



# Installation and operating instruction

2022

WPLK

**Note:**

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Please refer to the relevant data sheet for information on technical details such as power consumption, COPs, etc.

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## 1. Introduction

Congratulations on your purchase of a quality product from M-Tec!

### 1.1. General information

This document is aimed both at heating engineers who install M-Tec heat pumps and at end customers who operate a M-Tec heat pump. Please read this document carefully.

### 1.2. Content of this document

This manual is part of the product. It should be kept for the entire service life of the product and, if required, passed on to any subsequent owners or users of the product.

All the figures used in this manual are example graphics!

### 1.3. Not included in this document

Information on planning and servicing the system.

### 1.4. Additional documents

- M-Tec schematic manual

### 1.5. Required tools

- 1 set of cross and slotted screwdrivers
- Side cutter
- Scissors
- 1 set of wrenches or pipe wrenches
- Plumbing material for sealing the threads
- Equipment for electrical connections
- Protective gloves
- Tester and current tongs

## 2. General Information

The heat pumps of the WPLK series are full inverted units, that is with high performance components and widely dimensioned to privilege the efficiency of the machine.

The use of the gas R452b permits to reach high performances and a low environmental impact. The presence of two electronic valves, reversing valve, pressure transducers and temperature sensors ensure, through the software integrated in the electronic board as microprocessor, the full functionality and reliability of the machine in the different operating modes.

The control of the machine is done through a remote control that permits to monitor the operation of the machine and change the temperature set of the water produced and the mode of operation (summer/winter).

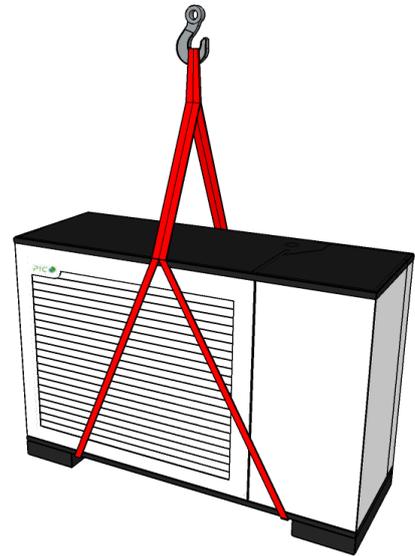
### 3. Transport instructions

During the transport it is possible to tilt the heat pump no more than 45° (in each direction). The safety for the transport must be removed before of the put in action. The aspiration and unloading zone mustn't be reduced or covered. Respect specific building regulations of each countries.

The dirt trap, not included but supplied on demand of the customer, must be assembly on the heating return upstream of the heat pump. Respect the regulations in force for the countries concerned. Respect the right-handed rotation field: in case of incorrect wiring the start of the heat pump is hindered. The programmer of the heat pump shows the relevant warning indication (to correct the wiring).

The operation of the heat pump with too low temperature system can cause its total block. After a prolonged power cut you must use the method of put in action described below.

Clean at regular intervals the dirt trap. Before opening the device cut off power to all the electrical circuits. Works on the heat pump can be done only by authorized and competent people of the customer care.



### 4. Safety information

Observe the following points to ensure the reliable, safe and trouble-free operation of the heating heat pump:

Installation and initial operation of the heat pump system is restricted to the experts of M-Tec and its partners. Before starting work, disconnect the power supply to the system, ensure that no voltage is present and safeguard against unintentional reconnection. Observe the prevailing guidelines, standards and regulations that are applicable for use, even if these are not stated in this document.

These include:

- Universally applicable accident prevention regulations
- Safety requirements
- Environmental requirements
- All relevant laws, standards, guidelines and regulations
- Requirements of the local power supply utilities

All maintenance and repairing activities concerning the heat pump system are restricted to the experts of M-Tec and its partners. Ensure clockwise rotation. The compressor may be damaged if constantly rotated in the wrong direction! It is not allowed to use the heat pump system for purposes other than the ones determined by the contract.

It is also prohibited to use system components for purposes other than their intended tasks. Modifications on the heat pump system, whatsoever, are acceptable only after consultation with M-Tec and can be carried out only by experts of M-Tec or its partners.

To prevent deposits (e.g. rust) in the condenser of the heat pump, use of a suitable anti-corrosion system is recommended. In case of a breakdown of the heat pump system (high pressure failure, low pressure failure or limit temperature reached) and in case of frost danger in the building, the heat pump system switches to antifreeze mode. Is the heat pump installed in not permanently inhabited buildings (e.g. summer residences), the user is responsible for keeping the system frost-free.

If refrigerant is leaking from any part of the heat pump system – whatever the reason might be – take care of adequate aeration and avoid handling with open light or fire. Leave the danger zone immediately and notify M-Tec.

## 5. Intend use of the heat pump

### 5.1. Fields of work and safety devices

The application limits for the individual heat pump types can be found in the respective technical data sheet.

The ECOAir heat pump is equipped with a safety pressure switch that stop the operation of the machine when a pressure of 4,2 MPa (42 bar) is reached. The heat pump is equipped with a frost protection system which prevents freezing of the water pipes connected to the heat pump at low outside temperatures. When the frost protection is activated, the circulating pump remains ON, even if the heat pump is set to OFF. The machine remains in the standby state when the protection is active and therefore could start up if conditions require it (even if it is in the OFF state). The basis for this is the connection of the control voltage.

## 6. Equipment of supply

### 6.1. Main components

**The heat pump is supplied on a pallet.**

### 6.2. Inspection

The delivery consists of the heat pump module with Integrated central control.

Please check the system for completeness and damage immediately after receipt of the heating heat pump!

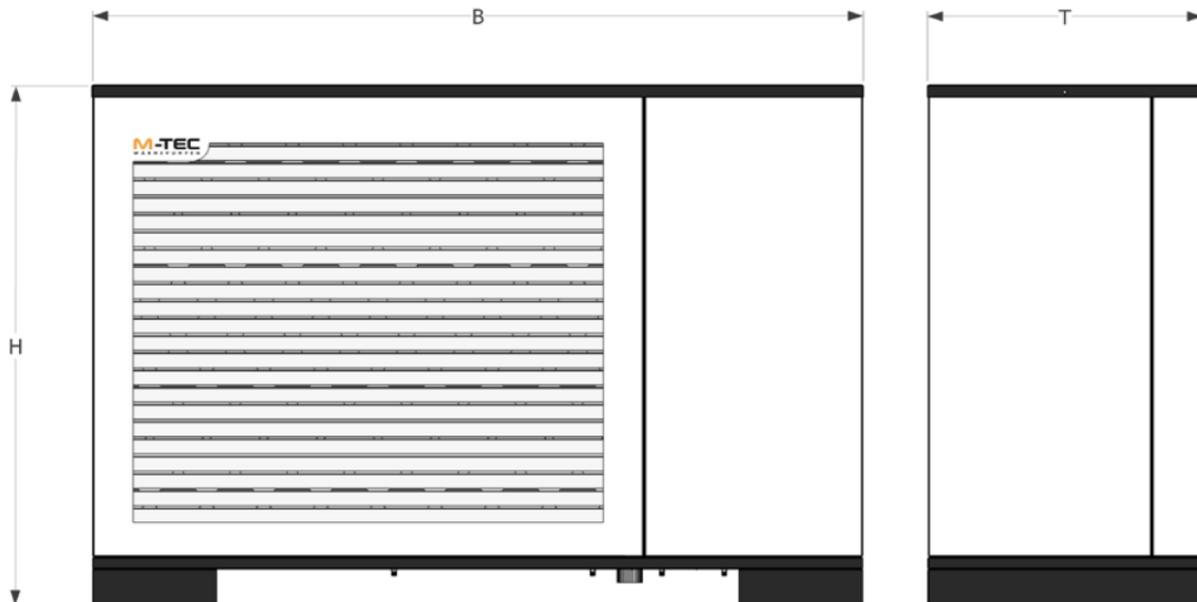
**If necessary, tighten the hydraulic connections on the heat exchangers as they are provided with paper seals and may, under certain circumstances, reduce their design.**

Please see the delivery note for the exact scope of delivery. If you notice any damage or the delivery is incomplete, please inform M-Tec immediately, as a complaint will not be possible later.

## 7. Installation

### 7.1. Measures of the device

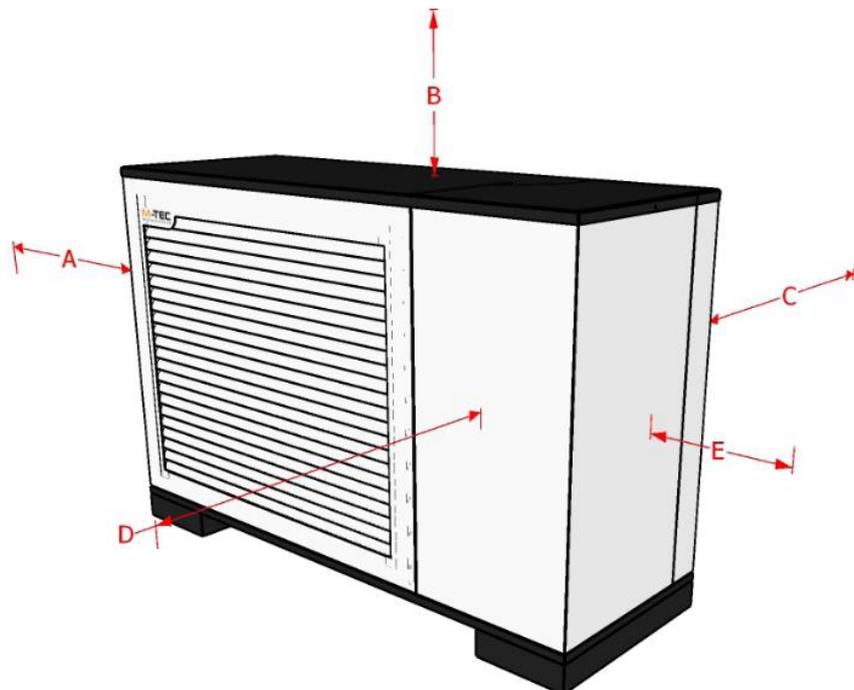
Distance	WPLK412	WPLK618	WPLK722	WPLK1030
H	1040mm	1202mm	1433mm	1433mm
B	1552mm	1746mm	1965mm	1965mm
T	552mm	621mm	755mm	755mm



### 7.2. Free spaces for assembly

Verify there is a sufficient space for the installation of the hydraulic piping.

Distance	Measurements
A	>400mm
B	>400mm
C	>400mm
D	>3000mm
E	>800mm



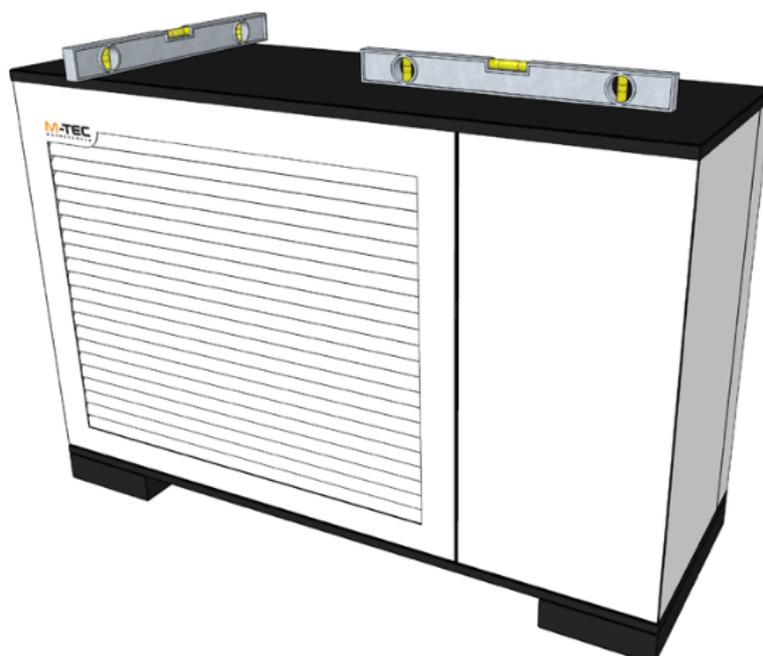
### 7.3. Decoupling of the heat pump

In order to avoid structure-borne noise and the associated noise pollution, it is strongly recommended to decouple the heat pump at the hydraulic connections with the noise decoupler set from the rest of the pipe system.

In addition, it is important that the place chosen for the exhibition is a place with a firm and level surface.

### 7.4. Installation guidelines

- Observe all local valid rules, regulations and required distances.
- Install air source heat pumps and split evaporators outside of the building
- Don't install the product:
  - near a heat source,
  - near flammable substances,
  - near ventilation opening of contiguous buildings,
  - below deciduous trees.
- For the installation of the product observe:
  - prevailing winds,
  - noise of operating parts,
- If necessary, install noise-protection system.
- Mount the heat pump on the concrete pavement or concrete block.
- Don't install the product near wells of air discharge.
- Prepare the laying of electrical cables.
- Avoid places where, on the air outlet of the product, strong winds may occur.
- Don't orient the fan towards the near windows.
- Don't expose the product to dusty and corrosive air (e.g. near rough roads).
- In places where there are snowfalls, install the heat pump at least 25 cm from the ground to avoid clogging at the inlet and drain zone.



## 7.5. Installation nozzle heater fan

(Art. No. 738133)

### Installation point

The nozzle heater is mounted around the fan.

### Installation instruction

Place the nozzle heater around the fan as shown in Figure 1. Make sure that the end (marked in red) and the electrical connection side of the cable (marked in green) are on the side of the electrical terminal boxes.

Furthermore, the heating tape must not touch each other and should run as parallel as shown in Figure 2 around the fan. Then it is attached to the fan with the included insulating strip. The electrical connection is made according to the evaporator connection diagram.

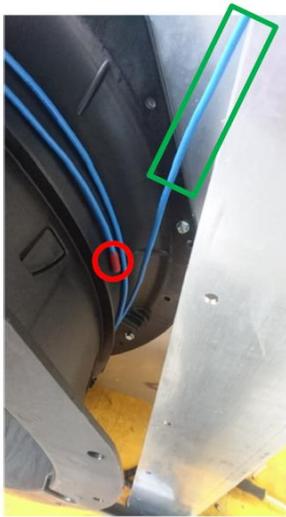
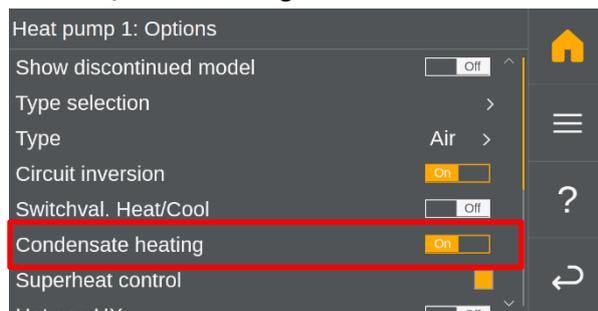


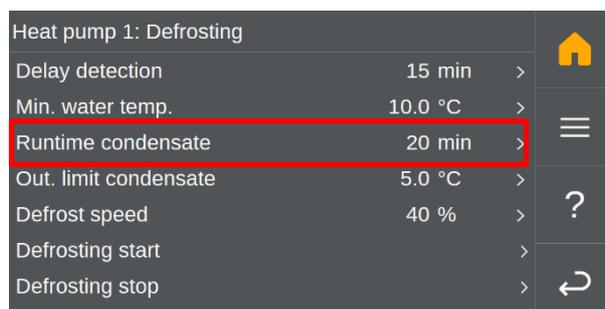
Abbildung 1

Abbildung 2

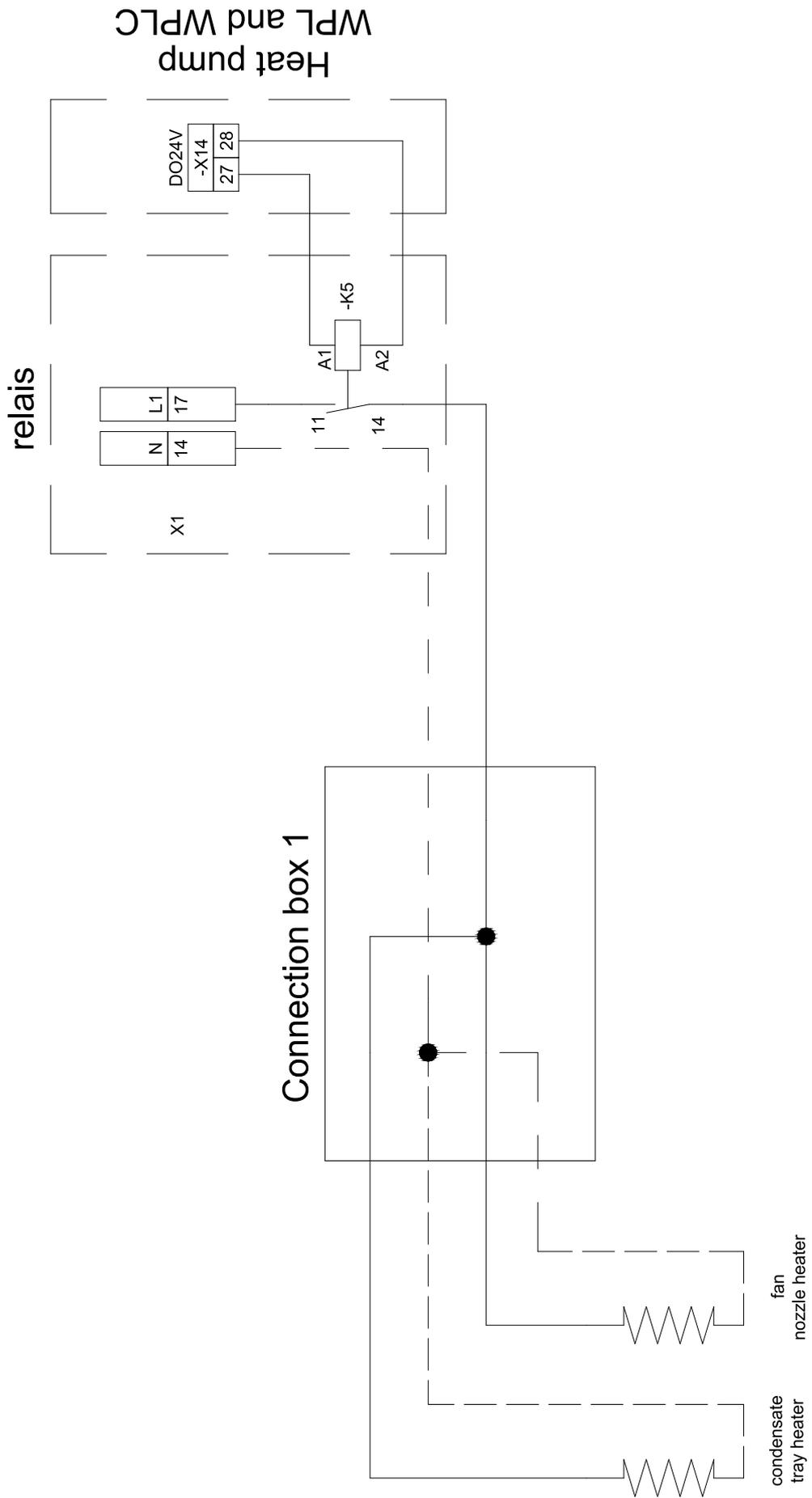
### Function / control setting



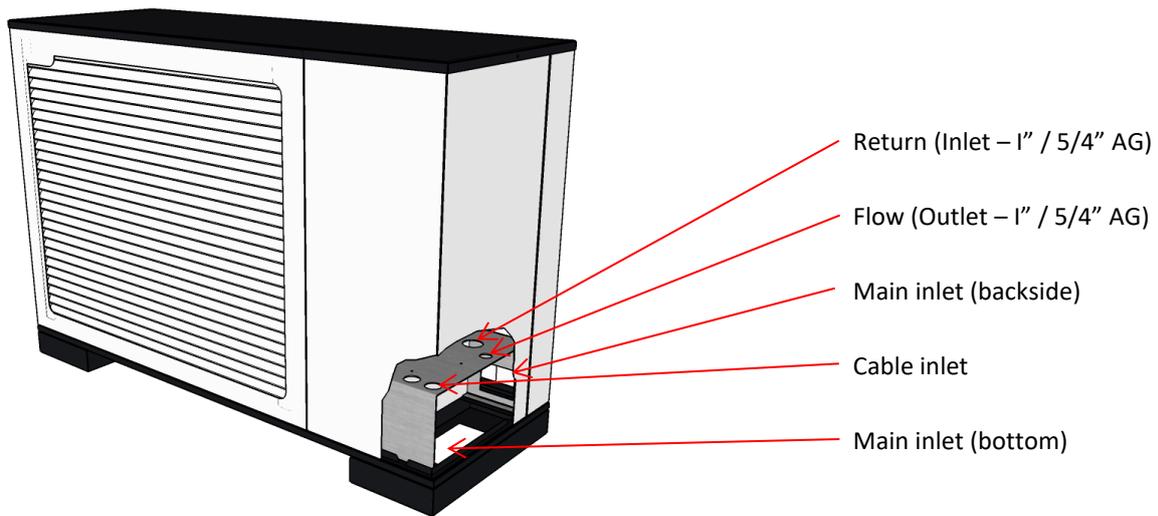
The fan heater is operated in parallel with any heating cable in the condensate tray. If this is not available, the function of these must nevertheless be activated. To do this, activate the Condensate drain heating option under the heat pump options.



