Installation and service instructions

for contractors

Vitotron 100
Type VMN3, VLN3

Electric system boiler for central heating
with optional DHW heating

VITOTRON 100

6155049 GB 5/2022

Please retain for future use!

Safety instructions

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

Safety instructions explained

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

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

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

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.

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.
  Before removing equipment covers, wait at least 4 minutes to allow the voltage to drop out.
- 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. Before beginning work, touch earthed objects, such as heating or water pipes, to discharge any static.

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-authorised 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

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.

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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.

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 Vitotron.

Product description

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

The standard delivery depends on the appliance version.

The Vitotron type VLN3 is set up for operation with a constant flow temperature.

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. In conjunction with the heating circuit module VCMG3, several heating circuits can be supplied with heat.

In combination with a 3-way valve, it is also possible to charge a buffer cylinder.

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

The Vitotron is only intended for installation in sealed unvented heating systems.

The following components are integrated into the hydraulic system of the Vitotron 100:
- Circulation pump
- Safety valve
- Expansion vessel (5 litres)

DHW heating with a DHW cylinder

The standard delivery of the appliance versions for optional heating of an external DHW cylinder includes a 3-way valve and a cylinder temperature sensor. The 3-way valve must be installed outside the Vitotron in the heating flow. The cylinder temperature sensor must be installed on the DHW cylinder in accordance with the manufacturer's instructions. The cylinder temperature sensor can be connected to the boiler control unit and calls for heating energy.

Installation information

- The heating system must be thoroughly flushed before the Vitotron is installed.
- Do not install any shut-off fittings (e.g. valves) at the safety valve diffuser.
- The Vitotron must be mounted on a solid and stable wall that meets the static requirements.
- The Vitotron 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 Vitotron is set at the factory for use with a central heating system. To operate the Vitotron in conjunction with a DHW cylinder, the standard setting must be changed in the advanced settings.
- Do not drain the water from the central heating system after the heating season.
- Leave the controller in standby mode between heating seasons and do not interrupt the power supply.

The Vitotron VMN3 is equipped with an expansion vessel (capacity: 5 l, pressure: 1.5 bar). If the liquid content of the heating system exceeds the values in the following table, an appropriate additional expansion vessel must be installed:

Heating medium temperature (flow and return)	Liquid content of the 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	

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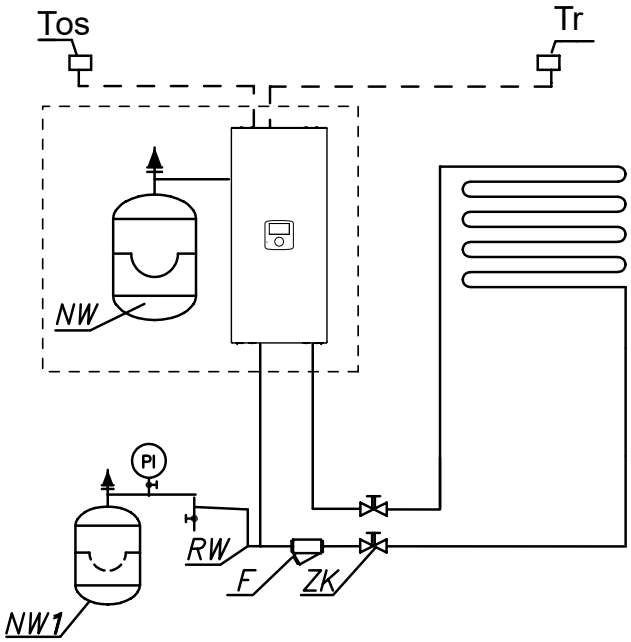
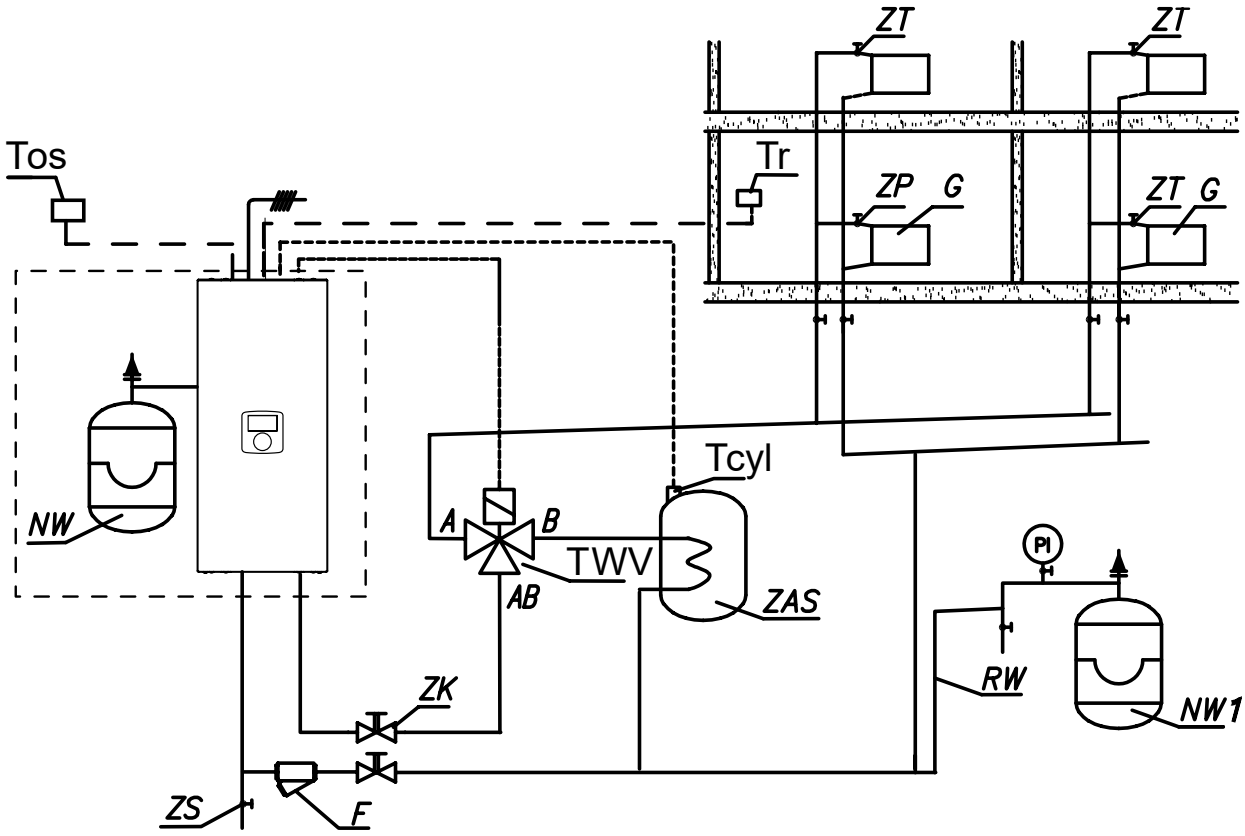
Connecting the Vitotron to the central heating system



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 – 3-way valve
ZAS – DHW cylinder
Tr – Room temperature sensor
Tcyl – Temperature sensor for DHW cylinder (WE-019/01)
Tos – Outside temperature sensor (WE-027)



Install all components according to the respective manufacturer's instructions. Observe the flow direction of the heating medium. Install a shut-off valve upstream and downstream of filter "F" to facilitate filter replacement and cleaning.

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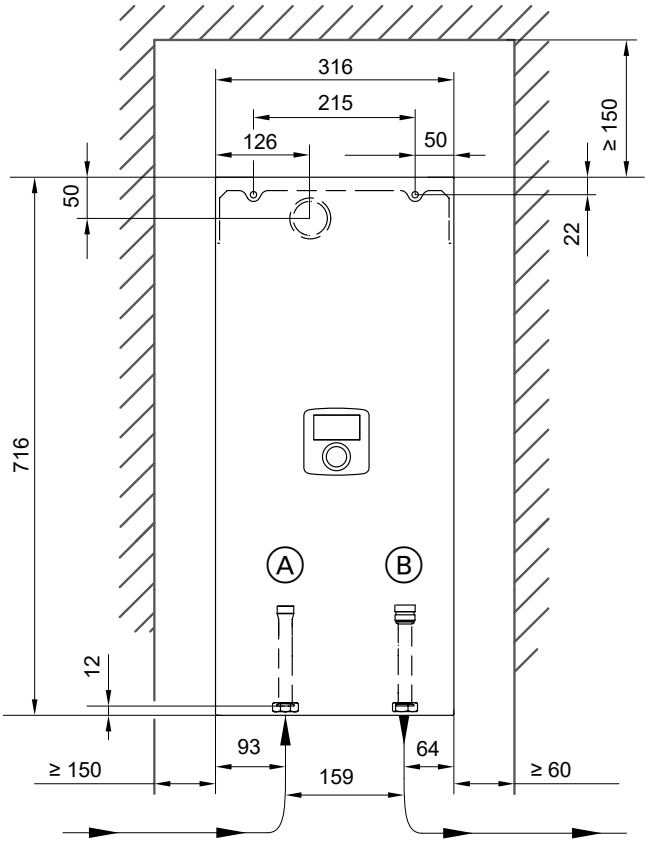
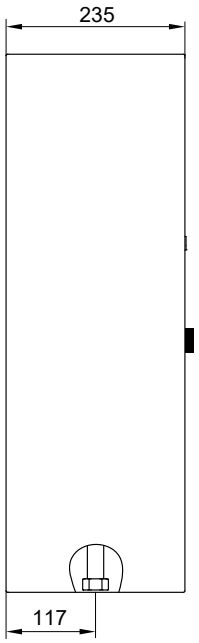
Assembly and installation



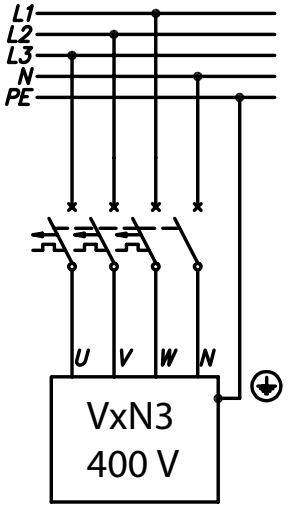


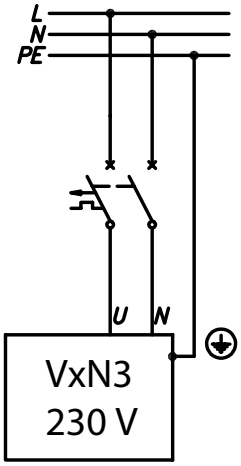
Ⓐ Heating return (to the Vitotron) G "
Ⓑ Heating flow G ¾"

1. Secure the Vitotron vertically with fixings and with the flow and return lines pointing downwards. Maintain the specified minimum clearances to the wall and ceiling.

   Caution
   The fixings must not result in any mechanical stress on the Vitotron.
2. Connect the Vitotron 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. Install and connect the Tr and Tos sensors and other appliances to the connection points for external sensors and appliances.
6. Connect the Vitotron to the electrical connection.
7. After completing the above steps, start the Vitotron, select the language in the Vitotron, run it at maximum output for 60 minutes, then vent the pump *[Configuration > Pump > Vent].*
8. Set the maximum temperature factor *[Configuration > Central heating circuit > MAX. power supply temp.].*

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





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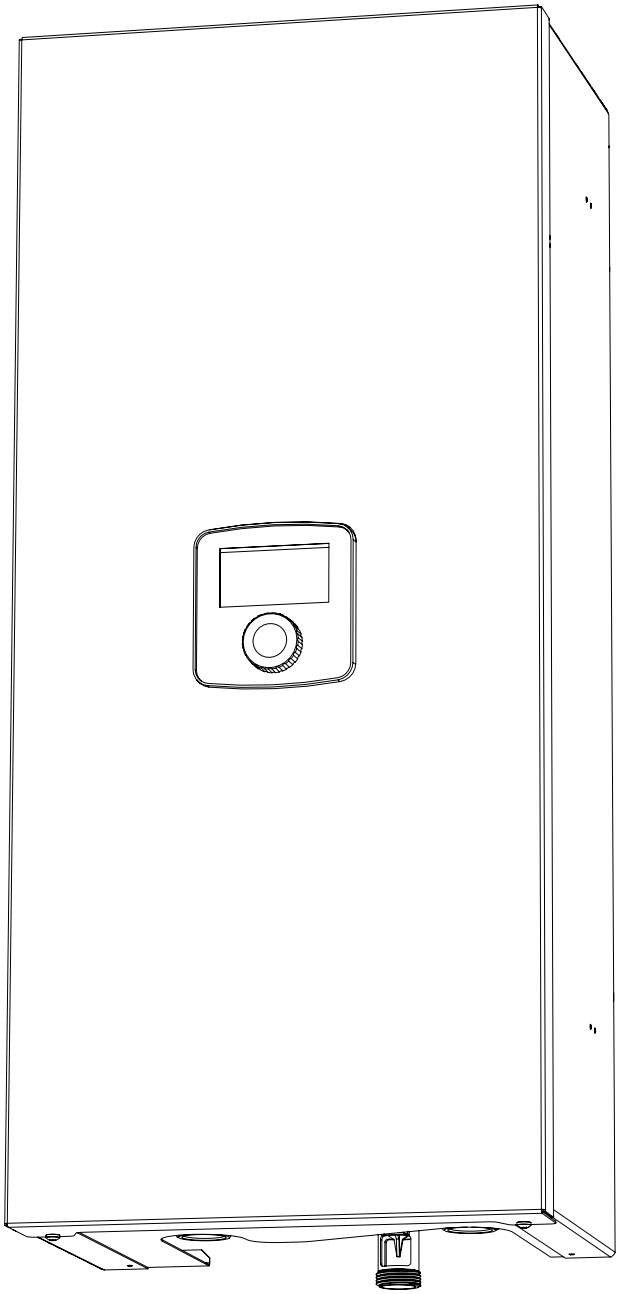
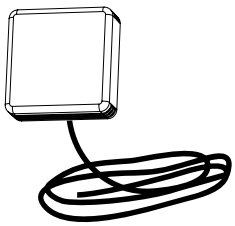
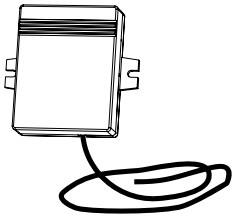
Assembly and installation (cont.)



