

# Installation and operating instructions

**VIESSMANN**

**Vitotron 100**  
Type VMN3, VLN3

Electric instantaneous water boiler for central heating



## **VITOTRON 100**



### Safety instructions

-  Please follow these safety instructions closely to prevent hazards, injury and material losses.

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### Safety instructions explained

-  **Danger**  
This symbol warns against the risk of injury.

**Note**  
*Details identified by the word "Note" contain additional information.*

-  **Caution**  
This symbol warns against the risk of material losses and environmental pollution.

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### Target group

These instructions are exclusively intended for qualified contractors.

- Work on electrical equipment must only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

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### Regulations to be observed

- National installation regulations
- Statutory regulations for the prevention of accidents
- Statutory regulations for environmental protection
- Codes of practice of the relevant trade associations
- Relevant safety regulations in each country

**Safety instructions** (cont.)**Safety instructions for working on the system****Working on the system**

- Isolate the system from the power supply, e.g. by removing the separate fuse or by means of a mains isolator, and check that it is no longer live.

**Note**

*In addition to the control circuit, there may be several power circuits.*

**Danger**

Contact with live components can result in severe injuries. Some components on PCBs remain live even after the power supply has been switched off. Wait at least 4 minutes until the voltage has completely dropped out before removing the covers from the appliances.

- Safeguard the system against reconnection.
- Wear suitable personal protective equipment when working on the system.

**Danger**

Hot surfaces and fluids can cause burns or scalding.

- Before maintenance and service work, switch OFF the appliance and let it cool down.
- Never touch hot surfaces on the appliance, fittings or pipework.

**Caution**

Electronic assemblies can be damaged by electrostatic discharge. Prior to commencing any work, touch earthed objects such as heating or water pipes to discharge static loads.

**Maintenance****Caution**

Repairing components that fulfil a safety function can compromise the safe operation of the system. Replace faulty components only with genuine Viessmann spare parts.

**Auxiliary components, spare and wearing parts****Caution**

Spare and wearing parts that have not been tested together with the system can compromise its function. Installing non-authorized components and making non-approved modifications or conversions can compromise safety and may invalidate our warranty. For replacements, use only original spare parts supplied or approved by Viessmann.

**Safety instructions for operating the system****What to do if water escapes from the appliance****Danger**

If water escapes from the appliance there is a risk of electric shock. Switch OFF the heating system at the external isolator (e.g. fuse box, domestic distribution board).

**Danger**

If water escapes from the appliance there is a risk of scalding. Never touch hot heating water.

**Keyword index**

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## Disposal of packaging

Please dispose of packaging waste in line with statutory regulations.

## Symbols

Symbol	Meaning
	See other documents for more information
	Warning of material losses and environmental pollution

## Intended use

The appliance is intended solely for installation and operation in sealed unvented heating systems that comply with EN 12828, with due attention paid to the associated installation, service and operating instructions.

Depending on the version, the appliance can only be used for the following purposes:

- Central heating
- DHW heating

The range of functions can be extended with additional components and accessories.

Intended use presupposes that a fixed installation in conjunction with permissible, system-specific components has been carried out.

Commercial or industrial usage for a purpose other than central heating or DHW heating shall be deemed inappropriate.

Incorrect usage or operation of the appliance (e.g. the appliance being opened by the system user) is prohibited and will result in an exclusion of liability. Incorrect usage also occurs if the components in the heating system are modified from their intended function.

### Note

*The appliance is intended exclusively for domestic or semi-domestic use, i.e. even users who have not had any instruction are able to operate the appliance safely.*

## Product information

### Vitotron 100, type VLN3, VMN3

The Vitotron 100 may only be delivered to the countries specified on the type plate. For deliveries to other countries, approved contractors must arrange individual approval on their own initiative and in accordance with the law of the country in question. The type plate is located at the top of the boiler.

## Product description

The Vitotron 100 is a system boiler with an optional connection to a DHW cylinder.

In the delivered condition, the Vitotron type VLN3 is set up for operation with a constant boiler water temperature.

In the delivered condition, the Vitotron 100 type VMN3 is set up for weather-compensated operation. An outside temperature sensor and a room temperature sensor are included in the standard delivery.

The appliance is equipped with a sealed unvented hydraulic system with 2 connections for the heating flow and return.

These boilers are only intended for installation in sealed unvented heating systems. Boilers for open vented heating systems are also available.

The following components are integrated into the hydraulic system:

- Circulation pump
- Safety valve
- Diaphragm expansion vessel (5 litres)

## DHW heating with a DHW cylinder

A 3-way valve is available for connecting the DHW cylinder, which must be installed on the outside of the boiler. The cylinder temperature sensor (accessories) can be connected to the boiler control unit and demands heating energy.

## Installation information

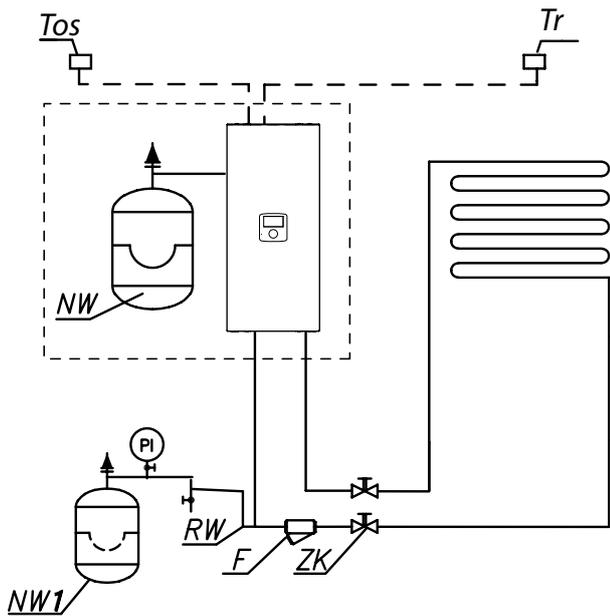
- A moist central heating system must be flushed before the boiler is installed.
- Do not install any shut-off fittings (e.g. valves) at the safety valve diffuser.
- The boiler must be installed on a flat wall surface.
- The boiler must not be installed in a humid environment, in a place where there is a risk of explosion, or in a place where the ambient temperature may fall below 0 °C.
- All installation work must be carried out with the power and water supply switched off.
- The boiler is set at the factory for use with a central heating system. To operate the boiler in conjunction with a DHW cylinder, the standard setting must be changed in the extended settings.
- The electrical installation must include surge protection to protect the sensitive, electronically controlled heating system from voltage peaks.
- Do not drain the water from the central heating system after the heating period.
- Leave the controller in standby mode between heating periods and do not interrupt the power supply.

The VMN3 boiler is equipped with an expansion vessel (content: 5 l, pressure: 1.5 bar). The expansion vessel is sufficient for the following heating system capacities at the specified heating medium temperatures and the specified central heating system pressure.

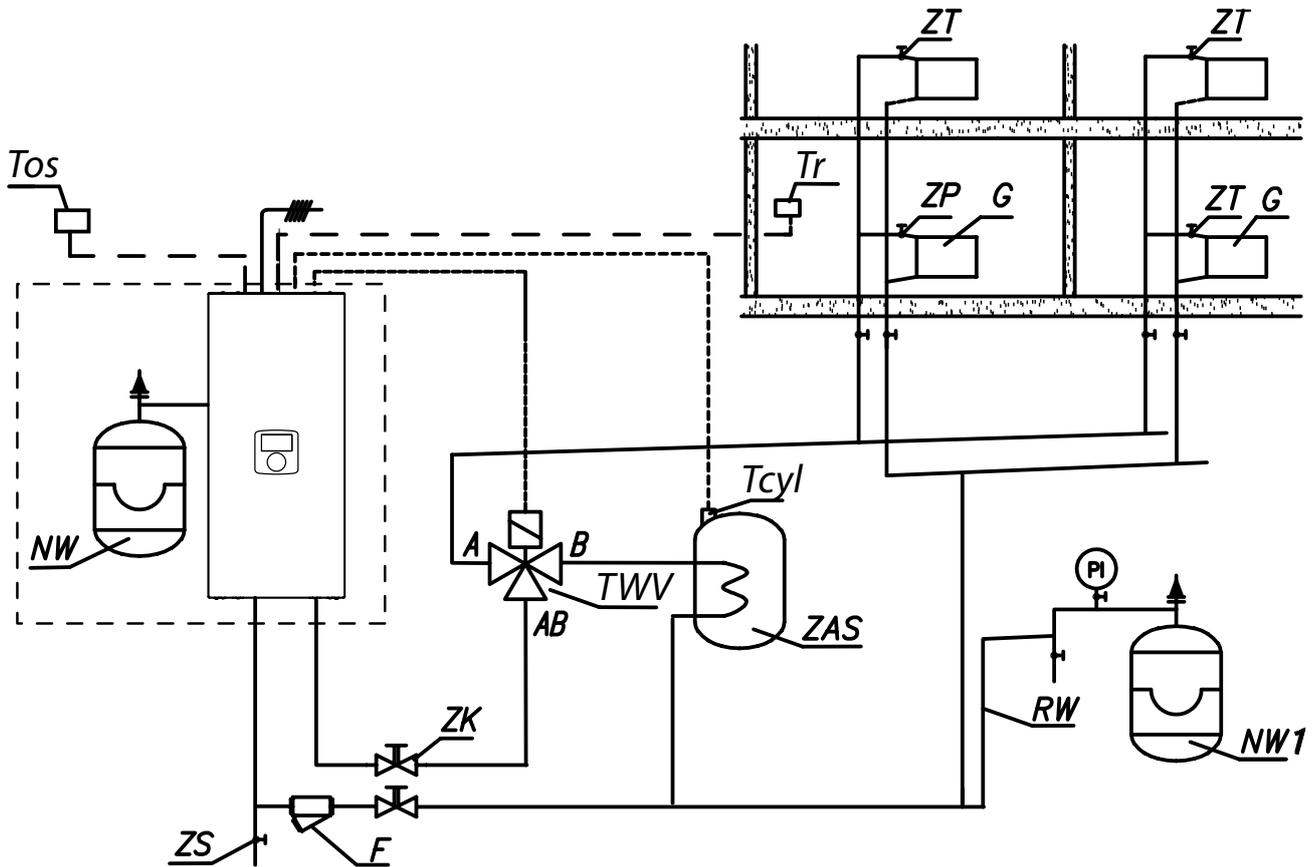
Heating medium temperature (flow and return)	Capacity of central heating system	Pressure in central heating system
[°C]	[l]	[bar]
85/70	56	1.5
70/55	80	
55/45	127	
50/40	153	
45/35	188	

If a higher capacity is required for the moist central heating system, an additional expansion vessel must be installed.

Connecting the boiler to the central heating system

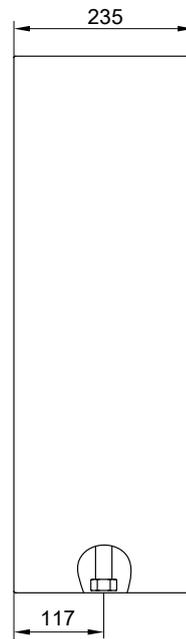
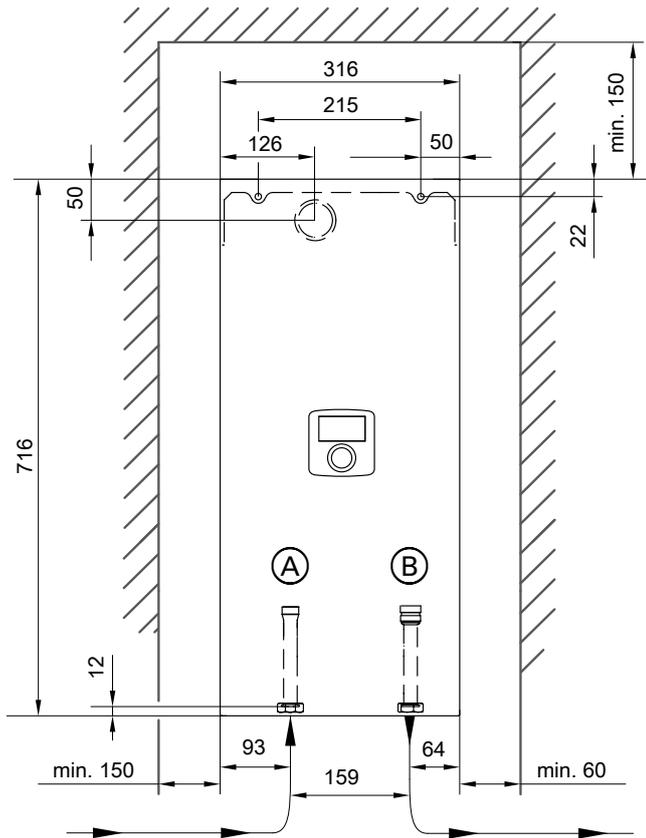


- PI – Pressure gauge
- ZK – Shut-off valve
- RW – Expansion line
- NW – Integral expansion vessel
- NW1 – Expansion vessel
- ZT – Thermostatic valve
- ZP – Instantaneous water heater valve
- F – Filter
- G – Radiator
- ZS – Drain valve
- TWV – Three-way valve
- ZAS – DHW cylinder
- Tr – Room temperature sensor
- Tcyl – Temperature sensor for DHW cylinder (WE-019/01)
- Tos – Outside temperature sensor (WE-027)



The filter must be installed so that the flow direction of the heating medium matches the arrow on the casing and the cover is on the bottom of the filter. Filters can be installed on horizontal and vertical lines. We recommend installing shut-off valves immediately before and after the filter to facilitate cleaning or replacement of the filter element.

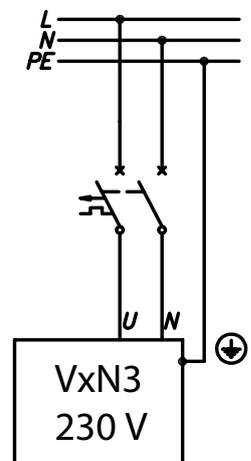
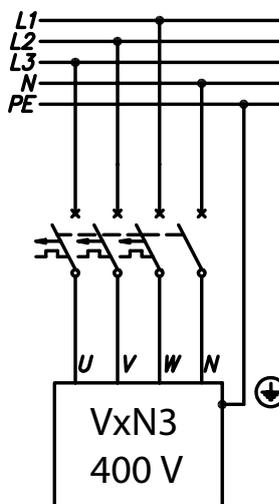
**Assembly and installation**



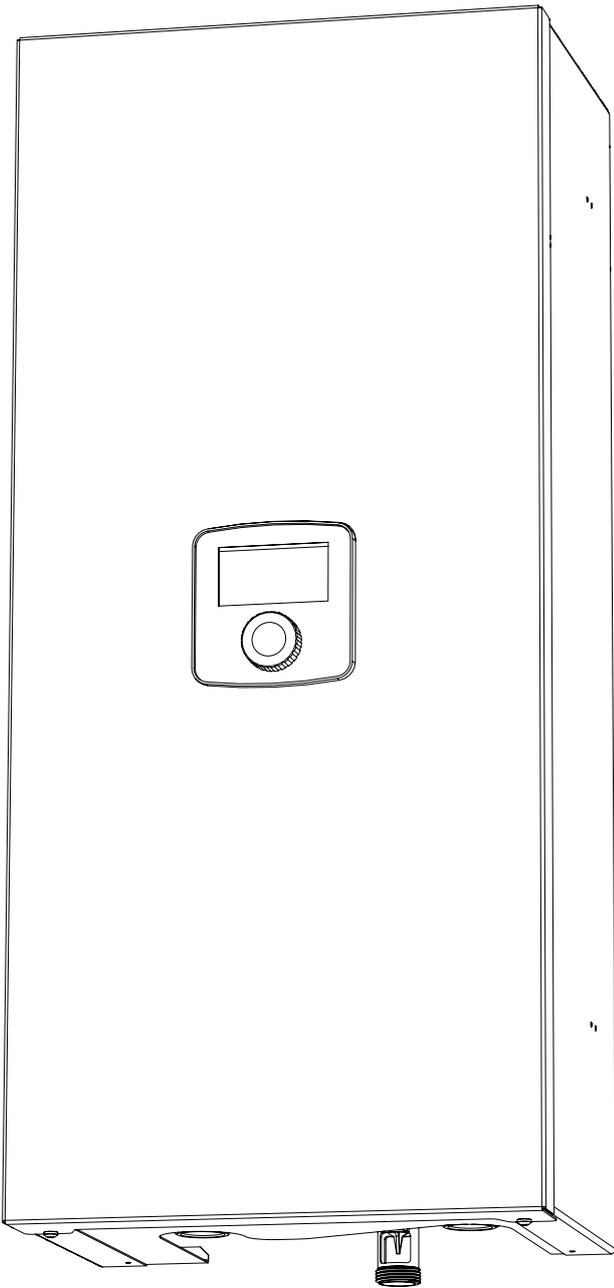
- (A) Heating return (to boiler) G 3/4"
- (B) Heating flow G 3/4"

1. Secure the boiler vertically with fixings and flow and return lines pointing downwards. Maintain clearances to the wall and ceiling.
2. Connect the boiler to the central heating system with shut-off valves.
3. Fill the central heating system with treated water or frost-proof fluid.
4. Vent the central heating system.
5. Connect the boiler to the electrical connection.
6. Install and connect the Tr and Tos sensors and other appliances to the connection points for external sensors and appliances.
7. After completing the above steps, start the boiler, select the language on the boiler, run the boiler at maximum output for 60 minutes, then vent the pump [Configuration > Pump > Vent].
8. Set the maximum temperature factor in the installation [Configuration > Central heating circuit > MAX. power supply temp.].