The heater is thus activated at each defrost and runs for an adjustable time. The duration can be set for the heat pump parameters under "Defrost".



## 8. Hydraulic connections



### 8.1. Installation of hydraulic part

- Thorough washing of the system with clean water filling and emptying it many times. This operation allows to reduce the number of maintenances and avoid damages to exchangers and other components.
- Test of possible losses in the circuit;
- Insulate all the pipelines to reduce heat losses and avoid the formation of condensation;
- Free up the service points like wells vents etc...;
- Verify that the quality of the water is suitable, contrary:
  - performance penalty, higher loading losses, possible damages
- Always powered machine for frost protection.
- Mix water with ethylene glycol or propylene glycol considering that the pressure losses increase and you must verify the compatibility of all the hydraulic parts of all these compounds.
- In case of long stops completely empty the system opening all the cocks and pay attention to avoid water stagnation points.

### 8.2. Correct refilling of the heating system

During the operation of the heat pump system a pressure drop in the heating system can occur. The reason is often leaking air that has not been removed completely at the initial operation.

If the pressure of the heating system falls under 1.5 bar replenishment is necessary.

#### **IMPORTANT**

The replenishment must be done exclusively with treated heating water. The treatment must be carried out according to the applicable national standards, regulations and guidelines!

Fill water into the heating system until the manometer on the connection group displays 2.2 bar.

Recommended water quality:

Electrical conductivity	6-8
Concentration of chlorine ions	Lower than 220mV/ cm (at 25°C)
Concentration of sulfuric acid	Lower than 50 ppm
Total iron	Lower than 50 ppm
M alkalinity	Lower than 0,3 ppm
total hardness	Lower than 50 ppm
sulfur ions	Lower than 50 ppm (5°F)
ammonia ions	Zero
silicon ions	Zero
Electrical conductivity	Lower than 30 ppm

## 9. Electrical connections

### 9.1. General Information

#### CAUTION

Before starting work, disconnect the power supply to the system, ensure that no voltage is present and safeguard against unintentional reconnection. Work on electrical systems may only be carried out by authorised and trained electricians. Firstly, ensure that the power supply from the building was correctly relayed to the installation site. The installation and the cable cross-sections must be carried out by authorized specialists according to the technical standard of the country. Check that all electrical connections are tight. It is essential to ensure that the voltage connected for the supply matches the voltage that the machine is designed for.

#### WARNING

The wiring must comply with all applicable regulations. The type and position of the fused isolators must also comply with regulations. For safety reasons, these must be clearly visible and installed within operating distance of the machine. All machines must be earthed throughout.

#### IMPORTANT

Operating a machine with the wrong voltage or with excessive phase asymmetry represents incorrect use, which is excluded from the M-Tec guarantee. If the phase asymmetry exceeds 2 % (voltage) and 1 % (current), please contact your power supply utility immediately, before commissioning the heat pump.

### 9.2. Supply

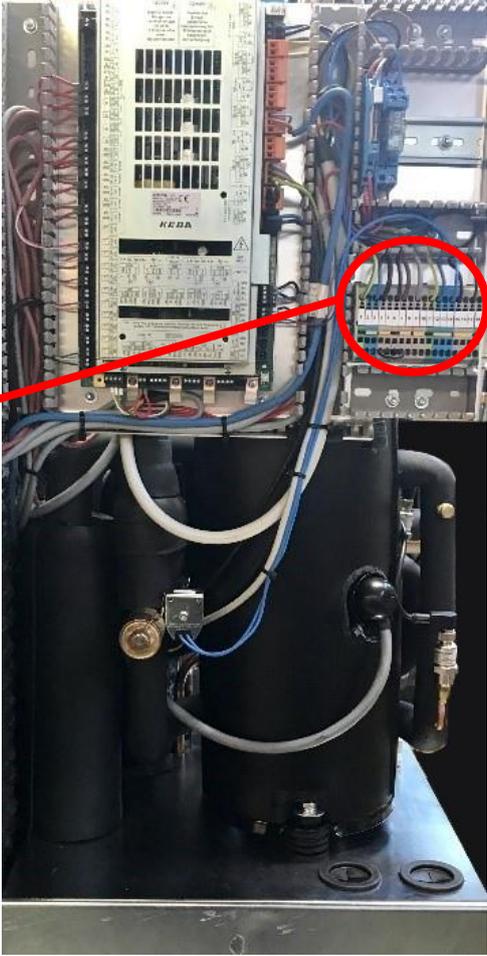
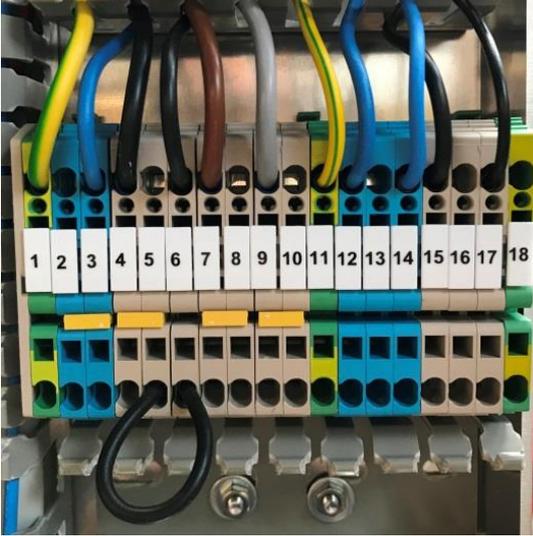
APPROXIMATE section of cables and internal protection:

	WPLK412 WPLK618	WPLK722	WPLK1030
<b>Supply compressor Supply Interface</b>	400V - 50 Hz 230V - 50 Hz	400V - 50 Hz 230V - 50 Hz	400V - 50 Hz 230V - 50 Hz
<b>Compressor Cable Interface Cable</b>	5x 2,5 mm <sup>2</sup> 3x 1,5 mm <sup>2</sup>	5x 2,5 mm <sup>2</sup> 3x 1,5 mm <sup>2</sup>	5x 2,5 mm <sup>2</sup> 3x 1,5 mm <sup>2</sup>
<b>Protections of compressor Protections of Interface</b>	3x C16 1x B13	3x C32 1x B13	3x C40 1x B13

#### Fuse:

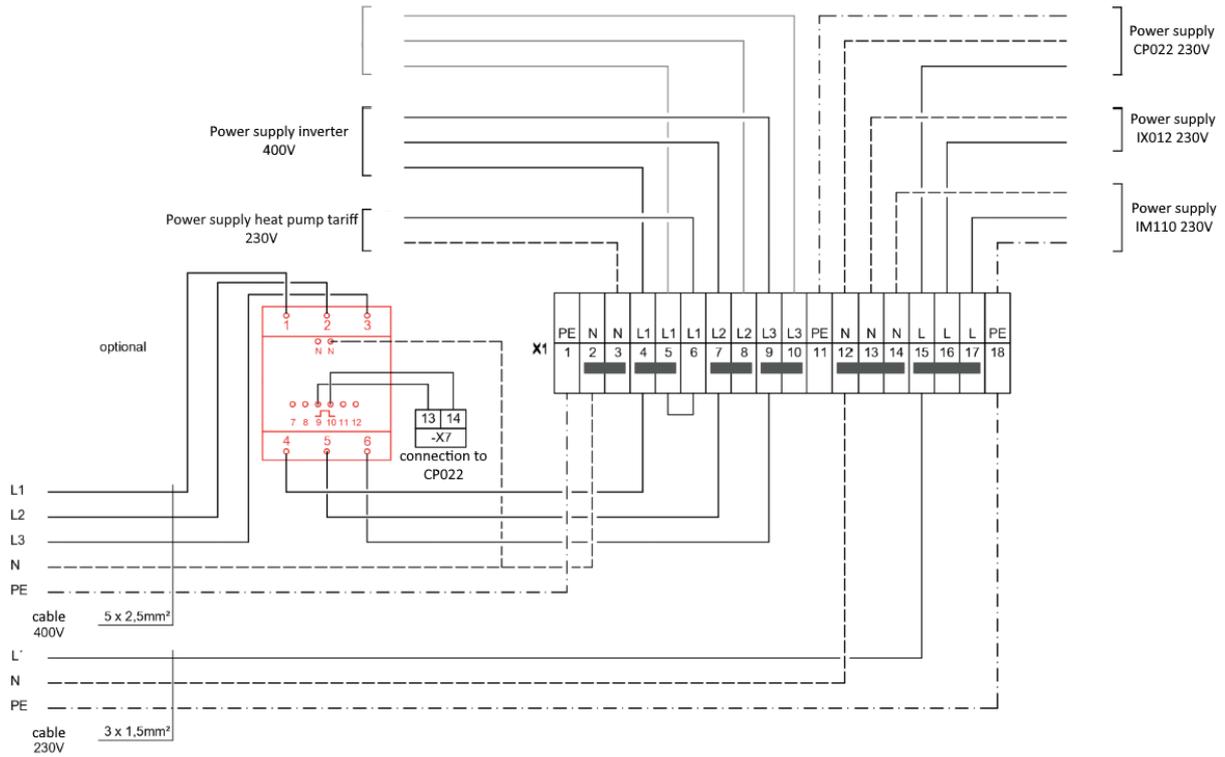
With a modulating heat pump, the residual current operated circuit breaker must be universal current sensitive. (Type B or B+)

### 9.3. Power supply connections

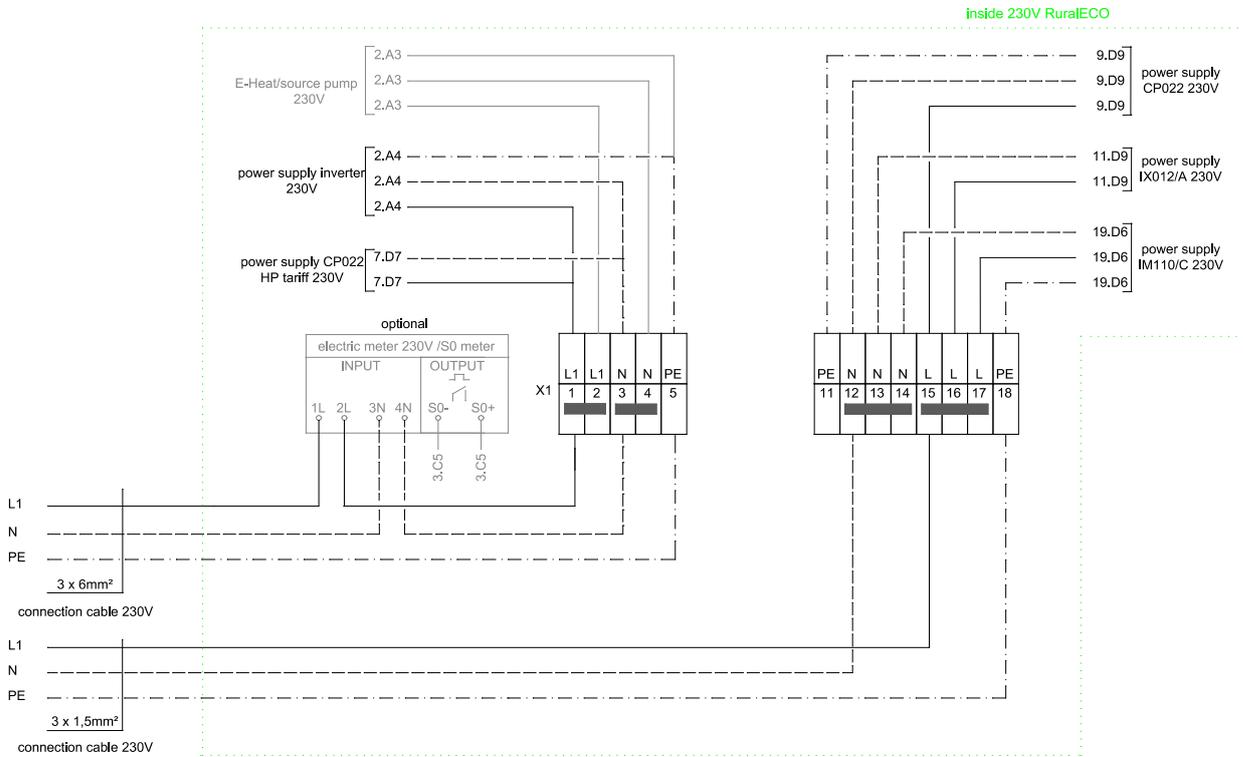


Get access to the terminal block inside the unit by removing the top and sideplate of the case. Now insert the cables to the inlet at the baseplate of the case and connect it with the terminal block. Use the cable ducts as good as possible and cable ties or like fix the wires on pipes or parts except the compressor or heat exchangers.

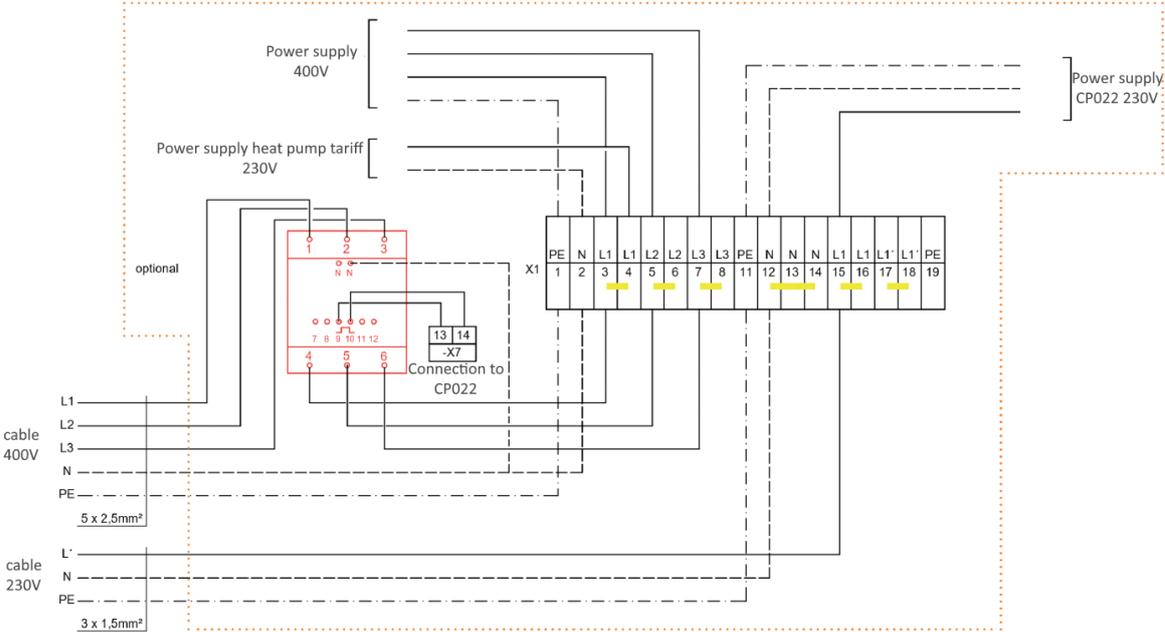
Connect the main power supply for WPLK412 / WPLK618 400V units according to the following diagram.



Connect the main power supply for WPLK 230V units according to the following diagram.



Connect the main power supply for WPLK722 /WPLK1030 units according to the following diagram.



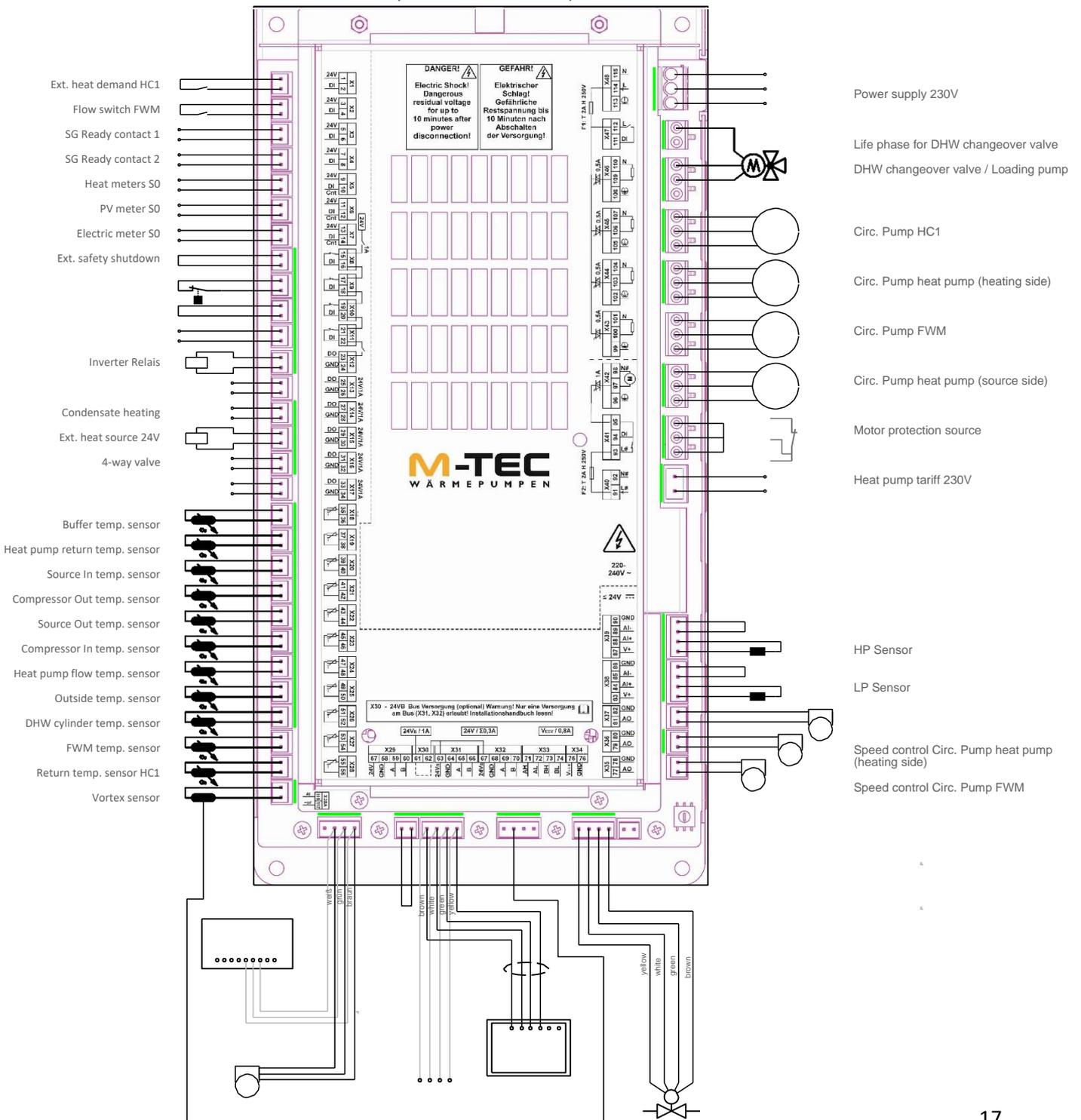
## 9.4. Wiring diagram of interface

The unit and its interface will not be delivered with all plugs. The connection plugs are included in the different additional parts packages (for example heat pressure switch,...). but can be ordered separately at M-Tec. For more details have a look at the electrical connection diagram for this heat pump type.

