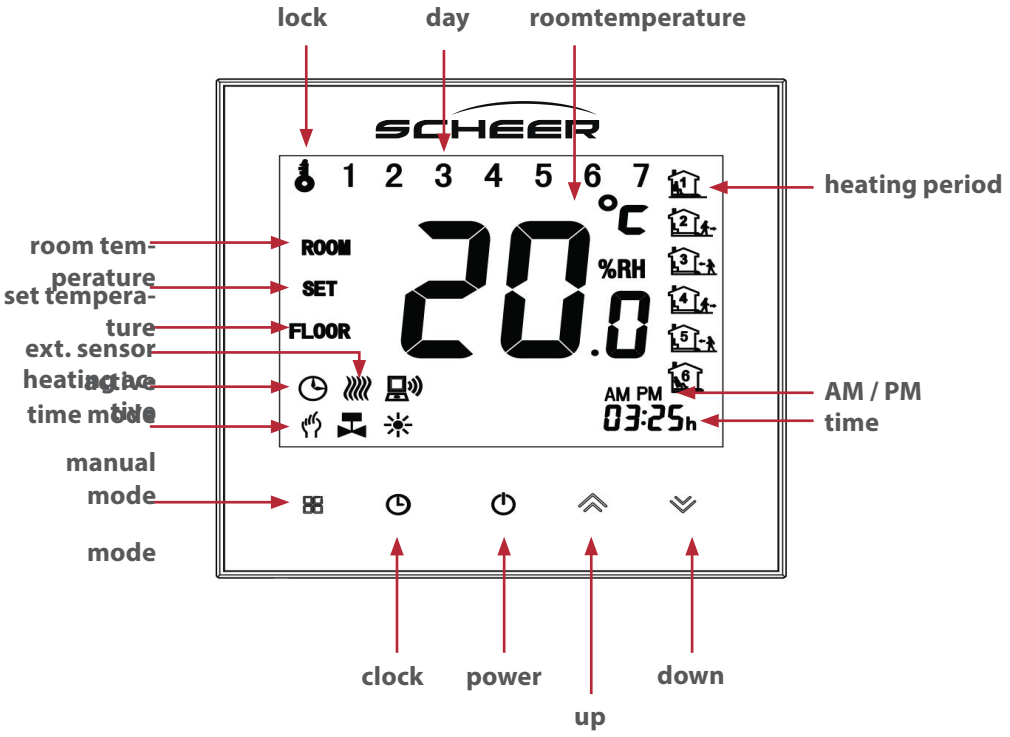
Step 4
Fix the mounting plate to the wall using the screws supplied.



Step 5
Attach the LCD part of the thermostat to the mounting plate by rotating it, Installation complete.



Homescreen quick reference



operation

1. **Power on/off:** Press ⏻ to turn the thermostat on/off.
2. **Manual/ Time program mode:** Touch ⊞ to change between manual mode and program mode. In manual mode, ✋ will show in the bottom left of the screen. In programmable mode, the period icon will show on the right side.
3. **Setting Temperature:** In the time program mode the temperature can only be controlled by the set heating program. In the manual mode, press ⏶ ⏷ to set the desired temperature.
4. **Adjusting/Setting the Clock:** Touch the 🕒 to set minute, hour and weekday (1 = Monday, 2 = Tuesday etc.) by using the ⏶ ⏷ arrows. Press 🕒 once more to confirm and exit.
5. **Locking your Thermostat:** Press and hold the ⏶ ⏷ for 5 seconds to lock/unlock your thermostat. In item 3 of the device parameters, you can select full lock (included).
6. **Adjusting/setting the Program Schedules:** When Wi-Fi connection is made, your thermostat will automatically accept the program schedule made via the APP on your device (see below for detailed instructions) To set the program schedules through your thermostat (NOT via your smartphone/tablet) simply follow the instructions as below:
   Please note: Setting the programme schedule through your thermostat can only be carried out if there is no Wi-Fi connection between your thermostat and smartphone/tablet
7. **Setting / adapting the time program on the thermostat:** The time program can only be set on the device if there is no active WLAN connection and time program mode is activated. Touch ⊞ to change between manual/ time program mode. In program mode, touch and hold the icon 🕒 until the weekday schedule settings appear (1 2 3 4 5 will show along the top of the screen). Use the ⏶ ⏷ arrows to adjust the „on“ time.
   Press the icon 🕒 and use the ⏶ ⏷ arrows to set the off time (2nd period).
   Press the icon 🕒 and use the ⏶ ⏷ arrows to set the temp. Repeat this process for periods 3 - 6.
   Press the icon 🕒 once more to enter the Saturday schedule settings (6 will show along the top of the screen). Repeat the above process to set the periods as well as temp. as well as Sunday schedule. Press 🕒 once more to confirm and exit.

Default settings for program schedule

heating periode	weekday (Monday-Friday) (1 2 3 4 5)		Weekend (Saturday) 6		Weekend (Sunday) 7	
	time	temperature	time	temperatur	time	temperatur
period 1	06:00 AM	20°C	06:00 AM	20°C	06:00 AM	20°C
period 2	08:00 AM	15°C	08:00 AM	20°C	08:00 AM	20°C
period 3	11:30 AM	15°C	11:30 AM	20°C	11:30 AM	20°C
period 4	01:30 PM	15°C	01:30 PM	20°C	01:30 PM	20°C
period 5	05:00 PM	22°C	05:00 PM	20°C	05:00 PM	20°C
period 6	10:00 PM	15°C	10:00 PM	15°C	10:00 PM	15°C

A separate schedule may be set for weekdays (Mon - Fri) and for weekends (Sat or Sun).