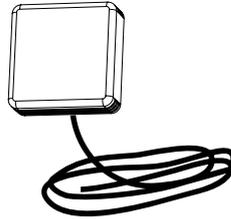
**!** **Caution**  
 An incorrect electrical connection will result in damage.  
 Do not connect the FN, MA, RT, Tcyl, Tos, Tr inputs when they are supplied with power!



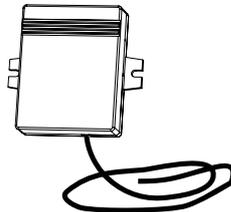
**Assembly and installation** (cont.)



Room temperature sensor



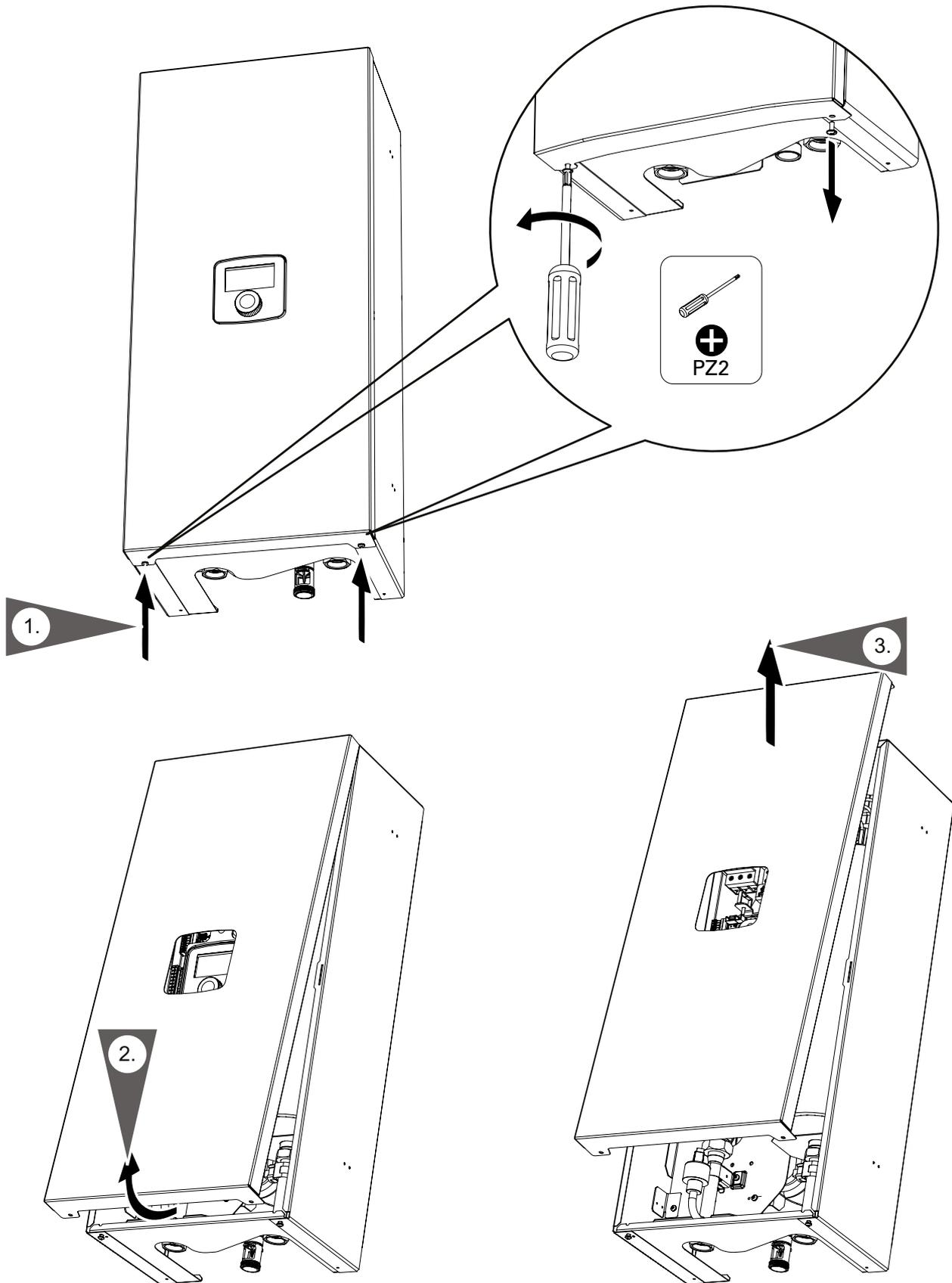
Outside temperature sensor



**Note**

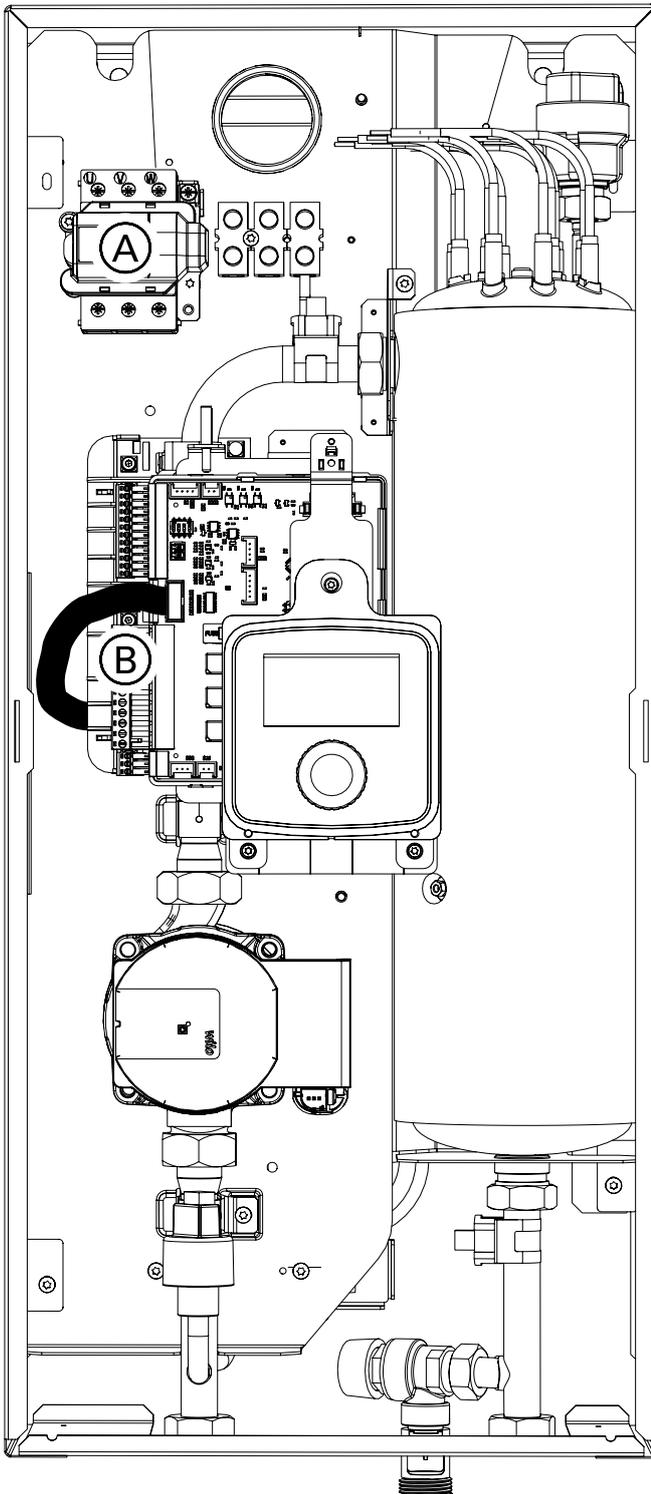
*A room temperature sensor and an outside temperature sensor are included in the standard delivery of model VMN3.*

Removing the side cover



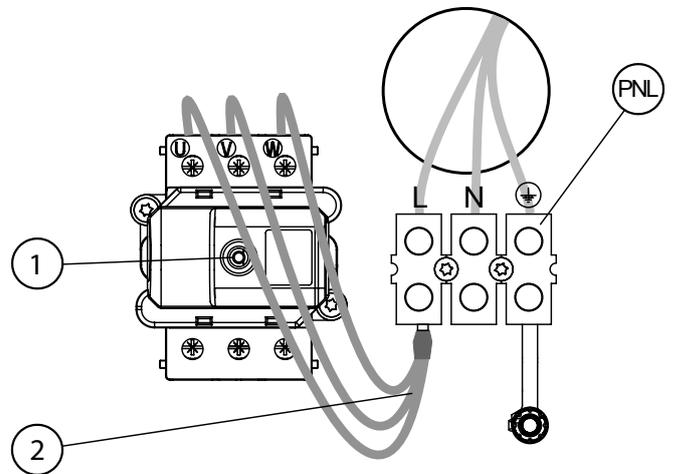
**Assembly and installation (cont.)**

**Internal view**



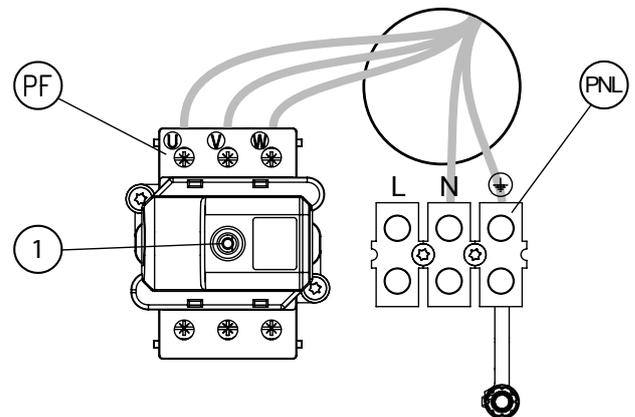
- Ⓐ Main power supply
- Ⓑ Control inputs/outputs and sensors

**Connection to a single-phase power system  
(for 4 kW, 6 kW and 8 kW boilers)**



- PNL – Terminals for neutral, earth and phase conductors
- ① – Temperature limiter
- ② – Additional conductors (only for single-phase system) Input Output

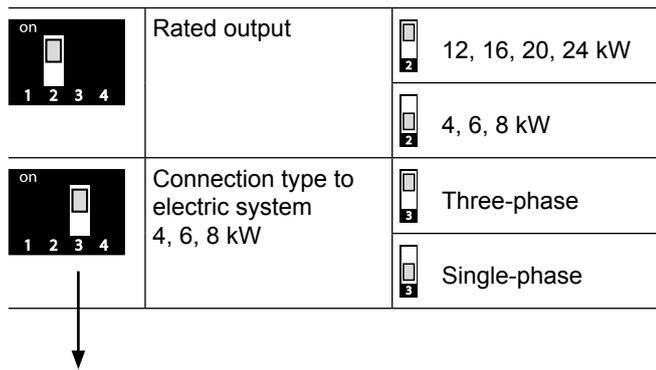
**Connection to the three-phase power system**



- PNL – Terminals for neutral and earth conductors
- PF – Terminals for phase conductors
- ① – Temperature limiter

## Installation sequence

### Selecting the power supply type



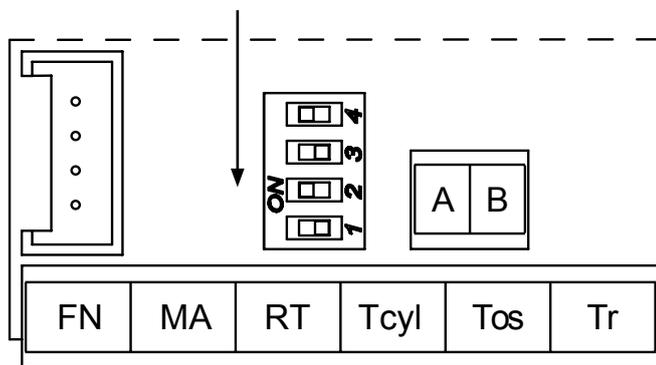
If the electrical connection type is configured incorrectly, e.g. using a single-phase installation at 12, 16, 20 and 24 kW, the configuration fault message "Configuration fault" appears after commissioning the boiler.



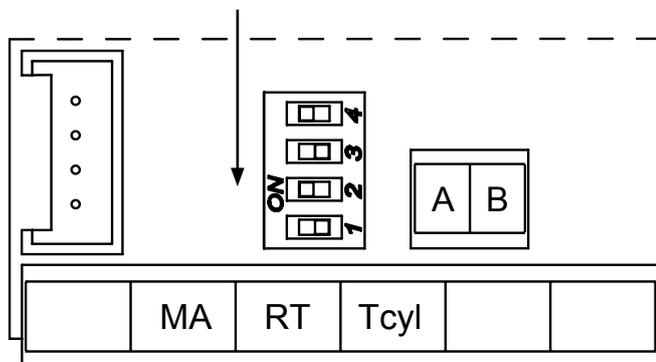
#### Caution

Do not adjust switches 1 or 2! – Keep factory settings. Adjust switch 3 according to the power supply type (1 or 3-phase).

### Type VMN3

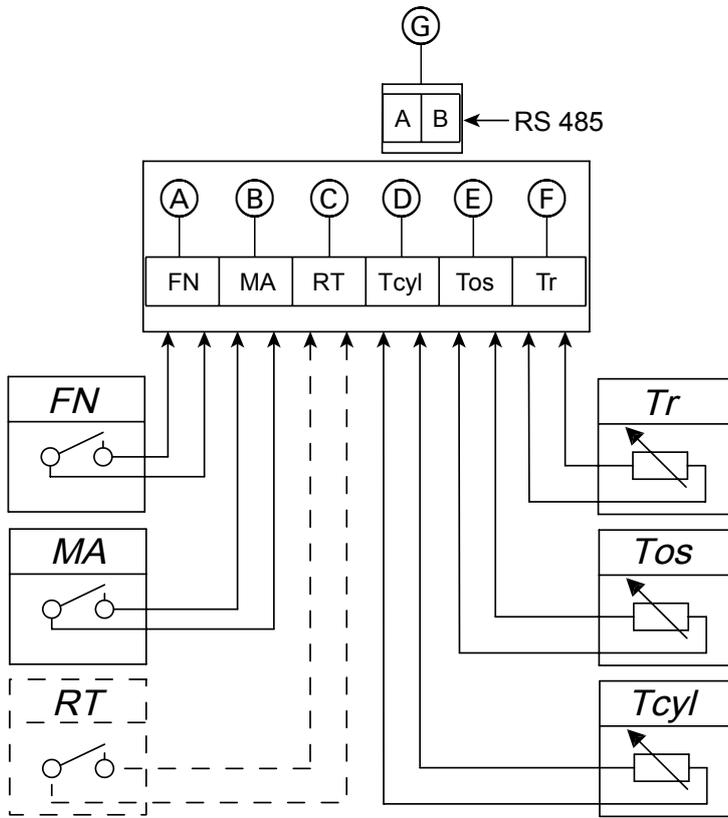


### Type VLN3



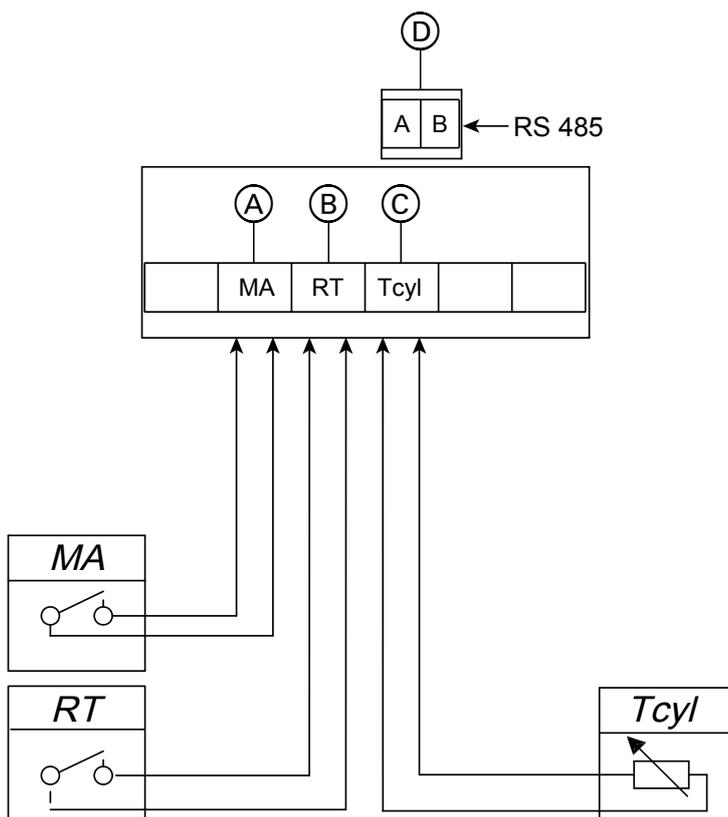
Connecting external sensors and control devices

Type VMN3



- Ⓐ Programmable function input
- Ⓑ Master appliance
- Ⓒ Alternative room temperature controller
- Ⓓ Temperature sensor for DHW cylinder
- Ⓔ Outside temperature sensor
- Ⓕ Room temperature sensor
- Ⓖ Communication range

Type VLN3



- Ⓐ Master appliance
- Ⓑ Alternative room temperature controller
- Ⓒ Temperature sensor for DHW cylinder
- Ⓓ Communication range

**Connecting external sensors and control devices (cont.)**

**FN – Programmable function input (only type VMN3)**

A short-circuited FN contact caused by an external appliance will lead to specific boiler behaviour, depending on the input configuration [Configuration > FN input]:

- Maintain the frost protection temperature regardless of the set room temperature
- Maintain a comfortable temperature regardless of the set room temperature
- Charge the buffer cylinder with limited user intervention outside the schedule (integration of boiler and PV installation).