### CP022

IO Configuration: **1HKd\_FWM**

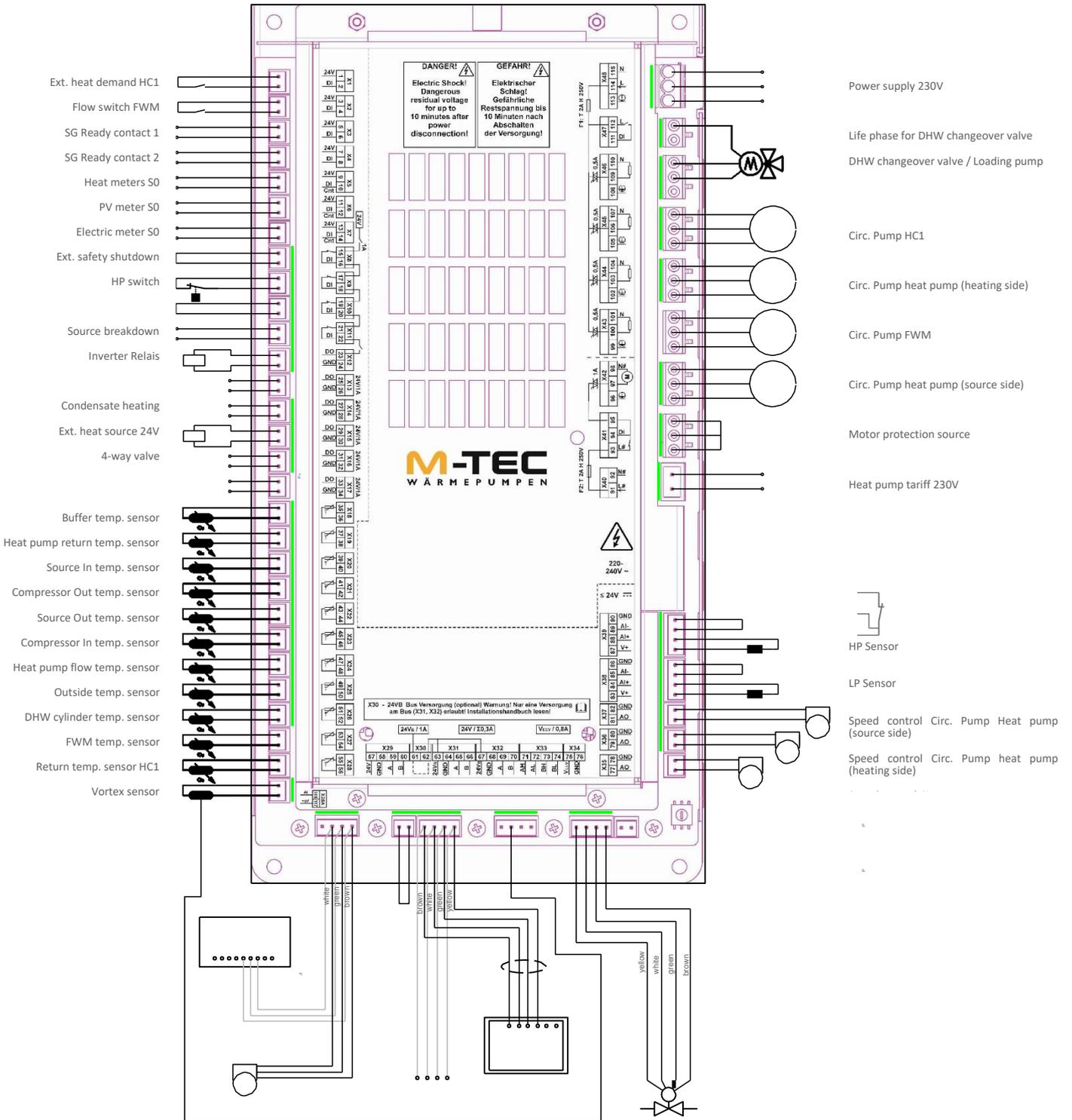
Max. possible: 1 HC unmixed, FWM

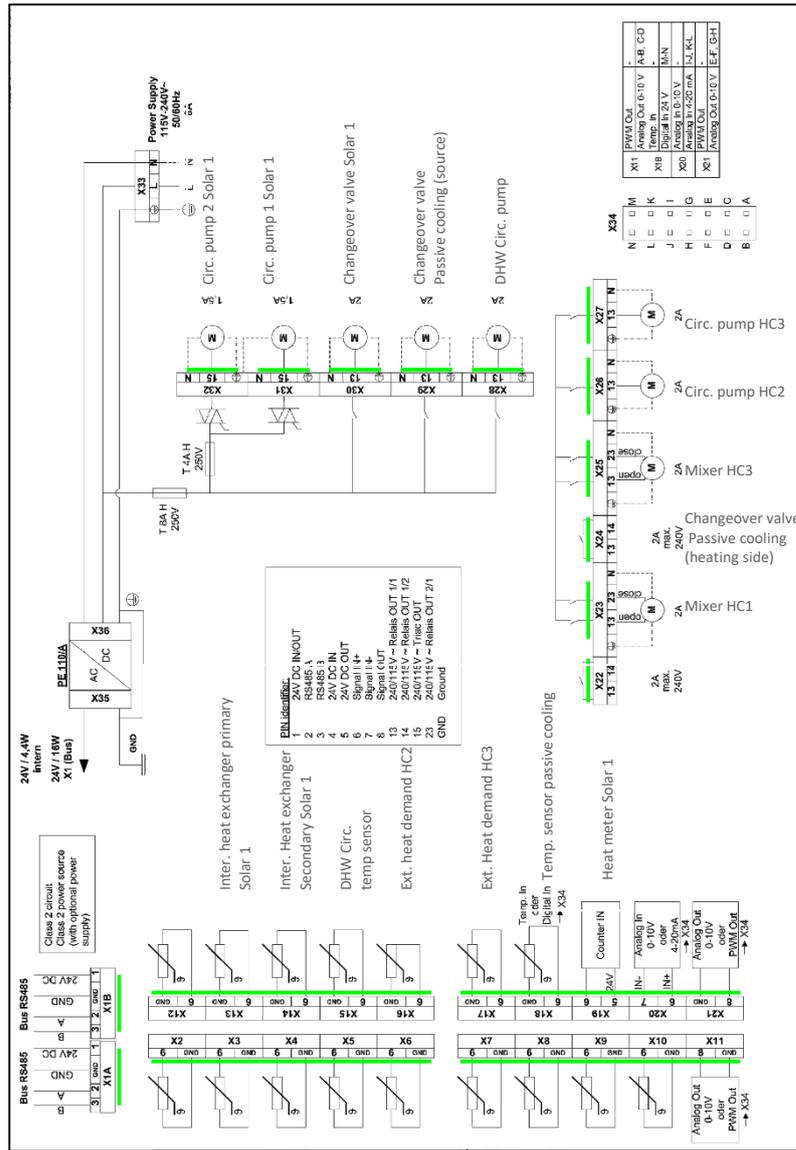


# CP022

## IO Configuration: 2g\_1d\_FWM\_ZIRK\_Kue\_Solar

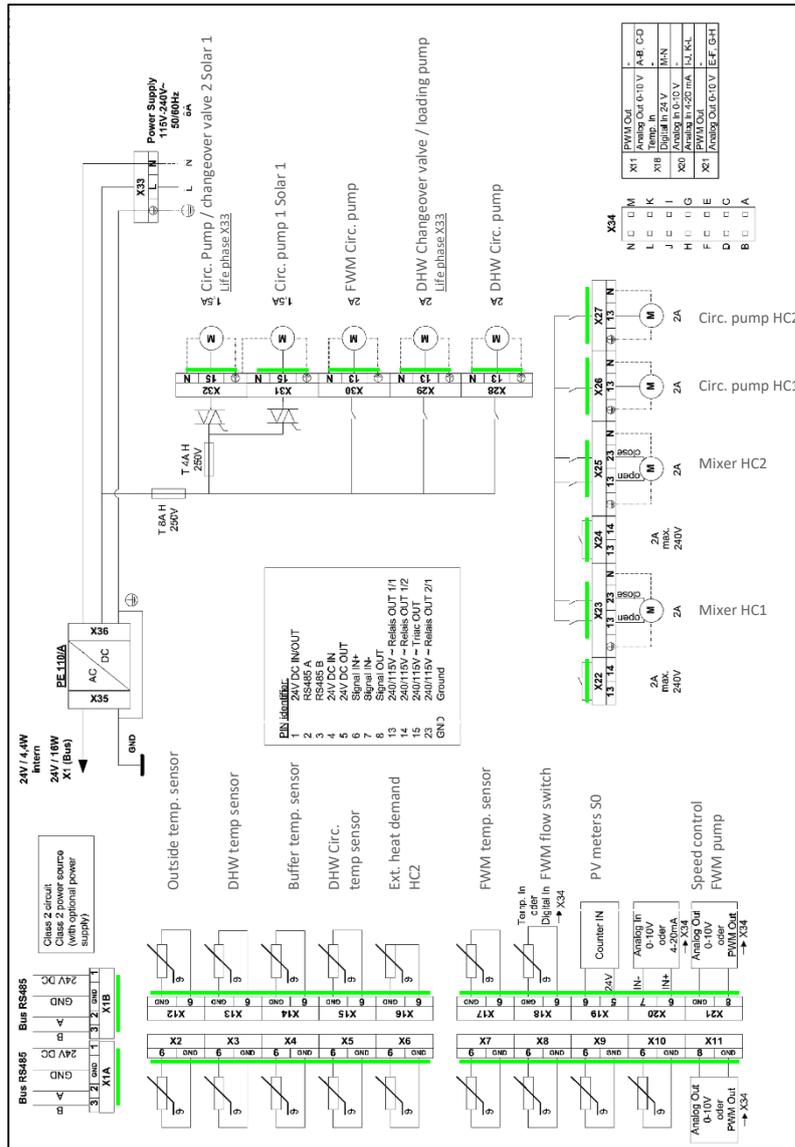
Max. possible: 2 HC mixed, 1 HC unmixed, DHW Circ., FWM, passive cooling, Diff. Controller





- Flow temp. sensor HC2
- Return temp. sensor HC2
- Flow temp. sensor HC3
- Flow temp. sensor HC1
- Collector temp. sensor Solar 1
- Consumer 1 Solar 1
- Consumer 2 Solar 1
- Speed control Circ. pump 1 Solar 1



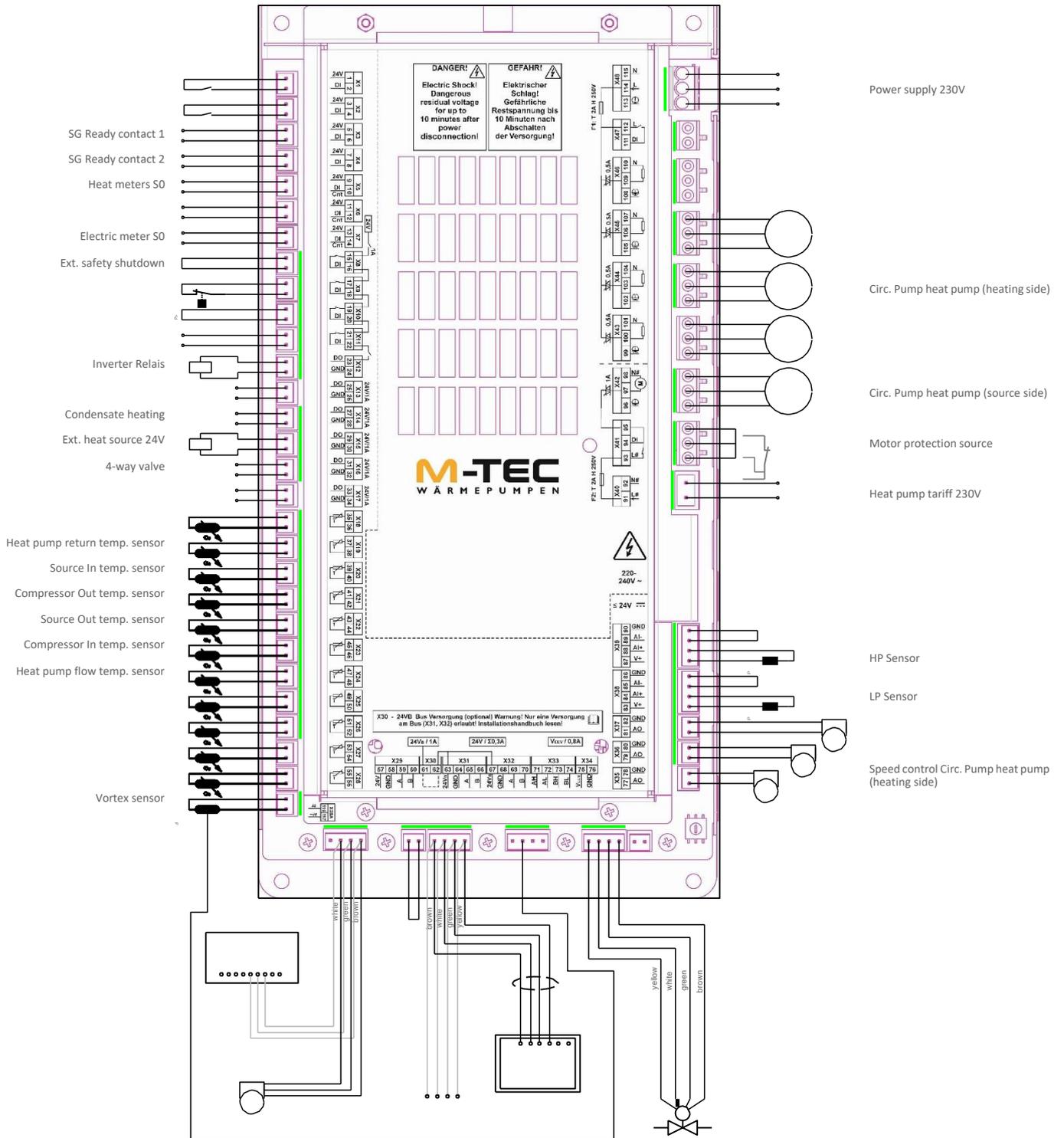


- Flow temp. sensor HC1
- Return temp. sensor HC1
- Ext. heat demand HC1
- Flow temp. sensor HC2
- Return temp. sensor HC2
- Collector temp. sensor Solar 1
- Consumer 1 Solar 1
- Consumer 2 Solar 1
- Speed control Circ. pump 1 Solar 1

# CP022

IO Configuration: **2HKg\_2HKd\_FWM\_ZIRK**

Max. possible: 2 HC mixed, 2 HC unmixed, FWM, DHW Circ.

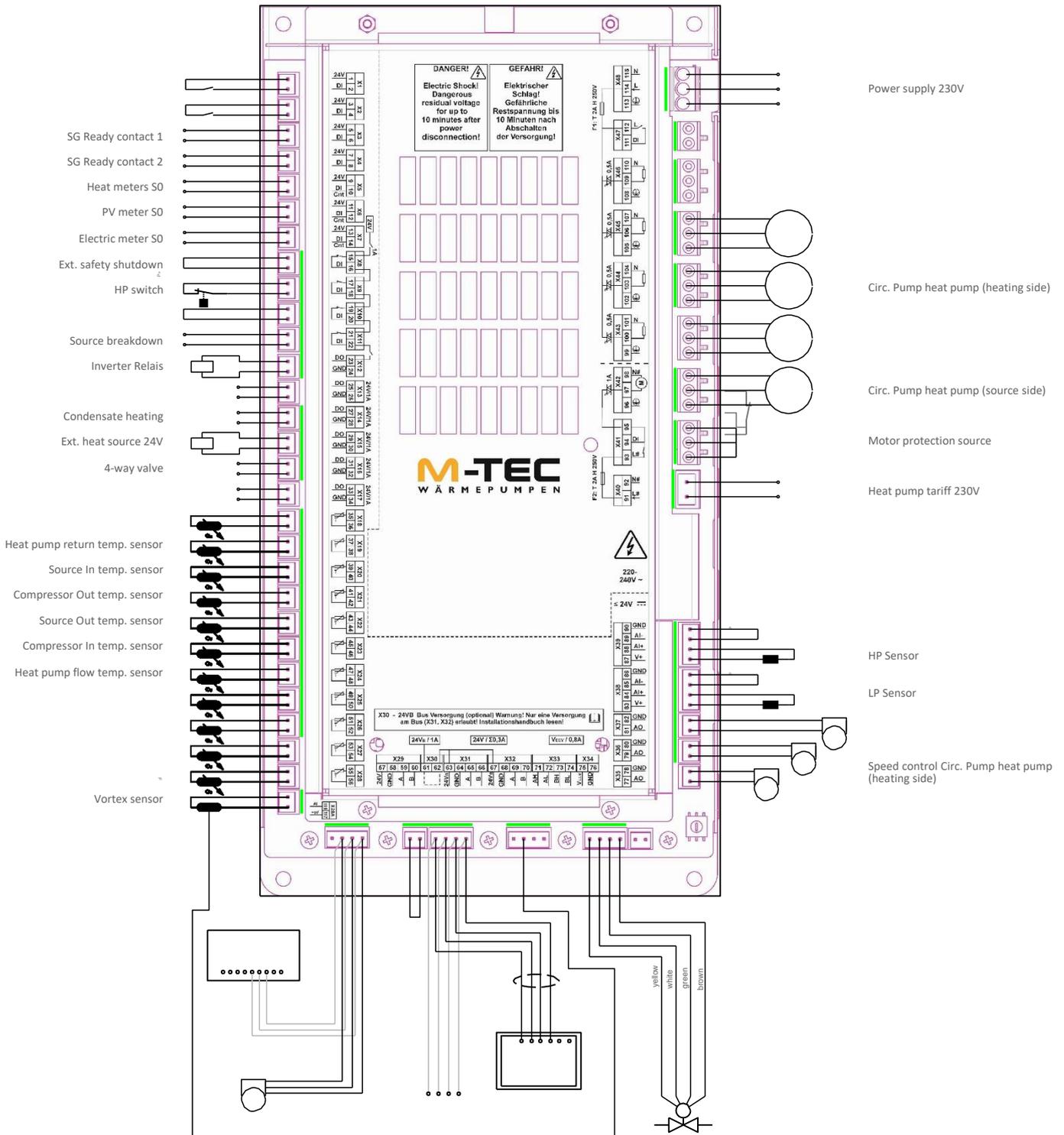




# CP022

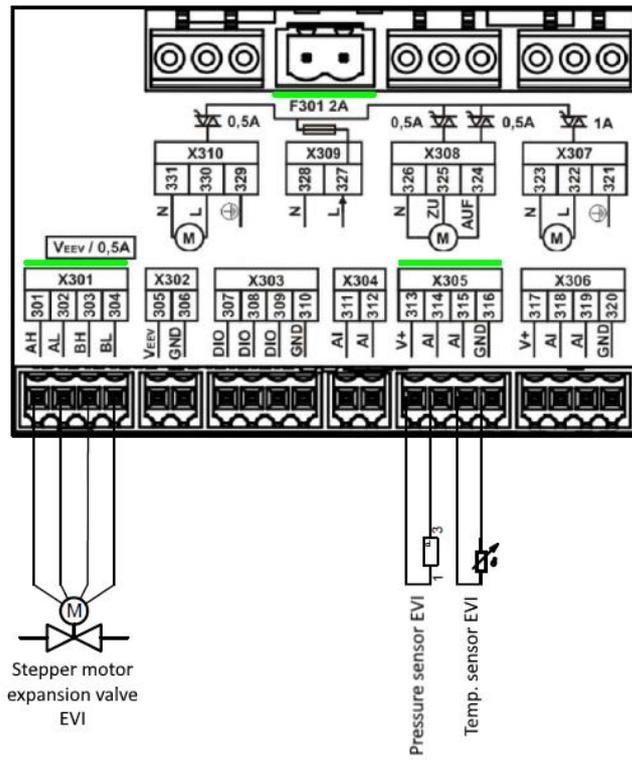
IO Configuration: **1g\_1d\_FWM\_ZIRK\_KUE**

Max. possible: 1 HC mixed, 1 HC unmixed, FWM, DHW Circ., passive cooling





## Wiring diagram of interface for WPLK722 / WPLK1030 (differences)



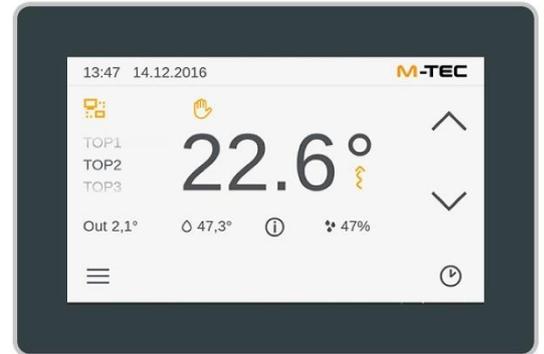
## 9.5. Connection of the Controller AP440

### Description of the assembly

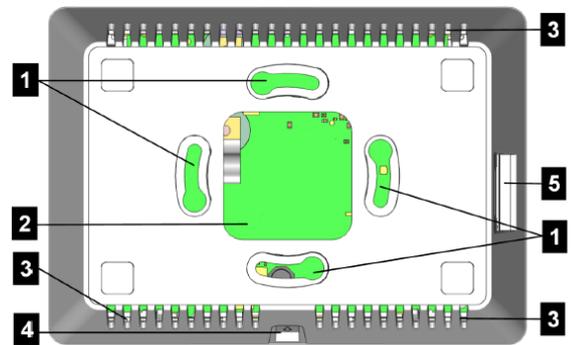
The AP440 is designed for operating and display tasks and intended for operation in closed rooms.