Room temperature sensor



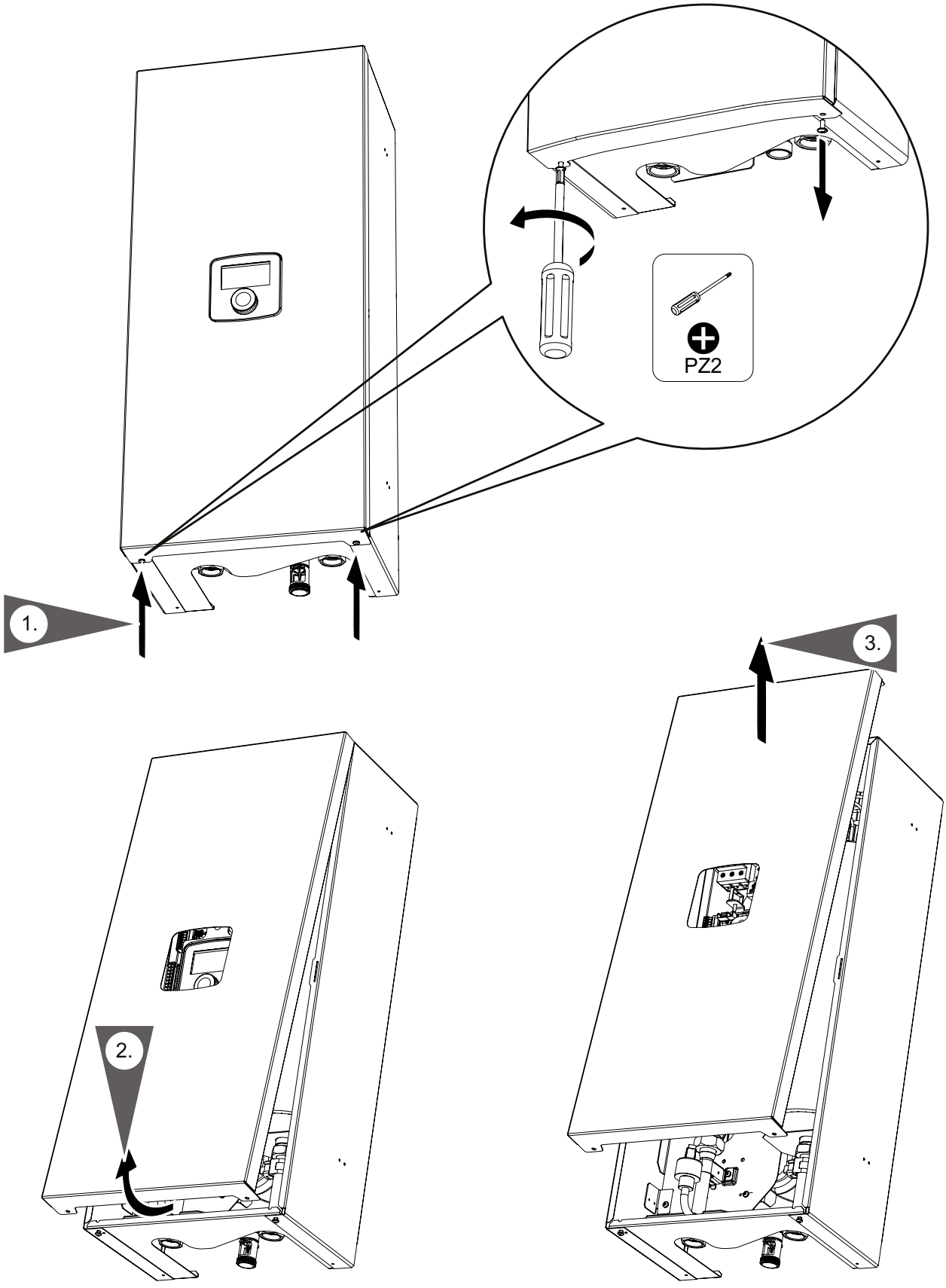
Outside temperature sensor



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

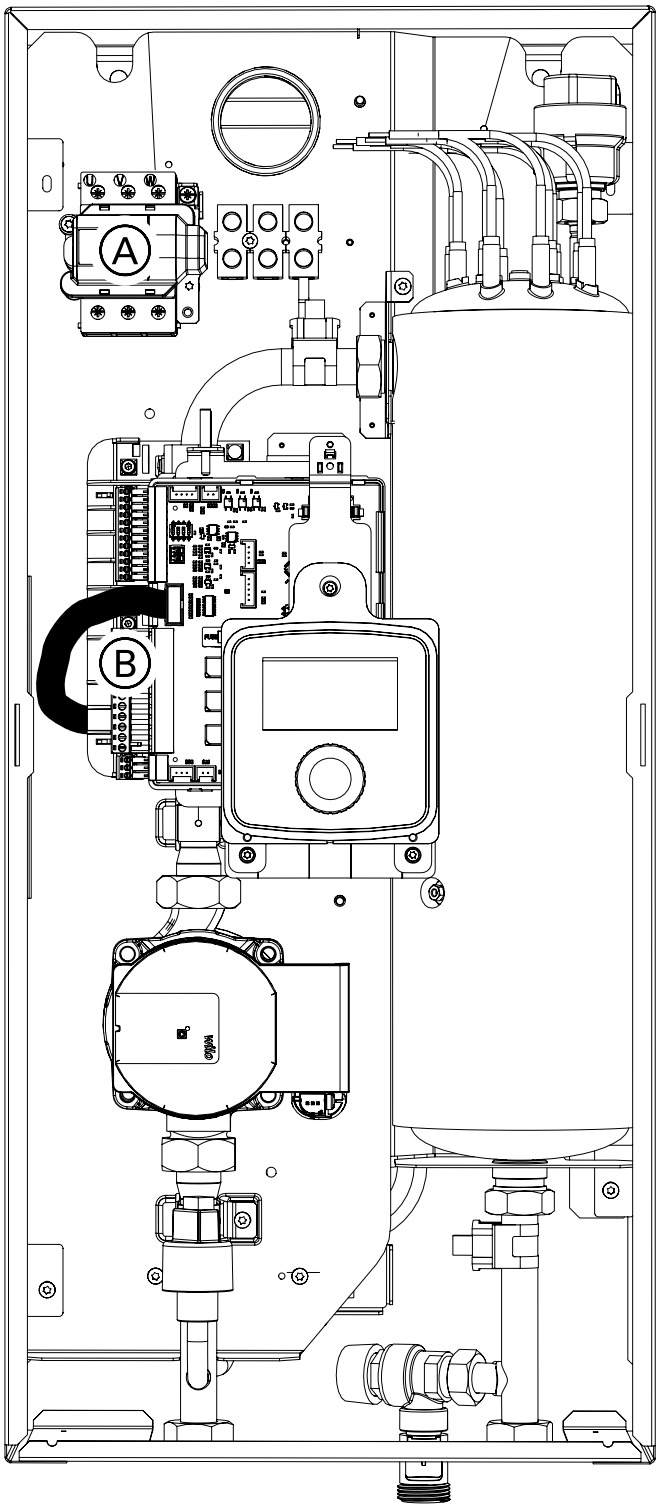
Assembly and installation (cont.)

Opening the appliance



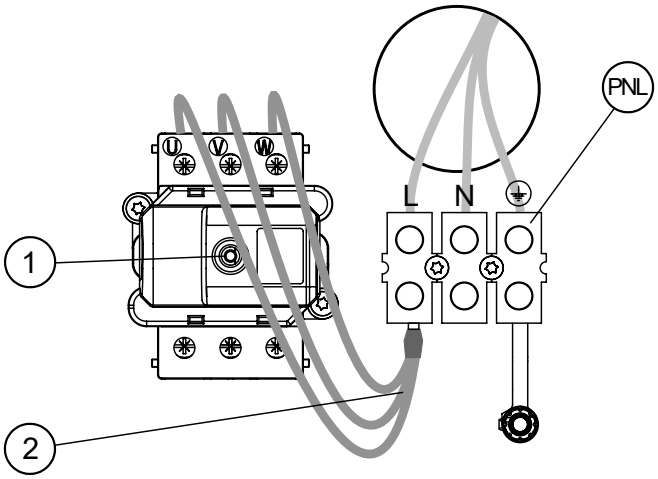
Assembly and installation (cont.)

Internal view



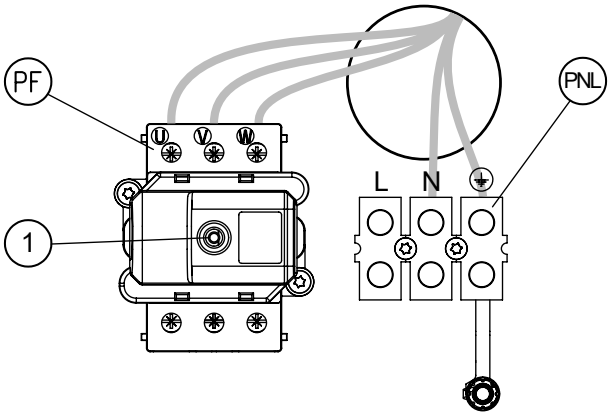
Ⓐ Electrical connection
Ⓑ Control inputs/outputs and sensors

Connection to a single-phase power system (only for Vitotron with 4 kW, 6 kW and 8 kW)



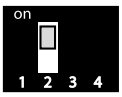
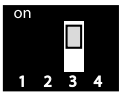
PNL – Terminals for neutral, earth and phase conductors
1 – Temperature limiter
2 – Additional conductors (only for single-phase system) Input Output

Connection to the three-phase power system



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

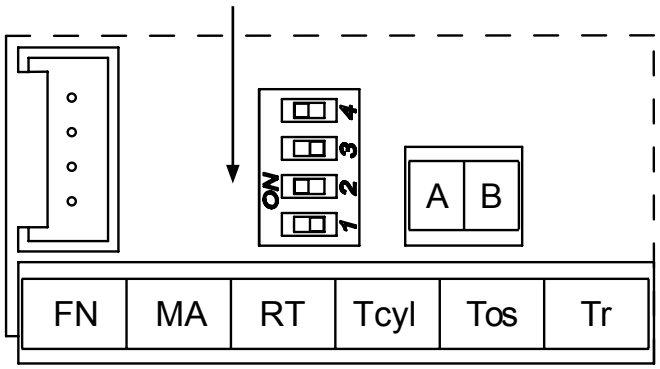
Selecting the power supply type

	Rated output	 12, 16, 20, 24 kW
		 4, 6, 8 kW
	Connection type to electric system 4, 6, 8 kW	 3-phase
		 Single-phase

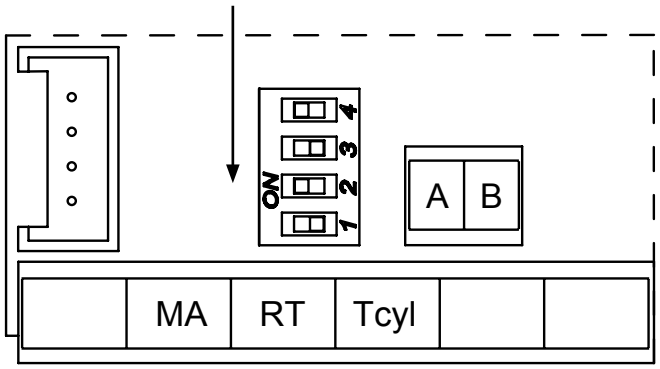
If the electrical connection type is configured incorrectly, e.g. using a single-phase installation for 12, 16, 20 and 24 kW, the message "Configuration fault" is shown after commissioning.

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

Type VMN3



Type VLN3



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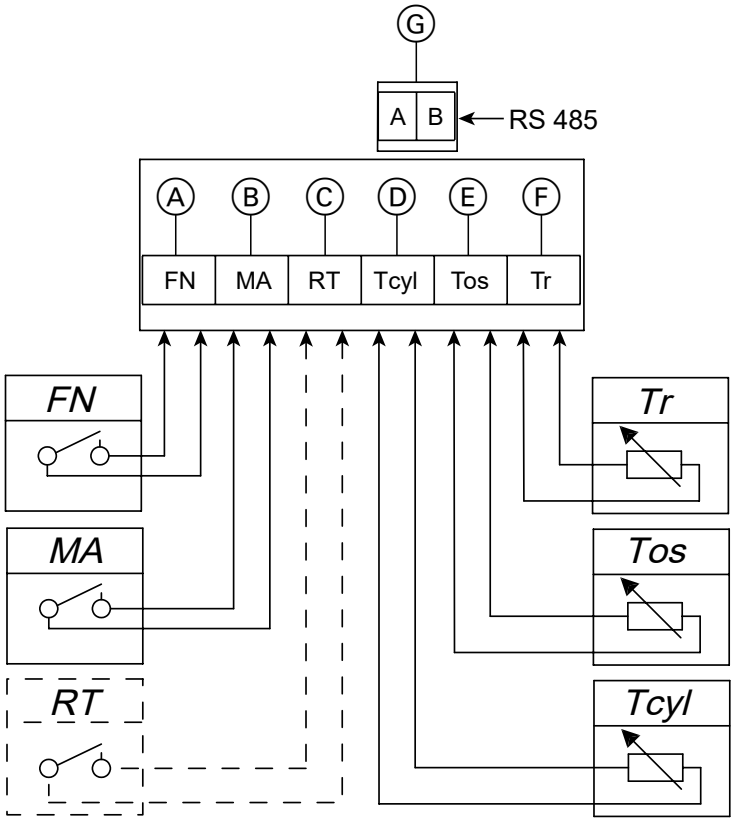
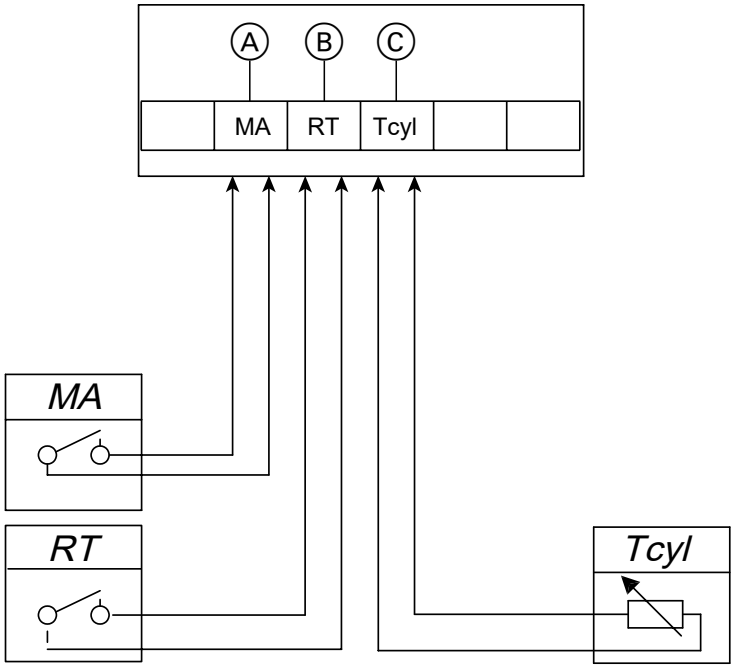
Connecting external sensors and control devices

Type VMN3



Ⓐ Programmable control input
Ⓑ Higher-level control unit (master unit)
Ⓒ Alternative room temperature controller
Ⓓ Cylinder temperature sensor
Ⓔ Outside temperature sensor
Ⓕ Room temperature sensor
Ⓖ Connection for external heating circuit controller

Type VLN3



Ⓐ Higher-level control unit (master unit)
Ⓑ Alternative room temperature controller
Ⓒ Cylinder temperature sensor

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Connecting external sensors and control devices (cont.)

FN – Programmable control input (only type VMN3)
A connection of the FN contacts by an external appliance will lead to specific behaviour of the Vitotron, depending on the input configuration *[Configuration > FN input]*:

- Frost protection function, independent of the set room temperature
- Maintaining a comfortable temperature regardless of the set room temperature
- Charging of the buffer cylinder with limited options for user intervention outside the schedule (integration of Vitotron and PV installation).

MA – Higher-level control unit (master unit)
If the MA input is opened, the heating function of the Vitotron is prevented. This can prevent an overload of the mains power if a priority appliance (e.g. an instantaneous water heater for supplying DHW) is operated in parallel.

RT – (alternative room temperature controller, type VMN3)
Optional control of Vitotron operation depending on current room temperature. The RT input must be activated *[Configuration > Room temperature > RT]*. If the RT input is activated, the room temperature controller integrated in the Vitotron is switched off. We recommend using the temperature sensor set at the factory in conjunction with the integrated room temperature controller for the Vitotron.

RT – (alternative room temperature controller, type VLN3)
Control of Vitotron operation depending on room temperature. A closed contact activates the central heating function. 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. The controller opens the contact when the set room temperature is reached.

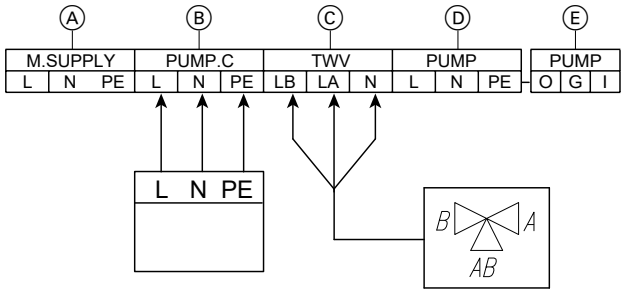
Tcyl – cylinder temperature sensor
The cylinder temperature sensor must be installed in accordance with the DHW cylinder manufacturer's instructions.

Tos – Outside temperature sensor (only type VMN3)
The outside temperature sensor must be installed in a shady location on the north or north-west façade of the building and away from windows and fans. The sensor lead must be as short as possible and must not be routed in the immediate vicinity of 230 V/400 V 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 heating circuit controllers.

DHW heating

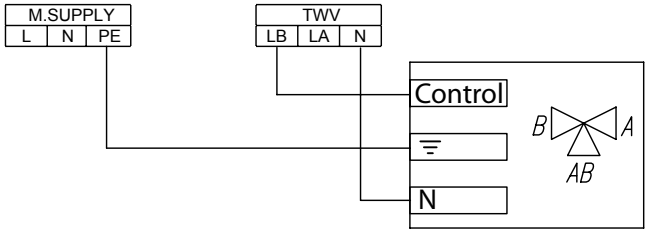


Ⓐ Mains supply to main PCB
Ⓑ DHW circulation pump
Ⓒ 3-way valve control (central heating/DHW)
Ⓓ Internal pump
ⒺPWM signal for internal pump

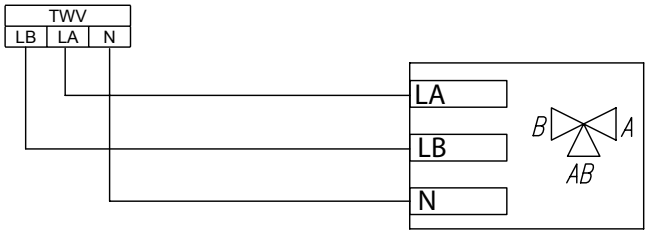
PUMP.C – DHW circulation pump
Controls the DHW circulation pump in the daily/weekly program. The function must be activated *[Configuration > Circulation > YES]*.