**MA – Master appliance**

To limit power consumption, boiler operation can be made dependent on other collectors, such as the DHW cylinder. To do this, it must be connected to the MA N/C contact to activate the main current receiver and open the contact. This blocks the boiler's heating operation and stops the DHW circulation pump.

**RT – (alternative room temperature controller, type VMN3)**

Optional control of boiler operation depending on current room temperature. The RT input must be activated [Configuration > Room temperature > RT], which causes the floating RT contact switches of the central heating to short circuit. If the RT input is activated, the room temperature controller integrated in the boiler is switched off. We recommend using the temperature sensor set at the factory in conjunction with the integrated room temperature controller for the boiler.

**RT – (alternative room temperature controller, type VLN3)**

Control of boiler operation depending on room temperature. An RT short circuit leads to central heating. The room temperature controller (RT) must be installed in a room typical of the building and as far away as possible from radiators, windows, doors and passageways. If the contact is not live, the controller opens when the required room temperature is reached.

**Tcyl – Temperature sensor for DHW cylinder**

The water temperature sensor in the DHW cylinder must be positioned in the cylinder connector.

**Tos – Outside temperature sensor (only type VMN3)**

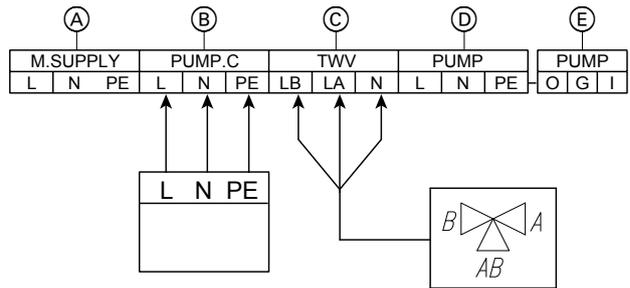
The sensor must be installed in a dark location on the north or north-west façade of the building and away from windows and fans. The temperature sensor cable must be as short as possible and must not be routed in the immediate vicinity of power cables.

**Tr – Room temperature sensor (only type VMN3)**

The room temperature sensor must be installed in a room typical of the building and away from radiators, windows, doors and hallways.

**RS485 – Communication range**

Terminals for additional heating circuit controllers.



- (A) Mains supply to main PCB
- (B) DHW circulation pump
- (C) Three-way valve control (central heating/DHW)
- (D) Internal pump
- (E) PWM signal for internal pump

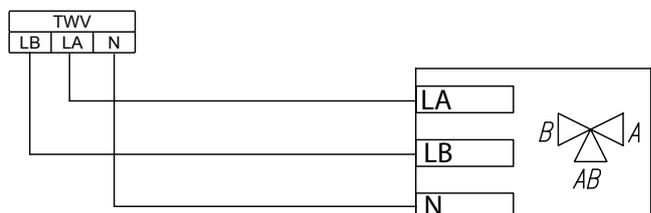
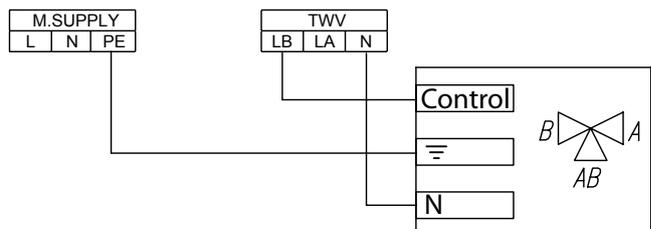
**PUMP.C – DHW circulation pump**

Controls the DHW circulation pump in the daily/weekly schedule. The function must be activated [Configuration > Circulation > YES].

**TWV – three-way valve control (central heating/DHW)**

Changes boiler operation over to central heating or DHW heating in the heating coil of the DHW cylinder by means of a three-way isolating valve with servomotor. Depending on the model used (SPST or SPDT control), the appliance must be connected as shown in the illustrations.

**SPST control  
SPDT control**



**Note**

To activate the DHW function as described in **Service/Configuration – Cylinder**.



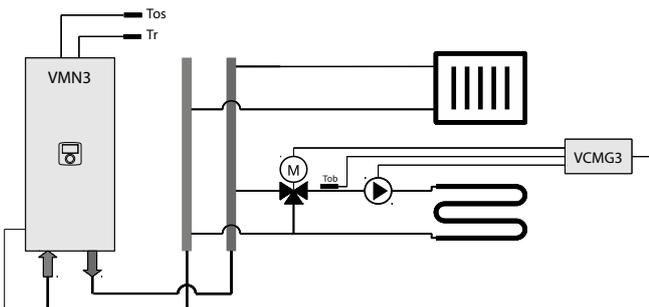
**Caution**

An incorrect electrical connection will result in damage. Do not connect the FN, MA, RT, Tcyl, Tos, Tr inputs when they are supplied with power!

**Extending the system with additional heating circuits (only for type VMN3)**

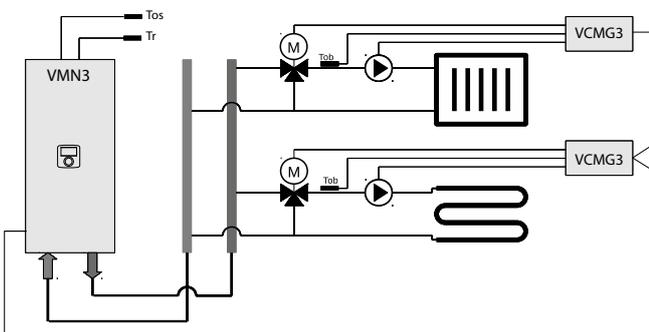
If the system needs to be extended with additional heating circuits, the VMG3 heating circuit modules must be used. Depending on the configuration of the heating system, the boiler will operate in the following modes [*Configuration > Operating mode*]:

- Basic – in the case of boiler heating, the VCMG3 heating module(s) receive(s) the command to control the temperature in the circuit. A heating installation is shown below for illustration purposes.

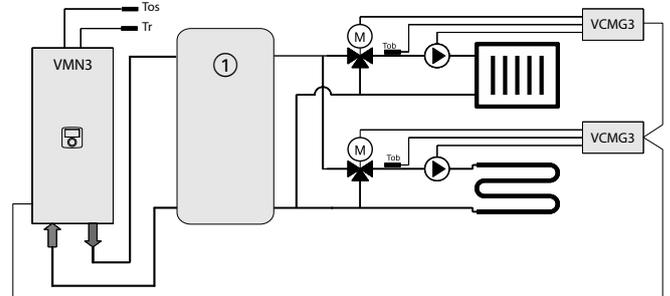


The circuit controlled by the heating module operates according to the boiler control schedule, but with its own heating curve or manual settings.

- Heat source – schedules are set individually in each module. For VCMG3 heating modules, the heating source (boiler) must be switched on. Thanks to the above function, it is possible to install a heating system consisting of several independent work processes (each with its own schedule and temperature settings). An example installation scheme is shown below.



- Buffer cylinder – the buffer cylinder is filled by the boiler according to its own schedule, while the heating modules drain the buffer according to their own schedule.

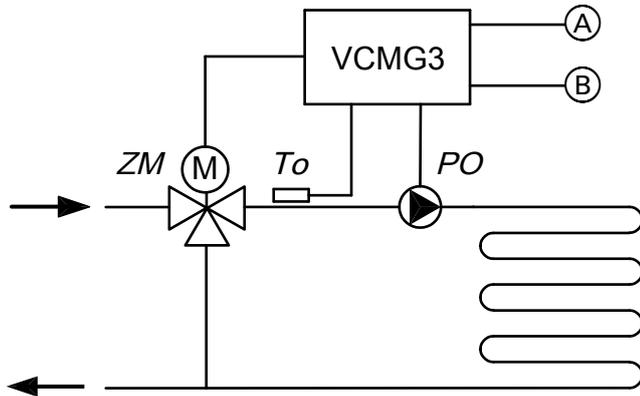


① – Buffer cylinder

## Installation sequence

### Description(only for type VMN3)

The heating circuit module (control) is a temperature controller for the heating medium in the system. It is equipped with a mixing valve with a servomotor. By mixing the heating medium in the installation inlet with the medium from the second heating source, it is possible to reach the required temperature at the valve outlet (circuit inlet).



- Ⓐ Feed ~230 V
- Ⓑ RS485
- ZM Mixing valve with servomotor
- To Temperature sensor, heating circuit
- PO DHW circulation pump

The process is controlled by gradually opening and closing the valves at specified time intervals. The valve is controlled by applying the voltage to terminal L<sub>o</sub> (open) or L<sub>c</sub> (close).



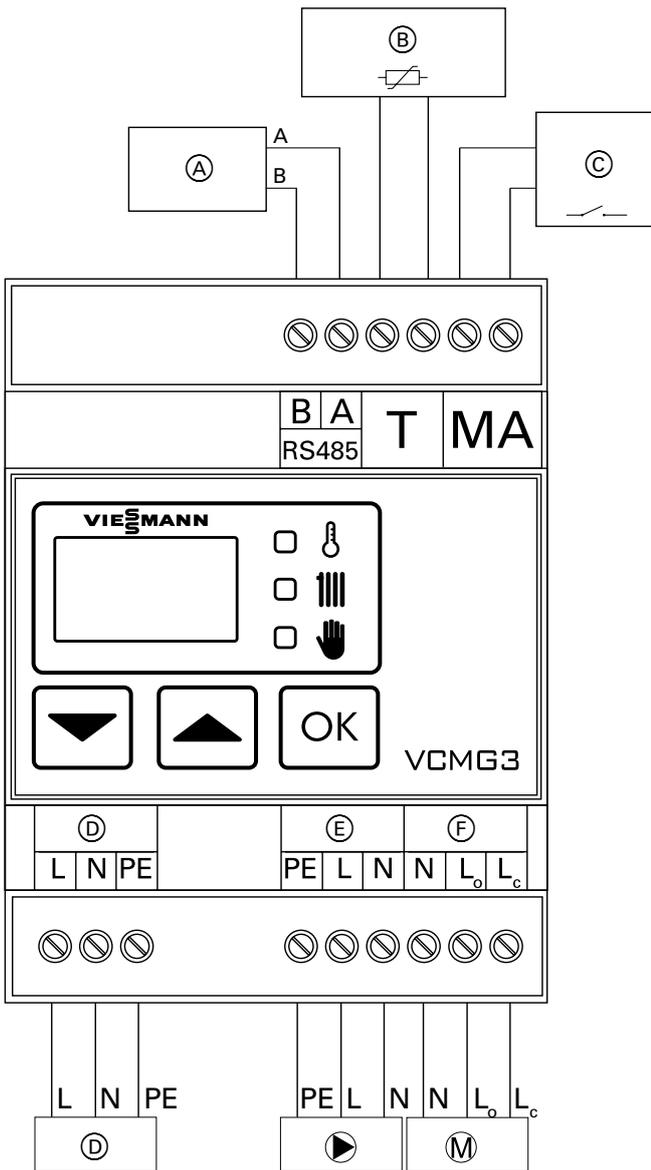
#### Caution

If the temperature of the heating medium is too high, it will damage the system. The installation of safety valves prevents excessive heating of the heating medium.

The drawings in these instructions are for illustration purposes only and are simplified – they do not contain any hydraulic fittings.

This appliance can be used by children aged 8 years or older and by persons with restricted physical, sensory or mental capacities or without sufficient experience and knowledge of the appliance's operation, provided that they are supervised or instructed in the safe use of the appliance and are fully informed about the potential hazards arising from its use. Never permit children to play with the appliance. Children must not carry out cleaning and maintenance work if unattended.

**Connection(only for type VMN3)**



The control unit exchanges information about operating parameters with the master appliance (boiler). Configuration parameters are set in the configuration menu.

To connect the control unit to the master appliance, a unique identification number must be assigned (see section 4.2 in configuration mode).

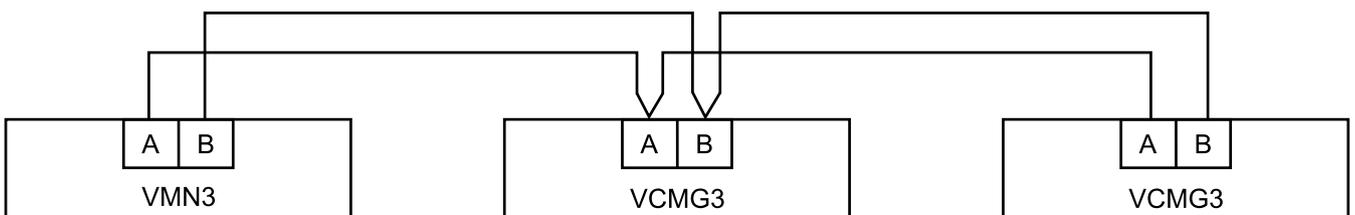
If several control units are working directly with the boiler, each must have its own unique identification number.

A jumper must be installed at the MA input. Opening the input blocks heating processes, the valve remains closed. This input can be used to block heating processes via other appliances. Note: The MA input is isolated from the power supply and can only be closed and opened.

**The outside and room temperature sensors must be connected to enable correct operation of the module.**

- Ⓐ Bus (computer)
- Ⓑ Circuit temperature sensor
- Ⓒ Master appliance or terminal
- Ⓓ Feed ~230 V
- Ⓔ Pump
- Ⓕ Valve

To connect an appliance to the bus (computer), a "point to point" connection topology must be used according to the diagram below.

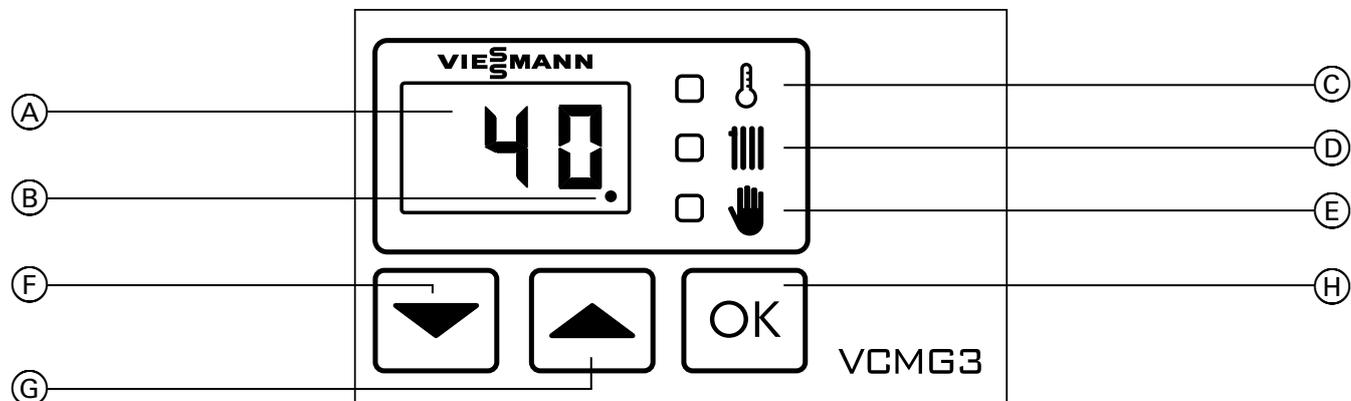


Connection to other appliances must be made with the cable (UPT-Cat. 5e 4 × 2 24 AWG). It is not permissible to connect system elements in a star topology.

## Installation sequence

### Using the control panel (only for type VMN3)

Figure 5 shows an overview of the control panel with signal elements (display, indicators) and control elements (buttons).