A BUS cable is used for the power supply and communication with other components of the control system. The AP440 is equipped with a TFT colour display with resistive touch sensitivity and has the following interfaces:

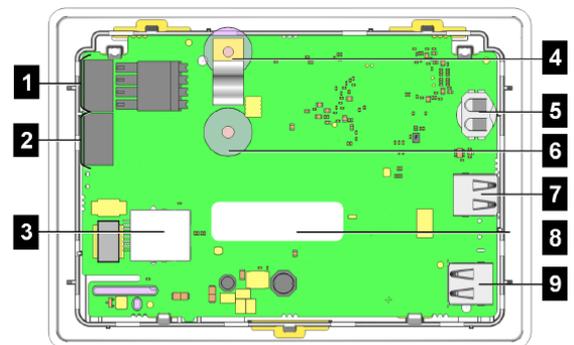
- 1 Ethernet interface
- 2 USB interfaces
- 1 system BUS interface incl. supply



- 1 ... Fixing holes for wall mounting or installation on a flush-mounted box
- 2 ... Cable inlet
- 3 ... Ventilation louvres
- 4 ... Opening slot

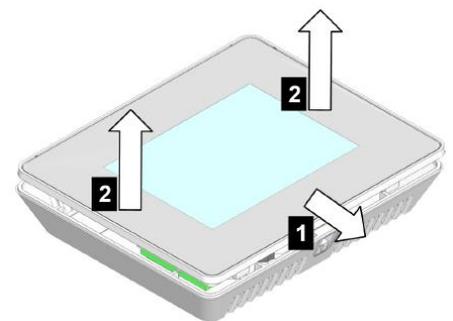
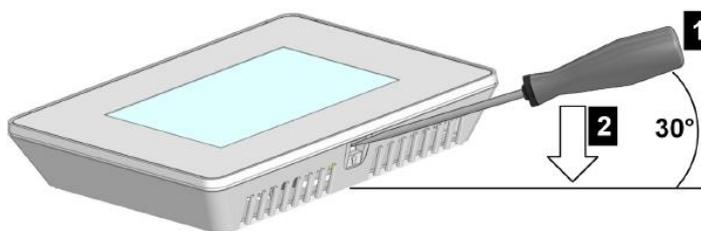


- 1 ... System BUS connection
- 2 ... Serial / KTY Sensor connection
- 3 ... Ethernet connection
- 4 ... screen connection
- 5 ... Battery
- 6 ... Connection for optional screen
- 7 ... USB connection (access from outside)
- 8 ... Type plate
- 9 ... USB connection (internal)



The installation surface must have an unevenness of  $\leq 0.5$  mm. This level must be assured during operation, installation and storage. To install the assembly, proceed as follows:

Open the AP440 casing by pressing lightly with a thin object on the bottom of the device, as shown in the figure below. Push the top of the housing up and remove.



### 9.5.1. Mounting

#### Space requirements

Above and below the device: at least 30 mm.

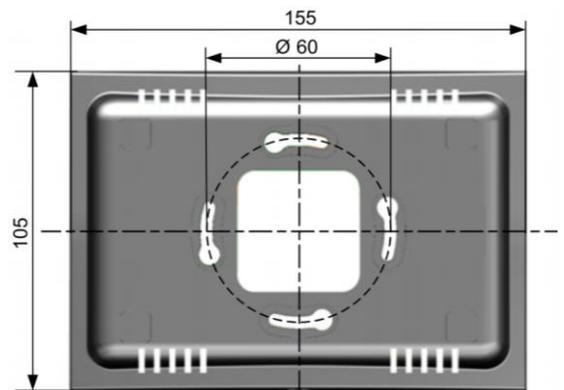
The ventilation louvres must be kept completely clear.

The device should not be installed close to heat sources (e.g. radiators) or in areas with a strong draught (e.g. close to doors), because otherwise, the captured room temperature may be distorted. The AP440 is suitable for mounting on a flush-mounted box (diameter 60 mm) and for horizontal wall mounting on a level, appropriately load-bearing and fire resistant substrate (e.g. a brick or concrete wall).

In the case of installation above a flush-mounted box, the electrical cables routed into the box must first be protected against draughts. Otherwise, cold air may be drawn in through the cables and may reach the room temperature sensor inside the device, which may result in the measuring result being distorted by several degrees Celsius.

Proceed as follows:

1. Mark out the holes at the relevant points on the wall.
2. Drill holes for screws with a 3 mm diameter.
3. Insert rawl plugs into the holes.
4. Open the AP440 casing by pressing lightly with a thin object on the bottom of the device, as shown in Figure 4: Opening the casing. Push the top of the casing up and remove.
5. Route required cables through the cable entry on the back of the casing.
6. Use screws and the fixing holes provided to secure the bottom section of the casing to the wall or on a flush-mounted box. Ensure that the text "Top/Oben" inside the bottom section of the casing is correctly aligned.
7. Once the wiring is complete, refit the top section of the casing on the bottom section and push it down until it clicks into place.



### 9.5.2. Connections and wiring

- Always route cables/leads of ultra-low safety voltage circuits (e.g. BUS) so that they are safely insulated against hazardous low voltage circuits.
- When using cables/leads of ultra-low safety voltage circuits (e.g. BUS), apply strain relief, because otherwise, they may drop on to dangerous voltages under the programming unit.
- Remove small parts (e.g. bits of cable and copper) from the casing once wiring has been completed.

### Strain relief

Replace the BUS cable screen on the screen clamp and apply strain relief by tightening the screw on the screen clamp.

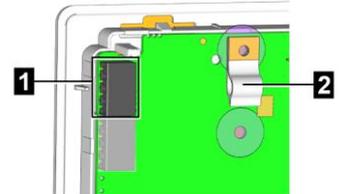
### Power supply and BUS connection

The AP440 is supplied with voltage via the system BUS. Connect no other external power supply.

### System BUS interface

The BUS interface with the integral 24 V DC supply is located at the top left of the open device.

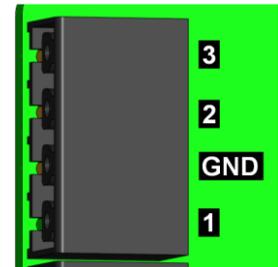
- 1 ... System BUS interface (pin 1 - 4)
- 2 ... Screen clamp



Use a screened cable for the connection. Connect the screen level with the PCB via the screen clamp provided (cable screen pulled back over the cable insulation).

### Systembus-Pin assignment

- GND ... Ground
- 3 ... RS-485-B
- 2 ... RS-485-A
- 1 ... 24 V DC



### Systembus- cable type

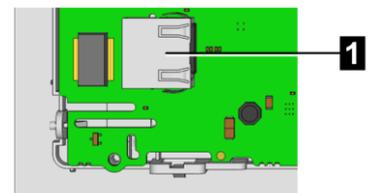
Always use a screened cable (braided screen) with 4 cores.  
Recommended BUS cable: YSLCY-OZ 4 x 0.5 mm<sup>2</sup>

### Cable length

Use a screened cable with 4 cores. The total cable length of the system (heat pump, AP440, OI420, Heating circuit, ...) is limited to 50m.

### Ethernet interface

The Ethernet interface is located at the top right of the open device.  
Use a non-crossover cable.



### Ethernet-cable type

The screened connection has been tested with the M-Tec "network cable grey". Use this or an equivalent quality cable for the connection (twisted pair and screened data cables with an impedance of 100  $\Omega$   $\pm$ 15%, ...).

### Ethernet-cable length

A 100 Mbit/s Ethernet transfer is specified as per IEEE 802.3 up to 100 m (50 m is guaranteed by M-Tec). In an EMC-disturbed environment, the maximum possible transfer distance may be shorter.

Minimum bending radius:

- during installation: 60 mm
- for an installed cable: 50 mm

### USB-Ports

For the connection of external USB devices (USB 2.0 high speed), there are 2 ports available.

### Connection of the AP440

Connect the AP440 to the internet and to the heating circuit module or the heat pump. The internet connection is via the Ethernet interface located at the top right of the assembly.

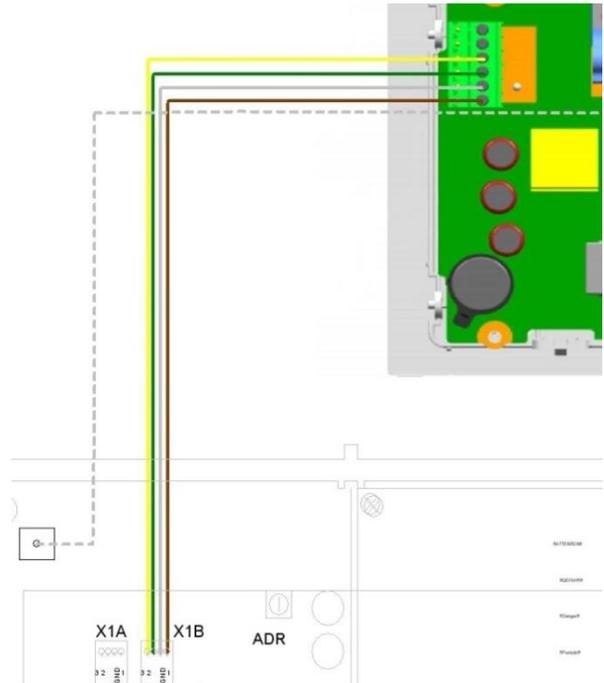
Communication with the heat pump takes place either via the heating circuit module or, in the case of simpler systems without a HCM, via a direct connection.

The following diagram illustrates the connection to the heating circuit module.

Connect the cable (4 x 0.5 mm<sup>2</sup>) similarly to the supplied 4 x 0.5 mm<sup>2</sup> cable from the heat pump to terminal X1B in the heating circuit module.

Assignment is as follows:

Connect yellow to 3, green to 2, white to GND and brown to 1 or 24 V. Secure the screen at the screen clamp.



### Removing the assembly

When removing the assembly, it is important to ensure and check that it is fully isolated from the power supply. To remove the assembly, proceed as follows:

1. Disconnect the AP440 from the power supply.
2. Open the AP440 casing by pressing lightly with a thin object on the bottom of the device, as shown in Figure 4: Opening the casing. Push the top of the casing up and remove.
3. Disconnect all electrical AP440 connectors.
4. Undo the fixing screws on the bottom section of the casing.
5. Take the bottom section of the casing off the wall.

## 9.6. Connection of the Controller OI420

### Description of the assembly

The digital control unit OI420 allows convenient adjustment of the desired room temperature and the mode of heating from the living area.

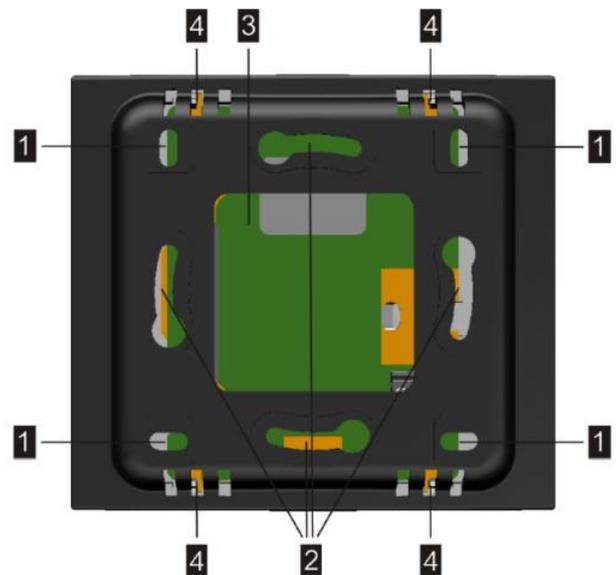
The settings are adjusted by easy to use buttons and visualised with LED indicators. In addition, the digital controller is used as room thermostat.

The OI420 transmits the actual temperature value to the heating control.

The connection with the other system components, as well as the 24 V supply and the data connection are made with a bus cable.



- 1 ... Fixing holes for wall mounting
- 2 ... Fixing holes for mounting on a flush box
- 3 ... Recess for the cable entry
- 4 ... Ventilation louvres



To ensure a sufficient air circulation, the OI420 must be installed horizontally on the wall.

Furthermore, the device may not be installed near heat sources (e.g. radiators) or in areas with strong drafts (e.g. near doors) otherwise the room temperature measurement can be corrupted.

When the OI420 is installed on a recessed conduit box the electrical hoses previously have to be hedged against drafts. Otherwise cold air can be drawn through the tubes and the measurement result may be falsified by several degrees.

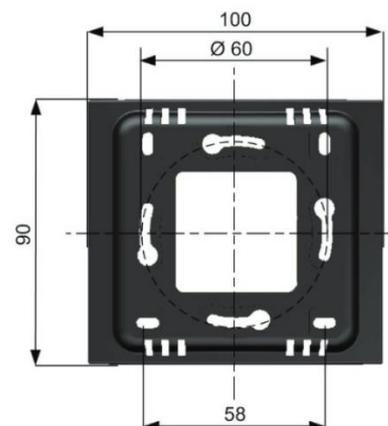
## 9.6.1. Mounting

### Space requirements

Above and below the device: at least 30 mm.

The ventilation louvres must be kept completely clear.

The device should not be installed close to heat sources (e.g. radiators) or in areas with a strong draught (e.g. close to doors), because otherwise, the captured room temperature may be distorted. The OI420 is suitable for mounting on a flush-mounted box (diameter 60 mm) and for horizontal wall mounting on a level, appropriately load-bearing and fire resistant substrate (e.g. a brick or concrete wall).



In the case of installation above a flush-mounted box, the electrical cables routed into the box must first be protected against draughts. Otherwise, cold air may be drawn in through the cables and may reach the room temperature sensor inside the device, which may result in the measuring result being distorted by several degrees Celsius.

### Proceed as follows:

1. Mark the drill holes at the intended location on the wall.
2. Drill holes for screws with 3 mm diameter
3. Put the wall plugs into the holes.
4. Open the OI420 casing by pressing lightly with a thin object on the bottom of the device, as shown in the following figure. Push the top of the casing down and remove.
5. Insert required cable through the cable gland on the rear panel.
6. Use screws and the fixing holes provided to secure the bottom section of the casing to the wall or on a flush box. Ensure that the text "Top/Oben" inside the bottom section of the casing is correctly aligned.



## 9.6.2. Connections and wiring

- Always route cables/leads of ultra-low safety voltage circuits (e.g. BUS) so that they are safely insulated against hazardous low voltage circuits.
- When using cables/leads of ultra-low safety voltage circuits (e.g. BUS), apply strain relief, because otherwise, they may drop on to dangerous voltages under the programming unit.
- Remove small parts (e.g. bits of cable and copper) from the casing once wiring has been completed.

### Strain relief

The bus cable must be attached with a cable tie to the device provided for strain relief.

### Power supply and BUS connection

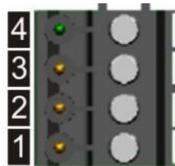
The AP420 is supplied with voltage via the system BUS. Connect no other external power supply.

### Systembus-interface

This interface device is located in the bottom right corner. For the connection, a shielded cable (4 x 0.5 mm<sup>2</sup>) has to be used and the shield must be connected to the surface of the circuit board (cable shield back over the cable insulation).

### Systembus-Pin assignment

- 4 ... RS-485-B
- 3 ... RS-485-A
- 2 ... GND
- 1 ... 24 V DC



### Cabeltyp-systembus

Always use a screened cable (braided screen) with 4 cores.

Recommended BUS cable: YSLCY-OZ 4 x 0.5 mm<sup>2</sup>

### Plug type

6-pin socket connector

The cable shield must be connected flat to the shield connection. An additional connection of shield and ground is not necessary.

### Cable lenght

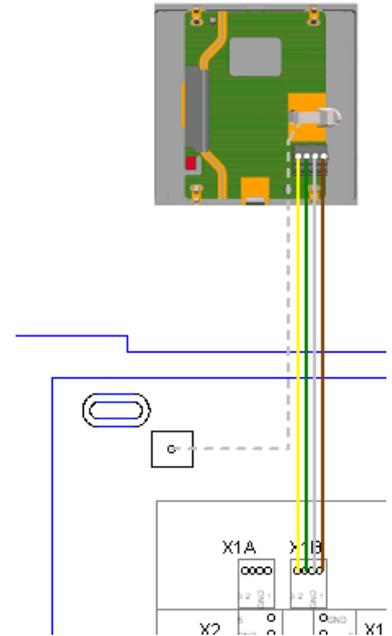
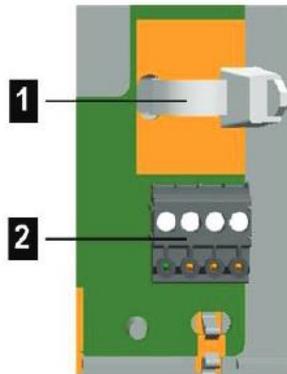
Use a screened cable with 4 cores. The total cable length of the system (heat pump, AP420, OI420, Heating circuit, ...) is limited to 150m.

