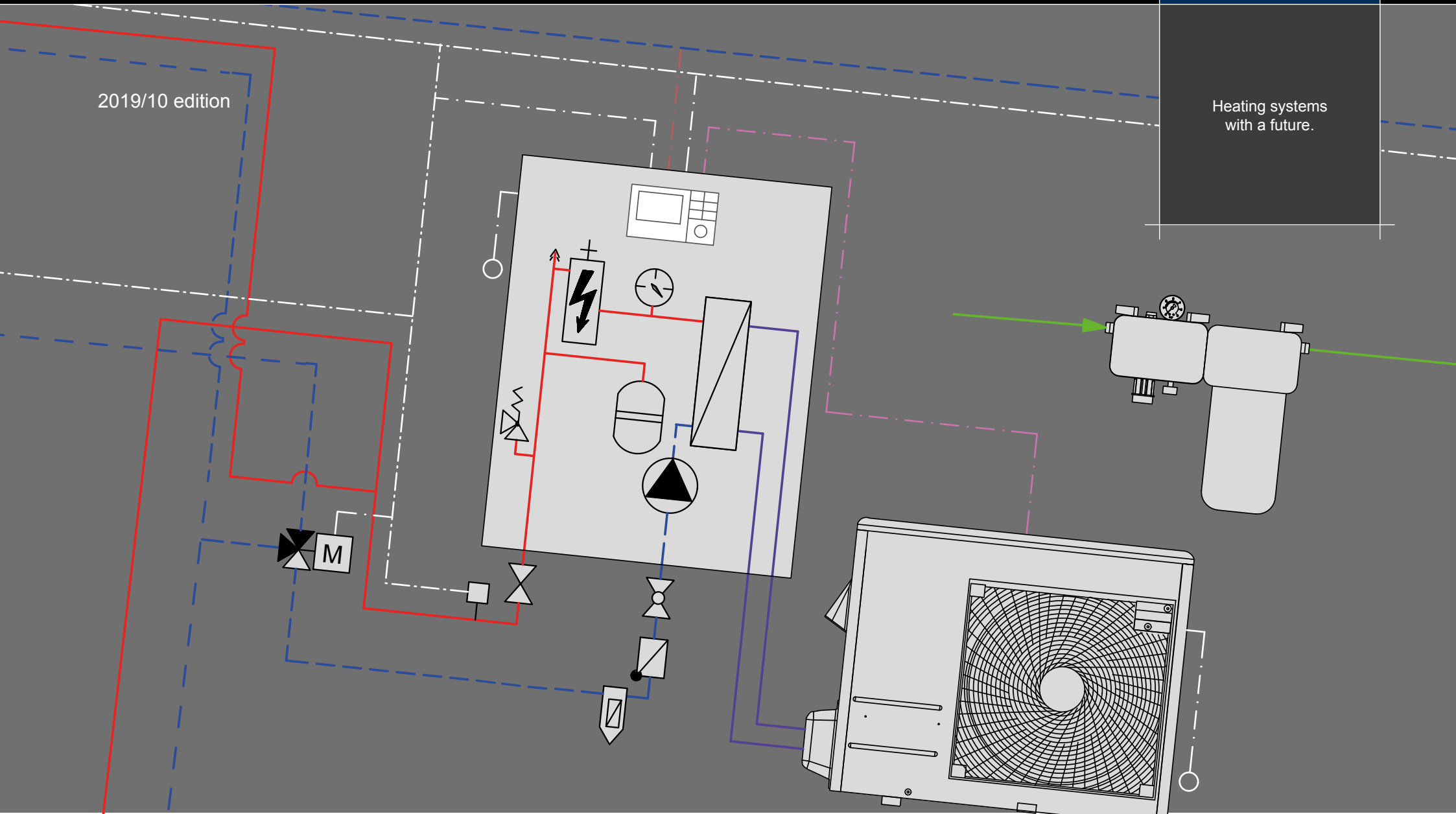
Technical and design guide

Manual of Heating Systems

Buderus

Heating systems
with a future.

2019/10 edition



This **Buderus heating system manual** is intended for heating professionals and is a guide in designing and construction of domestic heating and hot water systems. This material makes the choice of a hydraulics system with an appropriate setting for the most common applications of Buderus heaters easier. The introduction also describes the main problems associated with the solutions presented.