- Ⓐ Display
- Ⓑ Communication display
- Ⓒ Temperature display
- Ⓓ Heating display ON
- Ⓔ Display for parameter settings or manual settings
- Ⓕ, Ⓖ and Ⓗ Operating buttons

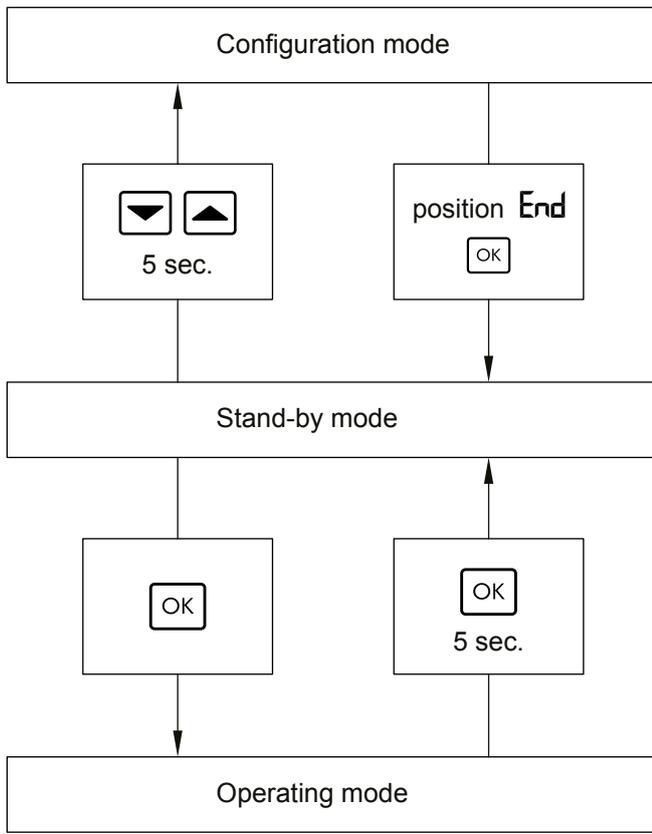
The control unit operates in three operating modes:

- "Operating" mode: Depending on the configuration, settings and external parameters, the appliance operates according to the control algorithm in the opening phase of the mixing valve, so that a set inlet temperature is reached in the circuit.
- "Standby" mode: Operating mode used outside the heating period. The mixing valve is closed and the pump is switched off. Once a day, according to the periods set by the user (protection period for the pump), the pump is switched on and the mixing valve is opened and closed to prevent blockage in the appliance during a long standby period.
- "Configuration" mode: Operating mode for setting the module's configuration parameters.

Operating modes are set via the master appliance (boiler). Manual settings made from the control panel are changed by the system to the currently required settings after 30 seconds of keyboard inactivity. The operating mode is selected using the buttons on the control panel, as shown in Figure 6.

## Using the control panel (cont.)

## "Standby" mode



"Standby" mode: Operating mode used outside the heating period. The mixing valve is closed and the pump is switched off. Once a day, according to the periods set by the user (protection period), the pump is switched on and the mixing valve is opened and closed to prevent blockage in the appliance during a long standby period.

"Standby" mode appears on the display (A) via a regular notification **FF**.

You can switch from standby mode to "Configuration" or "Operating" mode.

To call up "Configuration" mode, press both buttons simultaneously until notification **FF** appears on the display. Once the notification appears, the appliance configuration can be changed. To switch from standby mode to "Operating" mode, press button and wait until notification **FF** appears on the display. When button is released, the appliance is in "Operating" mode.

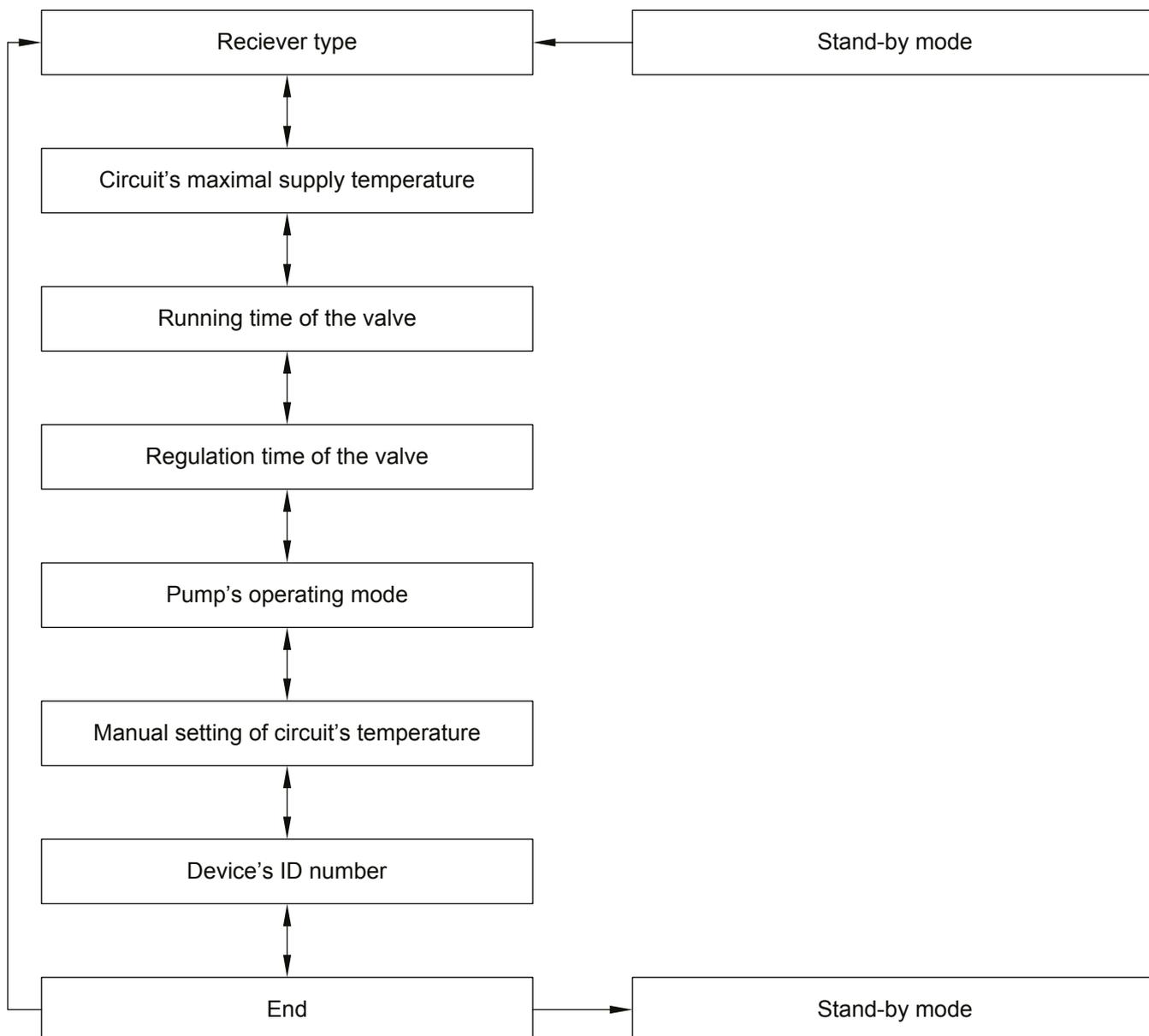
**Using the control panel (cont.)**

**"Configuration" mode**

To call up "Configuration" mode, press both buttons   simultaneously (for 5 seconds) in standby mode. Once the notification  appears on the display, the appliance is in "Configuration" mode.

The parameter can be changed by pressing buttons   and the parameter value can be changed by pressing button . A flashing display  indicates that the relevant parameter is being edited. Once parameter   has been edited, press button  to accept the parameter value.

Figure 7 shows the structure of the configuration menu.



## Using the control panel (cont.)

The following table describes the configuration parameters.

Type of parameter and symbol on display	Description/Comments
<b>Łoh</b> Heating type	Type of collector installed in heating circuit: <b>F</b> (Floor) – underfloor heating (20–55 °C) <b>R</b> (Radiator) – central heating (20–80 °C) The parameter settings are determined by the range of the heating circuit temperatures.
<b>nhŁ</b> Maximum heating temperature	Maximum heating temperature in the circuit. For example, if the installation requires a maximum set temperature of 45 °C, it must be set accordingly.
<b>Łrt</b> Valve runtime	Time required for switching the valve by 90 degrees. Control range from 60 to 480 seconds, standard setting: 120 seconds. During the configuration process, the set value must be balanced with the value of the valve drive.
<b>ŁAt</b> Valve actuating time	Operating time of the valve in a control time of 30 seconds. Control range of 2 to 15 seconds, standard setting: 5 seconds.
<b>Pn</b> Pump operating mode	<b>PnA</b> (Automatic pump mode) – the pump is only activated when heating is active. <b>PnC</b> (Continuous pump mode) – the pump runs continuously; used only during system commissioning. Standard setting: Automatic mode.
<b>nhŁ</b> Manual temperaturesetting	Configuration of the heating medium in the circuit during manual control of the circuit.
<b>idn</b> Identification number	Note: During system configuration, each appliance connected to the bus (computer) must be assigned a unique identification number. Standard setting: 5
<b>End</b>	Press "Configuration" to exit the operating mode  . The system enters standby mode.

### Operating mode

To activate "Operating" mode, press button  in standby mode. Press buttons   to call up the parameter display, which contains the parameters listed in the table below.

Type of parameter and symbol on display	Description
<b>ŁhŁ</b> Temperature of the heating system	Heating circuit inlet temperature (after mixing valve)
<b>ŁSh</b> Heating temperature setting	Current set flow temperature – display only. If the heating circuit is inactive, the following symbols are displayed: ---

The active display  indicates the manual setting of the heating medium temperature in the heating circuit.

## Service/Configuration



### Parameter display:

Display the input and output signals of the boiler.

### Configuration

Match the boiler to the heating system in the building.

*\* After entering the access code, it is possible to make changes to the configuration menu. When prompted to enter the access code, turn the rotary switch leftwards to the required code. Then press the rotary switch to confirm your selection. To return to the access code entry screen, press and hold the navigation rotary switch or wait for the system to automatically return to the main screen.*

**Code: 987**

Set the operating mode of the boiler at the beginning of the installation process. Various configuration parameters are available. As described in the chapter **Extending the system with additional heating circuits**, the following options are available:

- Basic – if only one heating circuit is installed or if there are additional heating circuits all working according to the same schedule
- Heat source – each heating circuit operates according to its own schedule
- Buffer – the buffer is filled according to the boiler schedule, but the heating modules drain the cylinder according to their own schedule.

## Using the control panel (cont.)

- Buffer (only available in buffer mode, only for type VMN3):
  - Output temperature:  
The temperature at which the buffer is filled.
  - Filling outside the program:
    - Yes – operation enabled even outside the schedule. If the temperature is too low, buffer filling is activated according to the parameters in the schedule.
    - No – the cylinder is only filled according to the schedule.
- Central heating (only type VMN3):
  - Heating curve no. (basic operating mode only):  
Heating curve selection  
(see chapter **Heating curve**).  
**Note: The parameter appears when the curve adjustment is set to "Heating" [Configuration > Control > According to curve].**
  - Heating curve offset (basic operating mode only):  
Heating curve offset (see chapter **Heating curve**).  
**Note: The parameter appears when a heating curve adjustment has been set [Configuration > Control > According to curve].**
  - Max. flow temp (not available in buffer mode): Maximum temperature of the heating circuit. **NOTE: Setting excessively high temperatures that are not matched to the building parameters, central heating type and degree of insulation in the building, can lead to high running costs, among other things.**
  - MAN temperature flow (not available in cylinder mode): Flow temperature in the system when operating with fixed parameters (manual setting of the flow temperature) [Configuration > Control > Fixed parameters].
  - Control (basic operating mode only):  
According to heating curve – installation temperature is calculated from the outside temperature and room temperature according to the schedule. Fixed parameters – flow temperature matches the MAN flow temperature.
  - Outside temperature switched off: The outside temperature. When the temperature is reached, the central heating is switched off, regardless of the room temperature.
  - Frost protection:
    - Yes – if the room temperature in standby mode falls below 7 °C and the outside temperature falls below 2 °C, the central heating is switched on.
    - No – frost protection switched off.
  - Boiler protection:
    - Yes – if the temperature at the boiler temperature sensor drops below 5 °C, the DHW circulation pump is switched on.
    - No – protection turned off. In this configuration, the central heating installation must be filled with frost-proof fluid.
- DHW heating:
  - Output temp.: Set coil output.
  - Switched off: DHW function is switched off. If the DHW function is switched off, it can only be switched on.
- DHW circulation:
  - Yes – DHW circulation pump control is switched on.
  - No – DHW circulation pump control is switched off.
- Room temp. (only type VMN3):
  - Room sensor
    - Tr: The room temperature sensor is connected to the Tr input.
    - RT: The external room controller is connected to the RT input. A short circuit of the input with an external room thermostat causes the central heating boiler to heat up.  
Note: This configuration is not recommended. If additional heating modules are used, this configuration is not recommended.
  - Tr control: Room temperature control (parameter not available with room sensor setting RT):
    - Yes – when the set room temperature is reached, the central heating is switched off.
    - No – no control when room temperature is exceeded.
  - Tr hysteresis: A reduction of the room temperature by the parameter value causes Turbo mode to start automatically, i.e. activation of the heating circuits with the maximum parameters.
- Automatic Turbo mode:
  - Tr hysteresis: A reduction of the room temperature by the parameter value causes Turbo mode to start automatically, i.e. activation of the heating circuits with the maximum parameters.
  - Cylinder:
    - Yes – DHW priority is maintained.
    - No – DHW priority is disabled when Turbo mode is enabled.
  - Switch off: Automatic Turbo mode is switched off.
- DHW circulation pump:
  - Pump protection: Time in which the pump is switched on for a short period of time during a longer idle time (blocking protection).
  - Automatic mode:
    - Yes – operation as required
    - No – continuous operation.
  - Type: Type of pump installed

### Using the control panel (cont.)

- Control unit:
  - p-constant – constant pressure
  - p-alternating – alternating pressure.

In the control mode (p-constant), the pressure differential generated by the pump is maintained and the output is fixed at a set value up to the maximum pump rate. This type of control is recommended for underfloor heating circuits or older heating systems with larger diameter pipes, as well as for all applications with fixed properties. In control mode (p-alternating – variable mode), the pressure differential generated by the pump is maintained at a level that varies linearly between  $\frac{1}{2}$  H and H. The differential pressure setting decreases or increases depending on the flow rate. This type of control is used in heating systems with radiators, as it reduces the flow noise of thermostatic valves.
- Air vent valve:
  - Switch on: Start the system venting process
  - Switch off: Stop the system venting process.

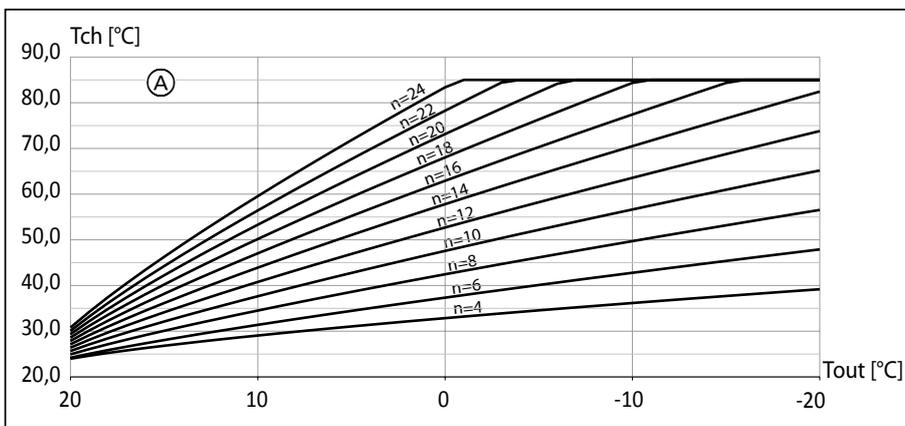
During the venting process (10 min), the pump operates alternately at maximum and minimum speed. This will collect the air bubbles, making it easier to remove them from the system.
- Pump stroke.
- Maximum boiler output: The set rated output of the boiler.
- FN input: Select the system response to a short-circuited FN input (only type VMN3):
  - Switch off: Function deactivated.
  - (✱): Frost protection temperature – the short circuit of the FN input inevitably results in the frost protection temperature being maintained regardless of the room temperature set in the central heating program.
  - (☺): Energy saving temperature. The short circuit of the FN input inevitably results in an energy saving temperature independent of the room temperature set in the central heating program.
  - PV (only available in cylinder operation): The short circuit of the FN input causes the cylinder to fill outside the schedule with limited rated output.
- PW MAX [kW] (only type VMN3): Setting for maximum buffer charging outside the schedule in the case of an FN input.  
Note: The parameter is available with the setting "Input FN: PV".
- Pressure control:
  - Yes – heating mode starts when the pressure reaches at least 0.5 bar
  - No – control switched off. The pressure control must be switched off when the boiler is operated in an open vented system.
- Operating mode (only type VMN3):
  - Basic: The boiler is the only appliance controlling the heating system. If additional heating modules are used, they will operate according to the boiler schedule.
  - Source: The boiler only acts as a heat source, the heating system is controlled by the heating modules by reporting a heat demand via the relevant parameters.
  - Buffer: The boiler monitors cylinder filling. The cylinder is drained via the heating modules.
- Heating circuits (only type VMN3): (If other heating circuits are installed in the system, select the relevant heating circuits from the list);
  - Maximum flow temperature: Maximum flow temperature of the heating circuit. For example, if the maximum temperature is 45 °C, this value must be set.
  - Control unit:
    - According to curve – the temperature in the heating circuit is calculated based on the outside temperature and the set room temperature according to the schedule. Fixed parameters – flow temperature of the heating circuit matches the MAN power supply temperature.
    - Heating curve no. Heating curve selection (see chapter **Heating curve**). Note: The parameter appears when the control is set according to the heating curve.
    - Heating curve offset – offset of the heating curve (see chapter **Heating curve**). Note: The parameter appears when setting "According to curve".
  - Automatic pump operation:
    - Yes – heating circuit operation as required
    - No – constant heating circuit operation.