### Connection of the OI420

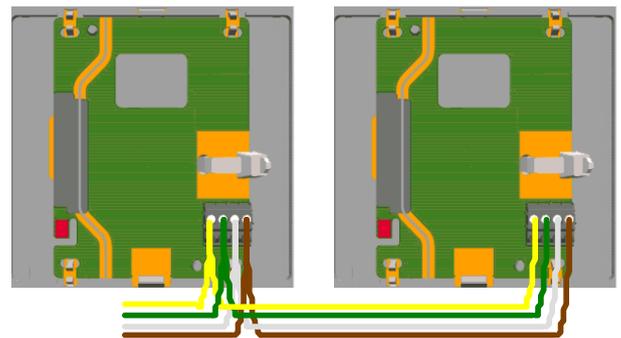
Power is supplied via the bus system. The bus interface is based on RS485. This interface device is located in the bottom right corner.

The bus cable must be attached with a cable tie **1** to the device provided for strain relief **2**.

For the connection, a shielded cable (4 x 0.5 mm<sup>2</sup>) has to be used and the shield must be connected to the surface of the circuit board (cable shield back over the cable insulation).



If two or more OI420 are to be connected to the heating circuit module they have to be connected in series. That means that the cable of the first OI420 has to be looped to the second and continuing.



### Removing the assembly

When removing the assembly, it is important to ensure and check that it is fully isolated from the power supply. To remove the assembly, proceed as follows:

1. Disconnect the OI420 from the power supply.
2. Open the OI420 casing by pressing lightly with a thin object on the bottom of the device, as shown in the following picture. Push the top of the casing up and remove.
3. Disconnect all electrical OI420 connectors.
4. Take the bottom section of the casing off the wall.



### 9.6.3. Assign to heating circuit

To assign the room control device OI420 to a particular heating circuit, proceed as follows:

Press the  and  keys at the same time for 5 seconds. The LED of the first operating mode (left LED on the upper arc) lights up and signals the selection of the menu item "bus address".

Now press  and  to adjust the desired address. The LED-row is used to display the currently selected address value. Starting from the left, the addresses 1 to 5 are displayed. If for example the LED at -2.5 degrees lights up, the room controller is assigned to the first circuit. If the LED at -2.5 and -2 degrees light up, the controller is assigned to the second heating circuit.

The setting may be changed with the  and  button.

To save the configuration, the arrow keys have to be pressed for 5 seconds again.

If during a time of 30 seconds no settings are made, the controller goes back to the start menu, without saving any settings. If 2 or more room controllers are assigned to the same heating circuit the status LED on the OI420 lights up yellow and red.

### 9.6.4. Operating

#### Temporarily changing room temperature

By using  and  you have the option to change the room target temperature (depending on the temperature prescribed by the current time program).

This setting is reset when the time program starts the next time.

#### Disable the heating circuit

Use button  and  to disable the heating circuit.

#### Activate automatic operation

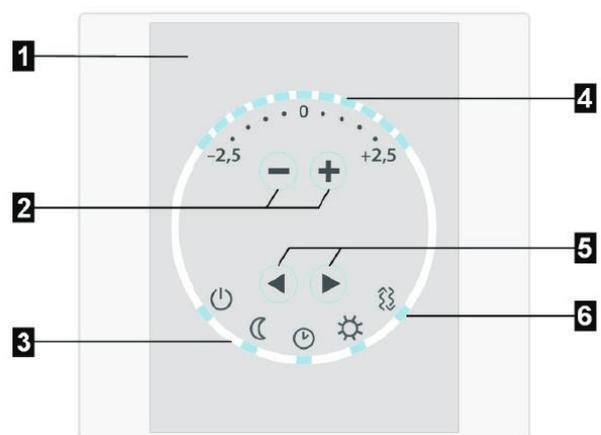
Press  and  until the LED at  (automatic mode) lights.

#### Status LED

- 1 ... Design foil
- 2 ... Adjusting the temperature
- 3 ... LED for operating mode change
- 4 ... LED for room temperature change
- 5 ... Changing the operating mode
- 6 ... Status LED

#### Status LED

Green:	Heating mode
Orange:	Cooling mode
Orange flashing:	Update in progress
Yellow flashing:	double used address
Red flashing:	communication error
Red:	Error



## 10. Operation and display

This chapter describes the basic screen display and important controls of the display interface.

### 10.1. User level

Several user levels exist on the visualization, which can be divided in the three "Easy", "Advanced" and "Expert" modes that are intended for certain user groups. Depending on the user level, certain masks are accessible and special information parameters and setting parameters will be displayed. Thereby, they offer different functionality levels. The end customer user can operate the heating system and adjust it to suit individual needs. The service technician user can configure the heating system and start up the system.

Level	Mode	User	Functionalities
1	Easy	End customer	Minimum setting options, no User Password required
2	Advanced	End customer	Additional setting options, User Password "100" required
4	Plumber	Technician	Settings for the heating systems manufacturers . Access to needed parameters. Service technician password required
10	Expert	Technician	Access to all parameters. Service technician password required

### 10.2. Display and operating elements

<b>Status light</b> 	This display element indicates whether a certain parameter/option has been set (status light turns orange) or not (status light turns white).
<b>Selection dial</b> 	The selection dial can be used to set values (segmented in specified increments) The value displayed in the center is currently selected. Touch the selection dial and move it up or down to select a new value.
<b>Open sub mask</b> 	This button indicates that there is a sub mask for the corresponding entry, which can be opened here. It also opens input panels for the individual parameters.
<b>Menü back</b> 	With this button you can return to the mask from where you accessed the current mask. Name of the original mask will be displayed to the right of the button.
<b>ON/OFF-switch</b> 	Specific settings and system options can be turned on or off here.

### Scrollbar



If more entries for one mask exist than what can be displayed on the screen, you can scroll through the mask (by using the up and down arrows as well as by moving the scrollbar between the arrows). Scrolling through the screen entries is done on a per line basis.

### Close/Off/Open slider



This is a sliding button used in conjunction with specific setting parameters to select one of the three states **Close**, **Off** and **Open**.

### Text Selection menu

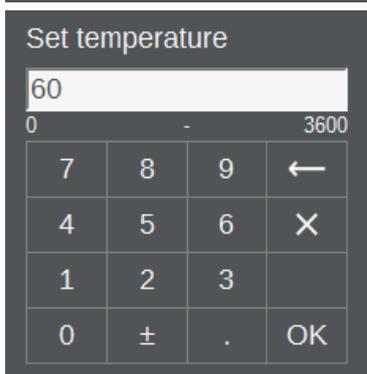


Used to select a status. The number and type of the status texts differ depending on the parameter. After selecting an entry, the selection menu closes automatically and the selected status text appears in the parameter field.

### Input field



Touching a field automatically opens the keyboard for the respective input field. Text input fields are associated with the alphanumeric input panel. Here, the entered text is displayed on the editing line and after completed confirmation, by pressing **OK**, the value from the editing line is accepted and carried over. Switching to the key layout with additional character is carried out with **ALT**.



Numeric input fields are associated with the numeric input panel. The value range within which an entry is possible is displayed below the editing line. If a value is entered that falls outside of the displayed range, the value cannot be accepted with **OK** and the value range is highlighted in red.

In general, the title line displays an exact designation of the parameter for which the panel is currently open. Via **X** you can exit an input panel again without accepting the entered values. Inputs on the editing line can be deleted with **←**.

## 10.3. Visibility

Some masks of the detail menu are only visible when the corresponding modules (heating circuit, hot-water tank, solar circuit, ...) have been activated. Some masks (e.g. **Brightness**) are only accessible via the local visualization.

## 11. Operating masks - Easy

### 11.1. Start mask home



The Home mask displays a clearly structured overview of the most important display values and setting options. Among other items, it includes a display of the exterior temperature and pull-up options for the masks. **Short information** and **Operating mode for heating circuit**. A heating circuit can be selected via a selection bar and the nominal temperature can be modified.

#### Information

*The nominal room temperatures of a heating circuit can only be set within a range of 5°C above and below that temperature, which has been set for the respective operating modes in the mask **Operating mode for heating circuit**.*

The screenshot shows the Home mask interface with the following elements and callouts:

- 1: Detail menu (hamburger icon)
- 2: Outside temperature (Out 9,4°)
- 3: Select heating circuit (TOP1)
- 4: Alarm active (warning icon)
- 5: Remote maintenance active (remote icon)
- 6: Date / Time (09:38 27.03.2018)
- 7: Shortcut into Detail Menu (wrench icon)
- 8: Manual Mode active (hand icon)
- 9: Screenshot drying active (SSS icon)
- 10: Additional heat source active (flame icon)
- 11: PV excess energy active (sun icon)
- 12: Change room temperature (up/down arrows)
- 13: Heating / Cooling mode active (wavy line icon)
- 14: Operation mode of heating circuit (clock icon)
- 15: Humidity of heating circuit (28%)
- 16: Overview menu (info icon)
- 17: Room temperature (24.0°)
- 18: DHW temperature (51,3°)

- 1 Detail menu
- 2 Outside temperature
- 3 Select heating circuit
- 4 Alarm active
- 5 Remote maintenance active
- 6 Date / Time
- 7 Shortcut into Detail Menu
- 8 Manual Mode active
- 9 Screenshot drying active
- 10 Additional heat source active
- 11 PV excess energy active
- 12 Change room temperature
- 13 Heating / Cooling mode active
- 14 Operation mode of heating circuit
- 15 Humidity of heating circuit
- 16 Overview menu
- 17 Room temperature
- 18 DHW temperature

#### Example: Adjustment of the daytime nominal temperature on the Home mask

If the daytime nominal temperature on the mask **heating circuit** has been set to 22°C, the actually desired daytime temperature can be adjusted directly on the mask **Home** in the range from 17°C to 27°C. This adjustment of the temperature on the mask **Home** does not change the normally set daytime nominal temperature on the mask **heating circuit**.

#### Alerts



The icon  signals on the **Home** mask that some alarms in their respective submask are due. By selecting this icon the mask **Alerts** is opened. The Mask contains detailed information of the alert.

## Additional mask

The  icon allows to open an additional mask. If a hot water tank is available, the hot water tank temperature mask will be opened after clicking this icon.

## Activity icons

Depending on the operating mode the following activity icons will appear above the nominal room temperature:



## Operating mode for heating circuit

In this mask, the existing operating modes of the heating circuits can be selected (and thereby continuously activated). Additional details to the operating modes listed here can be found on main mask.

Icon	Operating mode	Meaning
	Party	Setting of the point in time for the party end.
	Day	Activation of the operating mode Day (normal temperature):
	Timer	Automatic change between day and night. Based in the preset daily heating times (individually based on the day of the week)
	Night	Activation of the operating mode Night (decrease mode).
	Standby	Turning the currently selected heating circuit on and off. For a deactivated heating circuit, the frost protection function remains active.

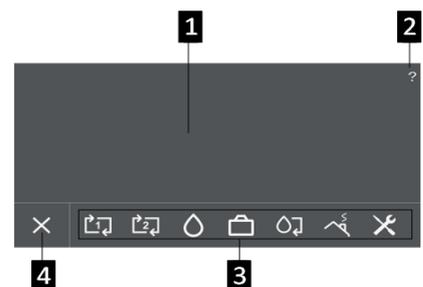
## 11.2. Mask settings



In addition to the selection masks of the different system operating modes and the heating circuit operating types that can also be called up at other locations, additional setting masks of the heat generating system can be selected and subsequently edited.

## 11.3. Basic layout of the settings menu

- 1 Mask display area
- 2 Call Mask: Help
- 3 Mask selection
- 4 Close settings



## 11.4. Heating circuits



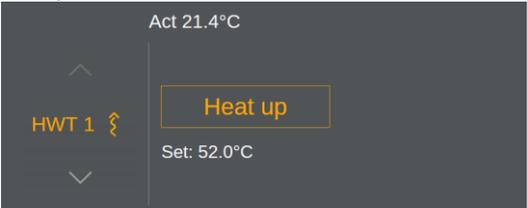
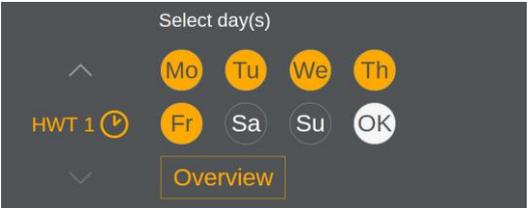
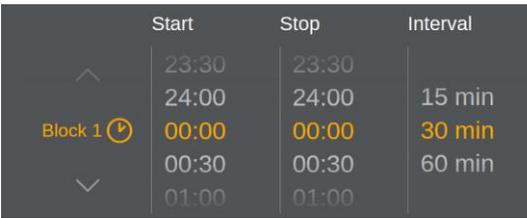
With the selection of a heating circuit a operating mode can be chosen via a selection wheel and then modified. To activate a operating mode press its corresponding button in the menu on the mask **Home**.

Heating circuit operating mode	Description																																				
<p><b>Heating</b></p> <table border="1"> <thead> <tr> <th>TOP1</th> <th>Normal temp.</th> <th>Reduced temp.</th> </tr> </thead> <tbody> <tr> <td>↑</td> <td>21.0</td> <td>20.0</td> </tr> <tr> <td></td> <td>21.5</td> <td>20.5</td> </tr> <tr> <td>Heat</td> <td>22.0 °C</td> <td>21.0 °C</td> </tr> <tr> <td></td> <td>22.5</td> <td>21.5</td> </tr> <tr> <td>↓</td> <td>23.0</td> <td>22.0</td> </tr> </tbody> </table> <p><b>Cooling</b></p> <table border="1"> <thead> <tr> <th>TOP1</th> <th>Normal temp.</th> <th>Reduced temp.</th> </tr> </thead> <tbody> <tr> <td>↑</td> <td>20.0</td> <td>19.0</td> </tr> <tr> <td></td> <td>20.5</td> <td>19.5</td> </tr> <tr> <td>Cool</td> <td>21.0 °C</td> <td>20.0 °C</td> </tr> <tr> <td></td> <td>21.5</td> <td>20.5</td> </tr> <tr> <td>↓</td> <td>22.0</td> <td>21.0</td> </tr> </tbody> </table>	TOP1	Normal temp.	Reduced temp.	↑	21.0	20.0		21.5	20.5	Heat	22.0 °C	21.0 °C		22.5	21.5	↓	23.0	22.0	TOP1	Normal temp.	Reduced temp.	↑	20.0	19.0		20.5	19.5	Cool	21.0 °C	20.0 °C		21.5	20.5	↓	22.0	21.0	<p>Enables the setting of the nominal room temperature for the operating mode Day (daytime temperature / normal temperature) and for the operating mode Night (nighttime temperature / lower temperature) as well. The temperatures can be set within the range of 10°C to 30°C. The function of <b>Cooling</b> is analog to <b>Heating</b></p> <p>The nominal value set here can be adjusted in the mask <b>Home</b> within a range of ±5°C.</p>
TOP1	Normal temp.	Reduced temp.																																			
↑	21.0	20.0																																			
	21.5	20.5																																			
Heat	22.0 °C	21.0 °C																																			
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	21.5	20.5																																			
↓	22.0	21.0																																			
<p><b>Party</b></p> <table border="1"> <thead> <tr> <th>TOP1</th> <th>Party end</th> </tr> </thead> <tbody> <tr> <td>↑</td> <td>11:30 PM</td> </tr> <tr> <td></td> <td>11:45 PM</td> </tr> <tr> <td>Party</td> <td>12:00 AM</td> </tr> <tr> <td></td> <td>12:15 AM</td> </tr> <tr> <td>↓</td> <td>12:30 AM</td> </tr> </tbody> </table>	TOP1	Party end	↑	11:30 PM		11:45 PM	Party	12:00 AM		12:15 AM	↓	12:30 AM	<p>This initiates a one-time adjustment of the daytime temperature heating time (and a potential interruption of the nighttime temperature cycle) without permanently changing the settings that are normally used.</p> <p>The "Party End" time is specified through the right selection dial. The daytime temperature will now be held constant until that time. After that, the heating circuit returns to the original operating mode again.</p>																								
TOP1	Party end																																				
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Party	12:00 AM																																				
	12:15 AM																																				
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<p><b>Time switch</b></p> <table border="1"> <thead> <tr> <th>TOP1</th> <th>Select day(s)</th> </tr> </thead> <tbody> <tr> <td>↑</td> <td>Mo Tu We Th</td> </tr> <tr> <td>Heat</td> <td>Fr Sa Su OK</td> </tr> <tr> <td>↓</td> <td>Overview</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>TOP1</th> <th>Select day(s)</th> </tr> </thead> <tbody> <tr> <td>↑</td> <td>Mo Tu We Th</td> </tr> <tr> <td>Cool</td> <td>Fr Sa Su OK</td> </tr> <tr> <td>↓</td> <td>Overview</td> </tr> </tbody> </table>	TOP1	Select day(s)	↑	Mo Tu We Th	Heat	Fr Sa Su OK	↓	Overview	TOP1	Select day(s)	↑	Mo Tu We Th	Cool	Fr Sa Su OK	↓	Overview	<p>The following mask supports the setting of the heating/cooling circuit for each individual day of the week or for a group of days. The weekday selection can be carried out on the initially displayed <b>Week timer</b></p> <p>On the <b>Week timer</b> individual and consecutive days can be selected via direct touch.</p> <p>The <b>Time switch</b> supports the setting of the nominal hot water temperature for each individual day of the week or for a group of days.</p> <p>Up to 3 blocks of time can be entered per weekday. The daytime temperature (normal temperature) will be maintained during the active blocks of time and the nighttime temperature (lower temperature) will be maintained during inactive times. The setting of the times takes place via the two selection dials in the middle. Further the time interval of the selection can be set via a selection dial on the right. A block of time can be deactivated by setting the same time for starting time and stop time.</p>																				
TOP1	Select day(s)																																				
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Cool	Fr Sa Su OK																																				
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<table border="1"> <thead> <tr> <th></th> <th>Start</th> <th>Stop</th> <th>Interval</th> </tr> </thead> <tbody> <tr> <td>↑</td> <td>23:30</td> <td>23:30</td> <td></td> </tr> <tr> <td></td> <td>24:00</td> <td>24:00</td> <td>15 min</td> </tr> <tr> <td>Block 1</td> <td>00:00</td> <td>00:00</td> <td>30 min</td> </tr> <tr> <td></td> <td>00:30</td> <td>00:30</td> <td>60 min</td> </tr> <tr> <td>↓</td> <td>01:00</td> <td>01:00</td> <td></td> </tr> </tbody> </table>		Start	Stop	Interval	↑	23:30	23:30			24:00	24:00	15 min	Block 1	00:00	00:00	30 min		00:30	00:30	60 min	↓	01:00	01:00														
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Block 1	00:00	00:00	30 min																																		
	00:30	00:30	60 min																																		
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## 11.5. Hot water



This mask is used to select a hot water tank and offers subsequently settings options to the hot water tank (**Temperature**) and a mask for setting the hot-water tank's week timer (**Time switch**).

Operating mode	Description
<p><b>Temperature</b></p> 	<p>This mask shows the actual temperature of the hot water tank. The nominal hot water temperature can be set via selection dial. A toggle field allows to switch between the modes <b>Auto</b> and <b>heating up</b>. <b>Heating up</b> allows the hot-water tank to be heated one single time, which starts immediately unless the current hot water temperature is already higher than the desired nominal temperature.</p>
<p><b>Timer switch</b></p>  	<p>Its functionality is analog to its functionality for the heating circuits.</p>

## 11.6. Vacation



Allows the one-time temporary adjustment of the temperature settings for a time span of several days without changing the normally used daytime and nighttime temperatures.

Vacation from 00:00		until 23:59	
May 2021	30 Fr	May 2021	16 Fr
Jun 2021	31 Sa	Jun 2021	17 Sa
Jul 2021	01 Th	Jul 2021	18 Su
Aug 2021	02 Fr	Aug 2021	19 Mo
Sep 2021	03 Sa	Sep 2021	20 Tu

Use the selection dials to enter a start date (from) and an end date (to) of the vacation time period. The vacation time frame therefore lasts from 00:00 AM on the start date to 11:59 PM on the end date. During this time frame, the specified nominal temperature will be maintained and the

icon  will be displayed on the **Home** screen. After that, the heating circuit returns back to the original operating mode and uses the saved temperature values.