Materials include:

- Hydraulic diagrams
- Wiring diagrams
- Brief description of the heating systems presented
- List of equipment with product article numbers

The electrical connections in the hydraulic diagrams are showed in a simplified form. They are set out in detail in wiring diagrams. The cross-section of the cables depends on the intended use.

Requirements for the cross-section of cables and their number, based on the usage:

- Low voltage cable 12 V (e.g. sensors):
  - 2 × 0.75 mm^2 to 1.50 mm^2 at 20 m
  - 2 × 1.50 mm^2 at 20 m to 100 m
- High voltage cable 230 V:
  - 3 × 2.50 mm^2 to power control unit (Logamatic 5000 series automatics)
  - 3 × 1.50 mm^2 to power automatics and EMS Plus boilers
  - 3 × 1.50 mm^2 to power circulation pumps, 4 x 1.50 mm^2 to power valve actuators
- Connection bus EMS Plus:
  - 2 × 0.50 mm^2 at 100 m
  - 2 × 1.50 mm^2 at 300 m
- Connection bus CBC (5000 series automatics):
  - CAT.6 network cable with RJ45 connectors, limited to 100 m between 2 devices, expandable with switch/amplifier, optical fibers, etc.

Heating system control

For its devices and associated installations Buderus offers comprehensive control systems. Almost any heating system can be controlled in several ways. The following are the basic methods of heating control.

Room temperature dependent control

In this mode, the thermostat measures the air temperature in the room it is installed. This temperature is compared to the temperature set at the control unit. The automatics determines the necessary output of the heat source in order to reach or maintain the given temperature.

The system is solely controlled based on the reference room temperature in (control unit installation room). All other rooms are heated to a greater or less extent, depending on the reference room heat demand. One heating circuit can only have one reference room.

Outside temperature dependent control

This mode operates on the basis of the measured outside temperature. This information is transmitted to the heat source automatics. Combined with other preset values (e.g. heating curve), the corresponding flow temperature of the heating system is determined. A heating curve is a diagram showing the correlation between the heating flow temperature of the system and the outside temperature. This is set up by Buderus Logamatic automation. The final room temperature is defined by setting the thermostatic valve of the room heat sources. Thus, all rooms can be heated independently.

It is possible to control the unit by means of a weather-dependent function with an impact of the room temperature taken into account – this is a kind of a combination of both control methods mentioned above.

Quantity control

Quantity control is an optimization of the flow through the heat sources, so that each of them receives the right amount of water to achieve the desired room temperature. This is achieved through thermostatic valves. Quantity control is necessary to ensure proper functioning of the heating system.

List of control units and function modules for Buderus automatics

Control unit Module	Connected sensors	Functions	Notes
R5313	– outside temperature – supply	Boiler circuit control (or: heating circuit control). DHW circuit circulation control	For boilers with SAFE burner control or heat sources with built-in automatic controls, operating in the EMS Plus system. 4 slots for function modules
R5311	– outside temperature – boiler – supply	Boiler circuit control (or: heating circuit control). DHW circuit circulation control	For boilers with external burner. 4 slots for function modules
FM-SI	–	Connect up to 5 external safety devices	Cannot be used with heat sources with built-in EMS Plus automatics
FM-MW	– DHW	1 heating circuit (mixed/unmixed) control. 1 DHW circuit control	1 module per control unit can be used
FM-MW	– supply	2 heating circuits (mixed/unmixed) control.	4 modules per control unit can be used
FM-MW	– 2× supply – 2× cylinders	Integration of an alternative heat source	1 module per control unit can be used
FM-CM	– supply	Connect up to 4 heat sources	A mixed cascade can be used – boilers with Logamatic 5000 and EMS control operate together. Up to 4 cascade modules per system can be connected (max 16 heat sources within a system)
BFU	–	Heating circuit remote control	1 control unit per 1 heating circuit can be used