The position in the menu can be displayed by pressing "End" or by pressing and holding the rotary switch. If no entries are made for 3 minutes, the display returns to the main function screen.

**Using the control panel** (cont.)

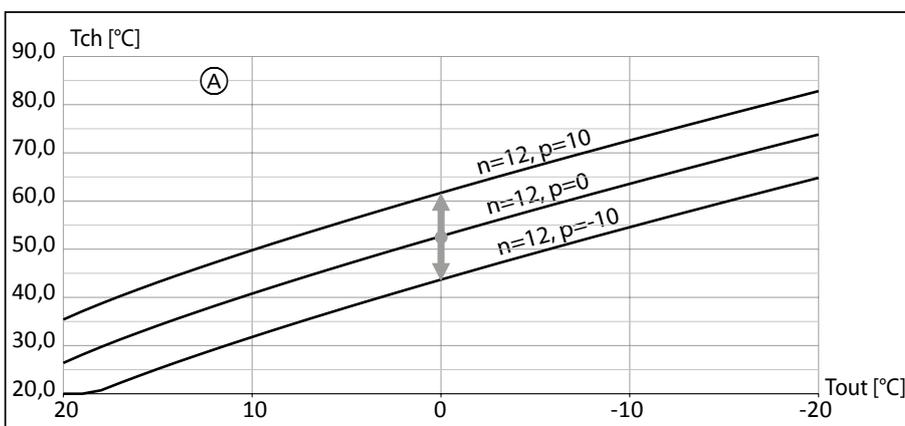
**Heating curve (only type VMN3):**

The boiler control unit ensures that the correct temperature is maintained in the central heating installation depending on the outside temperature. When there is a low outside temperature, the heat demand inside the building is higher. On the other hand, when there is a high outside temperature, it is not necessary to maintain a high temperature inside the installation. The correlation between the outside temperature and the temperature of the heating installation can be represented graphically with a heating curve. The diagram below shows a summary of the heating curves for a set room temperature of 22 °C. The corresponding heating curve must be selected according to the building properties, climate zone and type of heating installation.



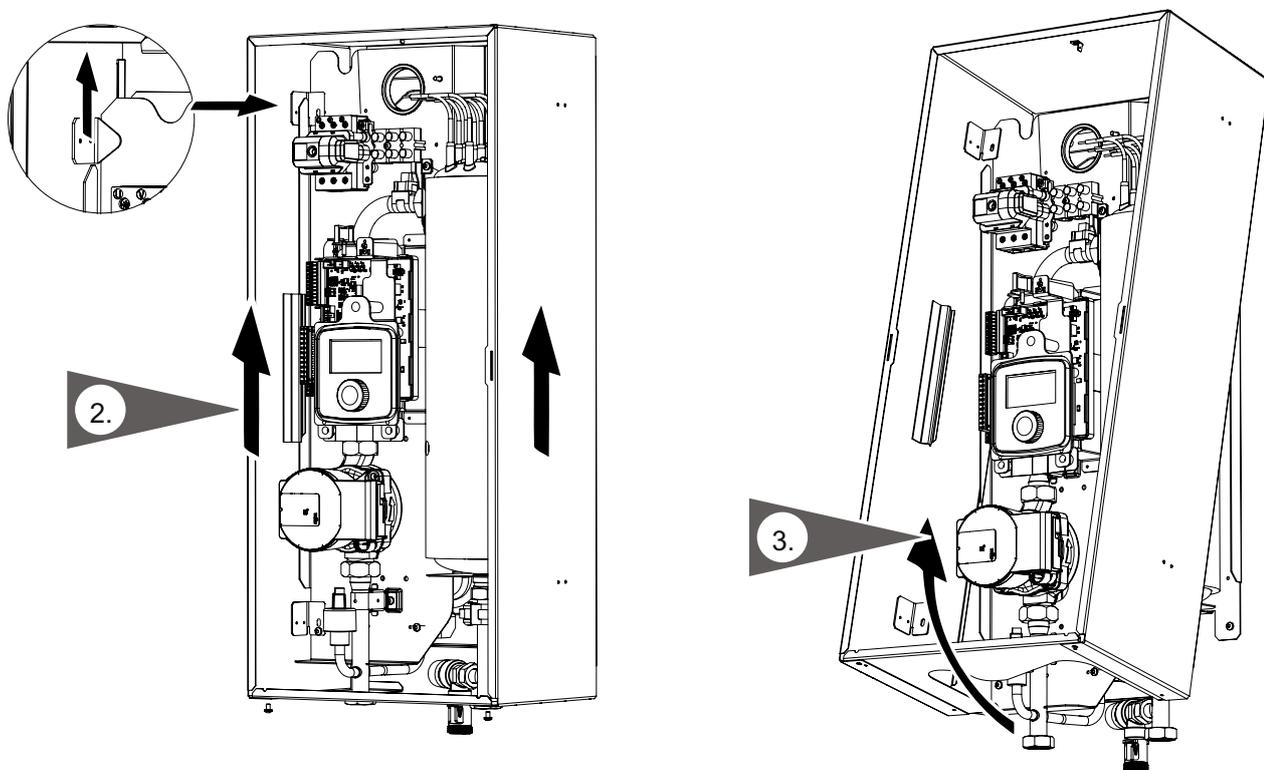
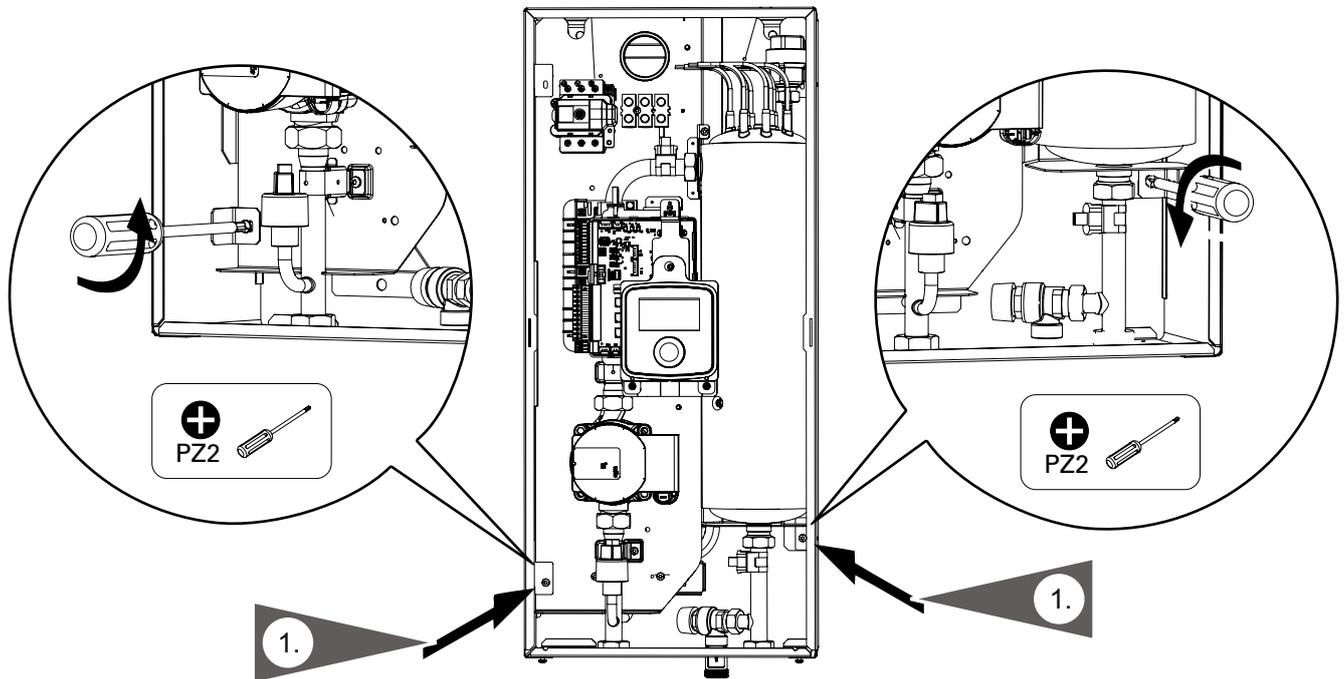
Ⓐ Heating curve no. (p = 0)

If an offset of the heating curve is required, the parameter [heating curve] must be changed. The diagram below shows heating curve no. 12 with an offset of -10 °C and 10 °C.

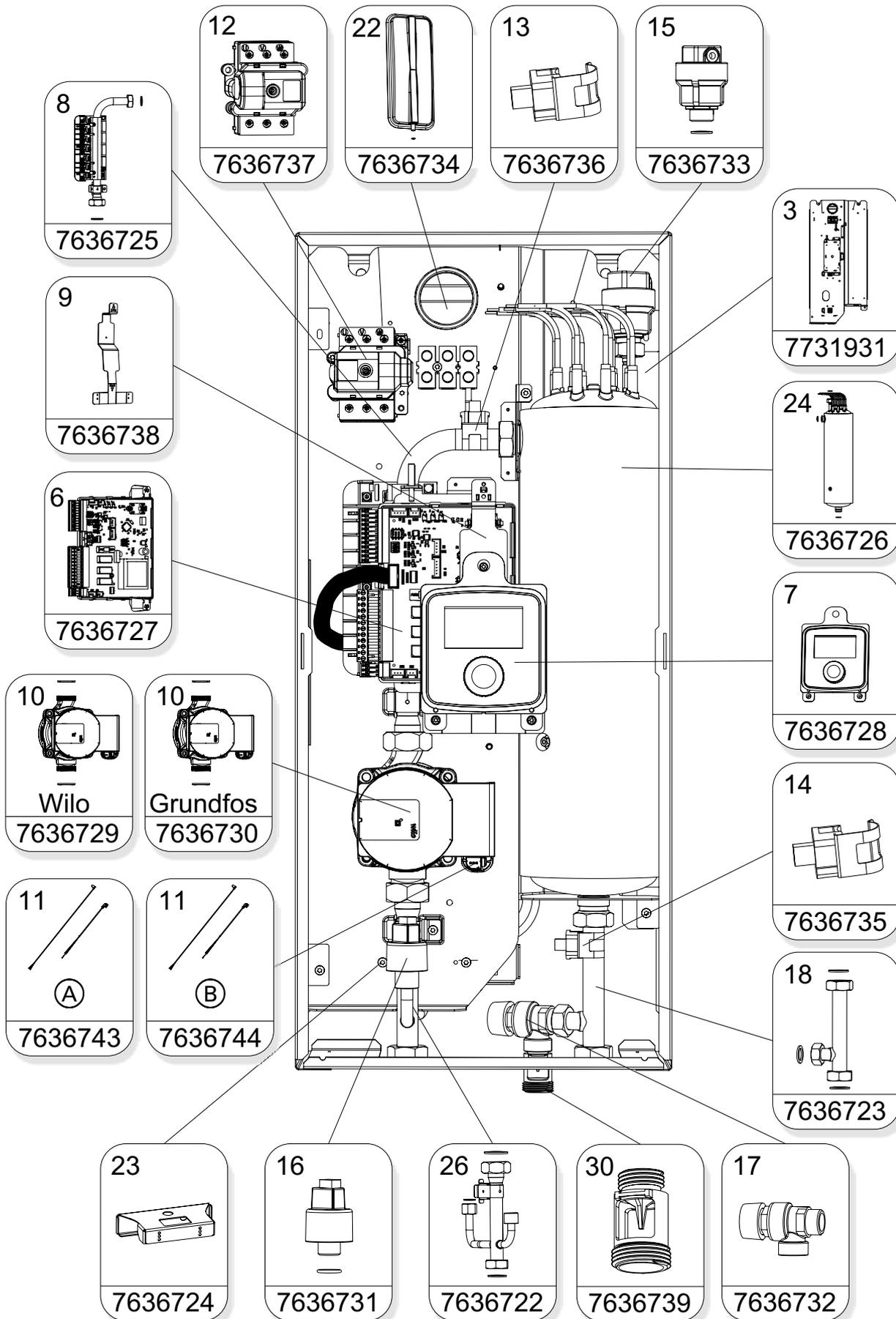


Ⓐ p – heating curve offset

Removing the side cover

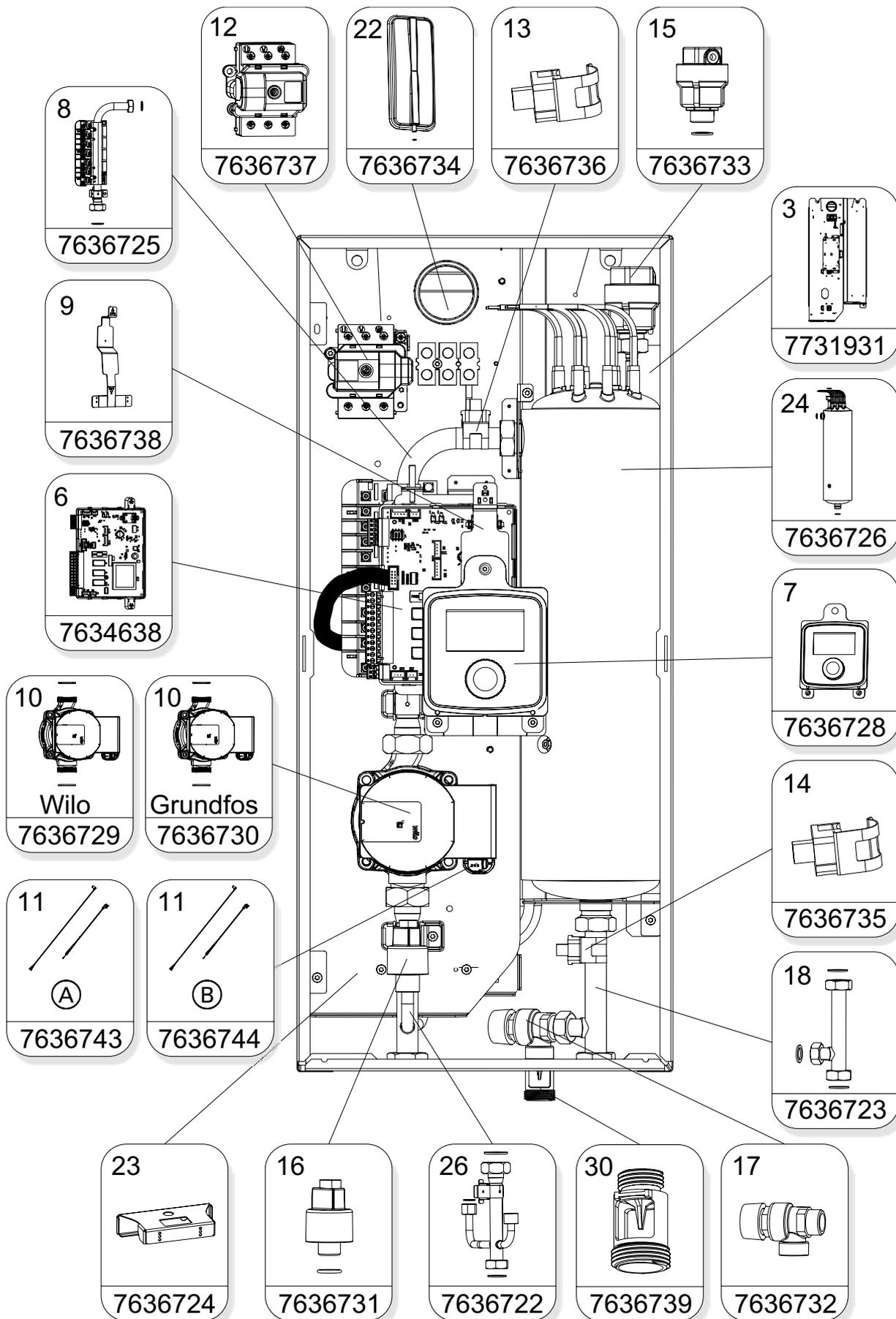


Internal view VMN3



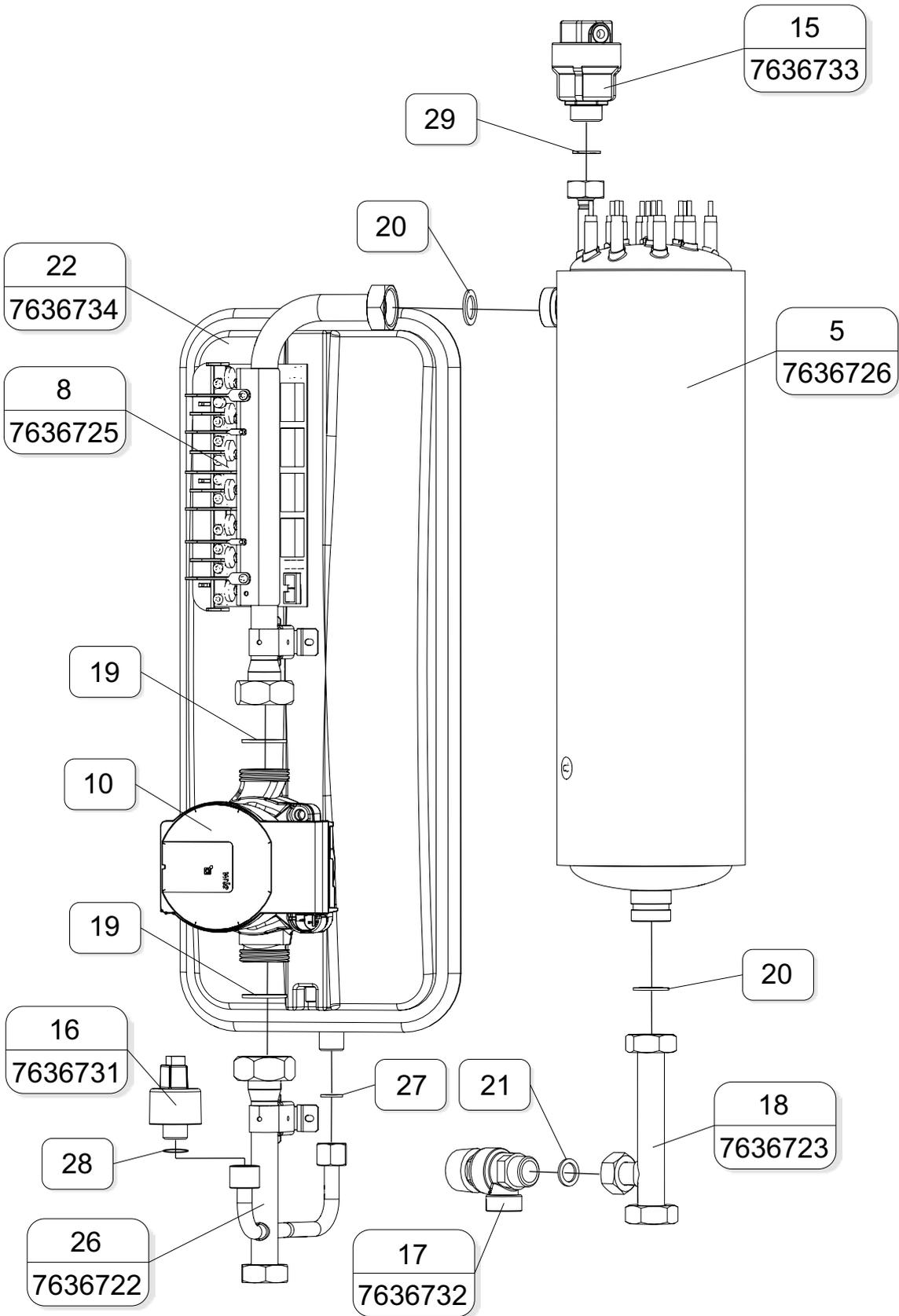
6155049 (A) Wiring of the Wilo Yonos pump i PWM WILO  
 (B) Wiring of the Grundfos UPM3 pump