TWV – 3-way valve control (central heating/DHW)
The 3-way valve switches between central heating and DHW heating. Depending on the model used (SPST or SPDT control), the valve must be connected as shown in the illustrations.

SPST control



SPDT control



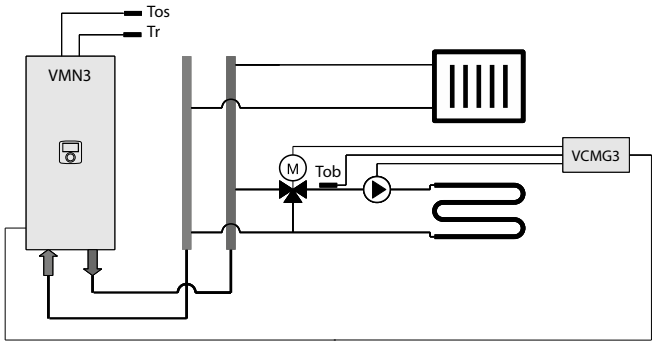
Note
Activation of the DHW function:
See „Service/Konfiguration“ auf Seite 22

! Caution
An incorrect electrical connection will result in damage.
Do not connect the FN, MA, RT, RT, Tcyl, Tos or Tr inputs with an external power source!

Extending the system with additional heating circuits
(only for VMN3 with VCMG3 heating circuit module)

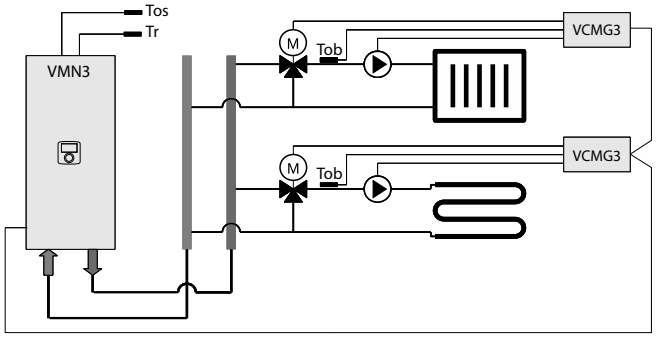
To operate several heating circuits, the heating circuit modules VCMG3 must be used. Depending on the configuration of the heating system, the Vitotron will operate in the following modes *[Configuration > Operating mode]*:

- Basic – mixed operation (heating circuits with and without heating circuit module VCMG3). The parameters for heating circuits with heating circuit module can be set individually.

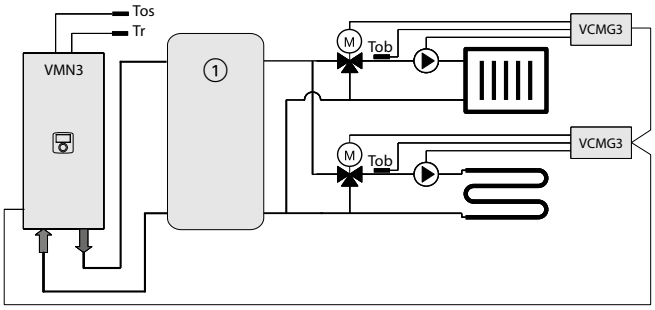


The heating circuit controlled by the heating circuit module operates according to the Vitotron control schedule, but with its own heating curve or manual settings.

- Heat source – all heating circuits are equipped with their own heating circuit module VCMG3. The parameters for each heating circuit can be set individually.
  An example installation scheme is shown below.



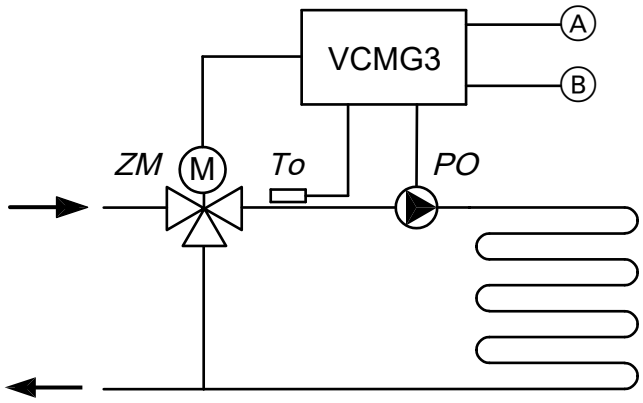
- Buffer cylinder – the buffer cylinder is charged by the Vitotron according to the set parameters. The heating circuits draw the heat they require from the buffer cylinder. The electrical energy supply can occur at different times to the heat demand.



1 Buffer cylinder

VCMG3 heating circuit module (only for VMN3)

The heating circuit module (control unit) regulates the temperature in a heating circuit. It is equipped with a mixing valve with a servomotor. The required flow temperature of the heating circuit is set via the mixing valve.



Ⓐ Feed ~230 V
Ⓑ Heating circuit controller RS485
ZM Mixing valve with servomotor
To Heating circuit flow temperature sensor
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_o (open) or L_c (close).

! **Caution**
If the temperature of the heating medium is too high, it may damage the system. Install suitable safety valves.

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

Note
The heating circuit module VCMG3 ***cannot*** *be connected to type VLN3.*

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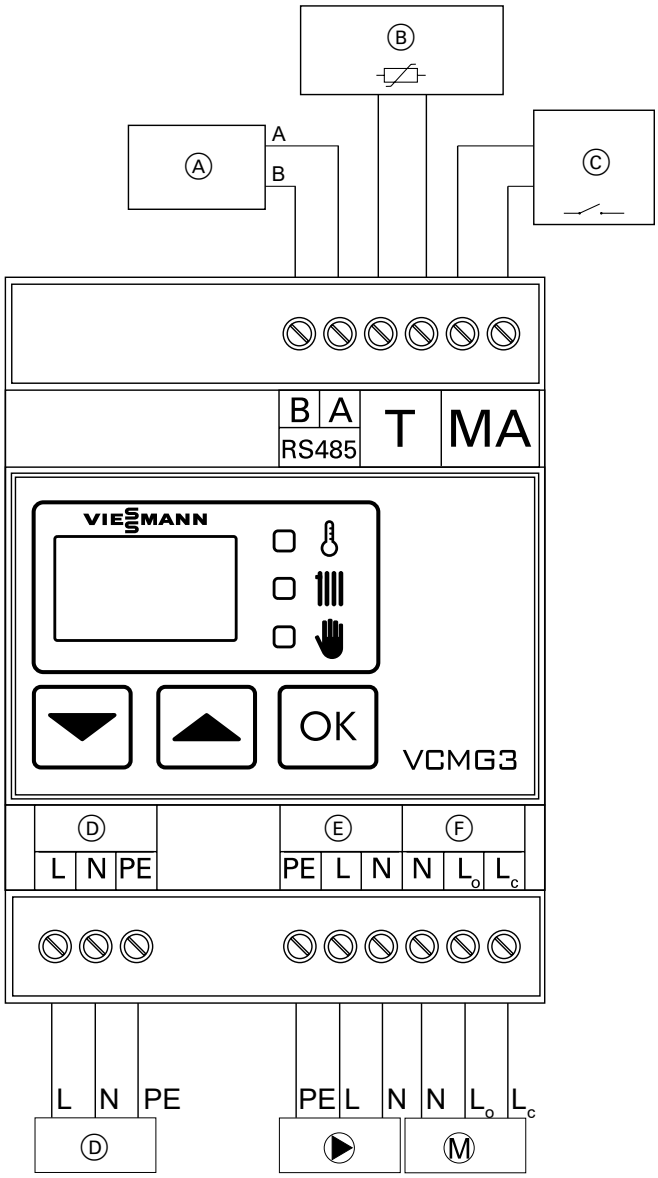
Connection of the VCMG3 heating circuit module (only for VMN3)



The heating circuit module communicates with the Vitotron. Configuration parameters are set in the configuration menu of the heating circuit module: See „Parameter des VCMG3 Heizkreismoduls“ auf Seite 21.

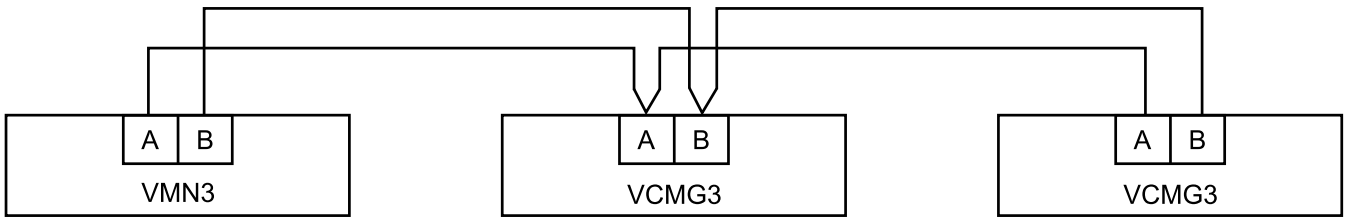
Each heating circuit module must be assigned a unique identification number (see „Betriebsart – Konfiguration“ auf Seite 20 and „Parameter des VCMG3 Heizkreismoduls“ auf Seite 21).

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 the heating circuit at a higher level. 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 heating circuit module.

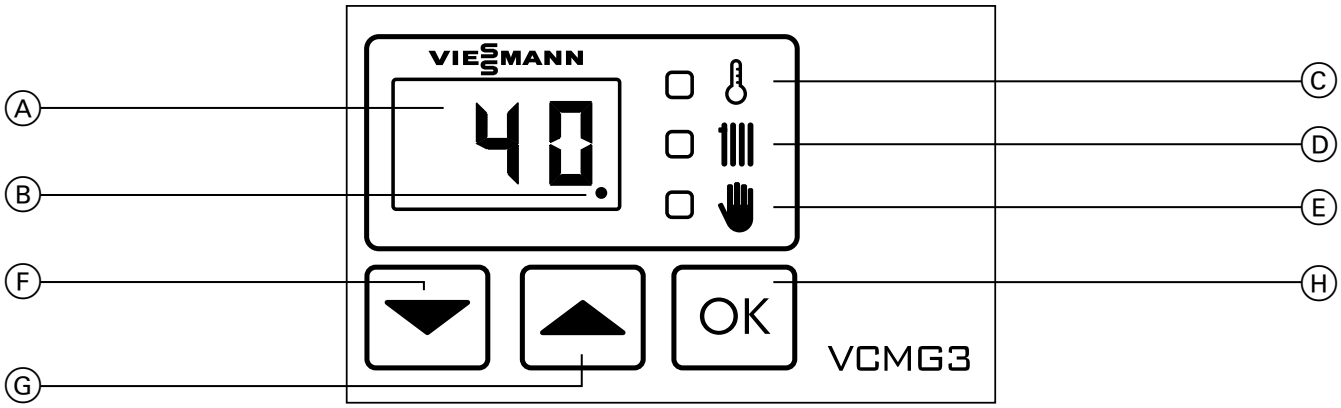
Ⓐ Connection to the Vitotron (RS485)
Ⓑ Heating circuit flow temperature sensor
Ⓒ Master unit or terminal
Ⓓ Feed ~230 V
Ⓔ Heating circuit pump
Ⓕ Mixing valve

Connection of several VCMG3 heating circuit modules to a Vitotron (type VMN3) with cable type UPT Cat. 5e 4*2 24 AWG according to the sketch below:



Operation of the VCMG3 heating circuit module (only for VMN3)

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
Ⓕ, Ⓖ, Ⓗ	Operating buttons

The heating circuit control unit operates in three operating modes:

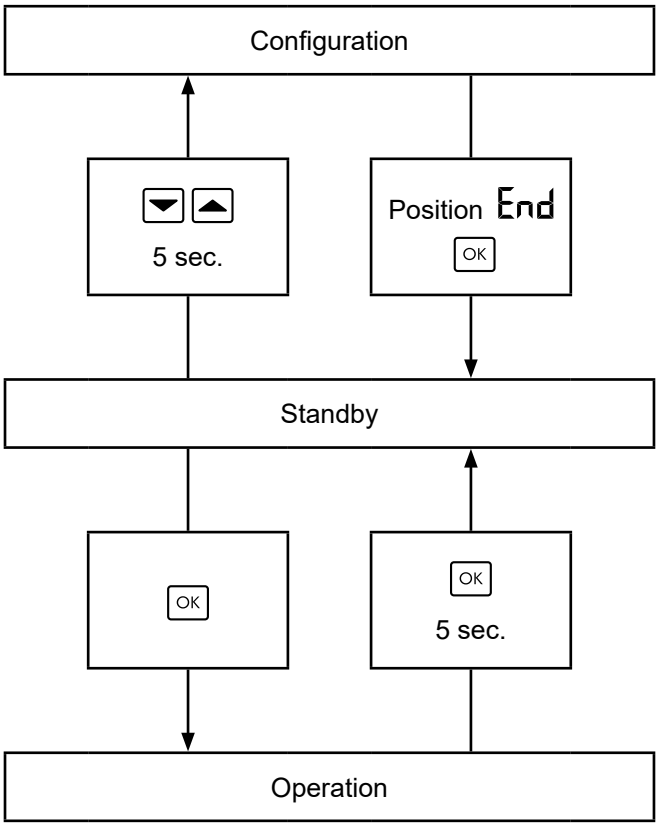
- "Operating" mode: Depending on the configuration, settings and external parameters, the heating circuit module operates according to the algorithm for the opening phase of the mixing valve, so that the set flow temperature is reached in the heating circuit.
- "Standby" mode: Operating mode used outside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

The Vitotron can change the operating mode of the heating circuit module VCMG3. If the Vitotron is switched to "Standby", for example, then the heating circuit module will also automatically switch to "Standby".

The operating mode of the heating circuit module is selected using the buttons on the control panel, as shown in the following diagram.

Manual settings made from the control panel are discarded after 30 seconds of keyboard inactivity if they have not been saved.

Operation of the VCMG3 heating circuit module (only for VMN3) (cont.)



"Standby" mode is indicated on the display (A) via the regularly appearing symbol oFF.

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

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

"Standby" mode

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

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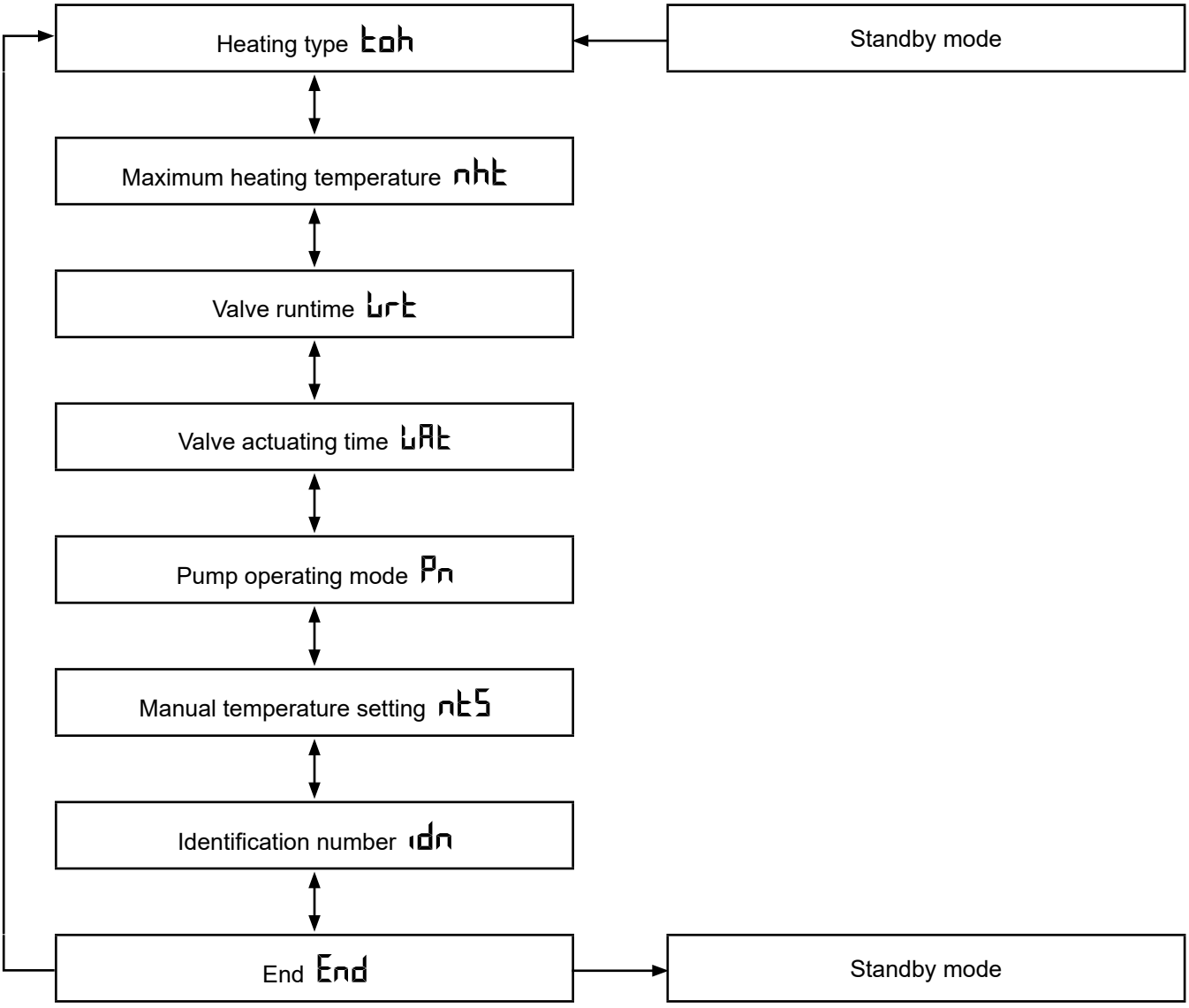
Operation of the VCMG3 heating circuit module (only for VMN3) (cont.)