Table 1 Automatics 5000

Control unit Module	Connected sensors	Functions	Notes
RC100	–	Heating circuit remote control	
RC200	–	Heating circuit remote control or weather-dependent control unit for 1 boiler	1 MM100 module can be used
RC310	– outside temperature	Weather-dependent control unit for 1 boiler or cascade of boilers. 4 heating circuit and 2 DHW circuit control	6 MM100 modules can be used (4 heating circuits and 2 DHW circuits)
MC400	–	Cascade module supporting 2 to 4 boilers	Max 5 modules can be used (up to 16 boilers in a cascade)
MM100	– supply	Control of 1 heating circuit or 1 DHW charging circuit	Max 6 modules in a system with control unit RC310 (4 heating circuits and 2 DHW circuits)
MS100	– collector – cylinder	Standard solar installations control	Compatible with control unit RC200 or RC310
MS200	– collector – cylinder	Expanded solar installations control	Compatible with control unit RC310
KM100	–	Internet module for remote system control	Designed for Logamax plus GB192i boilers; installed inside the boiler. RC310 required
KM200	–	Internet module for remote system control	Designed for boilers with EMS Plus automatics. RC310 required
MC110	–	Boiler control unit	Designed for SAFe boilers
BC30E	–	Service module for the control unit MC110	Easy to adjust weather-dependent function after purchasing an outside temperature sensor

Table 2 Automatics EMS

Protection of the heating system

Water quality is a factor responsible for a smooth and economical operation of a heating system, as well as a service life. The main methods for improving water quality:

Magnetic separation

Deposits in heating water can form due to sealant residues, metal shavings, sand or other contaminants. Additional contamination may originate from corrosive components. The magnetic separator traps all sediment particles larger than 5 µm. The separator's two magnets remove magnetic particles that can cause circulating pumps to fail. Furthermore, a special separation chamber ensures the removal of non-magnetic particles. They fall to the bottom of the chamber and can then be removed without interrupting the operation of the installation.

Benefits of magnetic separation:

- Fewer pump failures by eliminating magnetic contamination
- Reduced deposits, – increased service life of the heat exchanger and all components of the heating system
- Limitation of malfunctions
- Long term energy efficiency

Deaeration

No heating system is 100% airtight and therefore contains air bubbles. Even after deaeration of a freshly filled installation, a large number of micro-bubbles remain in the water. Besides, air enters the system due to microscopic leaks in pipes, valves, etc. Heating water gases in the form of micro bubbles can be removed with an air extractor.

Benefits of deaeration:

- Energy savings by preventing reduced heat transfer because of air pockets
- Noise reduction
- Deaeration is automatic

Demineralization

The content of calcium carbonate and salt in household water varies from region to region. Basically, calcium carbonate dissolved in water settles in the warmest place of the installation, that is, in the heat source. This can result in system failures. During demineralization, not only calcium carbonate is removed from the water, but corrosive salts as well. During the demineralization process, the water entering the installation flows through the ion-exchange resin.

Benefits of demineralization:

- Prevents the formation of scale, limiting the heat conduction process in the boiler
- Prevents corrosion and damage to installation components
- This ensures a constant flow rate and a consistently high efficiency of the heating system to be achieved

Demineralization kits

Description

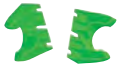
- These demineralization cartridges provide demineralized water with a conductivity of <10 µS/cm.
- During the demineralization process, the filled and replenished water is purified of all salts that harden water (e.g. lime) and all corrosion activators (e.g. chlorides).

Safety requirements

- VES treated water is not potable
- Max operating temperature: 30 °C
- Max operating pressure 6 bar; connection of pressure reducer possible

Calculation formula

$$\text{Amount of demineralized water [l]} = \frac{\text{Cartridge capacity [L x °dH]}}{\text{Water hardness [°dH]}}$$