Internal view VLN3



- (A) Wiring of the Wilo Yonos pump
- (B) Wiring of the Grundfos UPM3 pump

Structure of the boiler – water section

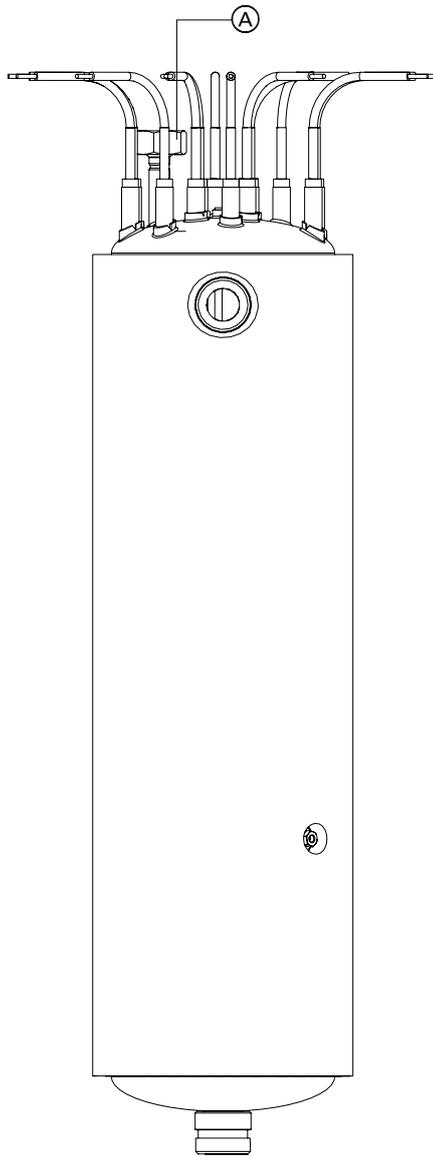


10	7636729
	7636730
19	7636745
20	7636746
21	7636747
27	7636748
28	7636749
29	7636750

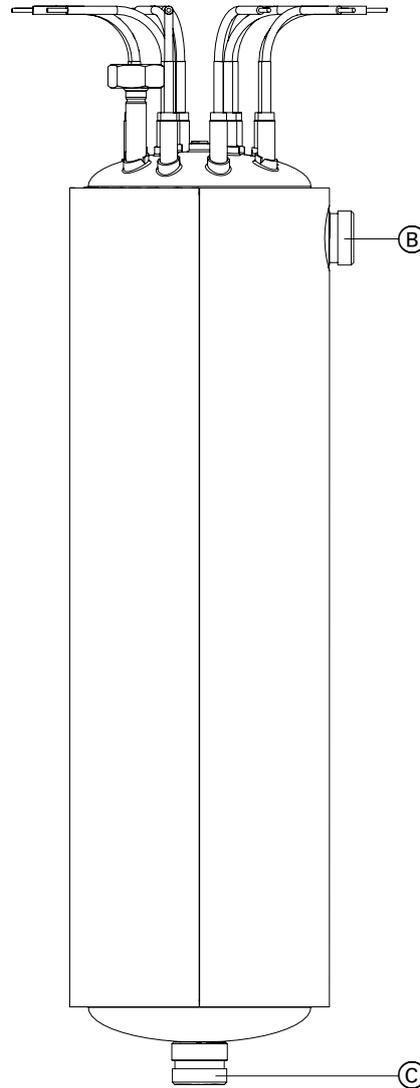
# Installation sequence

## Heater

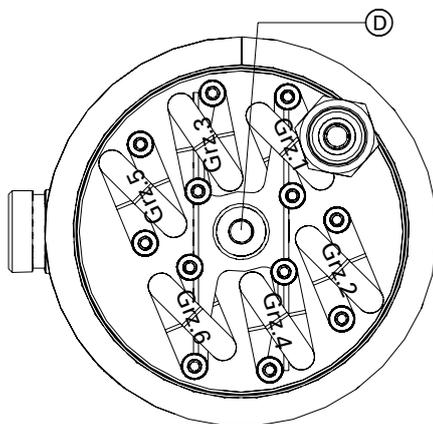
Front view



Side view



View from above

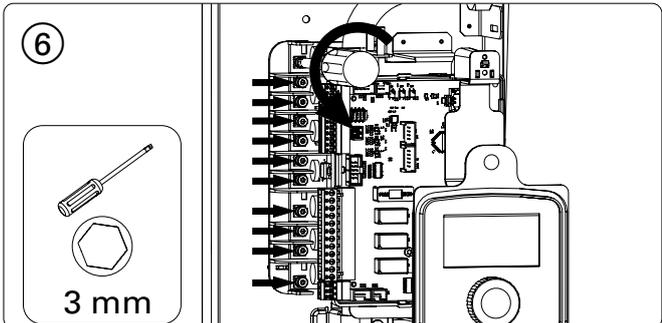
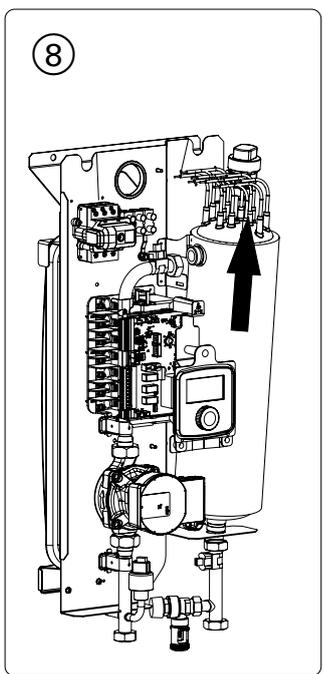
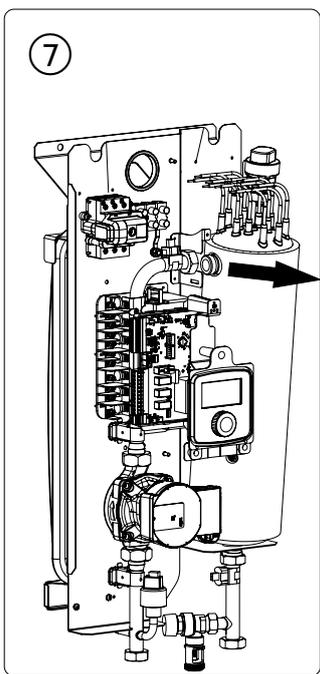
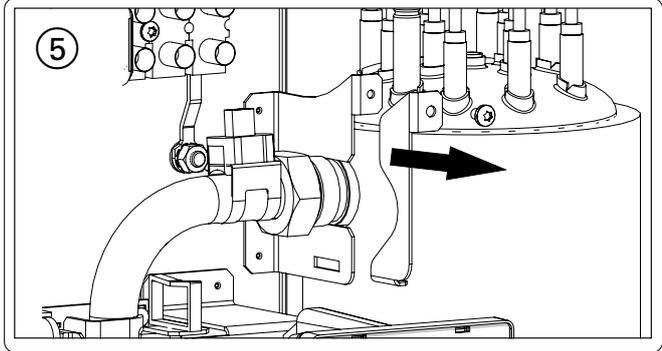
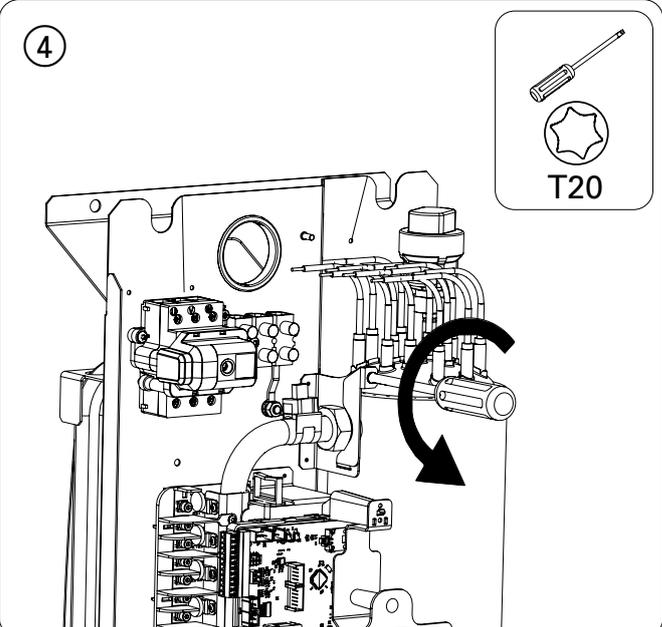
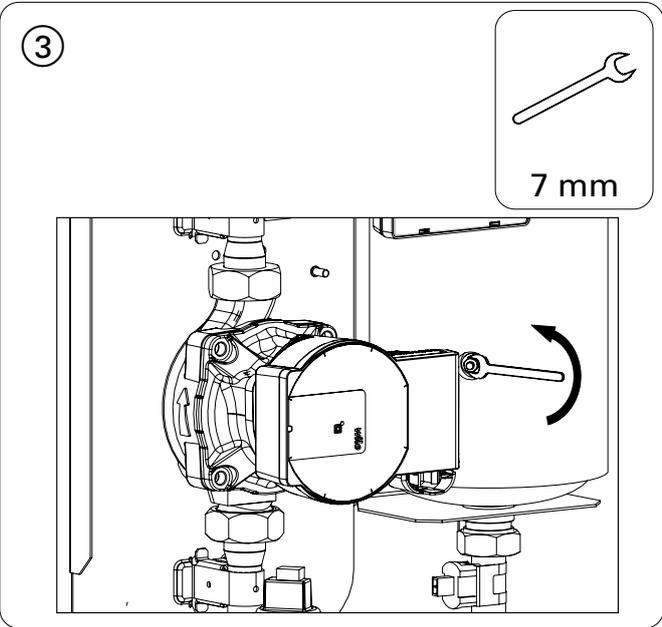
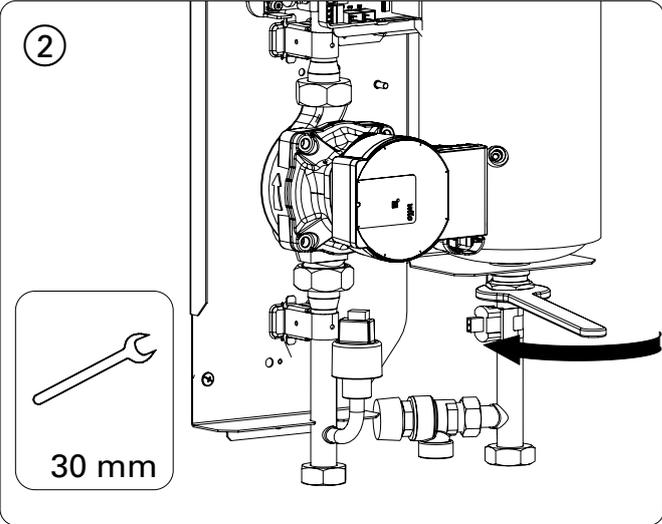
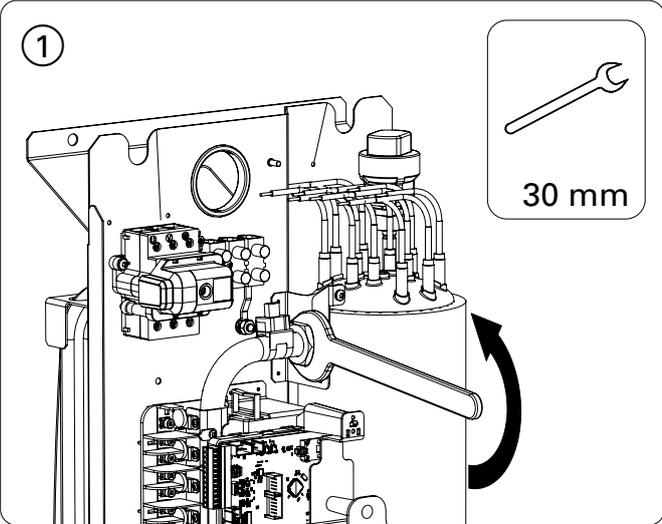


- (A) Gw 1/2" – Automatic air vent valve
- (B) Gz 3/4" – Return connector
- (C) Gz 3/4" – Flow connector
- (D) Capillary tube WT-3

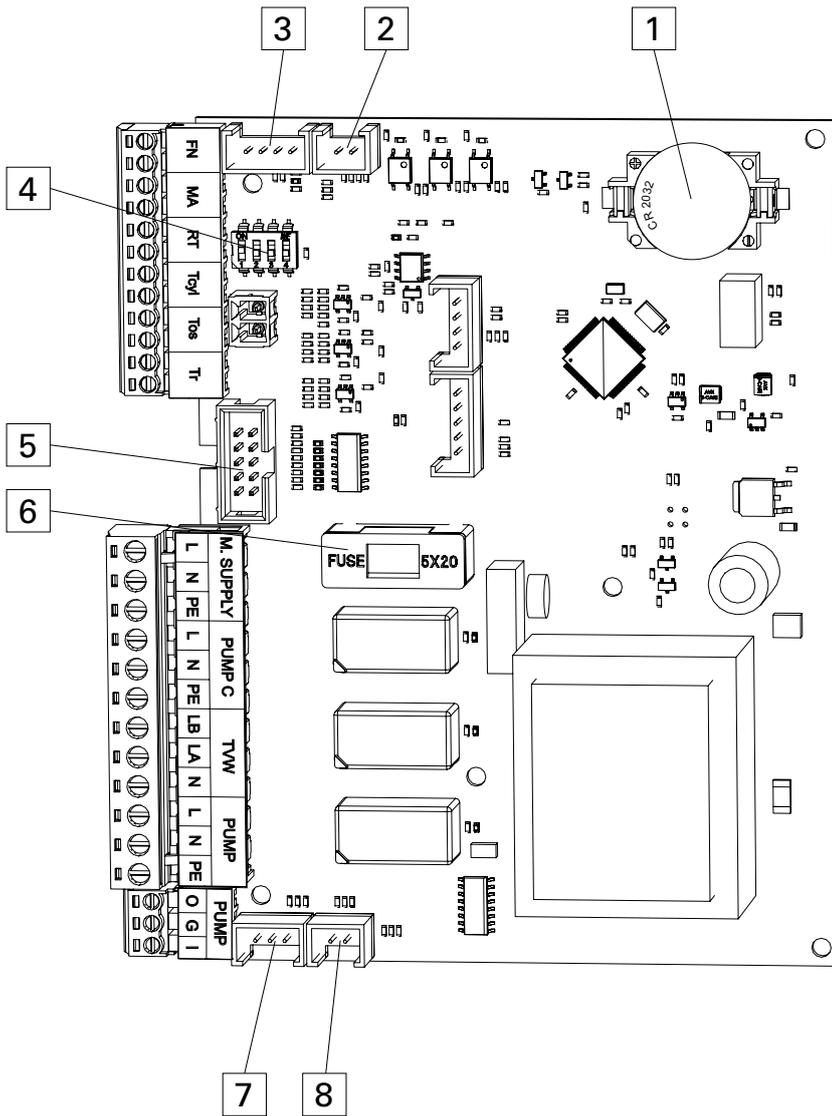
Boiler type	Service code	No. of heating elements	Heating elements Resistance [Ohm]
VLN3/VMN3 4 – 24 kW	7636726	6	~40 W

Table 1. Electrical values of the heater

Removing the heater



**Description of PCB MSK.80/04 VMN3**



**FN** Programmable function input.  
A short-circuited FN contact caused by an external appliance will lead to specific boiler behaviour, depending on the input configuration

[Configuration > FN input]:

- Maintain the frost protection temperature regardless of the central heating program
- Maintain an economic temperature regardless of the central heating program
- Charge the buffer cylinder with limited user intervention outside the schedule (integration of boiler and PV installation).