"Configuration" mode

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

The parameter can be changed by pressing ▼ ▲ and the parameter value can be changed by pressing OK. A flashing display ✋ indicates that the relevant parameter is being edited. Once parameter ▼ ▲ has been edited, press OK to apply the parameter value.

Structure of the configuration menu:



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Operation of the VCMG3 heating circuit module (only for VMN3) (cont.)

Parameters of the VCMG3 heating circuit module

Type of parameter and symbol	Description/comments
toh Heating type	Type of heating circuit: F (floor) – underfloor heating (20-55 °C) r (radiator) – room heating (20-80 °C)
nht Maximum heating temperature	Maximum flow temperature in the heating circuit: Select value according to requirements.
Urt Valve runtime	Time required for switching the valve ranging 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.
UAt 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.
Pn Pump operating mode	PnA (automatic pump mode) – the heating circuit pump is only activated when heating is active. PnC (continuous pump mode) – the heating circuit pump runs continuously; used only during system commissioning. Standard setting: Automatic mode.
nt5 Manual temperature setting	Flow temperature for manual mode
idn Identification number	Note: During system configuration, each heating circuit module must be assigned a unique identification number. Standard setting: 5
End	Press "Configuration" to exit the operating mode OK. The system enters standby mode.

"Operating" mode

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

Type of parameter and symbol	Description
th5 Temperature	Heating circuit flow temperature (after mixing valve)
t5h Heating temperature setting	Set flow temperature – display only. If the heating circuit is inactive, the following symbol is displayed: ---

The symbol ✋ is displayed in manual mode.

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Operating the Vitotron

Service/configuration

Parameter display:
Display of the input and output signals of the Vitotron.

Configuration
Matching the Vitotron 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 at the beginning of commissioning. 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 parameters
– Buffer – the buffer cylinder is filled according to the Vitotron schedule, but the heating circuit modules drain the buffer cylinder according to their own schedule.

Operating the Vitotron (cont.)

- Buffer (only available in buffer mode, only for type VMN3):
  - Output temperature:
    The temperature at which the buffer cylinder is filled.
  - Filling outside the program:
    Yes – Operation enabled even outside the schedule. If the temperature is too low, buffer cylinder filling is activated according to the parameters in the schedule.
    No – The buffer cylinder is only filled according to the schedule.

- Central heating (only type VMN3):
  - Heating curve no. (basic operating mode only):
    Selection of the heating curve
    (see „Heizkennlinie (nur Typ VMN3)“ auf Seite 25).
    Note: The parameter appears when the curve adjustment is set to "Heating" *[Configuration > Control > According to curve]*.
  - Heating curve offset (basic operating mode only):
    Shift of the heating curve (see „Heizkennlinie (nur Typ VMN3)“ auf Seite 25). **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: Excessively high temperatures lead to unnecessarily high energy consumption and can cause damage to the heating system.
  - 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 – the flow temperature corresponds to the MAN flow temperature.
  - Outside temperature switched off: When the selected outside temperature is reached, central heating is switched off, regardless of the actual room temperature.
  - Frost protection:
    Yes – If the room temperature in standby mode falls below 7 °C and the outside temperature falls below 2 °C, central heating is switched on.
    No – Frost protection switched off.
  - Boiler protection:
    Yes – If the temperature at the Vitotron 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.
  When the DHW function is switched off, the assigned parameter settings are hidden.

- 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: Room temp. sensor input from Tr
    RT: External room controller input from RT.
    Heating operation only takes place when the room controller requests it by connecting the two RT contacts.
    Note: This configuration is not recommended when heating circuit modules are used.
  - Tr control: Room temperature control (parameter not available with room sensor setting RT):
    Yes – When the set room temperature is reached, 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 – Central heating in turbo mode has priority over DHW heating
  - Switch off: Automatic turbo mode is switched off.

- DHW circulation pump:
  - Pump protection: Anti-seizing protection of the circulation pump. Pump duty cycle during longer downtimes.
  - Automatic mode:
    Yes – Operation as required

Operating the Vitotron (cont.)

No – Continuous operation.
- Type: Type of pump installed
- Control unit:
  p-constant – constant pressure
  p-alternating – alternating pressure.
  In 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 static properties. In control mode (p-alternating – variable mode), the pressure differential generated by the DHW circulation pump is maintained at a level that varies linearly between ½ H and H. The differential pressure setting decreases or increases depending on the flow rate. Recommended operating mode for radiators.
- Venting:
  Switch on: Start the system venting process
  Switch off: Stop the system venting process.
  During the venting process (10 min.), the DHW circulation 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 Vitotron.

- FN input: Behaviour of the system with bridged FN input (only type VMN3):
  - Switch off: Function deactivated.
  - (❄): Frost protection temperature. Maintain the frost protection temperature regardless of the room temperature set in the heating program.
  - (☾): Temperature setback, e.g. manual activation of night setback
  - PV (only available with cylinder operation): Filling of the cylinder outside the schedule with restricted rated output

- PW MAX [kW] (only type VMN3): Setting of the maximum buffer charge when the FN input is activated.
  Note: The parameter is available with the setting "Input FN: PV".

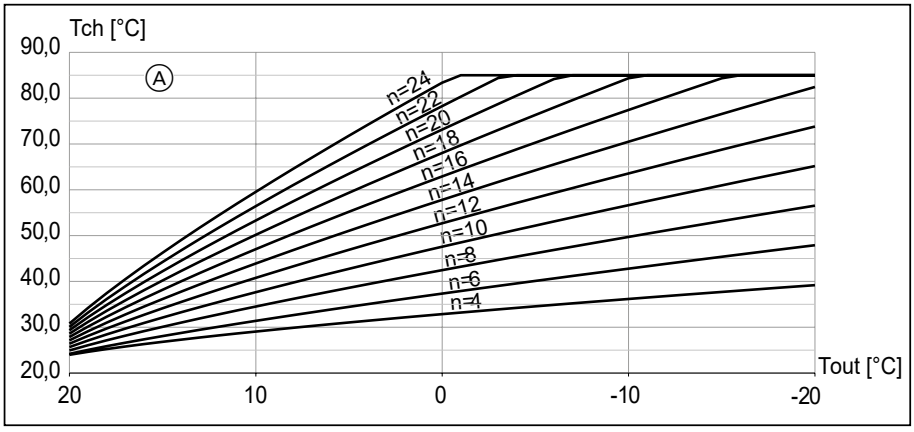
- Pressure control:
  Yes – Safety function: Heating operation is blocked below 0.5 bar pressure in the heating circuit.
  No – Control switched off. Pressure control must be switched off when the Vitotron is operated in an open vented system.

- Operating mode (only type VMN3):
  - Basic: The Vitotron is the only appliance controlling the heating system. If heating circuit modules are used, they will operate according to the Vitotron schedule.
  - Source: Vitotron only acts as a heat source. The heating system is controlled by the heating circuit modules by having a heat demand reported via the corresponding parameters.
  - Buffer cylinder: The Vitotron fills a thermal accumulator. The cylinder is drained via the heating circuit modules.

- Heating circuits (only type VMN3): Parameter settings of the heating circuits, if available;
  - Maximum flow temperature: Maximum flow temperature of the heating circuit.
  - 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 – the flow temperature of the heating circuit corresponds to the MAN temperature setting.
    Heating curve no. – Selection of the heating curve (see „Heizkennlinie (nur Typ VMN3)“ auf Seite 25). Note: This parameter appears when control according to the heating curve is set.
    Curve offset – shift of the heating curve (see „Heizkennlinie (nur Typ VMN3)“ auf Seite 25). Note: This parameter appears with the 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.

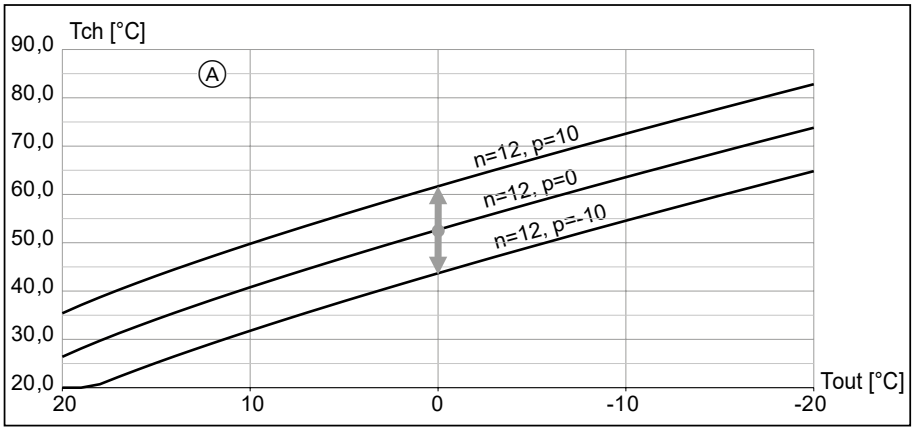
Operating the Vitotron (cont.)

Heating curve (only type VMN3)
Temperature control ensures that the correct temperature is maintained in the central heating installation depending on the outside temperature. At low outside temperatures, the heat demand in the building is higher. The correlation between the outside temperature and the temperature of the heating installation is represented graphically with the heating curve. The graph below shows a compilation of heating curves for a set room temperature of 22 °C. The most appropriate heating curve is selected depending on the building properties, climate zone and type of heating installation.



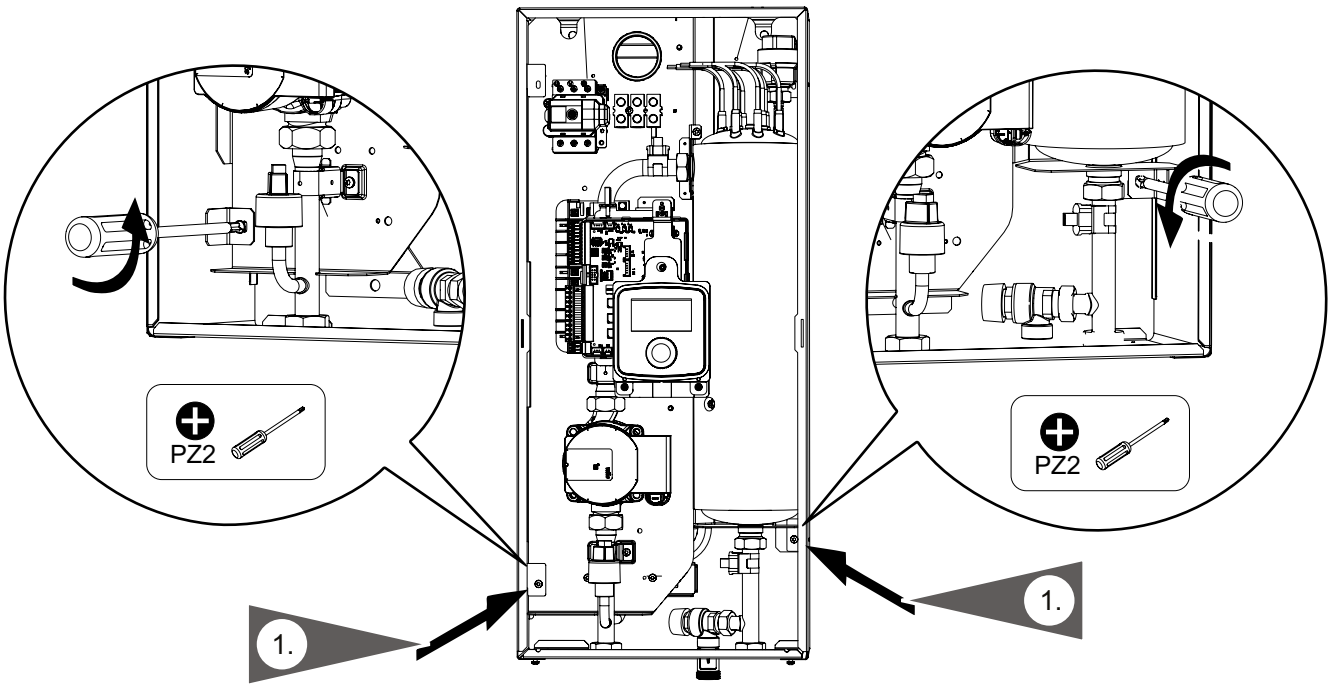
Ⓐ Heating curve no. (p = 0)

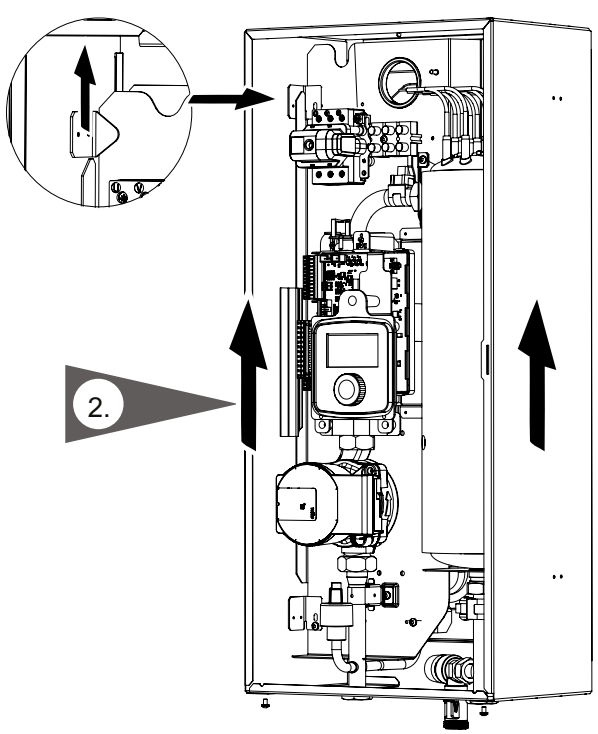
To offset the heating curve, the [Heating curve] parameter has to be changed. The graph below shows heating curve no. 12 with an offset of -10 °C and 10 °C.