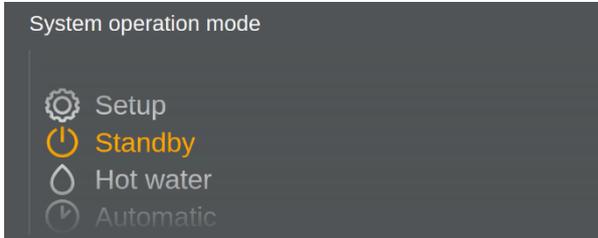
### Information

On the parameter mask **Settings** ► **Device** ► **Service** ► **Heat circuit** ► **Heat circuit** ► **parameters** ► **Heating via parameter "Room temp. Vacation"** the nominal value of the vacation temperature can be changed.

## 11.7. Select system operating mode



This mask is utilized to select the system operating mode. The following operating modes can be selected via a selection dial:



The system operating mode **standby** is set as a default. In this case, the set operating modes of heating circuits, hot-water tank, solar system and photovoltaic are deactivated and the heat generator is not active but the frost protection will remain active.

An active system operating mode must first be selected for the entered settings on the heating circuits to take effect. Available options are the **automatic mode** or the **hot water mode**.

For the **hot water mode** system mode, the heating circuits are turned off (frost protection remains active), hot-water tanks, solar systems and photovoltaic are turned on.

In the **automatic** system mode, heating circuits and cooling circuits, hot-water tanks, solar systems, and photovoltaic frost protection are activated.

From this system mode also the two options **automatic heating** and **automatic cooling** are available, which only have one type of temperature distribution circuits (heating or cooling) and one type of buffer (heating or cooling). These system mode is also activated automatically, in case of performed settings on the option masks of the system. This modified settings will be accepted when switching to an active system operating mode again.

## 11.8. Chimney Sweeper



This mask is used to start the chimney sweeper mode by pressing the button "start". The mask will also show the remaining time as well as the corresponding status icon  on the activity bar of the **Home** screen. The chimney sweeper mode is used to measure the pollution emissions.

### Information

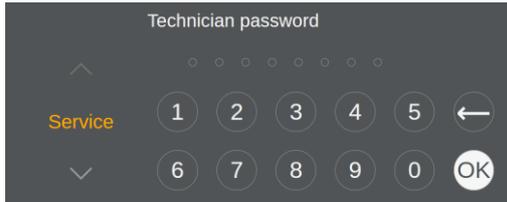
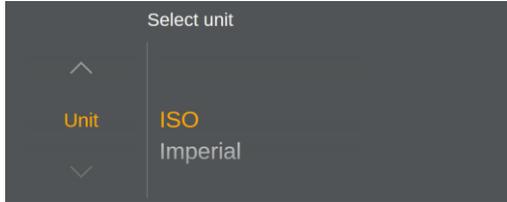
The mask **external heat source** is only visible in case of activated option "Has emissions" in **Settings ▶ Device ▶ Service ▶ Ext. heat source ▶ Parameter**.

Type of heat source	Description
<b>External heat source</b> 	<p>Upon activation, the actual heat generator is stopped and the external heat source is operated with maximum output, up to 2 hours (see displayed Remaining time). The chimney sweeper function can be terminated by the operator at any time, otherwise the function ends automatically after the indicated remaining time expires. At that time, the system returns to its original operating mode.</p>

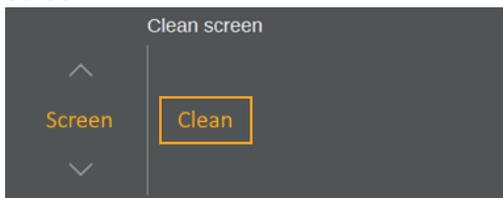
## 11.9. Device



In this mask the following submasks can be chosen via the selecting dial on the left:

Submenu	Description
<b>Service</b> 	<p>By entering (or an incorrect password) you exit the Expert mode again and return to User Level 1. If the Service Technician user level is active and the operating unit is not operated for 30 minutes, the system will automatically reset to the normal user mode (User Level 1).</p>
<b>Language</b> 	<p>This mask allows you to choose the language. The change will occur when leaving this mask.</p>
<b>Unit</b> 	<p>Here you can select the Unit system namely <b>ISO</b> and <b>Imperial</b> in which the device should operate. The change will occur when leaving this mask.</p>

## Screen



After selecting this parameter, the entry option of the display is blocked for 10 seconds in order to carry out a cleaning of the screen without the touch screen responding to touch.

**ATTENTION:** Never clean the touch screen with solvents, scrubbing solution or scrubbing sponges. Otherwise the touch screen surface could be damaged!

Use a soft cloth for cleaning which has been lightly moistened with water or with a mild cleaner. The cleaner should always be sprayed directly onto the cloth and not directly onto the surface of the touch screen.

## 11.10.Mask help



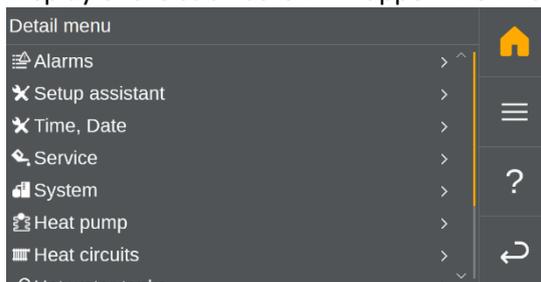
By clicking on the help button, an online window with the operating manual opens. The text of the help differs from mask to mask. At detail menu masks the help of each single parameter is listed whereas at all other masks a description of the mask and its handling is displayed.

## 12.Operating masks – Expert

This chapter describes the masks which can be activated by entering a password. Furthermore, additional masks are available in the detail menu. Further masks with display and adjustment parameters of the individual system components are available, which enable the end user to read off most actual values, parameters and options of the system and its individual components.

### 12.1. Basic layout of the detail menu

The basic layout is that part of the M-Tec visualisation, which is always displayed on the screen. The Display of the submasks will happen within the Basic layout.



Mask	Description
Home 	Call Mask <b>Home</b>
Detail menu 	Call the first level of the <b>Detail menu</b> .
Help 	Call Mask <b>Help</b> for information concerning the current mask
Menu back 	Revert to previous mask.

## 12.2. Alarms

Currently pending alarms that were triggered by the control are administrated on the alarm mask with a descriptive title. When an alarm is selected, the detail mask with status, alarm ID, time of occurrence and alarm text of the triggered alarm opens, the two arrow buttons can be used to move up and down

in the alarm table and can be confirmed via button .

Alarms for which the cause of the error has not been fixed yet will continue to be displayed in the Alarm mask in spite of the confirmation. These alarms will only not be pending any more after the cause of the error has been fixed.

### 12.3. Time, Date

Contains the basic settings for the display of the user software and the parameters, such as system time and for the illustration on the display, as well as setting the **LED brightness** of the optional remote control.

**Date** and **Time** are set via their own pop-up windows with selection dials.

The specific **Time zone** can be selected by choosing the region and the related capital city of the respective nation. The settings will finally be accepted by pressing **Apply**. Depending on the selected time zone, summer/winter time is set automatically.

The **Screen saver** activation time (e.g. after 20 min inactivity) can be selected via a text selection menu.

The **Display brightness** as well as the **LED brightness** is set via a numeric input panel, whereat in each case a minimum brightness is given.

### 12.4. Service

Provision of the functions required for the service, such as e.g. status report, update software, save/load parameters ...

A specially prepared USB stick is required to carry out some of the service functions included herein (e.g. update software, USB data logging, ...), which must be inserted into the operating unit (an USB stick can either be prepared as update stick or as diagnosis stick).

### 12.5. Save/Load parameters

All setting parameters of the entire control system can be saved locally, on a USB stick or on a terminal device (PC / mobile), or can be loaded from the stick onto the control system.

This mask also provides the expanded options to load parameter templates or to backup one's own new parameter templates. During this process, the setting parameters of individual system components can be saved locally, on a USB stick, or can be loaded from the stick onto the control system.

Load parameters		Save parameters	
Load parameters		Save parameters	
From storage	Local >	To storage	Local >
Group	System >	Group	System >
Name	>	Name	>
Detail Menu - Service - Parameters – Load Parameters		Detail Menu - Service - Parameters - Save Parameters	

The storage location (locally on the system or onto a plugged-in USB stick) onto which the backup is to be carried out, or from where already existing backup data is to be uploaded, is specified via a text selection menu. Via web application it is furthermore possible to store the data on the terminal device (PC / mobile).

Parameter "Group" determines what should be stored or loaded: "System"(system parameters), "All LinTabs" or "IO config"

If the parameters are to be saved, the backup file is automatically given a file name with date stamp (e.g. HS-2014-05-03). The name can be changed via the input panel. If the system parameters are to be loaded, the desired parameter set (if existent) can be selected from a text selection menu. In case of loading system options it is switched into **Setup** mode automatically and has to be switched to the desired system operating mode manually.

Load parameter template		Save parameter template	
Load parameter template		Save parameter template	
From storage	Local >	To storage	Local >
Component	Heating circuit >	Component	Heating circuit >
Number	1 >	Number	1 >
Name	>	Name	>
Detail Menu - Service - Parameters - Load parameter template		Detail Menu - Service - Parameters - Save parameter template	

Parameter "Component" determines the type of the component that should be stored or loaded. Together with the component type, parameter "Number" determines the specific system module.

**Information**

*It is possible to save two backups of each component in the local memory. If further backups are stored in the local memory, the oldest backups are deleted automatically.*

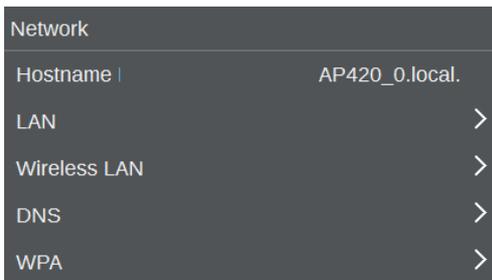
**Conventions for "Saving parameters templates":**

- Filename for system parameters starts with HS (Heating System)
- Filename for templates starts with LT or IO (linearization tables, IO configurations)
- Filename for components starts with HP, HC (heat pump, heating circuit)

By operating **Start saving** or **Start loading** the backup process or loading process is started and the status is shown on a progress bar. In web application, **Upload** with a standard dialog **Open file** is available, instead of **Start loading** and parameter **Name**.

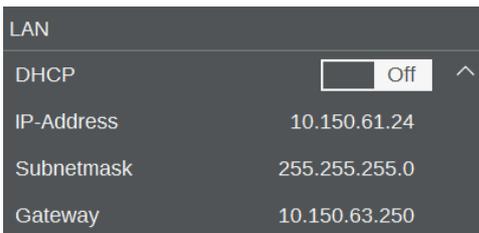
## 12.6. Network

This is not available in the web application and provides settings for the network configuration of **LAN** and **Wireless LAN**. Furthermore masks are provided for entering **DNS** and **WPA**. By selecting a category, special configuration masks are opened where the settings can be carried out.



The "Hostname" displays the name of the master operating unit of the heat generating system.

### LAN



In this mask, the LAN network settings can be edited. The network address can either be:

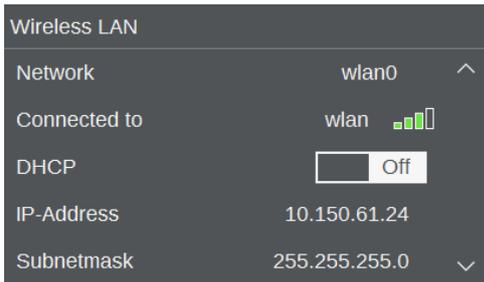
obtained via DHCP (this enables the automatic integration into an existing network without manual configuration) or specially defined. During this process, the network addresses must be entered manually via input panel.

Designation	Meaning
DHCP	Through the activation of "DHCP", the IP address will be automatically obtained via a DHCP server and the remaining input lines will be deactivated.
IP Address	Indication of the IP address for the visualization communication, as well as
Subnet mask	- the corresponding subnet mask and
Gateway	- the standard gateway

The settings will finally be accepted by pressing **APPLY**. Below of **APPLY** the "MAC address" of the LAN interface is displayed (necessary for possible IT unlocks).

### Wireless LAN

This mask offers the possibility to connect the master operating unit with an existing WLAN network. Like on the mask **LAN**, for this purpose the operating unit requests either an IP address from the DHCP server, or it can be set a fixed IP address on the operating unit.



The mask is only fully, when a WLAN stick is connected to the master operating unit and it is also connected to the network that has been defined on the mask **WPA**.

In case of successful connection, the parameter **Connected to** indicates, next to the name of this network, the signal strength of the connection.

The settings will finally be accepted by pressing **APPLY**.

Below of **APPLY** the "MAC address" of the LAN interface is displayed (necessary for possible IT unlocks).

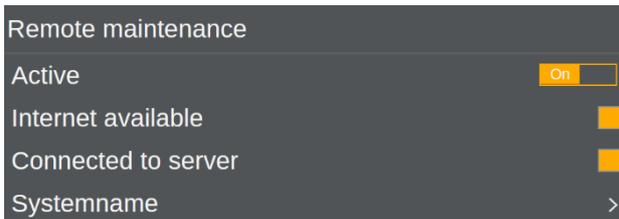
### DNS

The IP addresses of up to two DNS (Domain Name System) server (both LAN and WLAN) can be set on this mask. The performed settings will be accepted by pressing **APPLY**.

### WPA

In this mask a WLAN connection can be established by inserting the network name (SSID) and also the password (PSK). The performed settings will be accepted by pressing **APPLY**.

## 12.7. Remote maintenance



Remote maintenance via a VPN connection can be activated via ON/OFF switch. Thereby a temporary remote access onto the heating system by a M-Tec application technician for the purposes of optimization, fault analysis or troubleshooting is enabled.

When opening the mask, the current status of the remote maintenance is automatically determined and displayed. For that purpose via status light is displayed if an Internet connection is available and if a connection to the VPN server (a so-called VPN tunnel) has been established or not. To finish the configuration of the mask **Remote maintenance** the **Device name** must be entered via alphanumeric panels.

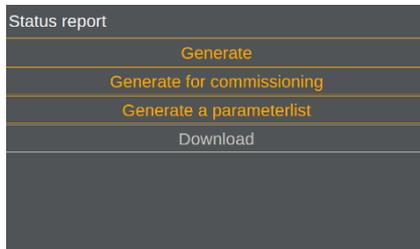
For high secured networks and firewalls, please open the following outgoing ports:

Port	Name	Usage
80	Appliance	
443	Appliance / Web GUI	Gatemanager
11444	Appliance	Sitemanager Web
55000-59999	Go To Appliance	Agent WWW
12222	Scope	Agent Full
22	SSH	Agent Full

## 12.8. Restart

Selecting this parameter initiates a restart. After confirming the appearing message window the restart is performed.

## 12.9. Status report



In case of a problem with the system or upon instruction by the service technician, the system condition can be saved in a status report via the button **Generate** and transmitted to an USB stick or a PC for further analysis. During the generation of the status report, an activity bar is displayed. During that time, the system should not be turned off.

After the generation, the status report needs to be transferred to a plugged-in USB stick. Via **Copy to USB** all existing reports will be copied.

### Information

In the web application of the visualization **Copy to USB** is replaced with **Download** and the last generated status report is transferred to the PC.

## 12.10. Event log



Opens the event log mask which shows the content of the event log in list form. All system alarms are recorded over a longer period of time. Thus offers a complete recording of the system alarm history.

- 1 Status icon
- 2 Event class (AIReset, AISet, WebHMI)
- 3 Time the event occurred up to ms
- 4 Moving up and down on the event table
- 5 Event text with message ID

By selecting an event, the detail mask with message ID, time of the occurrence and event text of the triggered event is opened.

Icon	Event class	Description
	Error	Error and down-time in application/control of the system, which prevent the flawless operation of the system.
	Warning	Warnings of the application. The additional operation of the system (sometimes with limitations) is given.
	Information	Information of the application (to be adhered to!). The complete further operation of the system is given.

## 12.11. Notification

To use the functions of this mask, **Remote maintenance** must be active (existing internet connection required).

The type of the transmission of the message is set via "**modus**".

"**Recipient**" specifies the receiver of the notification.

"**Language**" determines in which language the messages will be sent. English will be used as the default language, if the message to be sent is not available in the target language on the system.

"**Level**" defines a filter for the Notifications.

### *Information*

*Active remote maintenance and existing Internet connection provided. Port 587 must be open to the outside. Occurring alarms are not sent immediately. Alarms have to wait a while before a notification is sent. The pending alarms are then sent in a packet.*

## 12.12. System information

Provides general information for the visualization and control system.

## 12.13. Factory settings

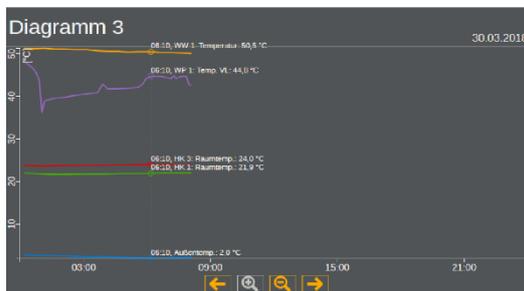
Is not available in the web application.

This sets all parameters and system settings, but no operational data, back to the original state at the time of delivery (module type and quantity [e.g. two heating circuits] and parameters to default settings). Following the confirmation of the opening dialog box, all factory settings will be loaded. When resetting the factory settings with User Level 3 also the operational data (e.g. system statistics) are deleted. After setting to factory settings, a new setting-up of system must be performed.

## 12.14.Charts

The visualization is only available with the AP440 and can display up to three different charts. Line charts represent data from the data logger whereas bar charts visualize statistical data.

Designation	Meaning
	<b>Previous Interval</b> , e.g. in the yearly view the previous year will be shown
	<b>Next Interval</b> , e.g. in the yearly view the next year will be shown
	<b>Zoom in</b> , e.g. from the yearly view will be changed to the monthly view
	<b>Zoom out</b> , e.g. from the monthly view will be changed to the yearly view

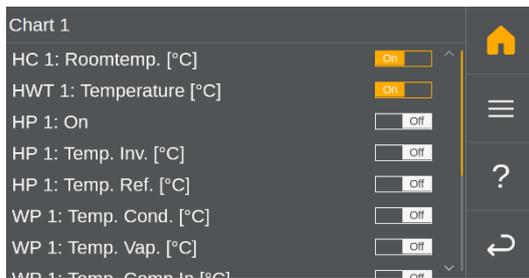


A line chart supports:

- zoom levels for a year (12 months)
- a month (4-5 calendar weeks)
- a week (7 days)
- a day (24 hours)

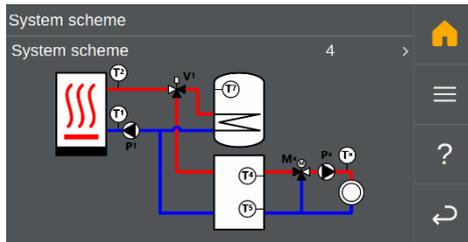
When the chart area gets clicked, a tip regarding the respective values of the single data sources will be shown.

### Chart configuration



The configuration mask lists all available data sources which can be added to the chart by activating it via the slider. Each chart can contain up to five data sources with two different units. All further data sources will be removed. If a data source from one kind is selected, all data sources from the other kind will be removed from the mask. By pressing the "Save" button, the selected configuration is saved.

## 13. System schemes



It is possible to choose between different hydraulic schemata, which reflect a certain structure of the system with a different configuration of the function units (system modules). The respective function volume is set by the appropriate options (e.g. reflux lift, unmixed heating circuit, ...).