- MA** Master appliance (open – heat exchanger)  
**RT** Alternative room temperature controller (open – central heating blocked)  
**Tcyl** Temperature sensor for DHW cylinder  
**Tos** Outside temperature sensor  
**Tr** Room temperature sensor  
**A, B** Terminals for additional heating circuit control units.  
**M SUPPLY** Power supply to PCB (230 V)  
**PUMP C** DHW circulation pump  
**TWV** Three-way valve control (CH/DHW)

**PUMP (L,N,PE)** Power connection DHW circulation pump  
 L – brown,  
 N – blue,  
 PE (earth conductor) – green-yellow

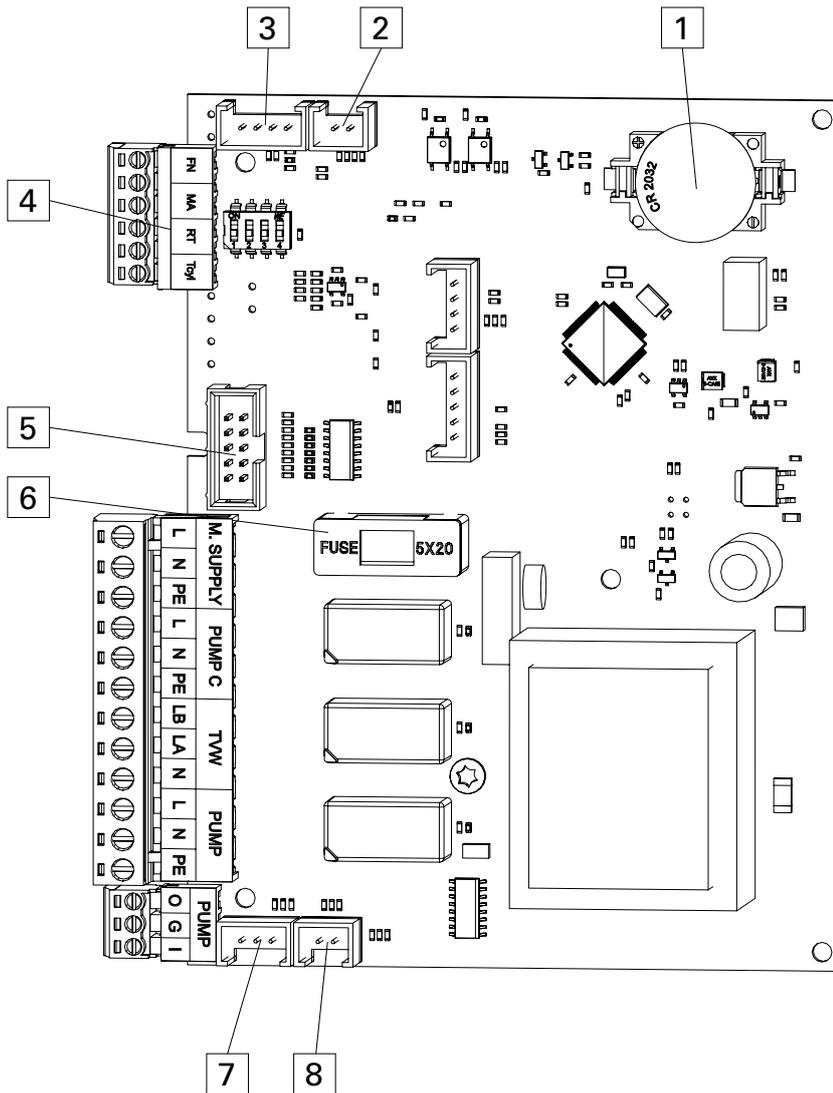
**PUMP (O,G,I)** PWM signal connection DHW circulation pump  
 O – brown,  
 G – blue,  
 I – black

- 1 Battery SN2032
- 2 Tin – terminal for return temperature sensor
- 3 PW35 – terminal for control panel
- 4 Microswitch for power supply settings
- 5 Terminal for main PCB
- 6 1 A fuse (pump and TWV supply)
- 7 Press – terminal for pressure sensor
- 8 Tout – terminal for flow temperature sensor

Operating mode settings	Rated output	Connection type to electrical system	Inactive
	12, 16, 20, 24 kW 2 – ON	Three-phase 3 – ON	
<b>Do not change!</b>	4, 6, 8 kW 2 – OFF	Single-phase 3 – OFF	

Table 2. Selecting the power supply type (Pos. 4)

Description of PCB MSK.80/05 VLN3



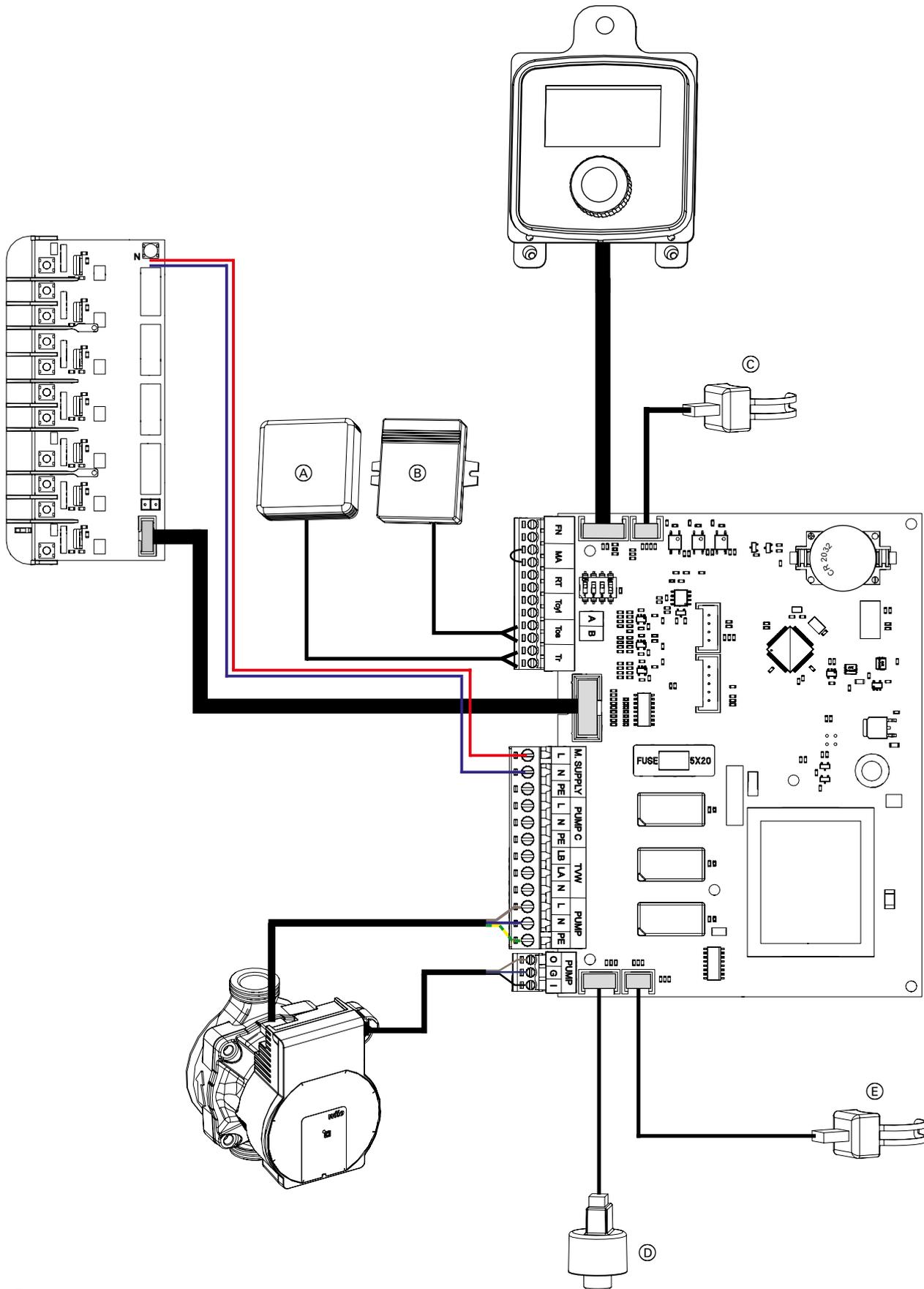
- FN disabled
- MA Master appliance  
(open – heat exchanger)
- RT Alternative room temperature controller  
(open – central heating blocked)
- Tcyl Temperature sensor for DHW cylinder
- M SUPPLY Power supply to PCB (230 V)
- PUMP C DHW circulation pump
- TWV Three-way valve control (CH/DHW)
- PUMP (L,N,PE) Power connection DHW circulation pump  
L – brown,  
N – blue,  
PE (earth conductor) – green-yellow
- PUMP (O,G,I) PWM-signal connection DHW circulation pump  
O – brown,  
G – blue,  
I – black

- 1 Battery SN2032
- 2 Tin – terminal for return temperature sensor
- 3 PW35 – terminal for control panel
- 4 Microswitch for power supply settings
- 5 Terminal for main PCB
- 6 1 A fuse (pump and TWV supply)
- 7 Press – terminal for pressure sensor
- 8 Tout – terminal for flow temperature sensor

Operating mode settings	Rated output	Connection type to electrical system	Inactive
Operating mode 1 – ON	12, 16, 20, 24 kW 2 – ON	Three-phase 3 – ON	
<b>Do not change!</b>	4, 6, 8 kW 2 – OFF	Single-phase 3 – OFF	

Table 3. Selecting the power supply type (Pos. 4)

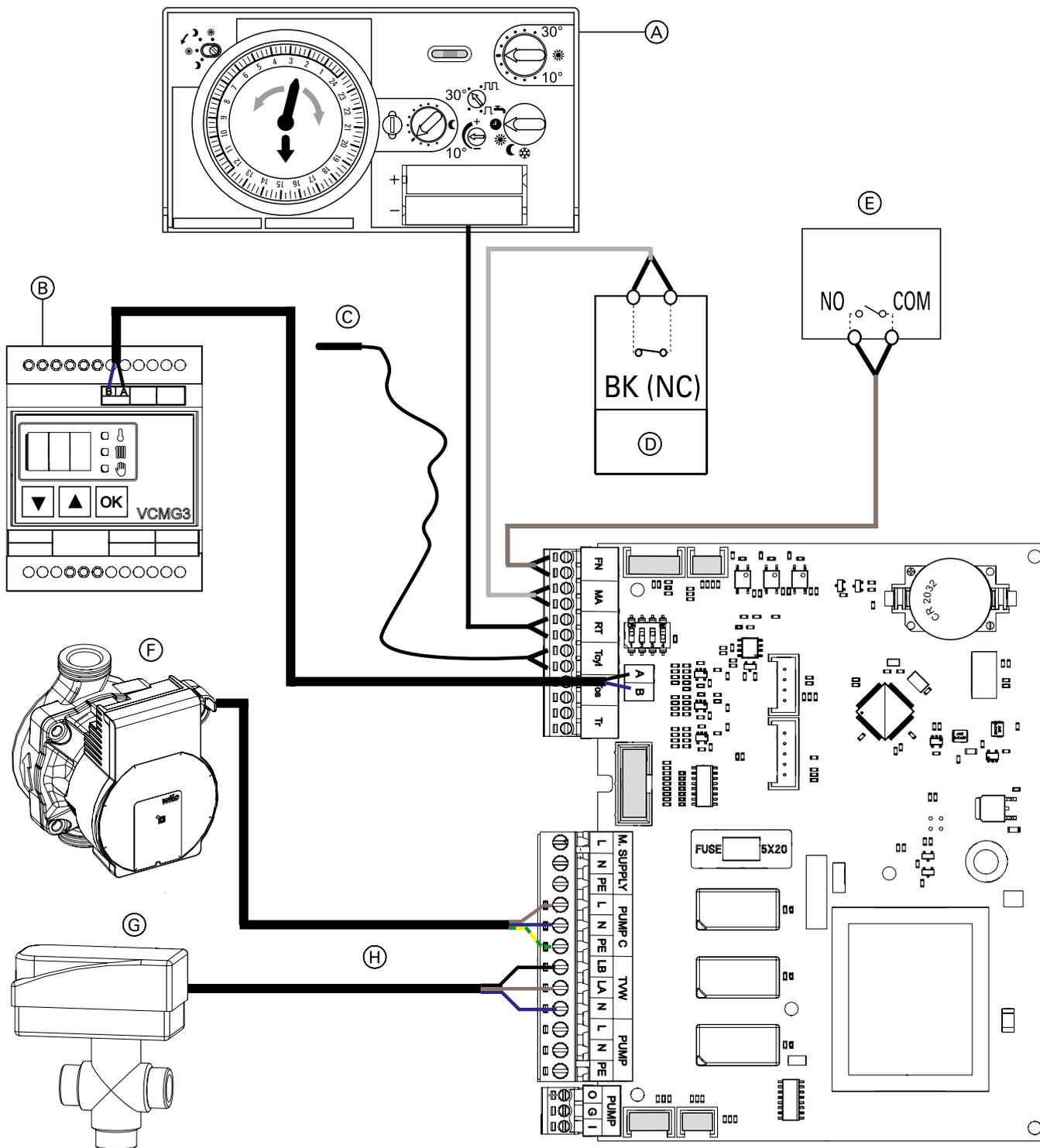
**Schematic diagram MSK.80/04 VMN3**



- (A) Room temperature sensor WE-033/02
- (B) Outside temperature sensor WE-027
- (C) Return temperature sensor
- (D) Pressure sensor
- (E) Flow temperature



Connecting optional appliances

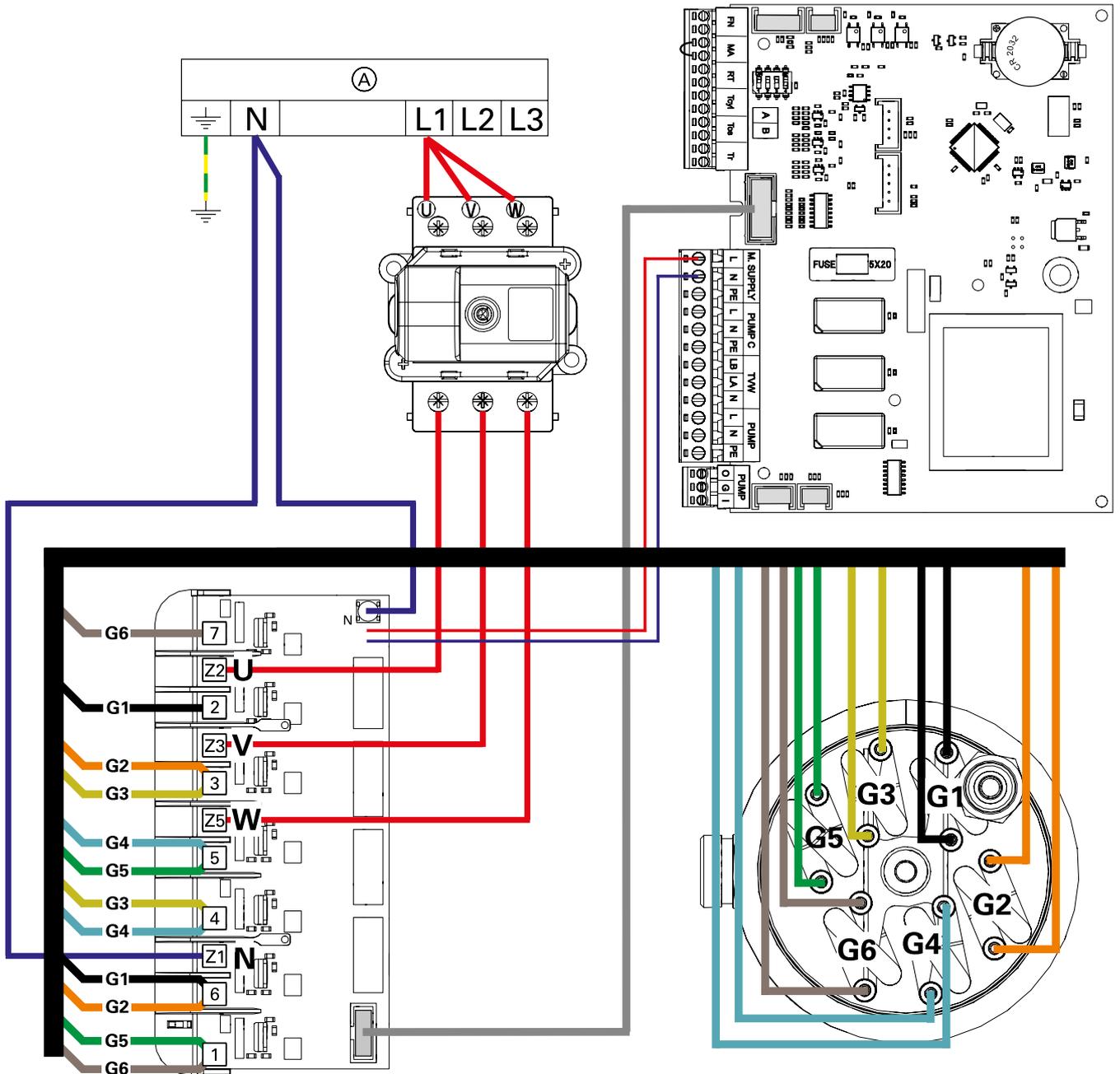


- (A) Alternative room temperature controller
- (B) Heating circuit module
- (C) Temperature sensor for DHW cylinder
- (D) Master appliance
- (E) Control device for FN input
- (F) DHW circulation pump
- (G) Three-way valve control (central heating/DHW)
- (H) SPDT control