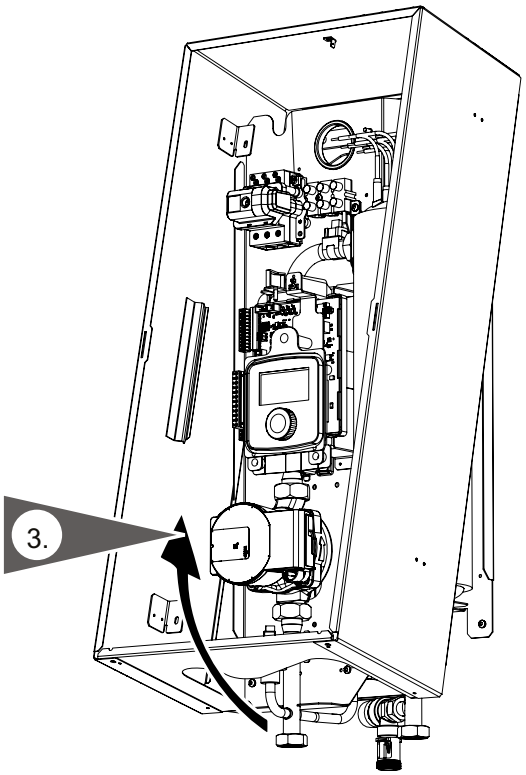


Ⓐ p – heating curve offset

Removing the side cover







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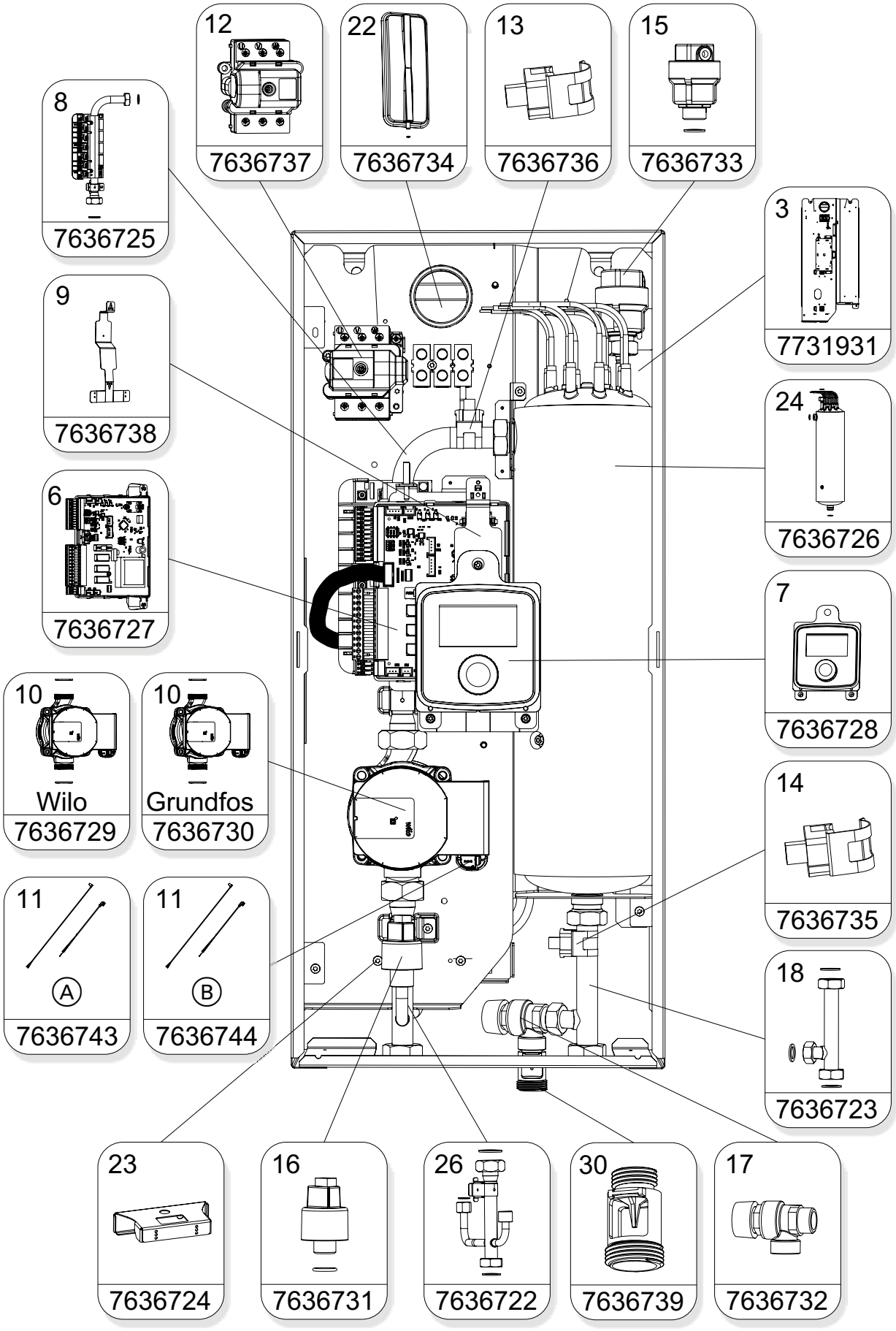
Interior view of VMN3 with spare part numbers



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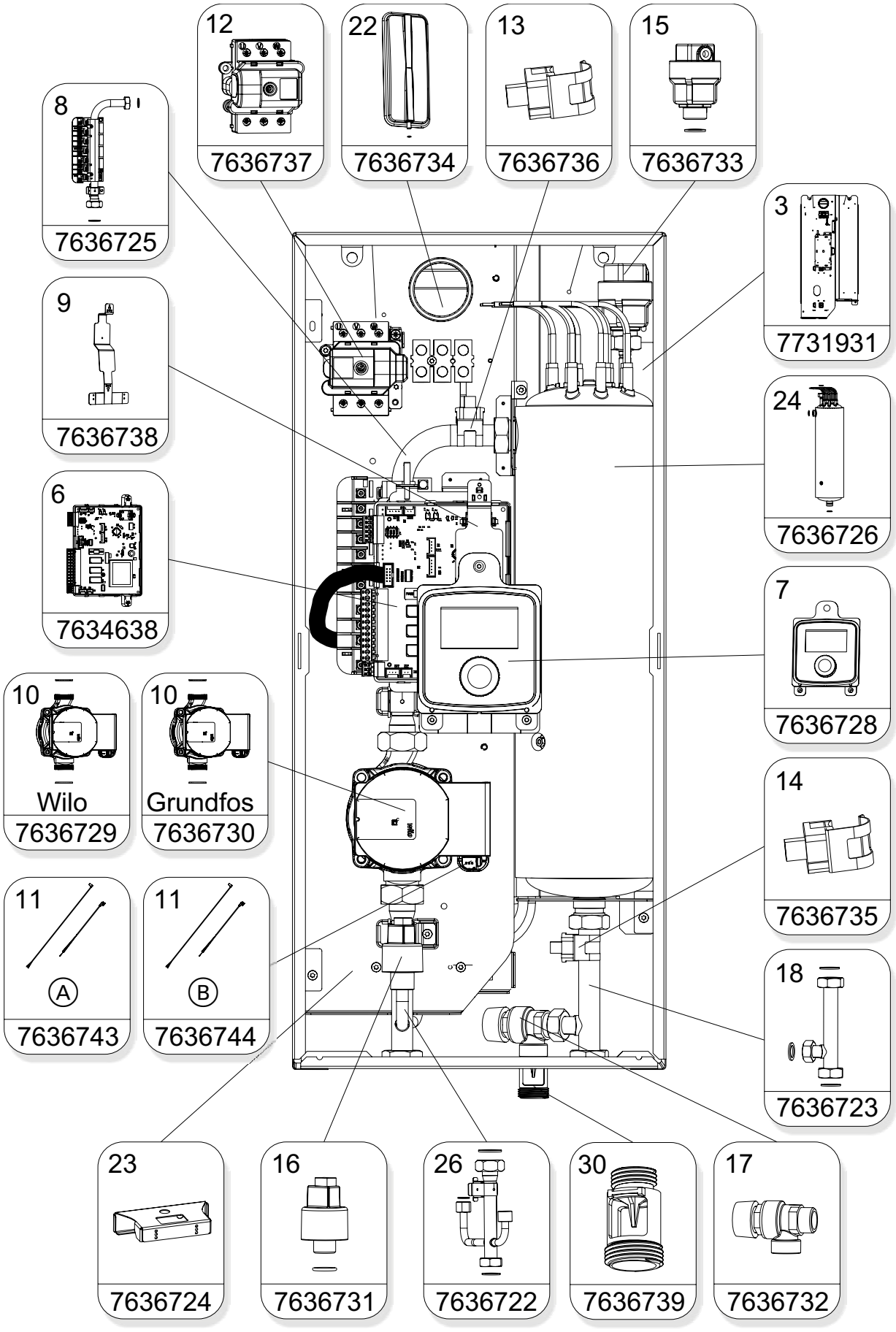
Ⓐ Wiring of the Wilo Yonos pump i PWM WILO
Ⓑ Wiring of the Grundfos UPM3 pump

Interior view of VLN3 with spare part numbers



Ⓐ Wiring of the Wilo Yonos pump
Ⓑ Wiring of the Grundfos UPM3 pump

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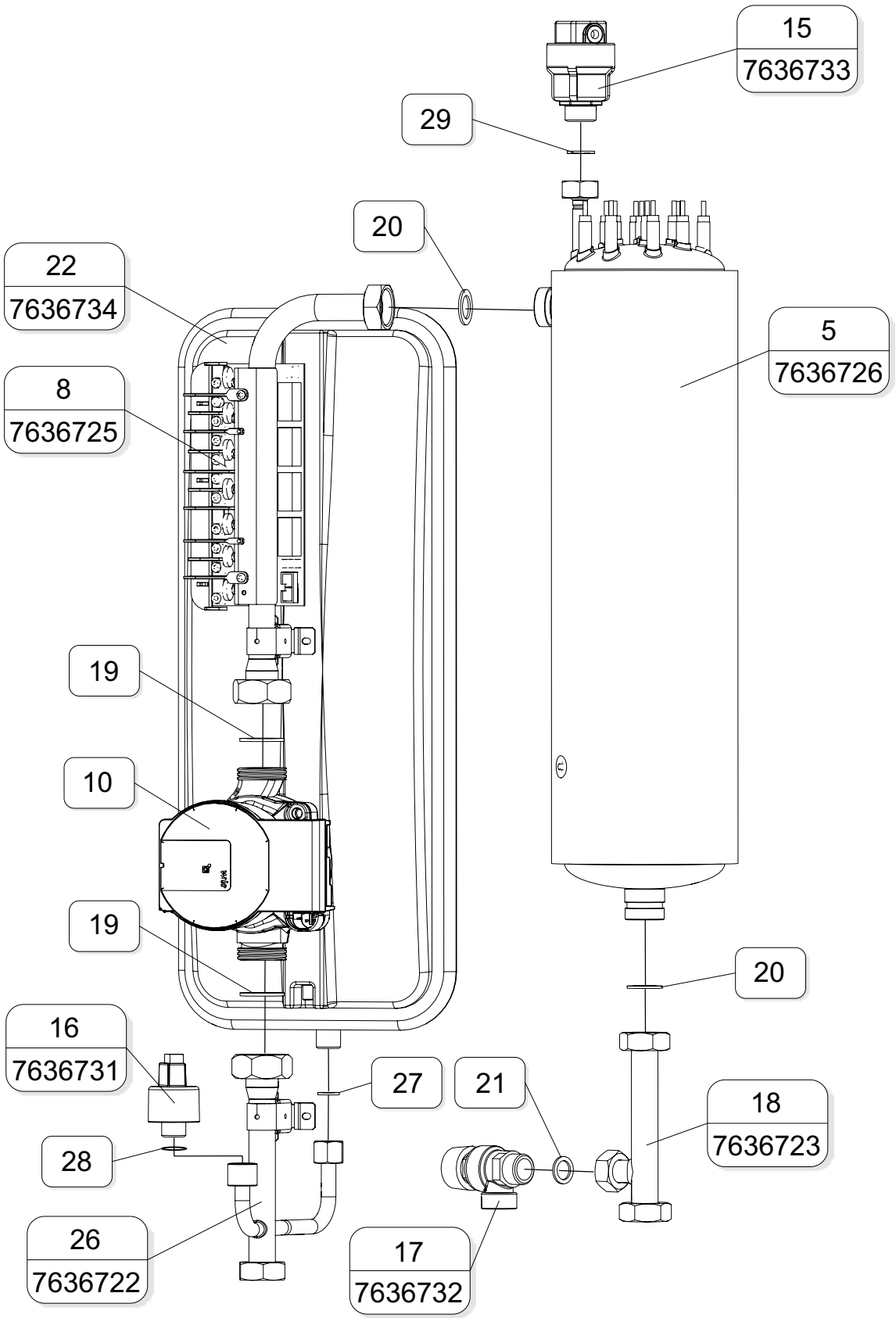
Detailed view with spare part numbers



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

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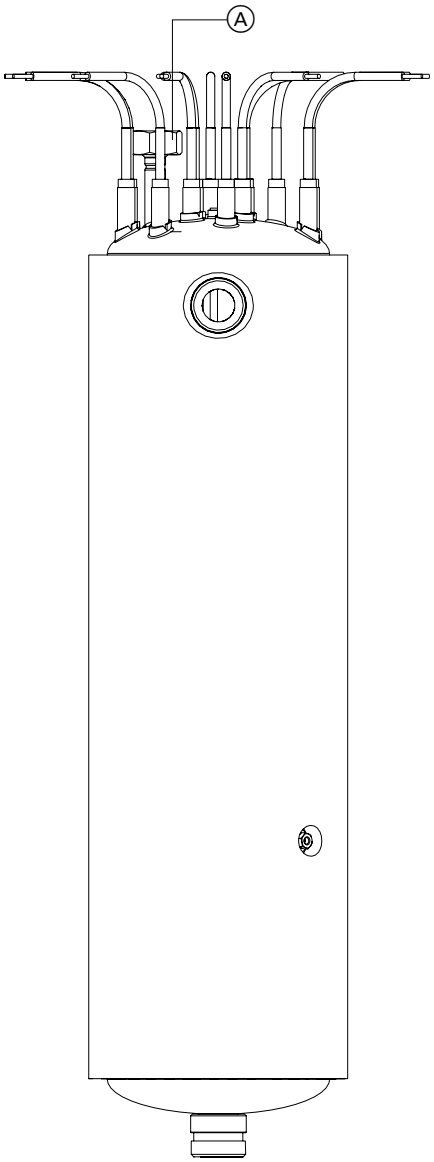
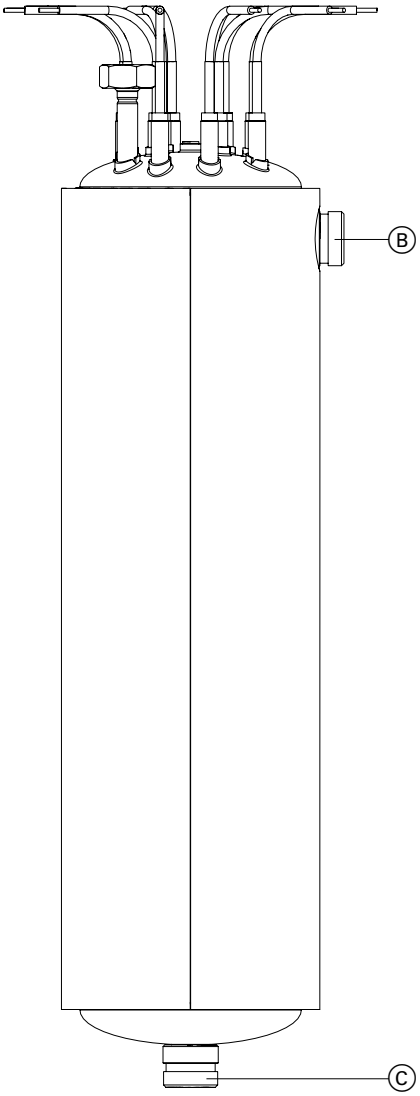
Heat exchanger

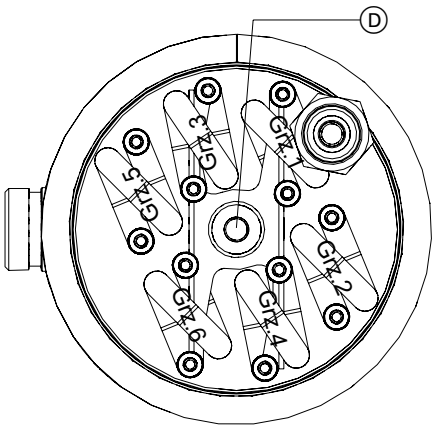
Front view



Side view



View from above



Ⓐ Gw ½" – Automatic air vent valve
Ⓑ Gz ¾" – Return connector
Ⓒ Gz ¾" – Flow connector
Ⓓ Capillary tube WT-3