Solar systems are not shown, but it can be selected, which heating target is associated with it (buffer tank, hot water tank, generic heating target such as swimming pool).

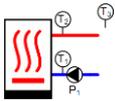
External heat sources are optionally available and are hydraulically similar to the connected heat generator. They have an autonomous (external) controlled circulation pump.

The selection of a schema takes place by confirming the line System scheme and entering the number of the desired schema.

shortcuts	Definition of terms
FU	Function unit
N/A	Not available
T1	Flow temperature of heat generator
T2	Reflux temperature of heat generator
T3	Exterior temperature
T4	Heat buffer temperature top
T5	Heat buffer temperature bottom
T7	Hot water temperature tank x
T8	Cold buffer temperature top
T9	Cold buffer temperature bottom
T10	Collective flow tank for cascades
Tx	Temperature flow of heating/cooling circuit x

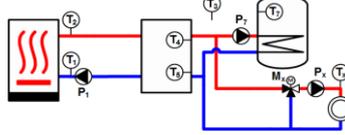
shortcuts	Definition of terms
P1	Pump heat generator
P7	Loading pump of hot water tank x
Px	Pump of heating/cooling circuit x
M1	Mixer reflux lift (optional)
Mx	Mixer hot water tank x
V1	Switch valve buffer / hot water tank
V2	Switch valve heating / cooling
Vx	Switch valve heating / cooling of heating/cooling circuit x
V4	Switch valve Buffer / heating circuit

### System schema 0



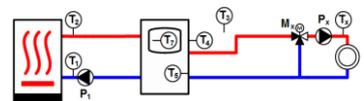
System consisting of heat generator, an external heat request and optionally an external heat source.

### System schema 1



System consisting of heat generator, an external heat request and optionally an external heat source, buffer storage, heating circuits and hot water storage. The external heat request requests the buffer memory.

### System schema 2



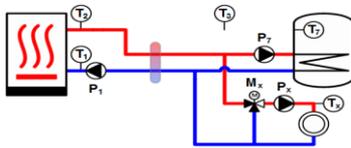
System consisting of a heat generator and optionally an external heat source, external heat request, buffer tank, heating circuits and hot water tanks. The external heat request requests the buffer tank. When the number of heat generators of the system is 0, the heating is carried out via an external heat generator.

Module	min. number	max. number
Heat generator	0	4
Buffer	0	0
Heating circuit	0	0
Hot water tank	0	0

Module	min. number	max. number
Heat generator	0	4
Buffer	1	1
Heating circuit	0	8
Hot water tank	0	4

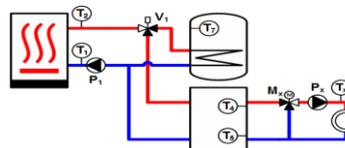
Module	min. number	max. number
Heat generator	0	4
Buffer	1	1
Heating circuit	0	8
Hot water tank	1	1

### System schema 3



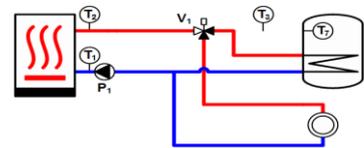
System consisting of heat generator, an external heat request and optionally an external heat source, hot water storage and heating circuits. The individual heating circuits and hot water tanks are connected via a hydraulic switch. Every heat consumer must have its own circulation pump / charge pump. The external heat request requests the heat generator.

### System schema 4



System consisting of heat generator, an external heat request and optionally an external heat source, buffer tank, a hot water tank, a hot water charging switchover valve and heating circuits. This scheme can also be used for a buffer tank with fresh water module when there is a zone switch over a valve. The fresh water module has no direct influence on the control of the heating system. The external heat request requests the buffer memory.

### System schema 5



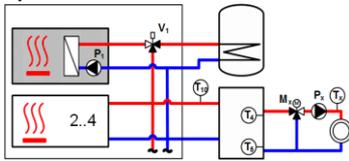
System consisting of heat generator, an external heat request and optionally an external heat source, heating circuits and optionally a hot water tank connected via a changeover valve. This scheme can also be used for one or two direct heating circuits. When using direct heating circuits, the following options must be set correctly for the scheme to work.

Module	min. number	max. number
Heat generator	0	4
Buffer	0	1
Heating circuit	0	8
Hot water tank	0	1

Module	min. number	max. number
Heat generator	0	4
Buffer	1	1
Heating circuit	0	8
Hot water tank	0	1

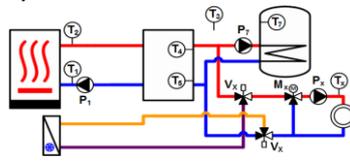
Module	min. number	max. number
Heat generator	0	4
Buffer	0	0
Heating circuit	0	8
Hot water tank	0	1

**System schema 6**



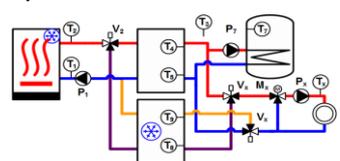
System consisting of a heat pump cascade, an external heat request and optionally an external heat source. The buffer tank with optional heating circuits is charged by a common flow. To a dedicated heat pump is connected via a switching valve of the hot water tank.

**System schema 7**



System consisting of heat generator, an external heat request and optionally an external heat source, buffer storage, heating / cooling circuits and hot water storage. As a source of cold, a heat exchanger on the source circuit of the heat generator (passive or free cooling) is available. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. The external heat request requests the buffer memory.

**System schema 8**



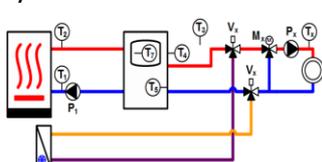
System consisting of heat generator, an external heat request and optionally an external heat source, buffer storage, heating / cooling circuits and hot water storage. As a source of cold, a heat exchanger on the source circuit of the heat generator (passive or free cooling) is available. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. The external heat request requests the buffer memory.

Module	min. number	max. number
Heat generator	2	4
Buffer	0	2
Heating circuit	0	8
Hot water tank	0	1

Module	min. number	max. number
Heat generator	0	4
Buffer	1	1
Heating circuit / Cooling circuit	0	8
Hot water tank	0	1

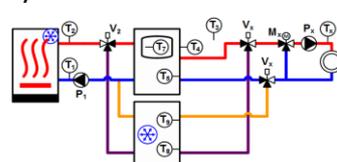
Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	2	2
Heating circuit / Cooling circuit	0	8
Hot water tank	0	1

**System schema 9**



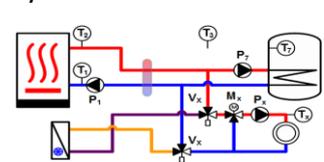
System consisting of heat generator, an external heat request and optionally an external heat source, buffer tank with an integrated hot water tank, heating / cooling circuits and hot water storage tanks. As a source of cold, a heat exchanger on the source circuit of the heat generator (passive or free cooling) is available. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. This scheme can also be used for a buffer tank with fresh water module. The external heat request requests the buffer memory.

**System schema 10**



System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, heat buffer with an integrated hot water tank, cold storage tank, a changeover valve for switching hot / cold buffers and heating / cooling circuits. In heating mode the heat buffer is charged, in cooling mode the cold buffer is charged. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. This scheme can also be used for a heat storage tank with fresh water module. The external heat request requests the heat buffer.

**System schema 11**



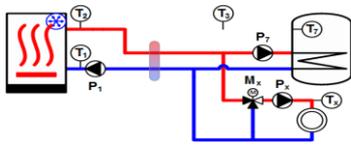
System consisting of heat generator, an external heat request and optionally an external heat source, hot water storage and heating / cooling circuits. As a source of cold, a heat exchanger on the source circuit of the heat generator (passive or free cooling) is available. The individual heating circuits and hot water tanks are connected via a hydraulic switch. Every heat / cold consumer must have its own circulation pump / charge pump. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. The external heat request requests the heat generator.

Module	min. number	max. number
Heat generator	0	4
Buffer	1	1
Heating circuit / Cooling circuit	0	8
Hot water tank	1	1

Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	2	2
Heating circuit / Cooling circuit	0	8
Hot water tank	1	1

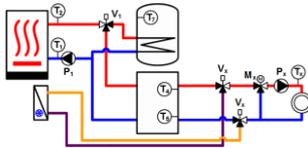
Module	min. number	max. number
Heat generator	0	4
Buffer	0	0
Heating circuit / Cooling circuit	0	8
Hot water tank	0	1

**System schema 12**



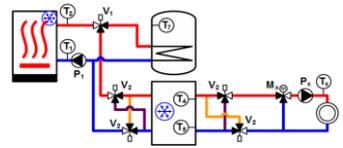
System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, hot water storage and heating / cooling circuits. The individual heating / cooling circuits and hot water storage tanks are connected via a hydraulic switch. Every heat / cold consumer must have its own circulation pump / charge pump. The external heat request requests the heat generator.

**System schema 13**



System consisting of heat generator, an external heat request and optionally an external heat source, buffer tank, a hot water tank, a hot water charging switchover valve and heating / cooling circuits. As a source of cold, a heat exchanger on the source circuit of the heat generator (passive or free cooling) is available. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. This scheme can also be used for a buffer tank with fresh water module when there is a zone switch over a valve. The fresh water module has no direct influence on the control of the heating system. The external heat request requests the buffer memory.

**System schema 14**



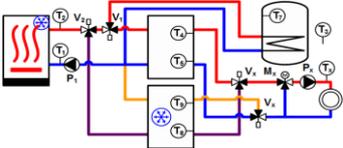
System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, storage tank for heat and cold, a hot water tank, a hot water charging valve and heating / cooling circuits. The priority of the heating / cooling circuits determines the operating mode of the buffer memory. In heating mode the cooling circuits are inactive, in cooling mode the heating circuits. In cooling mode, the stratification of the buffer can be changed via a change-over valve. The external heat request requests the buffer memory.

Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	0	0
Heating circuit / Cooling circuit	0	8
Hot water tank	0	1

Module	min. number	max. number
Heat generator	0	4
Buffer	1	1
Heating circuit / Cooling circuit	0	8
Hot water tank	0	1

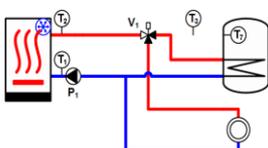
Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	1	1
Heating circuit / Cooling circuit	0	8
Hot water tank	0	1

**System schema 15**



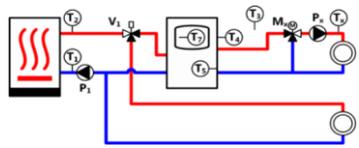
System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, heat buffer, cold storage tank, a hot water tank, a hot water changeover valve, a changeover valve for hot / cold buffer switching and heating / cooling circuits. In heating mode the heat buffer is charged, in cooling mode the cold buffer is charged. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. This scheme may also be used for a fresh water module heat buffer when there is a zone switch over a valve. The fresh water module has no direct influence on the control of the heating system. The external heat request requests the heat buffer.

**System schema 16**



System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, a non-mixed heating / cooling circuit and optionally connected via a switching valve hot water tank.

**System schema 17**



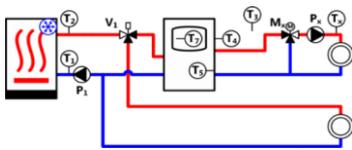
System consisting of heat generator, an external heat request and optionally an external heat source, a direct unmixed heating circuit and optionally a buffer tank connected via a changeover valve. The buffer tank can have integrated hot water or there is a hot water boiler connected via a charge pump. Further heating circuits with their own circulating pump can be connected to the buffer tank. The external heat request requests the buffer memory.

Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	2	2
Heating circuit / Cooling circuit	0	8
Hot water tank	0	1

Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	0	0
Heating circuit / Cooling circuit	0	1
Hot water tank	0	1

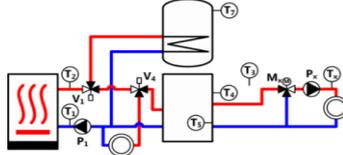
Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	1	1
Heating circuit / Cooling circuit	1	8
Hot water tank	0	1

**System schema 18**



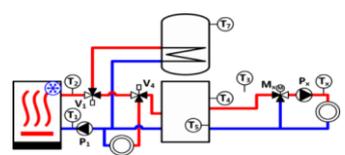
System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, a direct unmixed heating / cooling circuit and optionally a buffer tank connected via a changeover valve. The buffer tank can have integrated hot water or there is a hot water boiler connected via a charge pump. Further heating circuits with their own circulating pump can be connected to the buffer tank. The external heat request requests the buffer memory.

**System schema 19**



System consisting of heat generator, an external heat request and optionally an external heat source, a direct unmixed heating circuit, a hot water tank and a buffer tank. Between hot water tank, direct heating circuit and buffer memory is switched with 2 changeover valves. Further heating circuits with their own circulating pump can be connected to the buffer tank. The external heat request requests the buffer memory.

**System schema 20**



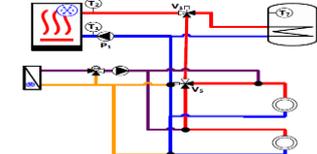
System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, a direct unmixed heating / cooling circuit, a hot water tank and a buffer tank. Between hot water tank, direct heating circuit and buffer memory is switched with 2 changeover valves. Further heating circuits with their own circulating pump can be connected to the buffer tank. The external heat request requests the buffer memory.

Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	1	1
Heating circuit / Cooling circuit	1	8
Hot water tank	0	1

Module	min. number	max. number
Heat generator	0	4
Buffer	1	1
Heating circuit	1	8
Hot water tank	0	1

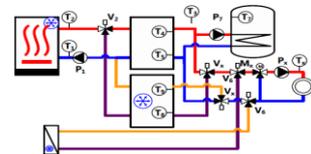
Module	min. number	max. number
Heat generator	0	4
Buffer	1	1
Heating circuit	1	8
Hot water tank	0	1

**System schema 21**



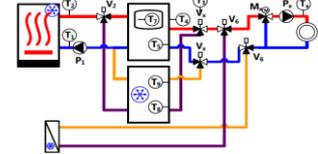
System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, one or two unmixed heating / cooling circuits and optional DHW cylinder connected via a changeover valve. Or. Changeover valve between the heating circuits. In addition, the position of the first heating circuit is dependent on the type of heating circuit of the first heating circuit.

**System schema 22**



System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, heat buffer, cold storage tank, hot water storage, a changeover valve for switching thermal / cold buffer and heating / cooling circuits. In heating mode the heat buffer is charged, in cooling mode the cold buffer is charged. Each heating / cooling circuit has its own switching valve for selecting the heat or cold storage. But it can also be used a common changeover valve for all heating / cooling circuits. The external heat request requests the buffer memory.

**System schema 23**



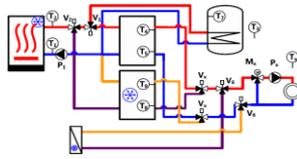
System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, heat buffer with an integrated hot water tank, cold storage tank, a changeover valve for switching hot / cold buffers and heating / cooling circuits. In heating mode the heat buffer is charged, in cooling mode the cold buffer is charged. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. This scheme can also be used for a heat storage tank with fresh water module. The external heat request requests the heat buffer.

Module	min. number	max. number
Heat generator	0	4
Buffer	0	0
Heating circuit	0	8
Hot water tank	0	1

Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	2	2
Heating circuit	0	8
Hot water tank	0	1

Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	2	2
Heating circuit	0	8
Hot water tank	0	1

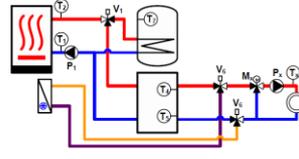
**System schema 24**



System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, heat buffer, cold storage tank, a hot water tank, a hot water changeover valve, a changeover valve for hot / cold buffer switching and heating / cooling circuits. In heating mode the heat buffer is charged, in cooling mode the cold buffer is charged. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. This scheme may also be used for a fresh water module heat buffer when there is a zone switch over a valve. The fresh water module has no direct influence on the control of the heating system. The external heat request requests the heat buffer.

Module	min. number	max. number
Heat generator / Cold generator	0	4
Buffer	2	2
Heating circuit	0	8
Hot water tank	0	1

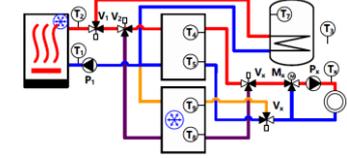
**System schema 25**



System consisting of heat generator, an external heat request and optionally an external heat source, buffer tank, a hot water tank, a hot water charging switchover valve and heating / cooling circuits. As a source of cold, a heat exchanger on the source circuit of the heat generator (passive or free cooling) is available. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. This scheme can also be used for a buffer tank with fresh water module when there is a zone switch over a valve. The fresh water module has no direct influence on the control of the heating system. The external heat request requests the buffer memory.

Module	min. number	max. number
Heat generator	0	4
Buffer	1	1
Heating circuit	0	8
Hot water tank	0	1

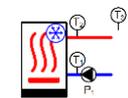
**System schema 26**



System consisting of heat / cold generator (active cooling), an external heat request and optionally an external heat source, heat buffer, cold storage tank, a hot water tank, a hot water changeover valve, a changeover valve for hot / cold buffer switching and heating / cooling circuits. In heating mode the heat buffer is charged, in cooling mode the cold buffer is charged. Each heating / cooling circuit has its own changeover valve for selecting the heat or cold generator. But it can also be used a common changeover valve for all heating / cooling circuits. This scheme may also be used for a fresh water module heat buffer when there is a zone switch over a valve. The fresh water module has no direct influence on the control of the heating system. The external heat request requests the heat buffer.

Module	min. number	max. number
Heat generator	0	4
Buffer	2	2
Heating circuit	0	8
Hot water tank	0	1

**System schema 27**



System consisting of heat / cold generator, an external heat request and optionally an external heat source.

Module	min. number	max. number
Heat generator	0	4
Buffer	0	0
Heating circuit	0	0
Hot water tank	0	0

## 14. Initial operation

Ensure that all valves in the water circuit and the refrigerant circuit are open and that water can flow unimpeded. Check whether all clamps are tight. Make sure that the appliance and the casing are properly closed. Check for refrigerant leaks caused by knocks etc.

## 15. Commissioning

- Before starting the commissioning activities, ensure that the casing and body are firmly mounted and the mechanical work on the heat pump has been completed.
- Panels and casings must be firmly mounted. It is also important that the electrical connection work is complete before the commissioning activities are started!
- Now push the main MCB up.
- The whole heating heat pump is now in setup mode and ready for the setup wizard.
- After completion, the heat pump is switching in automatic mode.
- Check whether the condenser input is becoming hot on the refrigerant circuit side and the condenser output is becoming hot on the water side.
- Make sure that the rotational direction of the compressor is correct. If the rotational direction of the compressor is found to be incorrect, this must immediately be remedied.
- Use the commissioning protocol, which is part of the warranty conditions, which can be ordered at M-Tec.

### 15.1. Commissioning AP440

Detail Menu ► Service ► Stationsettings:

Station settings		
Systemname	AP420	>
Type	Master	>
Heating circuit	none	>
Apply		

Mask is not available in the web application.

With **Systemname** a unique name for the master operating unit can be set via an alphanumeric input panel. Touch remote controls have to assign the same systemname as their master operating unit.

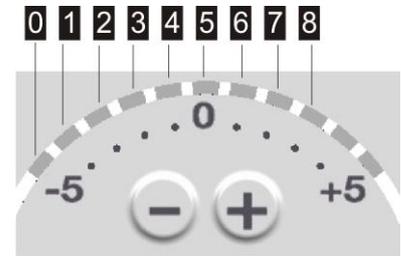
Via **Type** can be determined from a dialogue whether the station is a master operating unit or a touch remote control.

If present heating circuits should be operated with this station (e.g. setting the nominal room temperature of the heating circuit) a heating circuit has to be allocated to it via the parameter **heating circuit** from the corresponding text selection menu. The performed settings will be accepted by pressing **APPLY**.