	Legend	Description	Product number
	Cartridge VES Mini plus	– Demineralization cartridge 3500 l x °dH – Corresponds to approx. 175 l of demineralized water at 20 °dH – Consumption reading via resin indicator – External thread ¾» – Max 6 bar, max 0-40 °C – Cartridge instruction manual – Log book – Can be disposed with household waste – Be sure to install an additional solenoid valve in the direction of water flow before the cartridge	7738320206
	VES Mini plus cartridge fixture	– Plastic fastening clamps, incl. dowels and bolts – For demineralization cartridge VES mini plus 3500 l x °dH	7738320207
	Cartridge VES P10	– Demineralization cartridge 8000 l x °dH – Corresponds to approx. 400 l of demineralized water at 20 °dH – Max 6 bar, max 0-40 °C – Reusable, 1 bag per 7 liters required – Waste resin can be disposed with household waste – Extra inlet hose or filling device required – Be sure to install an additional solenoid valve in the direction of water flow before the cartridge	7738301294
	Cartridge VES P14	– Demineralization cartridge 16000 l x °dH – Corresponds to approx. 800 l of demineralized water at 20 °dH – Max 6 bar, max 0-40 °C – Reusable, 2 bags per 7 liters required – Waste resin can be disposed with household waste – Extra inlet hose or filling device required – Be sure to install an additional solenoid valve in the direction of water flow before the cartridge	7738320209
	Cartridge VES P10/14 inlet hose		7738301295
	Cartridge VES P10/14 filling device	– For mobile and fixed installation of cartridge VES P10/14 – Connection ¾» – 2 stopcocks – Pressure relief and blowdown cock – Built-in water meter – Handle for mobile transportation – No wall brackets	7738301296
	Filling device wall brackets	– Wall brackets for fixed installation of P10/14 cartridge filling device – Grade steel – Adjustable wall distance – 2 expansion bolts – 2 dowels	7738320208

	Legend	Description	Product number
	Ion-exchange resin for VES cartridges	– Demineralization and mixed bed resin for VES cartridges – 7 liters of mixed bed resin – Orifice 5 l/min – 1 bag per P10 cartridge required – 2 bags per P14 cartridge required – Waste resin can be disposed with household waste	7738301297
	Digital conduct-ance meter	– Conductance controller – Constant value 10 µS/cm – With water side adapter and LED indication – 2 LED (red/green) – Battery powered	7747208557
	Ion-exchange resin for VES cartridges	– Demineralization and mixed bed resin for VES cartridges – 20 liters of mixed bed resin – 2 bags per P42 cartridge required (mobile filling trolley) – Used VES P22/42 cartridges can be quickly refilled on site – Waste resin can be disposed with household waste	7738320210
	Mobile filling equipment VES Profi	– Mobile filling trolley with VES P42 cartridge – Per 40000 l x °dH – Mobile filling equipment already filled with 40 l VES resin – Corresponds to approx. 2000 l of demineralized water at 20 °dH – Max 40 °C, max 6 bar, filling rate 30 l/min	7738320211
	System filling device Honeywell NK300 1/2A	– Filling device for filling and refilling closed heating systems – Inlet and outlet ball valves, BA system filling device, pressure reduction valve, dirt strainer and pressure gauge – Operating pressure: max 10 bar – Adjustment range: 1.5 – 4 bar – DN: R ½” with additional outlet adapter G ¾”	NK300S1/2A
	AD300-1/2	– Threaded sleave R ½” and adapter G ¾” for direct connection of VES cartridges with G ¾ ” connection	AD300-1/2