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

Table 1. Electrical values of the heat exchanger

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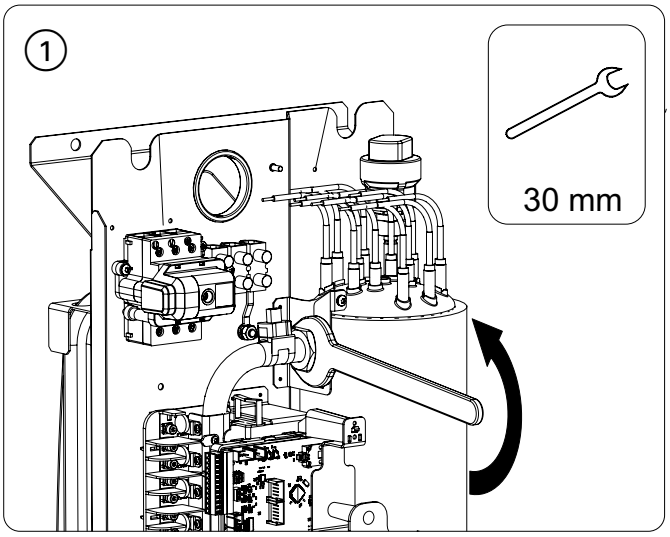
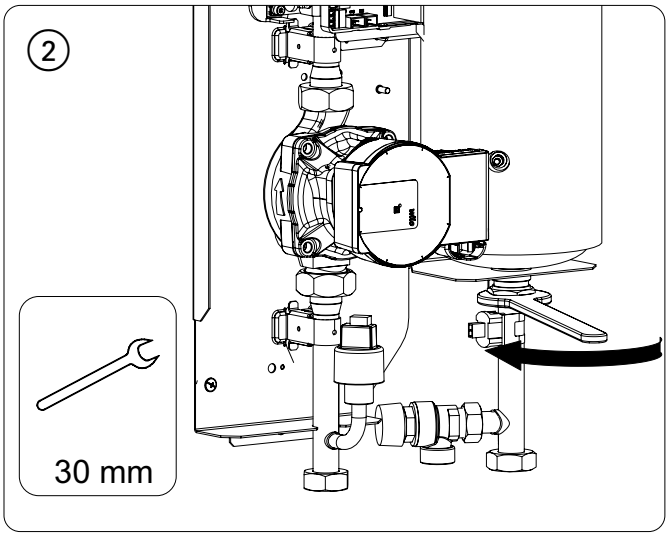
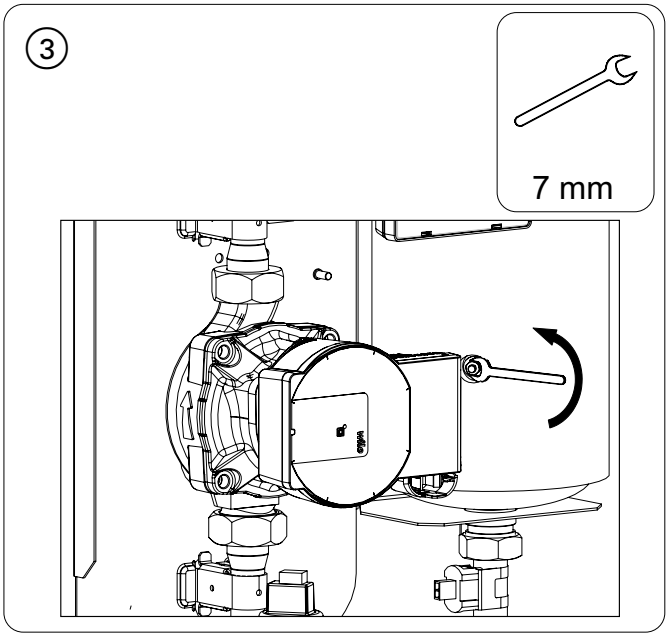
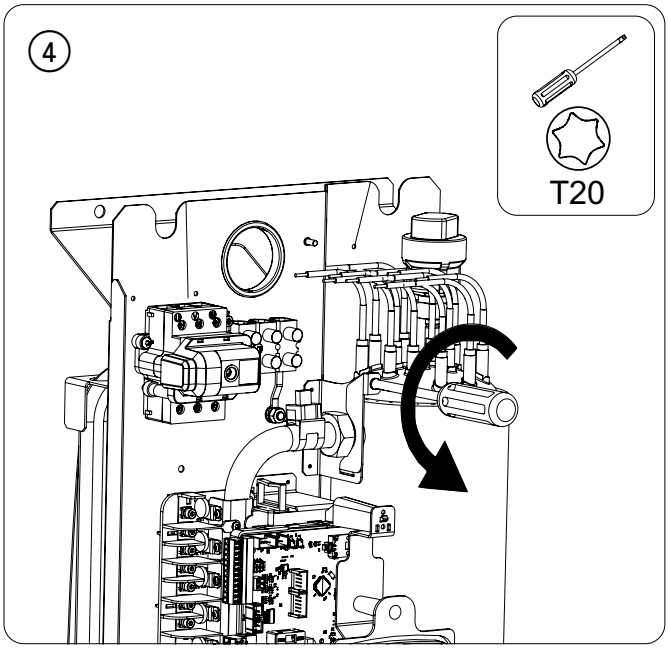
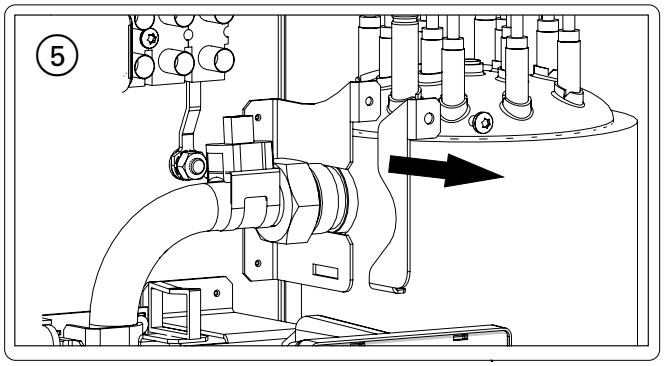
Removing the heat exchanger

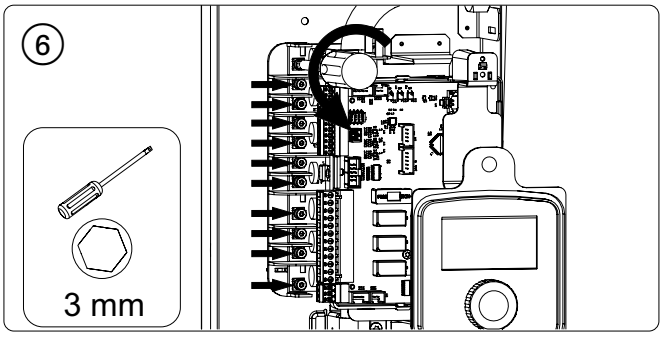


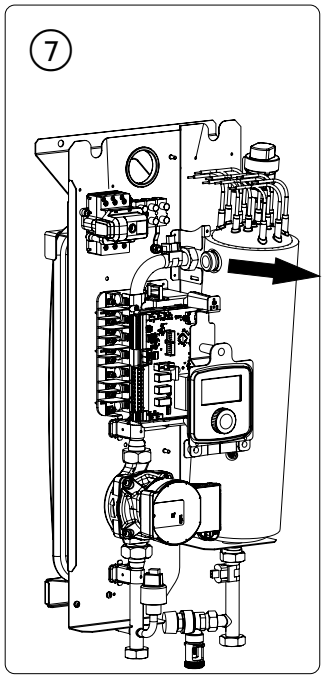


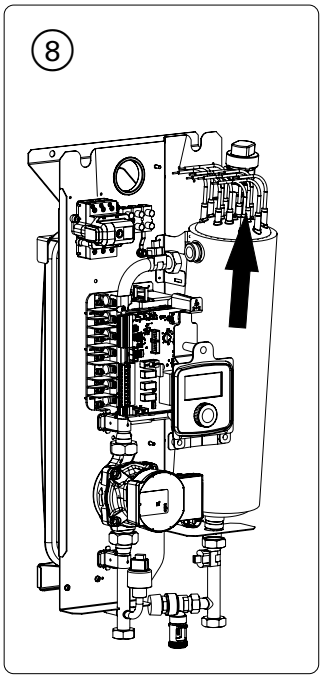












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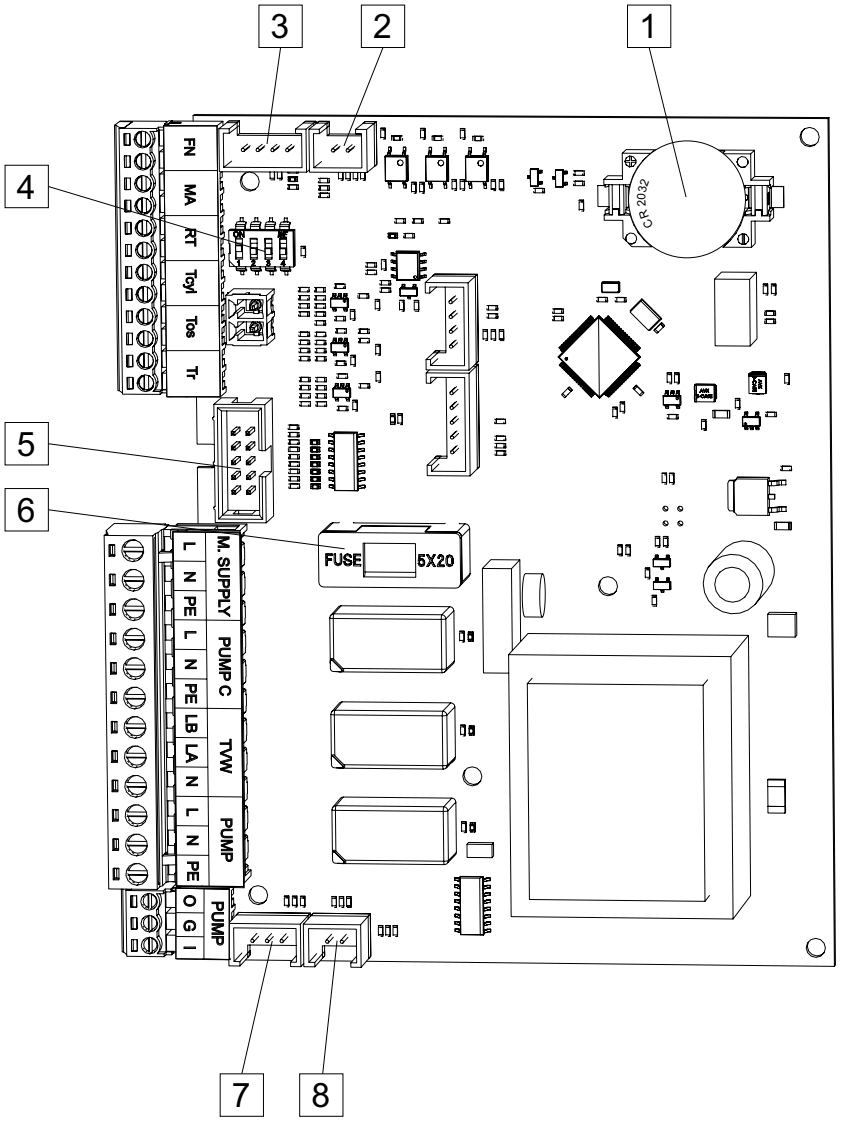
PCB MSK.80/04 VMN3



FN Programmable control input [Configuration > FN input]:
- Frost protection
- Maintain an economic temperature regardless of the central heating program
- Charge the buffer cylinder (integration of Vitotron and PV installation).

MA Higher-level control unit (master unit)
RT Alternative room temperature controller
Tcyl Cylinder temperature sensor
Tos Outside temperature sensor
Tr Room temperature sensor
A, B Additional heating circuit control units
M SUPPLY Power supply to PCB (230 V)
PUMP C DHW circulation pump
TVW 3-way valve control (CH/DHW)
PUMP (L,N,PE) Power connection for DHW circulation pump
L – brown
N – blue
PE (protective conductor)
– green-yellow
PUMP (O,G,I) PWM signal connection to circulation pump
O – brown
G – blue
I – black
! Battery CR2032
? Tin – return temperature sensor
§ PW35 – control panel
$ Microswitch
% Terminal for main PCB
& 1 A fuse (pump and TVW supply)
/ Press – pressure sensor
(Tout – flow temperature sensor

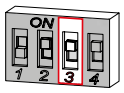
Operating mode settings	Rated output	Connection type	Inactive
			
Operating mode 1 – ON	12, 16, 20, 24 kW 2 – ON	3-phase 3 – ON	
			
Do not change!	4, 6, 8 kW 2 – OFF	Single-phase 3 – OFF	

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

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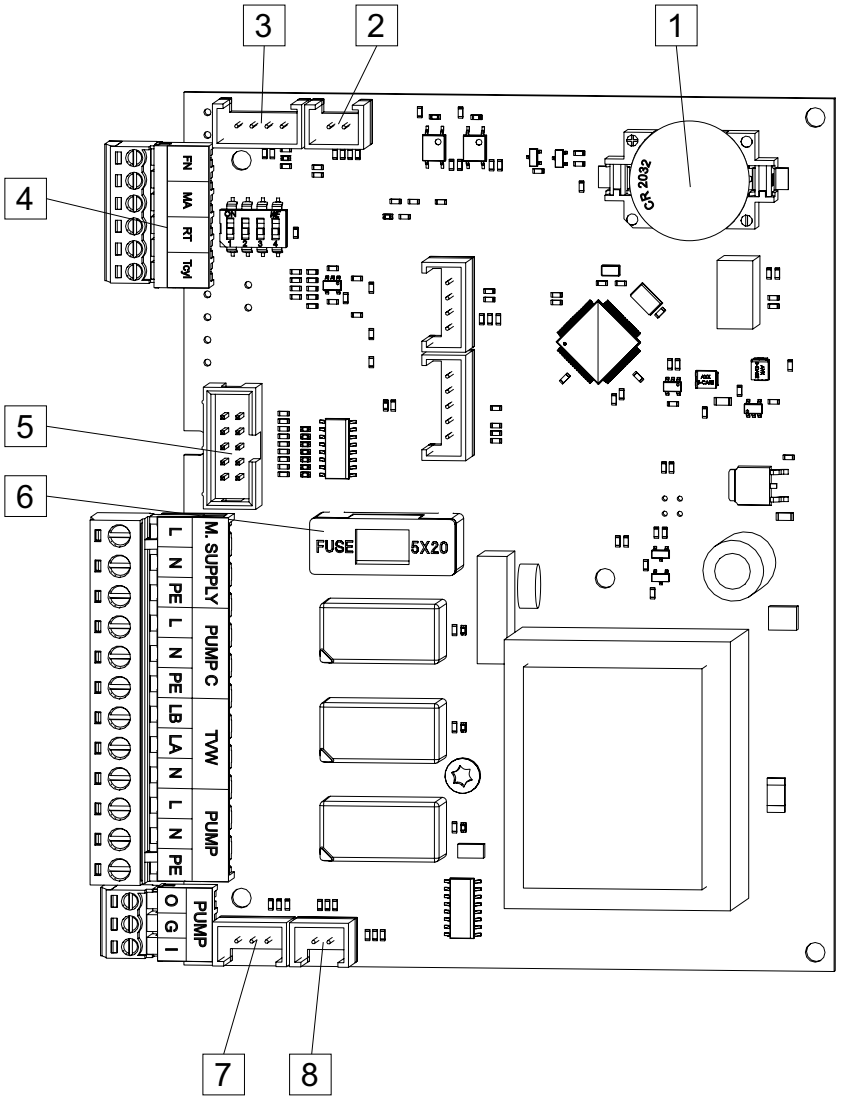
PCB MSK.80/05 VLN3



FN disabled
MA Higher-level control unit (master unit)
RT Alternative room temperature controller
Tcyl Cylinder temperature sensor
M SUPPLY Power supply to PCB (230 V)
PUMP C DHW circulation pump
TVW 3-way valve control (CH/DHW)
PUMP (L,N,PE) Power connection for DHW circulation pump
L – brown
N – blue
PE (protective conductor) – green-yellow
PUMP (O,G,I) PWM signal connection to circulation pump
O – brown
G – blue
I – black
! Battery CR2032
? Tin – return temperature sensor
§ PW35 – control panel
$ Microswitch
% Terminal for main PCB
& 1 A fuse (pump and TVW supply)
/ Press – pressure sensor
(Tout – flow temperature sensor