Change the system settings

Turn off the device.

Press and at the same time for 5 seconds to get to the system settings. Then press to cycle through the available settings and use to change the parameter values. All changes will be saved automatically.

code	function	setting an options	default
1	temperature compensation	-7 bis +9°C {for internal sensor)	-1
2	deadzone temperature	1-5°C	1
3	button locking	00: all buttons locked exept on/off 01: all buttons locked	01
4	sensor types	In: Internal Sensor (to control the temp.) Ou: External Sensor (to control the temp.) AL: Internal/ External Sensor (Internal sensor to control the temp., external sensor to limit the floor temp.)	AL
5	min. set tempature	5-15°C	05
6	max. set temperature	15-45 °C	35
7	display mode	00: display of set temp. and room temp. 01: display of only set temp.	00
8	low temperature protection setting	0-10°C	00
9	high temprature protection setting	25-70°C	45
A	economy mode	00: non-energy saving mode 01: energy saving mode	0
B	economy temprature	0-30°C	20
C	standby brightness	3-99	20

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Tel +49 (0) 48 39 / 9 05 - 0
Fax +49 (0) 48 39 / 4 53

Here is some place for your SCHEER-identification-plate:

service protocol

The guarantee is only valid if the complete protocol is completed!
Send the completed protocol to info@scheer-heizsysteme.de or by mail to
SCHEER Heizsysteme & Produktionstechnik GmbH | Chausseestraße 16 | D-25797 Wöhrden | Germany

customer :
street :
postcode : place :
country :
phone number : E-Mail address :
type of boiler : serial number :
type of burner : serial number :

burner protocol	yes	no	not true	comment:
Burner mounting flange tested, Marking upwards	☐	☐	☐	
burner installation depth (HR, B, B-tap)	☐	☐	☐	
oil nozzle checked	☐	☐	☐	
Ignition electrode checked	☐	☐	☐	
position of the baffle plate / mixing device checked	☐	☐	☐	
oil pump venting and oil pump pressure checked	☐	☐	☐	
air dumper setting checked (HR, B, B-tap, Compact 7, W1)	☐	☐	☐	
fuel line checked for leakage	☐	☐	☐	
forward and return flow of the oil hoses checked	☐	☐	☐	
inner diameter of the fuel line (min. 6 - max. 10mm)	☐	☐	☐	
oil filter positioned above the oil pump	☐	☐	☐	
external air supply available	☐	☐	☐	

boiler protocol	yes	no	not true	comment:
boiler installed and secured	☐	☐	☐	
ventilation valves available in the system	☐	☐	☐	
hydraulic pressure in the system (mind. 1 - max. 2 bar)	☐	☐	☐	
expantion tank available (min. 10% water capacity)	☐	☐	☐	
run the circulation pump for 3 minutes in deaerator mode (only Wilo-pumps)	☐	☐	☐	
check fresh water and set to litres per minute (pre-installed on MH)	☐	☐	☐	
control panel with all function checked	☐	☐	☐	
function of the room thermostat checked	☐	☐	☐	
boiler door / mounting plate secured	☐	☐	☐	
boiler and door insulation checked	☐	☐	☐	
combustion chamber insert / efficiency checked (HR / B25 / B35 / B45 / KB20)	☐	☐	☐	
exhaust system checked	☐	☐	☐	
condensation control available (KB and longer than 3 meters of chimney)	☐	☐	☐	
boiler thermostat checked - Switch-off at set boiler temperature	☐	☐	☐	

test measurement protocol

exhaust gas measurement between 60-65 °C boiler temperature

	figure:	comment:
CO_2 (MH, MA, KB, B1, B2, W1) - setting values see burner	%	
CO_2 (HR, B, B-tap, Compact 7) - settomg values between 11,5 - 12,5 %	%	
CO (<40 ppm)	ppm	
smoke gas temperature (<300 °C)	°C	
soot value (0-1)		

date / place :

customer

signature :
name :

mechanic

company :
phone number :
E-Mail :
signature :
name :

service-kits

designation	content	Item No.
Service-Kit MH 10/17 small	Appropriate electrodes, oil nozzle, flame tube, oil filter, filter cup seal for the unit	073079
Service-Kit MH 15/23 small		073080
Service-Kit MH 30/40 small		073082
Service-Kit MH 10/17 big	Appropriate electrodes, oil nozzle, flame tube, oil filter, filter cup seal for the unit, oil hoses, boiler insulation and cord for the unit	0730790
Service-Kit MH 15/23 big		0730800
Service-Kit MH 30/40 big		0730820
Service-Kit MH 10 Micro	Appropriate electrodes, oil nozzle and flame tube	073086
Service-Kit MH 20 Micro L		073087

service log for boiler-No.: _____ **burner-No.:** _____

with item No.: _____ **Date/stamp:** _____

Date / Place	serviceworker (name, company, telephoneno., E-Mail)	signature	annotations

Installation and maintenance instructions

MH-Serie
water heater

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1/2023