Table 3 Water treatment - demineralization

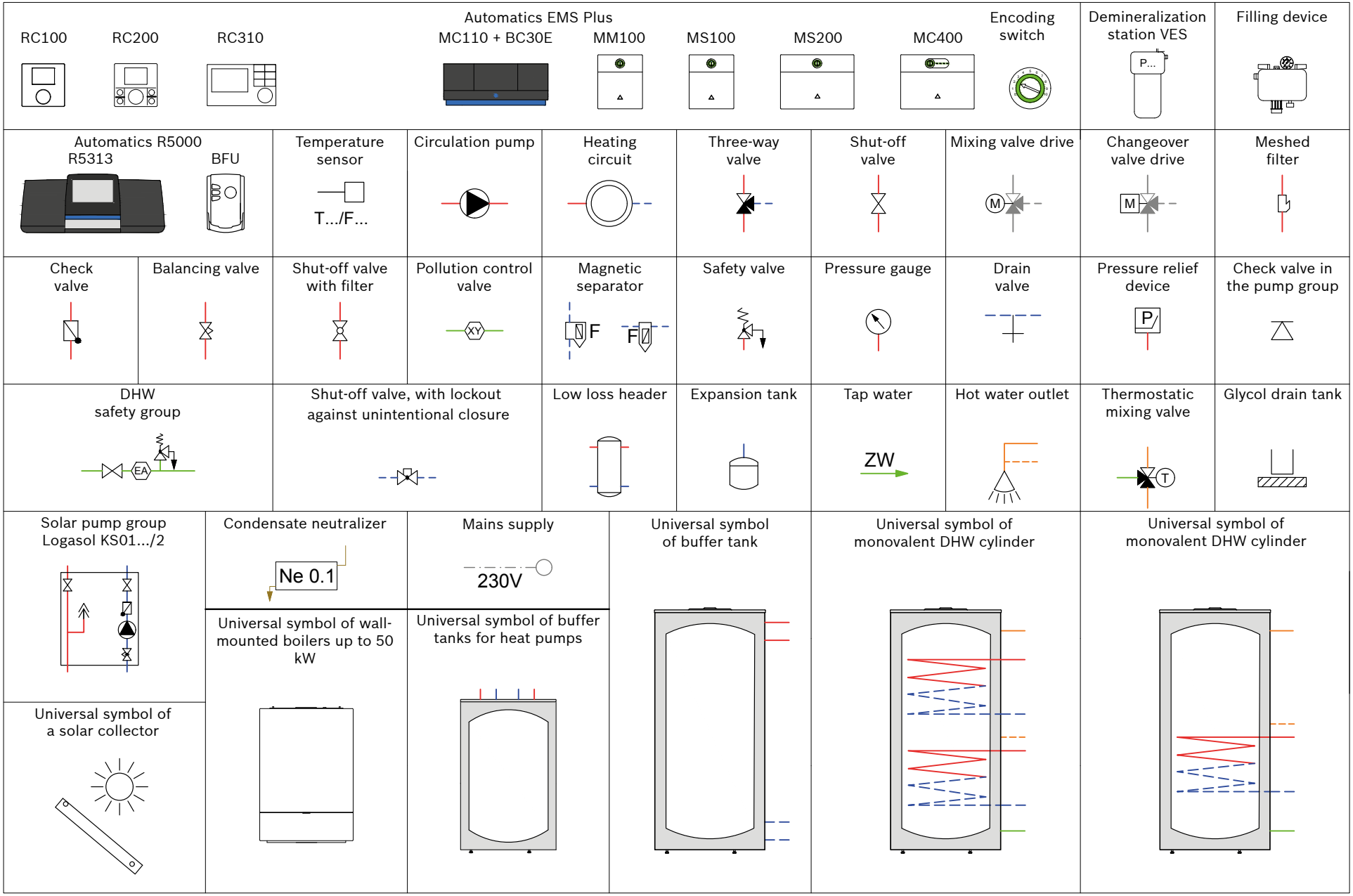


Fig. 1 Symbols and devices

System example

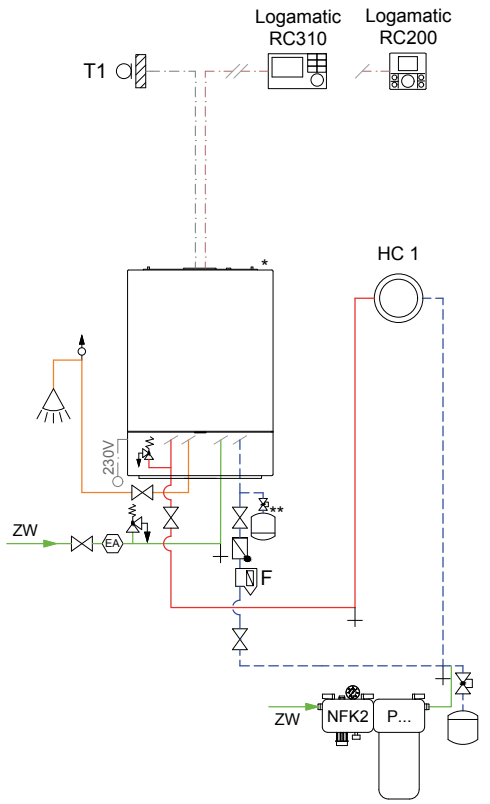
Buderus combined gas boiler Logamax plus with one direct heating circuit.

Description

The flow in the heating circuit is forced by the pump mounted on the heating installation. It is not possible to control an additional circulation pump. The system heating flow temperature depends on the outside temperature. The Logamatic RC310 or RC200 controllers can function as room regulators. The boiler heats up hot water by the flow-threw method without accumulating it.