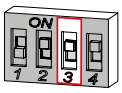
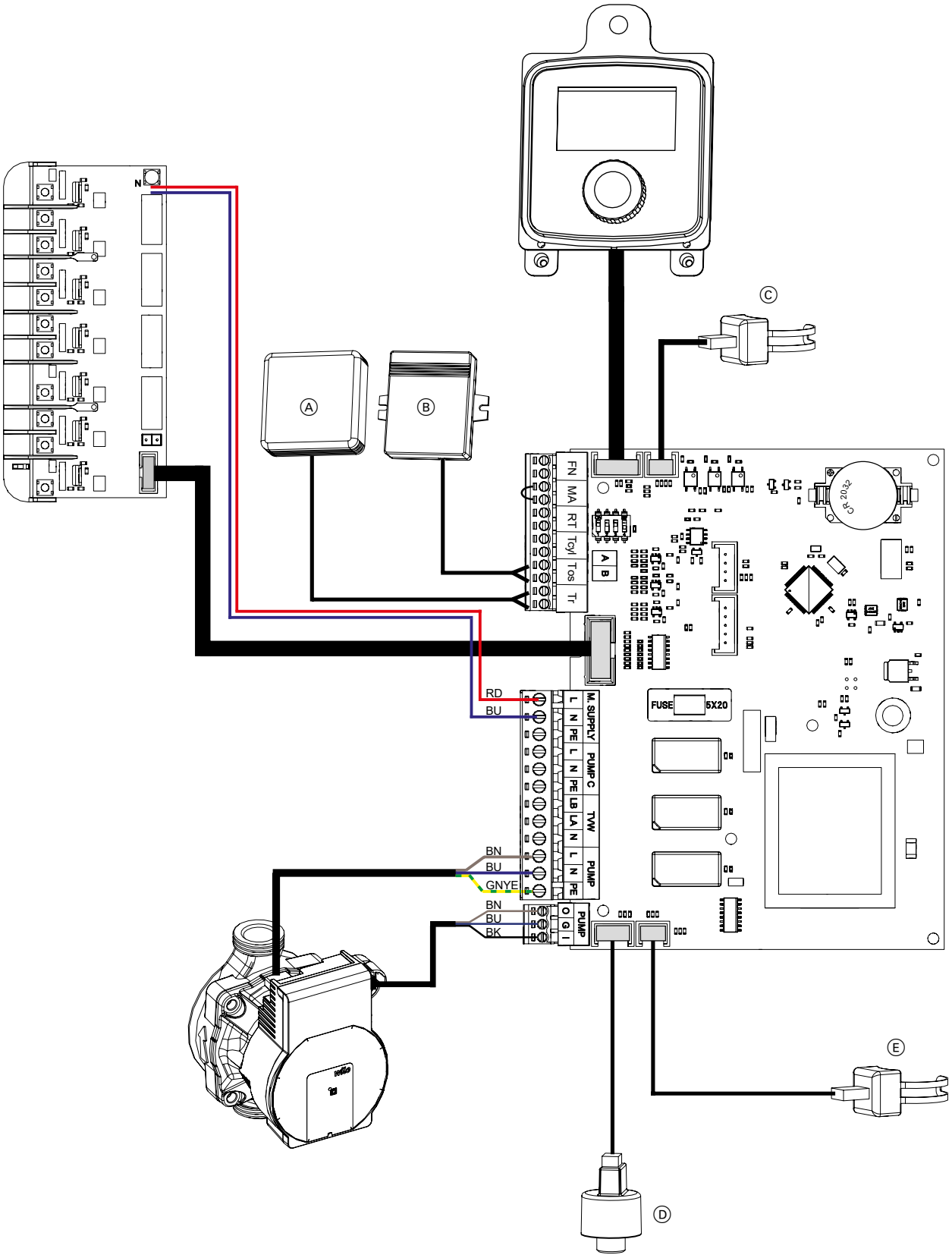
Operating mode settings	Rated output	Connection type	Inactive
			
Operating mode 1 – ON	12, 16, 20, 24 kW 2 – ON	3-phase 3 – ON	
			
Do not change!	4, 6, 8 kW 2 – OFF	Single-phase 3 – OFF	

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

Schematic diagram MSK.80/04 VMN3



Colour coding

BK	Black
BN	Brown
BU	Blue
GNYE	Green/yellow
RD	Red

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

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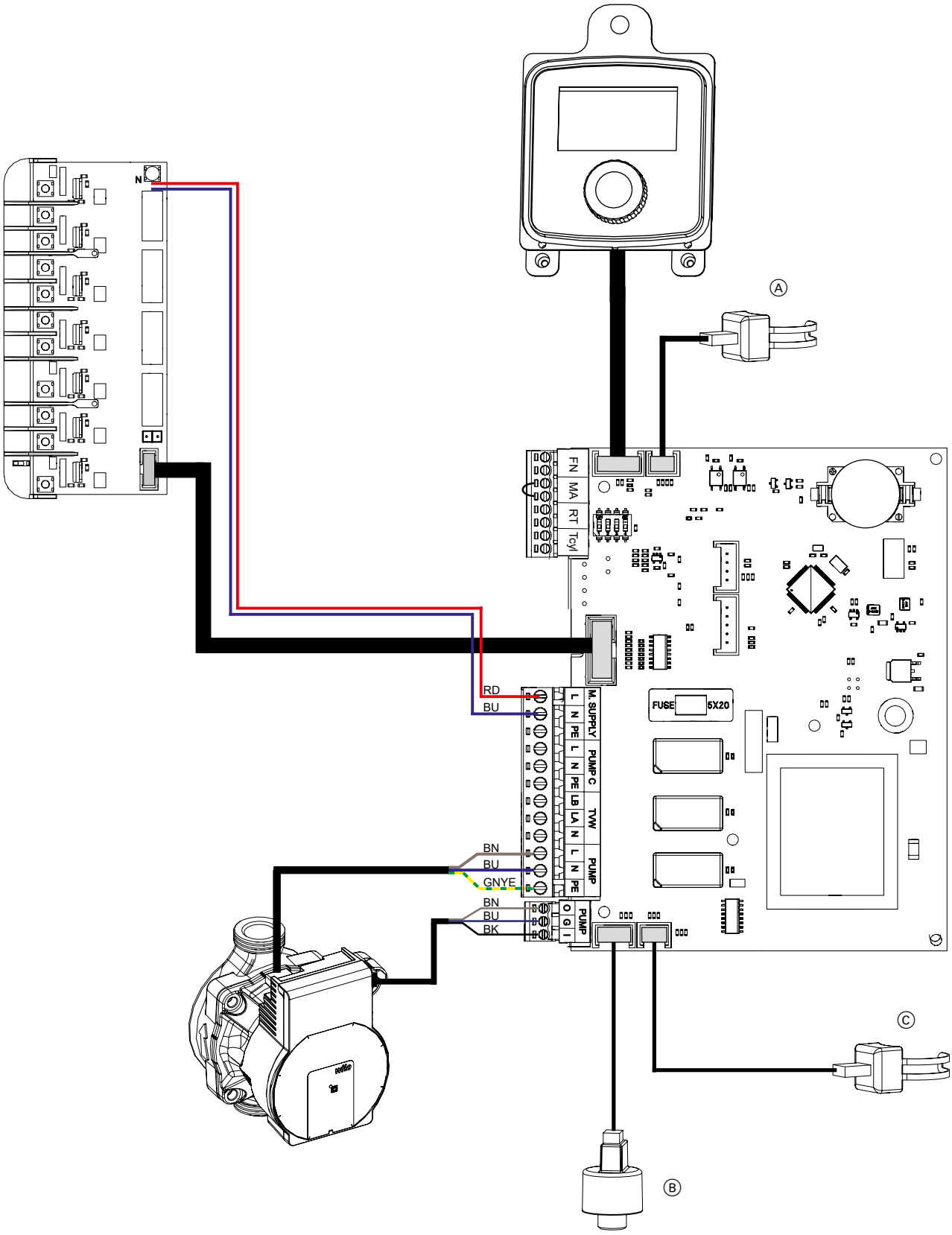
Schematic diagram MSK.80/05 VLN3



Colour coding

BK	Black
BN	Brown
BU	Blue
GNYE	Green/yellow
RD	Red

Ⓐ Return temperature sensor
Ⓑ Pressure sensor
Ⓒ Flow temperature

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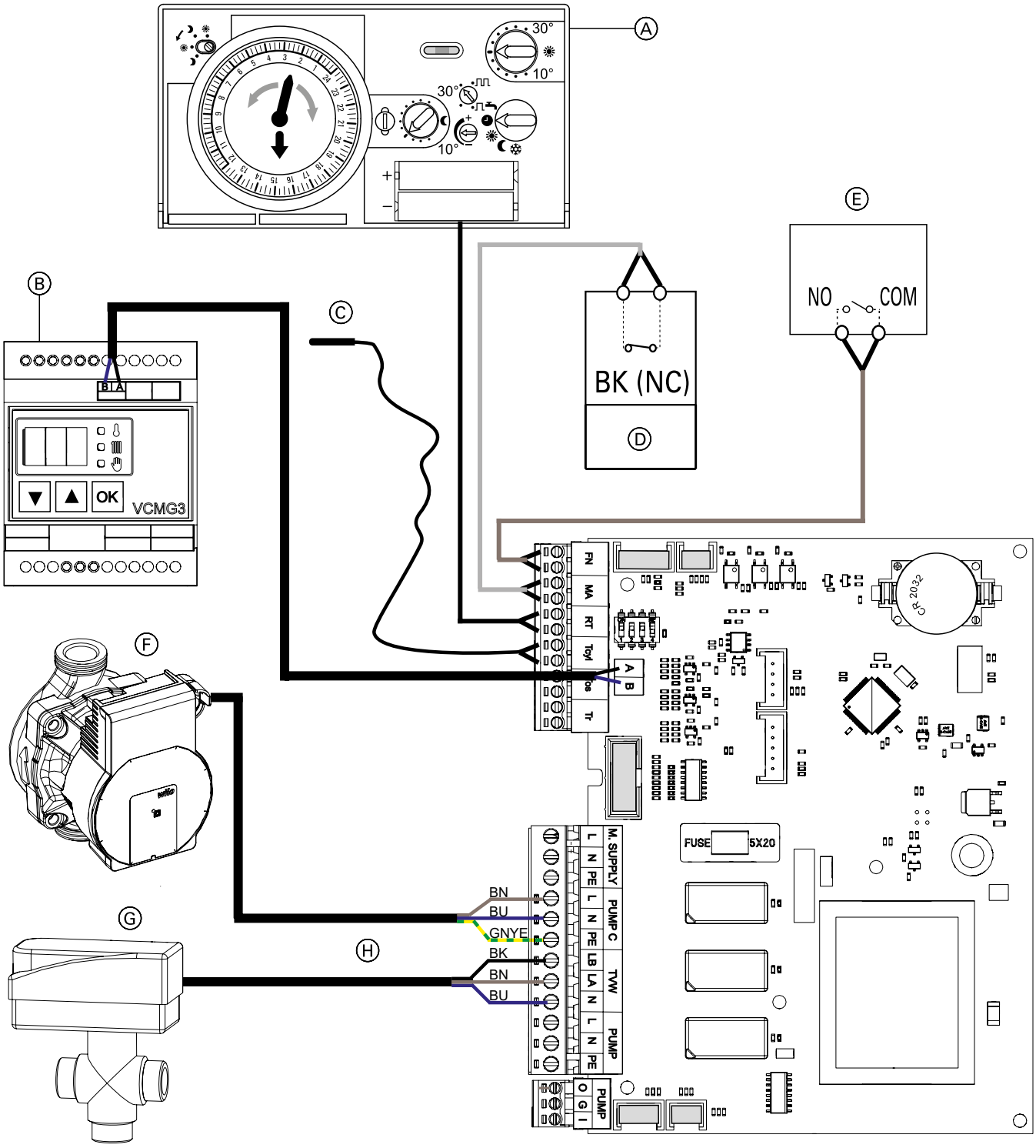
Connecting optional appliances



Colour coding

BK	Black
BN	Brown
BU	Blue
GNYE	Green/yellow

Ⓐ Alternative room temperature controller
Ⓑ Heating circuit module VCMG3
Ⓒ Cylinder temperature sensor
Ⓓ Higher-level control unit (master unit)
Ⓔ Control device for FN input
Ⓕ DHW circulation pump
Ⓖ 3-way valve control (central heating/DHW)
Ⓗ SPDT control

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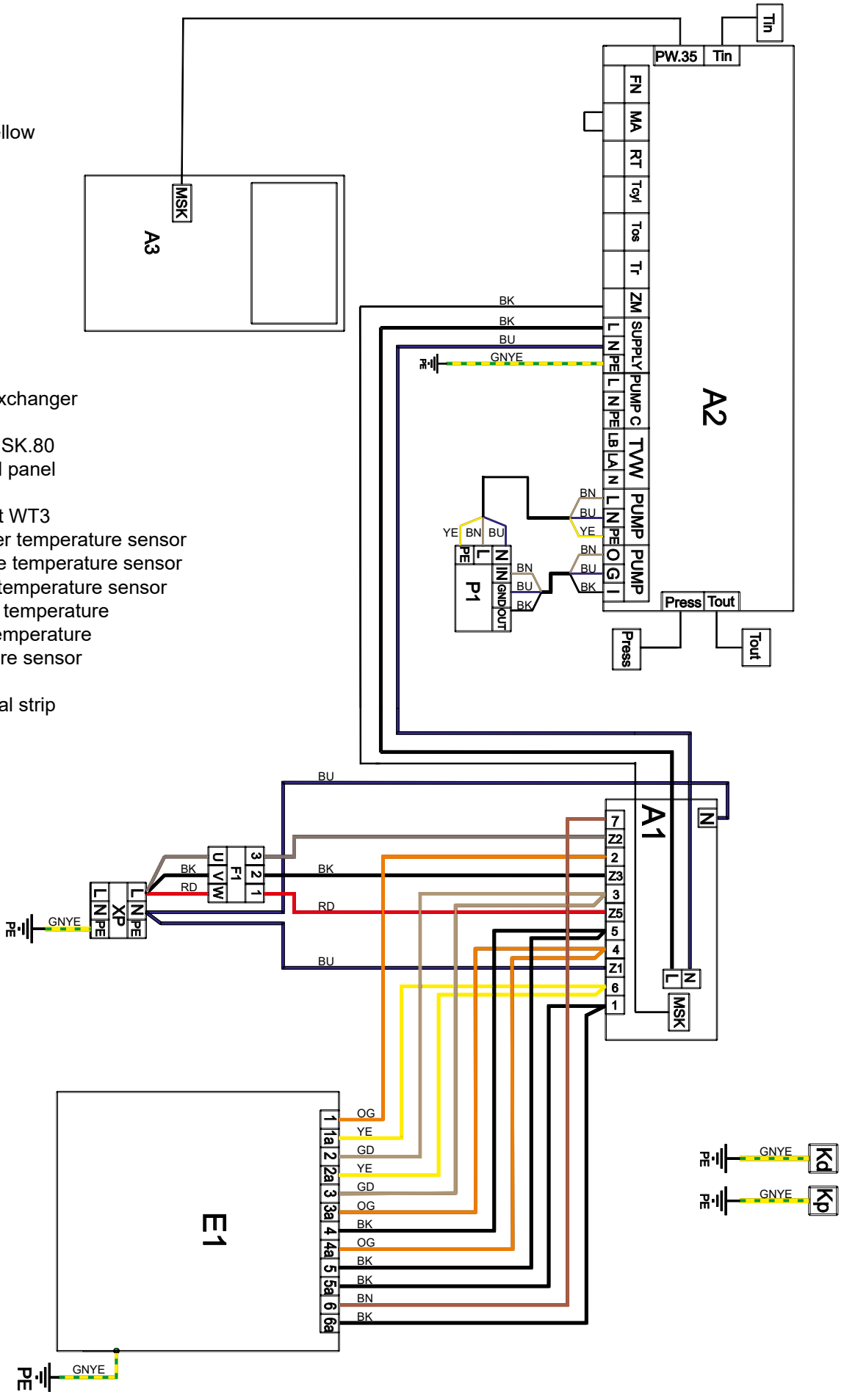
Wiring diagram 4–8 kW

Colour coding

BK	Black
BN	Brown
BU	Blue
GD	Gold
GNYE	Green/yellow
OG	Orange
RD	Red
YE	Yellow

E1	Heat exchanger
A1	PCB
A2	PCB MSK.80
A3	Control panel
P1	Pump
F1	Cut-out WT3
Tcyl	Cylinder temperature sensor
Tos	Outside temperature sensor
Tr	Room temperature sensor
Tin	Return temperature
Tout	Flow temperature
Press	Pressure sensor
Kd, Kp	Cover
XP	Terminal strip