## 15.2. Commissioning OI420

In the delivery mode, the address is set to 0 (thus heat circuit 1). An address may only be used once in the system for same-type modules! If there are additional OI 423/A with the same address on the system bus, the LED on the OI 423/A blinks alternating between red and orange. The address is set via the service menu. Proceed as follows:

1. Open the service menu by pressing both arrow keys  simultaneously for at least 3 sec. LED1 (left LED on the lower LED semi-circle) lights up and signals the selection of the menu item "Bus address".
2. Press the buttons "-" and "+" to set the desired address. The top semi-circle is used to display the currently selected address value. The currently specified address value is shown starting with 0 from the left.  
The assignment to the desired heating circuit (HC1, HC2, ...) is determined by the address (0, 1, ...) of the OI 423/A
3. Save the entered settings by pushing both arrow keys simultaneously (for three seconds).



The address is now set.

## 15.3. Setup assistant

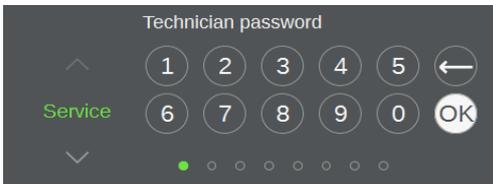
The commissioning of a system using the setup assistant is done by the processing of individual steps. In the following masks, the steps of device settings and system scheme are shown exemplarily. Are all steps of the setup assistant processed, the settings entered must be taken by consent. Then the standard layout appears again. In the delivery condition or respectively during the loading of the factory settings, no type is loaded by default. However the parameters are set with default values which represent a heat generator with a small heating power (< 10 kW).

Icon	Description
	<b>Next</b> , for opening the next settings mask of the setup assistant. Press it whenever you are not sure which values you have to change.
	<b>Previous</b> , for opening the previous settings mask of the setup assistant.
	<b>Cancel</b> , for cancelling the setup assistant. The settings made are discarded.
	<b>Help</b> , for opening the help system. Press it whenever you need further assistance.

To start the operation of the heat generating system, proceed as follows:

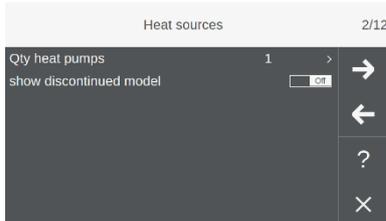


### 1. Detail menu:



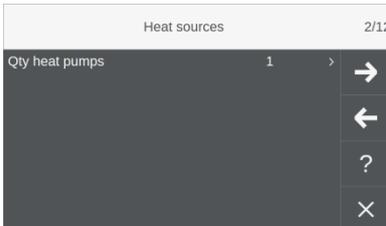
Put in the Service Technician password. If the Service Technician user level is active and the operating unit is not operated for 30 minutes, the system will automatically reset to the normal user mode.

### 2. Setup assistant:



Check the settings of the following screens and if necessary, adjust the parameters by clicking on the different values.

### 3. Heat sources



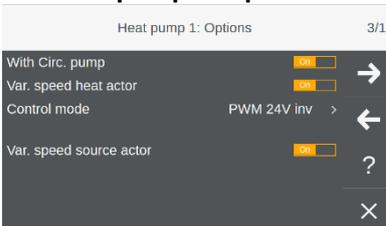
Quantity of heat pumps the system contains.

### 4. Type selection



By click on the value, it can be specified which of the existing compressor types with all their basic settings are to be loaded. Depending on the selected type, the parameter settings change in the subsequent masks.

### 5. Heat pump 1: Options

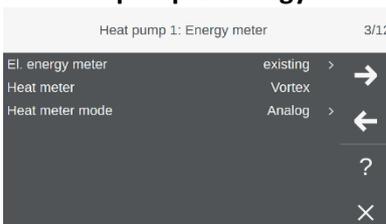


For WPL, WPLK and WPS26 the circulation pumps are already pre-set.

For all other types, please select the values according to the following table.

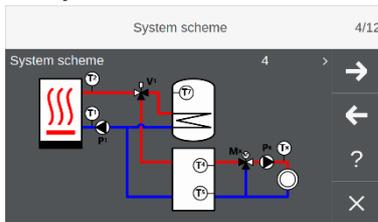
Pump	Control mode
Yonos PICO	ohne
Yonos Para	PWM 24 inv
Stratos Para 25	PWM 24 inv
Stratos Para 30	PWM 24V inv

### 6. Heat pump 1: Energy meter



The selected settings are required if an electricity / heat meter from M-Tec is installed. Incorrect values can lead to errors.

## 7. System scheme:



Configuration mask with a graphic of the currently selected system schema. Further information can be found in the chapter "System diagram".

## 8. IO Configuration:

Name	
	1HKaem-1HKd-Kuehlen
	1HKaem-Zirk-Kuehlen
	2HKaem-1HKdirekt
	2HKaemischt-Zirk
	3HKa-1HKd-Kue-2Solar
	3a-1d-Zirk-Kue-2Solar
	4HKa-1HKd-Zirk-2Solar
	4HKaem-1HKd-2Solar

Check the IO configuration of the following screen. The details of the designations can be found in the chapter "**Wiring diagram of interface**". The selection must be made as concrete as possible.

## 9. System configuration:

Check the settings of the following screens and adjust the parameters if necessary by clicking on the different values.

## 10. Heat circuit 1: options

This menu is only available after selecting a heating circuit. The settings selected here are for weather-compensated, mixed heating circuits with heating. If necessary, you can adjust the parameters and the heating curve on the following screen.

## 11. Hot water tank 1: Options

If a hot water storage is included in the scheme, you can specify the options on this screen.

The following screen is responsible for the main temperatures of the hot water tank.

## 12. Remote maintenance:

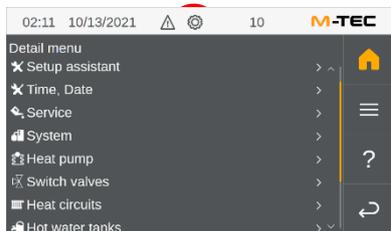
The remote maintenance can be activated via ON/OFF switch.

"**Internet available**" means, that the Internet is available.

"**Connected to server**" will be activated, if there is a contract with M-Tec to get the KEBA access.

"**Systemname**" designate the unit for the network.

### 13. Accept the settings:



The settings will be applied when exiting the setup mode. Switch to an active system operating mode, by pressing the following buttons:

You have completed the general configuration of the system.

The start up of the heating generator and the heat distribution follows.

### 15.4. Set-up of heating generator and heat distributing

For the settings of the heating circuits, use the following guidelines:



For the settings of the screed drying, use the following guidelines:



For the settings of the heating circuits, use the following guidelines:



## 16. Manual mode

The manual mode enables the service technician to manually activate and operate individual components of the heating system. This special system operating mode is activated automatically as soon as parameters of the sub masks are edited. Otherwise a direct activation is effected via the ON/OFF switch of **Manual mode**. An activate manual mode will be displayed on the status bar via the status icon



The duration of the manual operation is defined via the parameter "Start-up time" (default 2 hours) and will be deactivated automatically.

### 5.1. Testing of the sensors and actuators with manual mode

1. Detail menu ► System ► Manual mode:

“Manual mode” activated via ON/OFF switch.

If activated, all relays are turned off and the icon  will appear on the status bar

2. **Heating circuits ► Heating circuits 1-4:**

Return to the previous screen and enter “**Heat circuits**”

"Mixer nominal value" push the slider CLOSED/OFF/OPEN to see if the mixer settings changes.

3. If successful, return to the main screen. If the test cause any issues, please resolve now.

4. Press the  icon on the main screen and deactivate the manual mode.

5. **Detail menu ► Service ► Save/Load parameters ► Save parameters ► Start saving:**  
Backup the system configuration.

6. **Press two times Return and choose Restart:**  
Restart the system to accept the set configurations.

7. The heat generating system is now ready.

## 17.Screed drying

A screed heating program can be configured with the aid of the AP440 control unit. There is already a screed drying program deposited, this can be changed if necessary.

The number of intervals indicates the duration of the screed heating program. The duration of the intervals can also be adjusted.

### **ATTENTION!**

To operate the screed drying with the heat pump, a system temperature of min. 20 ° C is required. If screed heating is started at lower system temperatures, damage to the compressor is not ruled out. A claim for warranty is in this case not possible.

In mixed heating circuits, the temperature to be introduced is the flow temperature of the heating circuit. In unmixed heating circuits the buffer temperature or the flow temperature of the heat pump is used.

The following points must be considered for screed heating:

- The baking process must be carried out according to the requirements of the screed leveler
- Only after the required minimum hardening time of the screed used can the heating be started.
- During bake-out, the rooms are to be regularly ventilated intermittently, whereby drafts are to be avoided
- Repeating the baking process is only required if the residual moisture test is negative
- It is not recommended to carry out the heating with the heat pump without finished insulation of the building envelope.

### **Information**

It is expressly pointed out that a check of the residual moisture is essential.

A liability for the baking process is excluded!

## 18. Web application

You can operate your M-Tec heat pump directly via the control unit or via a web interface. There you can make all the settings according to the operating instructions analogous to the user interface of your control unit. There are two ways to access the web interface:

### 18.1. Connection via local network

The "local network" is defined as the internal home network of your building. The heat pump and the device with which you want to access the heat pump (e.g. PC, notebook, smartphone) are in the same network. This also requires a network connection of the heat pump either using a LAN cable or a WLAN stick (Art. No. 670076).

Once you have connected the heat pump to your network, we recommend restarting the heat pump so that the device is assigned an IP address by your network router. You can then read off the IP address on your control unit in the "Service" - "Network" - "LAN" menu (or, if you are using the WLAN-Stick, under "WLAN"). Enter this IP into the address bar of the browser and the visualization will be shown after a few seconds.

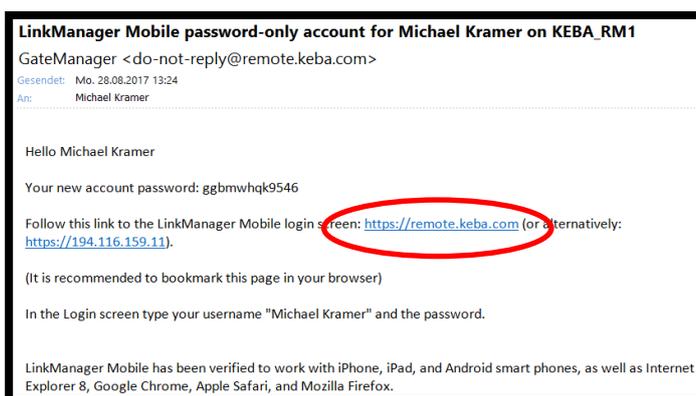
### 18.2. Connection via external network

With access from an external network, you can access your M-Tec heat pump worldwide with one device and make settings. The heat pump must be equipped with an active internet connection (via LAN cable or WLAN stick) and an active remote maintenance license must have been ordered.

## IMPORTANT

Even if the heat pump has remote maintenance access, access is not automatically activated. In order to gain access to the heat pump, this must be requested or ordered by the installing company (heating installer, plumber).

After the access has been activated, an email with the access data is automatically sent. It looks like this:



After setting up the portal access, the access data will be sent to your state e-mail address.

Follow the instructions as shown in the e-mail. Afterwards you will be taken to the overview screen in which you see the attachments assigned to them.

Click on the appropriate attachment:



Click on "WebHmi":



Click on "www" and get access to the visualisation



## IMPORTANT

The password from the mail can only be used once. You will be asked for a new password the first time you log in. It is therefore imperative that you carry out the first login process completely, as the password loses its validity immediately.

## 19. Handover to end customer

Once installation is complete and the system has been tested to ensure that it is functioning correctly, the operating instructions must be explained to the operator and its attention must be drawn to the following points in the operating instructions:

- Important informations and Safety Informations
- Refrigerant R410A
- Cleaning and care
- Operation and Display

The operator must also be informed that unauthorised work on the heat pump invalidates the warranty.

## 20. Cleaning and care

A periodic maintenance is necessary first of all to keep a correct and efficient operation of the heat pump, in order to reduce wear and deterioration of components. The frequency of interventions is decided by the user, and mainly it depends from two factors:

- Dirt can be removed from the surface with a damp cloth and commercially available cleaning agents.
- Lubricant and sealant residues and oxidation can contaminate the heating water. The heating water must therefore be checked at regular intervals. If contamination is detected, the heating water must be cleaned.
- The heating system may only be cleaned by an authorised contractor.
- The water pressure in the heating system must be regularly checked, as fault-free operation is not possible if there is insufficient heating water.
- If a drop in water pressure is detected, the system should be topped up with water.
- In case of a tank with anodic corrosion protection, the anode must be checked at least once a year. Replace the anodic corrosion protection if it is used up. Check the anode more frequently if the water is aggressive.

## 21. Warranty information

If one or more of these points apply, M-Tec cannot be held liable for its products by third parties. The warranty is invalidated if:

- servicing and maintenance has not been carried out in accordance with requirements, repairs have not been performed by M-Tec personnel or have been performed without prior written consent from M-Tec.
- modifications to the system have been carried out without prior written consent from M-Tec.
- settings and safety devices have been modified without prior written consent from M-Tec.
- refrigerants or lubricants other than the original ones or other than those prescribed have been used.
- the system was not installed and/or connected in accordance with the installation instructions.
- the system is being used improperly, incorrectly, negligently or not in accordance with its design and/or its intended purpose.

## 22. Disposal

The operator is responsible for proper disposal of the heat pump and all operating fluids and cleaning agents. The industry-specific and local regulations for the disposal of different materials must be observed. The heat pump may only be dismantled and disposed of by qualified personnel.

The refrigerant must be recycled or disposed of in accordance with the European directive relating to fluorinated greenhouse gases.

- Disconnect the heat pump from the supply lines/cables (water and electricity). Ensure that no other devices are affected by this.
- Make sure that all supply lines/cables to be detached have zero voltage and are unpressurised.
- Remove all operating and auxiliary materials (e.g. refrigerant) and dispose of them in an environmentally appropriate manner.
- Disassemble the heat pump until all system parts can be assigned to a material group and disposed of accordingly.
- Dispose of the heat pump in an environmentally responsible manner. Observe national regulations.

## 23. Safety datasheet

Because this is a closed refrigerant circuit, it is not expected that a refrigerant leakage occurs. However should a refrigerant leak occur follow the advices of the safety data sheet.

### Safety datasheet R410A

#### **1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY**

**Product name**

R410A

**Trade name**

R410A

**Components/Impurities**

**Contains the following components:**

50% w/w Difluoromethane (R32) {F+;R12} {EINECS No. 200-839-4}

50% w/w Pentafluoroethane (R125) {EINECS No. 206-557-8}

**Relevant identified uses**

Industrial and professional. Perform risk assessment prior to use.

**Uses advised against**

Consumer use.

**Company identification**

BOC, Priestley Road, Worsley, Manchester M28 2UT

**E-Mail Address** ReachSDS@boc.com

**Emergency phone numbers (24h):** 0800 111 333

#### **2 HAZARDS IDENTIFICATION**

*EC Classification*

Not classified as dangerous preparation.

In high concentrations may cause asphyxiation

**Risk advice to man and the environment**

Liquefied gas.

#### **3 COMPOSITION/INFORMATION ON INGREDIENTS**

**Substance/Preparation:** Preparation.

**Components/Impurities**

**Contains the following components:**

**1,1,1,2 -Pentafluoroethane (R 125)** 50 %

**CAS No:** 354-33-6      **EINECS No.:** 206-557-8

**EC classification of pure substance:**

Proposed by the industry

Not classified as a dangerous substance.

In high concentrations may cause asphyxiation.

**Difluoromethane (R 32)** 50 %

**CAS No:** 75-10-5      **EINECS No.:** 200-839-4

**EC classification of pure substance:**

Proposed by the industry

F+; R12

Contains no other components or impurities which will influence the classification of the product.

#### **4 FIRST AID MEASURES**

**Inhalation**

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF INHALATION OVEREXPOSURE. RESCUE

PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. *Conscious*

*inhalation victims should be assisted to an uncontaminated area and inhale fresh air. If breathing is*

*difficult, administer oxygen. Unconscious persons should be moved to an uncontaminated area and,*

*as necessary, given artificial resuscitation and supplemental oxygen. Treatment should be*

*symptomatic and supportive.*

**Skin/eye contact**

*In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing.*

*Immediately flush eyes thoroughly with water for at least 15 minutes.*

*Remove contaminated clothing. Drench affected area with water for at least 15 minutes*

*Obtain medical assistance*

**Ingestion**

*Ingestion is not considered a potential route of exposure.*

#### **5 FIRE FIGHTING MEASURES**

**Specific hazards**

*Exposure to fire may cause containers to rupture/explode. Non flammable.*

**Hazardous combustion products**

*If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition:*

*Carbonyl fluoride, Hydrogen fluoride, Carbon monoxide.*

**Suitable extinguishing media**

*All known extinguishants can be used.*

**Specific methods**

*If possible, stop flow of product. Move container away or cool with water from a protected position.*

**Special protective equipment for fire-fighters**

*Use self-contained breathing apparatus and chemically protective clothing.*

#### **6 ACCIDENTAL RELEASE MEASURES**

**Personal precautions**

*Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation.*

**Environmental precautions**

*Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Try to stop release.*

**Clean up methods**

*Ventilate area.*

#### **7 HANDLING AND STORAGE**

**Handling**

*Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Refer to supplier's handling instructions.*

**Storage**

*Keep container below 50°C in a well ventilated place. Secure cylinders to prevent them from falling.*

## 24. Declaration of Conformity



### EC Declaration of Conformity

PicoEnergy declares hereby, that the products fulfill all relevant EC directives, EC safety standards and product-specific standards as laid out in the guideline set down by the member states of the EC Commission. This declaration is valid for all products listed under Models-Types. Unauthorized changes to the product result in loss of valid of this declaration.

#### Company

M-TEC international GmbH & Co KG  
Aumühlweg 20  
AT 4812 Pinsdorf

#### Modell-Type

##### Direct expansion/Water heat pump

WPD412 230V	WPD412
WPD618 230V	WPD618

##### Brine/Water heat pump

WPS26 kompakt	WPS26 AC
WPS26 PVT	WPS26 PVT AC
WPS412 230V	WPS412
WPS618 230V	WPS618
WPS1036 AC	WPS1052 AC

##### Water/Water heat pump

WPS-W26	
WPS-W412 230V	WPS-W412
WPS-W618 230V	WPS-W618
WPS-W1036 AC	WPS-W1052 AC

##### Air/Water heat pump

WPL412	WPL412 230V
WPL618	WPL618 230V
WPLK412	WPLK412 230V
WPLK618	WPLK618 230V
WPLK722	WPLC1030

#### Relevant EC-Guidelines

EC-machinery directive (2006/42/EG)  
EC-low voltage directive (2014/35/EU)  
EC-EMC directive (2004/30/EU)  
EC-pressure equipment directive (2014/68/EU)  
EC-Ecodesign directive (2009/125/EG)  
EU-Energy Labelling Directive (2017/1369/EU)

#### Relevant harmonized European Standards

EN 60335-1:2012 / EN 60335-2-40:2014  
EN 55014-1:2012 / EN 55014-2:2016  
EN 61000-3-2:2019 / EN 61000-3-3:2014  
EN 378-1:2018 / EN 378-2:2018  
EN 378-3:2017 / EN 378-4:2019  
EN 14511-1:2019 / EN 14511-2:2018  
EN 14511-3:2018 / EN 14511-4:2018  
EN 16147:2017

#### National Standards / Guidelines

ÖNORM M 7755 Teil1/2 (A)  
ÖNORM M 7770 (A)  
Druckgeräteverordnung (A)  
DIN 8901 (D)  
Druckgeräterichtlinie (D)  
BGR 500 (D)  
SVTI (CH)

Pinsdorf, 01.01.2022

Dr. Hannes F. Jakob, MBA  
Executive Partner





# M-TEC

ENERGY FOR FUTURE

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