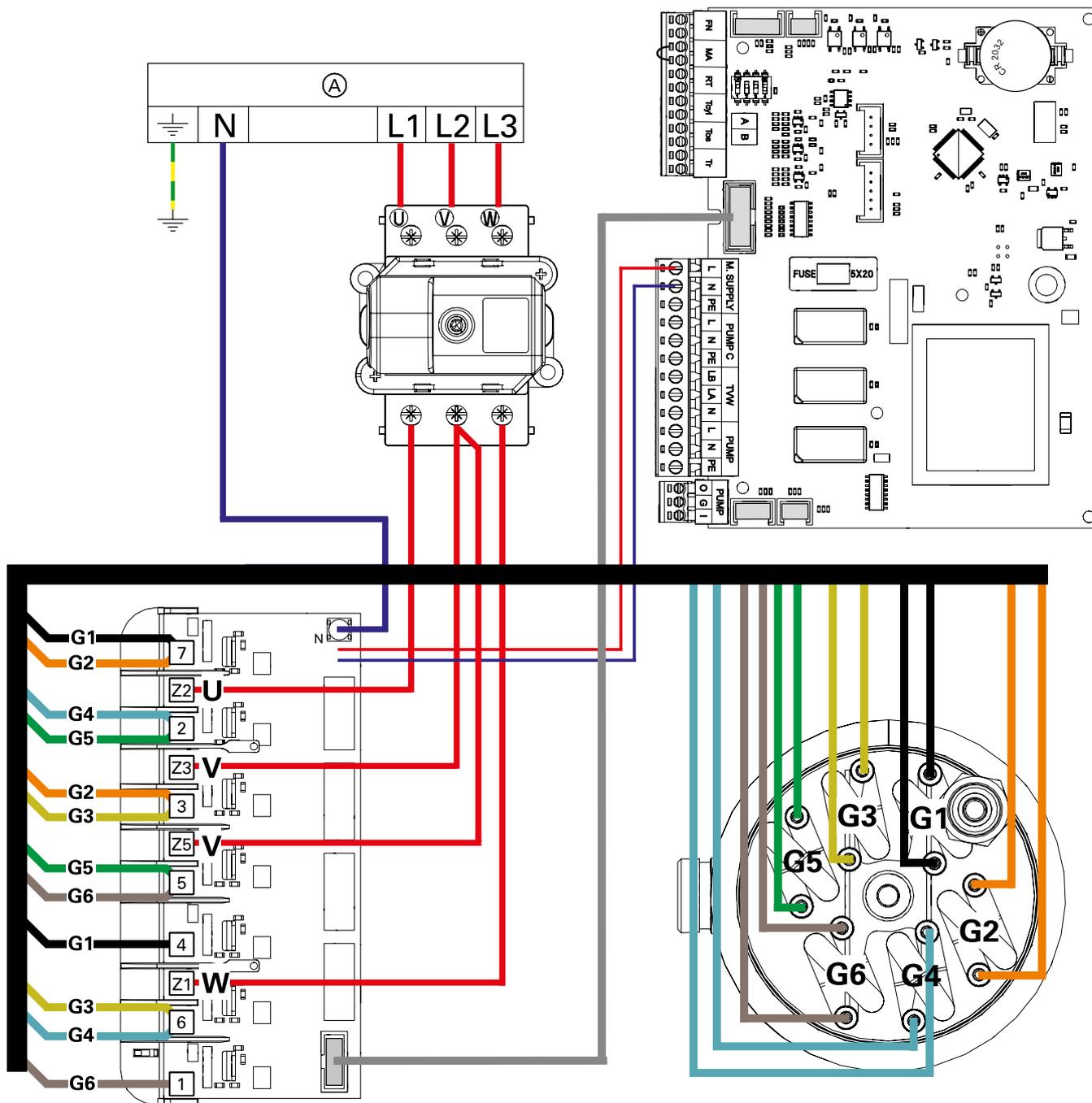


Connecting the PCB 4–8 kW (VLN3, VMN3)



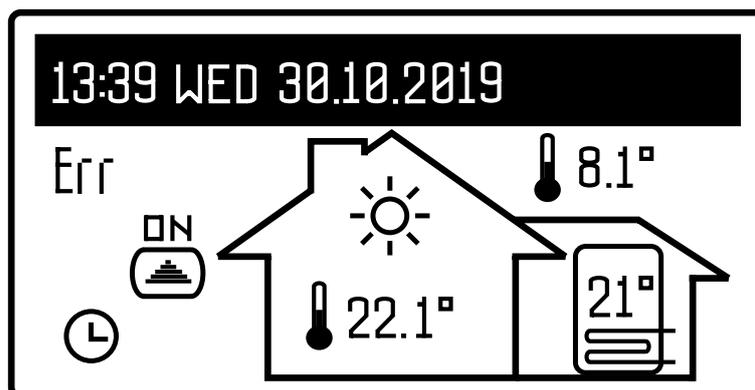
Ⓐ Power supply 230 V/400 V 3N~

Connecting the PCB 12–24 kW (VLN3, VMN3)



Ⓐ Power supply 400 V 3N~

## Fault messages



If a fault occurs in the boiler, the message "Err" will be displayed on the main function screen. Press the rotary switch to display a list of faults.

Symbol	Description	Possible causes
NO PRESSURE	Low pressure in heating circuit	<ul style="list-style-type: none"> <li>– Pressure below 0.6 bar</li> <li>– Pressure sensor faulty</li> <li>– PCB MSK.80 faulty</li> </ul>
TEMP SENSOR FAULT Tpcb	Temperature sensors on PCB are faulty	<ul style="list-style-type: none"> <li>– PCB MSK.80 faulty</li> </ul>
TEMP SENSOR FAULT Tout	Flow temperature sensor faulty	<ul style="list-style-type: none"> <li>– Tout sensor faulty</li> <li>– PCB MSK.80 faulty</li> </ul>
TEMP SENSOR FAULT Tin	Return temperature sensor faulty	<ul style="list-style-type: none"> <li>– Tin sensor faulty</li> <li>– PCB MSK.80 faulty</li> </ul>
TEMP SENSOR FAULT Thw	DHW cylinder temperature sensor faulty	<ul style="list-style-type: none"> <li>– Tcyl sensor faulty</li> <li>– PCB MSK.80 faulty</li> </ul>
TEMP SENSOR FAULT Tr	Room temperature sensor faulty	<ul style="list-style-type: none"> <li>– Tr sensor faulty</li> <li>– PCB MSK.80 faulty</li> </ul>
TEMP SENSOR FAULT Tos	Outside temperature sensor faulty	<ul style="list-style-type: none"> <li>– Tos sensor faulty</li> <li>– PCB MSK.80 faulty</li> </ul>
PUMP FAULT PO	Faulty pump	<ul style="list-style-type: none"> <li>– Pump faulty</li> <li>– Faulty fuse on PCB MSK.80</li> <li>– PCB MSK.80 faulty</li> </ul>
LOW BATTERY POWER	Low battery power on PCB MSK.80	<ul style="list-style-type: none"> <li>– Low battery power on PCB MSK.80</li> </ul>

Table 4. Fault messages

## Installation sequence

### "Service" test mode

"Service" test mode is available at:

SERVICE/CONFIGURATION -> CONFIGURATION -> SERVICE

Fault code: 15

P = 0.0kW	T = T0
Q = 16.2l/m	h = 3.0m
Tin = 25.7°C	Z3D = TWU
Tout = 26.8°C	EXIT

P Calculated output [kW]

An approximate value, calculated based on the flow value and the differential between the flow and return temperatures.

Q Current flow rate [l/min]

Tin Actual return temperature [°C]

Tout Actual flow temperature [°C]

T Triac test function

h Default setting for pump head [m] (this change only applies to SERVICE mode)

Z3D Currently selected flow direction in the three-way valve [central heating, DHW]

EXIT Exit SERVICE mode

Using SERVICE mode:

#### 1. Setting the pump head – h (checking the flow rate)

A change in the pump head height has a direct impact on the flow rate. The flow rate must be selected to match the heating system. In general, the following conversions can be used for the flow rate:

Radiator system – approx. 0.8 l/min/kW

Underfloor heating installation – approx. 1.5 l/min/kW

To achieve the same flow rate during normal boiler operation, set the same head under Configuration/Pump > Head

**"Service" test mode** (cont.)

## 2. T – testing the power module

The parameter "T" allows manual control of the power module. Use a terminal ammeter to assess operation of the power module and measure the phase current.

- a) T = 0 – no triac is connected.  
Valid phase currents should be close to 0. Possible values for current consumption are generated by operating the DHW circulation pump and supplying the control units (low values).
- b) T = 5 – a single triac is switched on. Only phase L1 is connected to the heating unit.  
Valid phase currents should be close to 0. In the event of a fault with a triac connected to the other phases, the power consumption increases significantly (high value). In this case, the power module must be replaced.
- c) T = 7 – a single triac is switched on. Only phase L2 is connected to the heating unit.  
Valid phase currents should be close to 0. In the event of a fault with a triac connected to the other phases, the power consumption increases significantly (high value). In this case, the power module must be replaced.
- d) T = T1 + T2 [G1] – switch on an individual heating element [GX] for full power.  
The parameter [X] (from 1 to 6) indicates the number of connected heating elements.  
Valid current values should be present:

Boiler 8 kW – 5.3 A per phase and heating element

Boiler 24 kW – 9.2 A per phase and heating element

The actual current values depend on the input voltage and the actual resistance of the heating elements. If the current values for the individual heating elements differ significantly, this indicates a faulty power module. The power module must then be replaced. If the electrical installation is not equipped with an RCD, the heating assembly may be damaged (opening of the insulation resistance in the heating element). The insulation resistance of the heating element must be checked. The heating assembly must be replaced. If the electrical installation is equipped with an RCD, connecting the mains power supply to the damaged heating assembly immediately switches off the current. The heating assembly must be replaced.

## 3. Tin, Tout – Tin, Tout – displays the flow and return temperature values.

Both values should be within realistic ranges that match current conditions. Incorrect measurements or no display of the temperature value means that the relevant sensor is damaged. The respective temperature sensor must be replaced.

## 4. Z3D – CO, manual control of the three-way valve setting for DHW.

Allows valve function to be tested. If the valve servomotor does not respond to parameter changes, check the fuse on the MSK.80 PCB (1 A) and the input voltage between N and the mains power connector.

CO – correct voltage at terminal LA 230 VAC

CWU – correct voltage at terminal LB 230 VAC

If the servomotor does not respond to changes in the function settings, the servomotor in the three-way valve has been damaged. The servomotor or three-way valve must be replaced.

## Spare parts list

Pos.	Service code	Figure number	Designation	Quantity (pce)	Note
1	7731932	OK.B14-00.00	Front cover	1	
2	7636721	EKCO.MN3-02.00.00	Side flashing EKCO.MN3	1	
3	7731931	EKCO.MN3-01.00.00	Enclosure	1	
4	7634637		Room temperature sensor	1	
5	7837053		Outside temperature sensor	1	
6	7636727		PCB MSK.80 VMN3 (with bracket)	1	
	7634638		PCB MSK.80 VLN3 (with bracket)	1	
7	7636728		Control panel VMN3	1	
8	7636725	EKCO.M3-05.00.00	PCB EKCO.M3 (with connecting cable)	1	
9	7636738	EKCO.M3-00.00.01	Heater closure	1	
10	7636729		Pump WILO Para 15-130/7-50/iPWM1-3	1	
	7636730		Pump GRUN UPM3 15-75 130 AZA EUX9	1	
11	7636743	WE-035/05 + WE-035/06	Cable set for pump Wilo Yonos PWM EKCO.M3	1	
	7636744	WE-035/07 + WE-035/08	Cable set for pump Grundfos UPM3	1	
12	7636737	WT3a-00.00.00/02	WT-3 Safety cut-out	1	
13	7636736	WE-029/09	EKCO.M3 return temperature sensor	1	
14	7636735	WE-029/10	Flow temperature sensor EKCO.M3	1	
15	7636733	01.305.0010.0	Automatic air vent valve	1	
16	7636731	01.000.0007.1	Pressure sensor	1	
17	7636732	01.303.0020.0	Diaphragm safety valve EPCO/EKCO	1	
18	7636723	EKCO.M3-07.00.00	Outlet connection pipe EKCO.M3	1	
19	7636745	01.233.0052.0	Gasket 2 × 30 × 21 (1")	2	
20	7636746	WP-054/12	Gasket 1.5 × 16 × 24	2	
21	7636747	WP-054/10	Gasket 1.5 × 13 × 18.6	1	
22	7636734	01.302.0013.0	Expansion vessel	1	
23	7636724	EKCO.MN3-00.00.01	Expansion vessel support EKCO.MN3	1	
24	7636726	EKCO.M3-02.00.00	Heater EKCO.M3	1	
25	7636722	EKCO.MN3-03.00.00	Inlet connection pipe EKCO.MN3	1	
26	7636748	WP-054/02	Gasket 1.5 × 8 × 14.8	1	
27	7636749	01.233.0100.0	O-ring 14 × 2	1	
28	7636750	WP-259	Gasket	1	
29	7636739	WP-205	Drain outlet L3, M3	1	
30	7636741		Cable set L3, M3 8 kW	1	
31	7636742		Cable set L3, M3 24 kW	1	
32	7179114		Temperature sensor for DHW cylinder	1	
33					
34					
35					
36					
37					
38					

## Specification

Max. pressure	MPa	0.3 (3 bar)
Min. pressure (for the sealed unvented system)	MPa	0.05 (0.5 bar)
Outlet temperature	°C	20 – 85
Max. temperature	°C	100
Dimensions (height × width × depth)	mm	716 × 316 × 235
Weight	kg	~20.5
Boiler connections		G ¾" (female thread)
Expansion vessel	l	~5
IP rating		IP 22
Maximum number of additional heating circuits		8

## Boiler

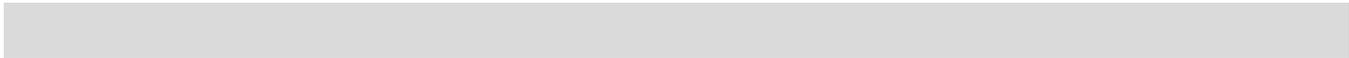
Boiler		4/6/8			4/6/8		
		4	6	8	4	6	8
Rated output	kW	4	6	8	4	6	8
Rated voltage		230 V~			400 V 3N~		
Rated current	A	17.4	26.1	34.8	3 × 5.8	3 × 8.7	3 × 11.6
Min. cross-section of the power cable	mm <sup>2</sup>	3 × 2.5	3 × 4	3 × 6	5 × 2.5		
Max. cross-section of the power cable	mm <sup>2</sup>	5 × 16					
Max. permissible mains impedance	Ω	0.27	0.17	0.15			0.27

Boiler		12/16/20/24			
		12	16	20	24
Rated output	kW	12	16	20	24
Rated voltage		400 V 3N~			
Rated current	A	3 × 17.4	3 × 23.1	3 × 28.8	3 × 34.6
Min. cross-section of the power cable	mm <sup>2</sup>	5 × 2.5	5 × 4		5 × 6
Max. cross-section of the power cable	mm <sup>2</sup>	5 × 16			
Max. permissible mains impedance	Ω			0.27	0.13

## Heating circuit module

Dimensions		70 × 90 × 58 mm
Supply		~230 V 50 Hz max. 170 VA
Power protection		1 A
Range of heating media in heating circuit	Radiator heating	20 – 80 °C
	Underfloor heating system	20 – 55 °C
<b>Outputs</b>		
Pump		~230 V 50 Hz max. 150 VA
Valve servomotor		~230 V 50 Hz max. 20 VA
<b>Inputs</b>		
Bus (computer)		RS485
Temperature sensor, valve outlet		NTC 10K (KOSPEL WE-019/01)
MA Master appliance		Potential-free input







The used product cannot be treated as domestic waste. The dismantled appliance must be sent to a collection point for electrical and electronic waste for recycling. Proper disposal of the used product prevents potentially harmful effects on the environment, which can occur due to the improper handling of waste.

For more information on recycling this product, please contact your local government, a waste disposal service, or the store where this product was purchased.

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