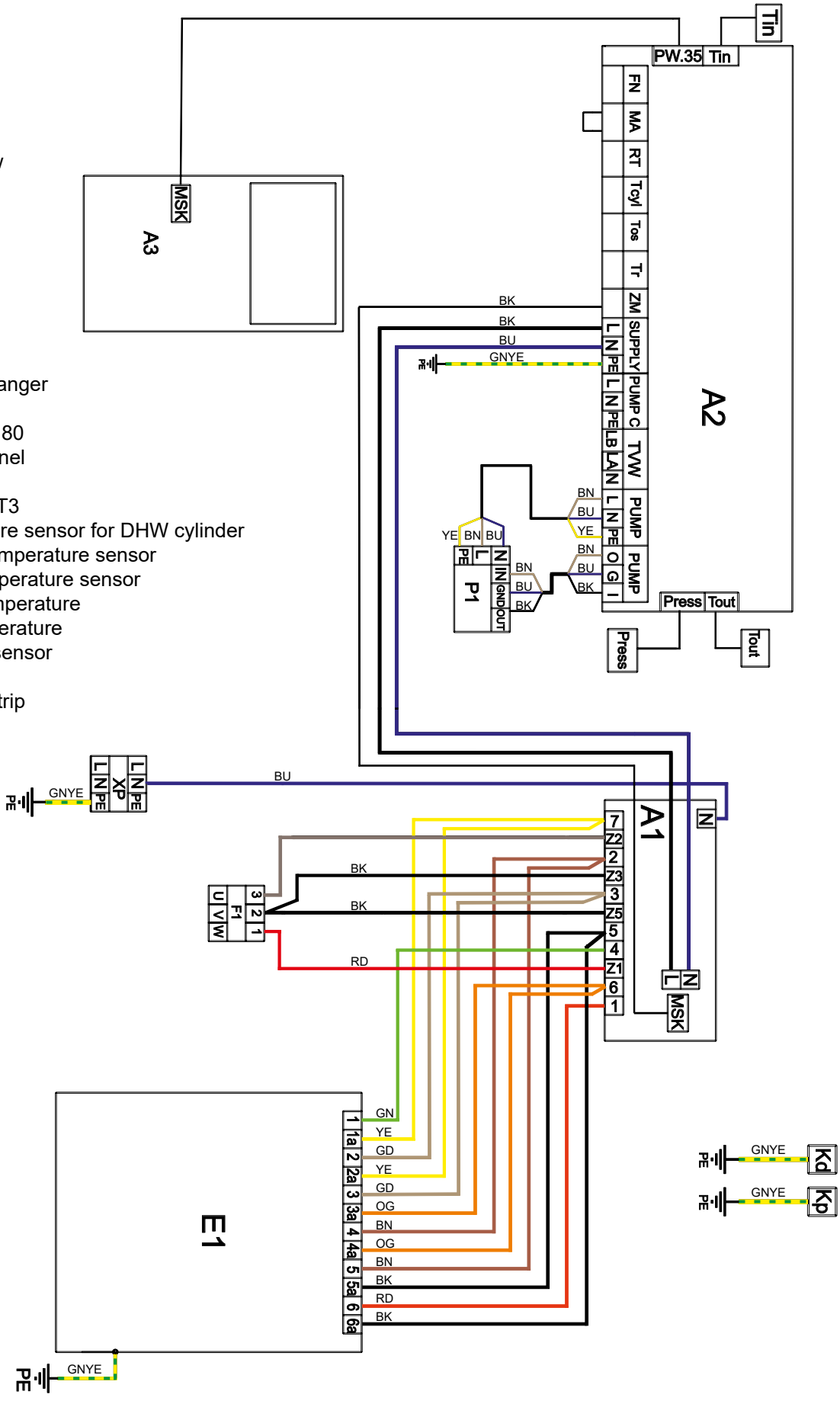


Wiring diagram 12–24 kW

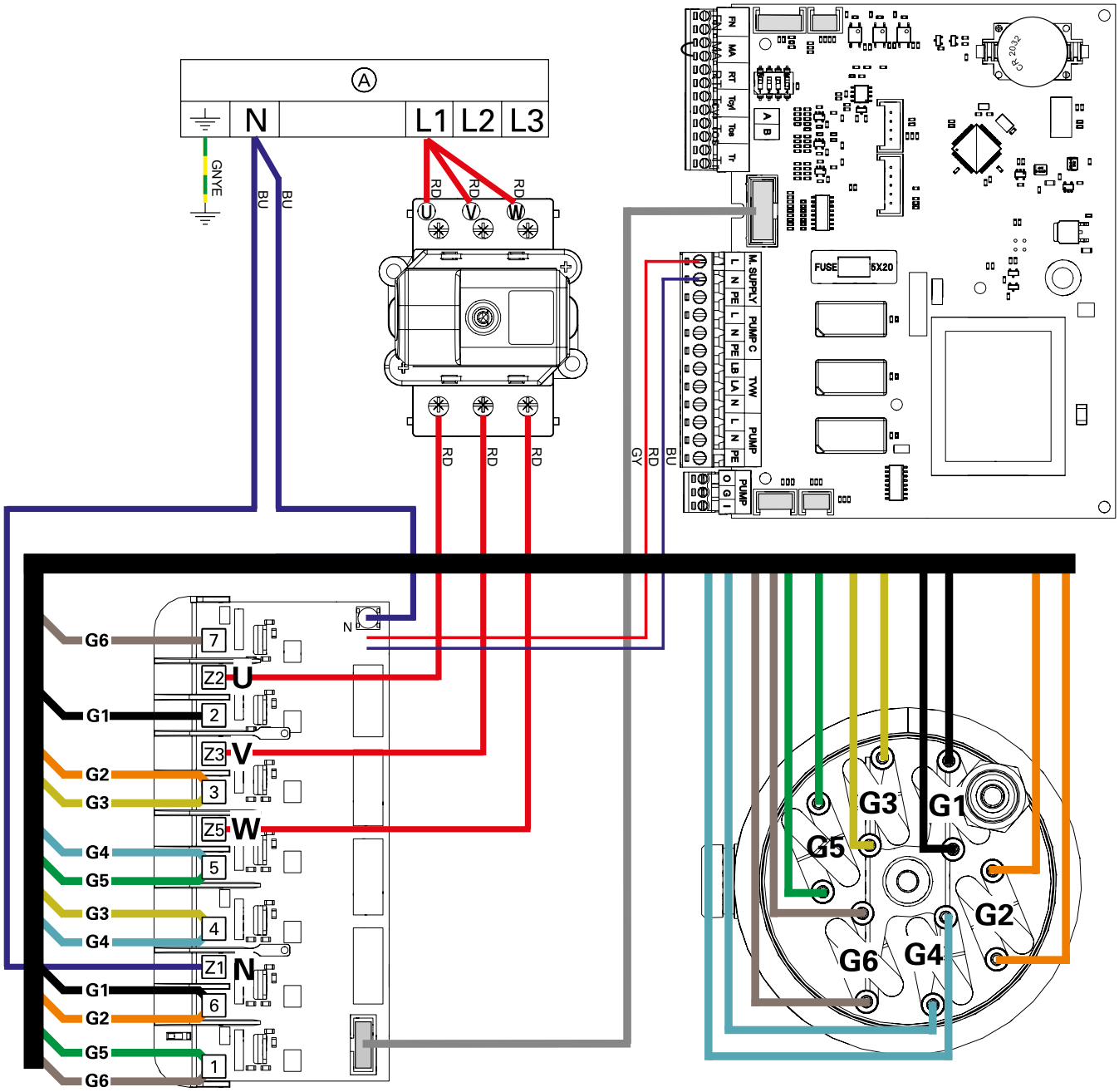
Colour coding

BK	Black
BN	Brown
BU	Blue
GD	Gold
GN	Green
GNYE	Green/yellow
OG	Orange
RD	Red
YE	Yellow

E1	Heat exchanger
A1	PCB
A2	PCB MSK.80
A3	Control panel
P1	Pump
F1	Cut-out WT3
Tcyl	Temperature sensor for DHW cylinder
Tos	Outside temperature sensor
Tr	Room temperature sensor
Tin	Return temperature
Tout	Flow temperature
Press	Pressure sensor
Kd, Kp	Cover
XP	Terminal strip



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



Colour coding

BU	Blue
GNYE	Green/yellow
GY	Grey
RD	Red

Ⓐ Power supply 230 V/400 V 3N~

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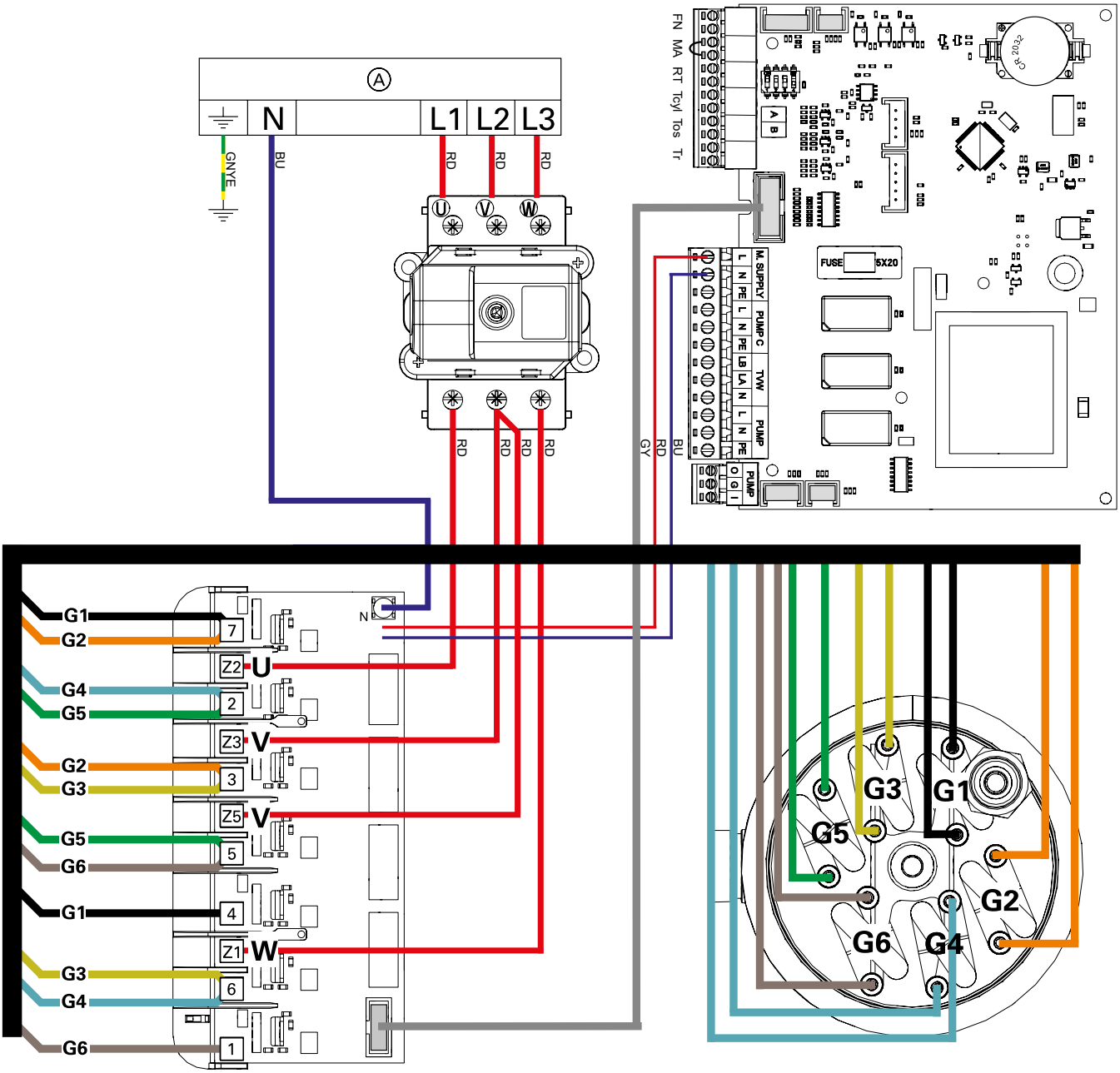
Connecting the PCB 12–24 kW (VLN3, VMN3)



Colour coding

BU	Blue
GNYE	Green/yellow
GY	Grey
RD	Red

Ⓐ Power supply 400 V 3N~

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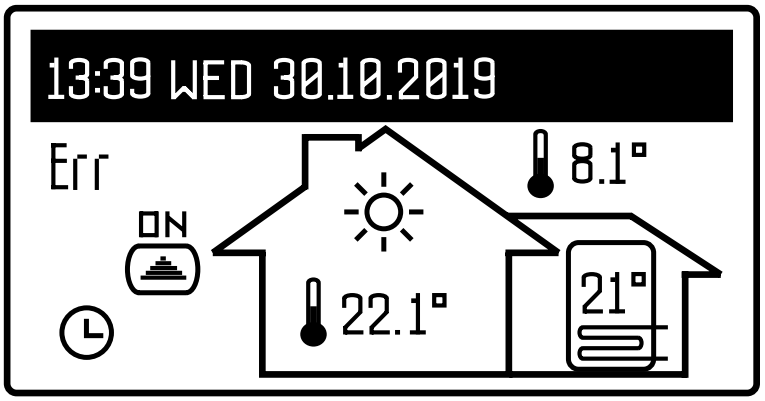
Fault messages



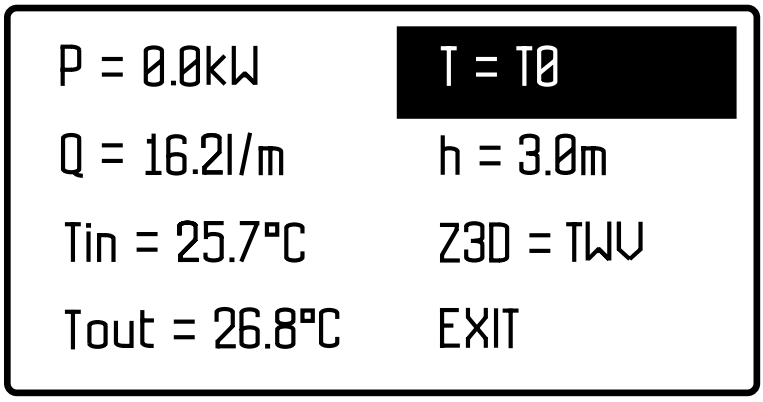
If a fault occurs in the Vitotron, the message "Err" will be displayed on the main function screen. Press the rotary switch to display a list of faults.

Symbol	Description	Possible causes
NO PRESSURE	Low pressure in heating circuit	– Pressure below 0.6 bar – Pressure sensor faulty – PCB MSK.80 faulty
TEMP SENSOR FAULT Tpcb	Temperature sensor on PCB faulty	– PCB MSK.80 faulty
TEMP SENSOR FAULT Tout	Flow temperature sensor faulty	– Tout sensor faulty – PCB MSK.80 faulty
TEMP SENSOR FAULT Tin	Return temperature sensor faulty	– Tin sensor faulty – PCB MSK.80 faulty
TEMP SENSOR FAULT Thw	Cylinder temperature sensor faulty	– Tcyl sensor faulty – PCB MSK.80 faulty
TEMP SENSOR FAULT Tr	Room temperature sensor faulty	– Tr sensor faulty – PCB MSK.80 faulty
TEMP SENSOR FAULT Tos	Outside temperature sensor faulty	– Tos sensor faulty – PCB MSK.80 faulty
PUMP FAULT PO	Faulty pump	– Pump faulty – Faulty fuse on PCB MSK.80 – PCB MSK.80 faulty
LOW BATTERY POWER	Low battery on PCB MSK.80	– Battery CR2032 empty

Table 4. Fault messages

"Service" test mode

"Service" test mode is available at:
[Service/configuration > Configuration > Service]
Fault code: 15



P Current calculated heating output [kW]
An approximate value, calculated based on the flow rate 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 priority in the 3-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 approximations 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 Vitotron 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 electric current values should be available:

   Vitotron 8 kW – 5.3 A per phase and heating element
   Vitotron 24 kW – 9.2 A per phase and heating element

   The actual electric current values depend on the input voltage and the actual resistance of the heating elements. If the electric current values for the individual heating elements differ significantly, this indicates a faulty power module. The power module must then be replaced. The insulation resistance of the heating element to the protective conductor must be checked with a suitable measuring device. The heating assembly will have to be replaced if the resistance is too low.

3. Tin, Tout – Tin, Tout – display of flow and return temperatures

   Both values should be in realistic ranges that fit the 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 3-way valve setting for DHW

   Enables a function check of the valve. 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 3-way valve is damaged. The servomotor or 3-way valve will have to be replaced.

Spare parts list

Pos.	Service code	Figure number	Description	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	Casing	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		Cylinder temperature sensor	1	

Specification

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

Power supply

Version		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^2	3 × 2.5	3 × 4	3 × 6	5 × 2.5		
Max. cross-section of the power cable	mm^2	5 × 16					
Max. permissible mains impedance	Ω	0.27	0.17	0.15			0.27

Version		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^2	5 × 2.5	5 × 4		5 × 6
Max. cross-section of the power cable	mm^2	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
Rated current		1 A
Temperature range in the heating circuit	Radiator heating	20 – 80 °C
	Underfloor heating	20 – 55 °C
Outputs		
Pump		~230 V 50 Hz max. 150 VA
Valve servomotor		~230 V 50 Hz max. 20 VA
Inputs		
Bus (computer)		RS485
Temperature sensor, valve outlet		NTC 10K (KOSPEL WE-019/01)
MA Master unit		Potential-free input

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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 if waste is not handled correctly.

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

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Subject to technical modifications!
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