Installation	Product number
Gas boiler	
1× Logamax plus GB122i-15K	7736901622
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
or Logamatic RC200	7738110073
1× sensor T1 (FA) (only for RC200)	5991374
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types

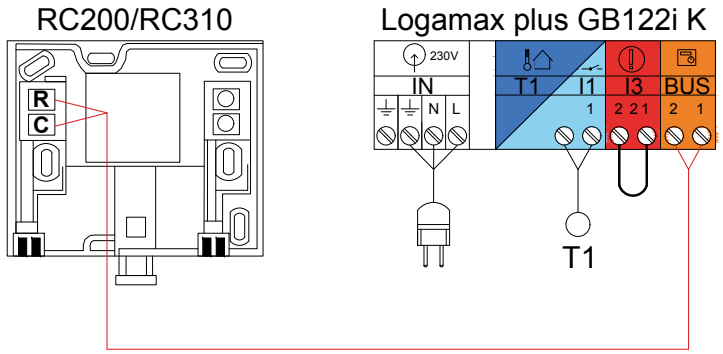
Table 4



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of the Logamax plus GB022K, GB122iK and GB072KV2 boilers (however, check their compliance with the heating system)

Fig. 2 Hydraulic diagram



EMS 2 / EMS plus bus-line

Fig. 3 Electrical diagram

System example

Buderus system gas boiler Logamax plus with one direct heating circuit and one mixed heating circuit.

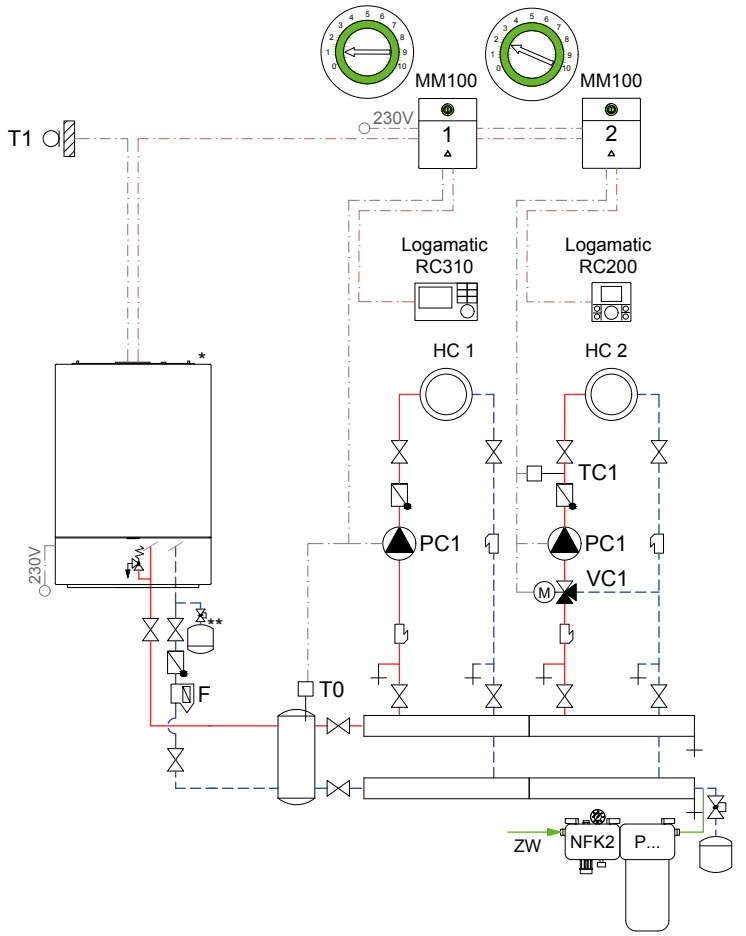
Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The Logamatic RC310 and RC200 control units can function as room regulators.

Installation	Product number
Gas boiler	
1× Logamax plus GB122i	Different types
or Logamax plus GB172i	Different types
or Logamax plus GB192i	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× Logamatic RC200 (option)	7738110073
2× MM100 module	7738110139
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× low loss header WHY 80/60 or WHY 120/80	8718599385 or 8718599386
2× pump group HS/HSM	Different types

Table 5



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 4 Hydraulic diagram

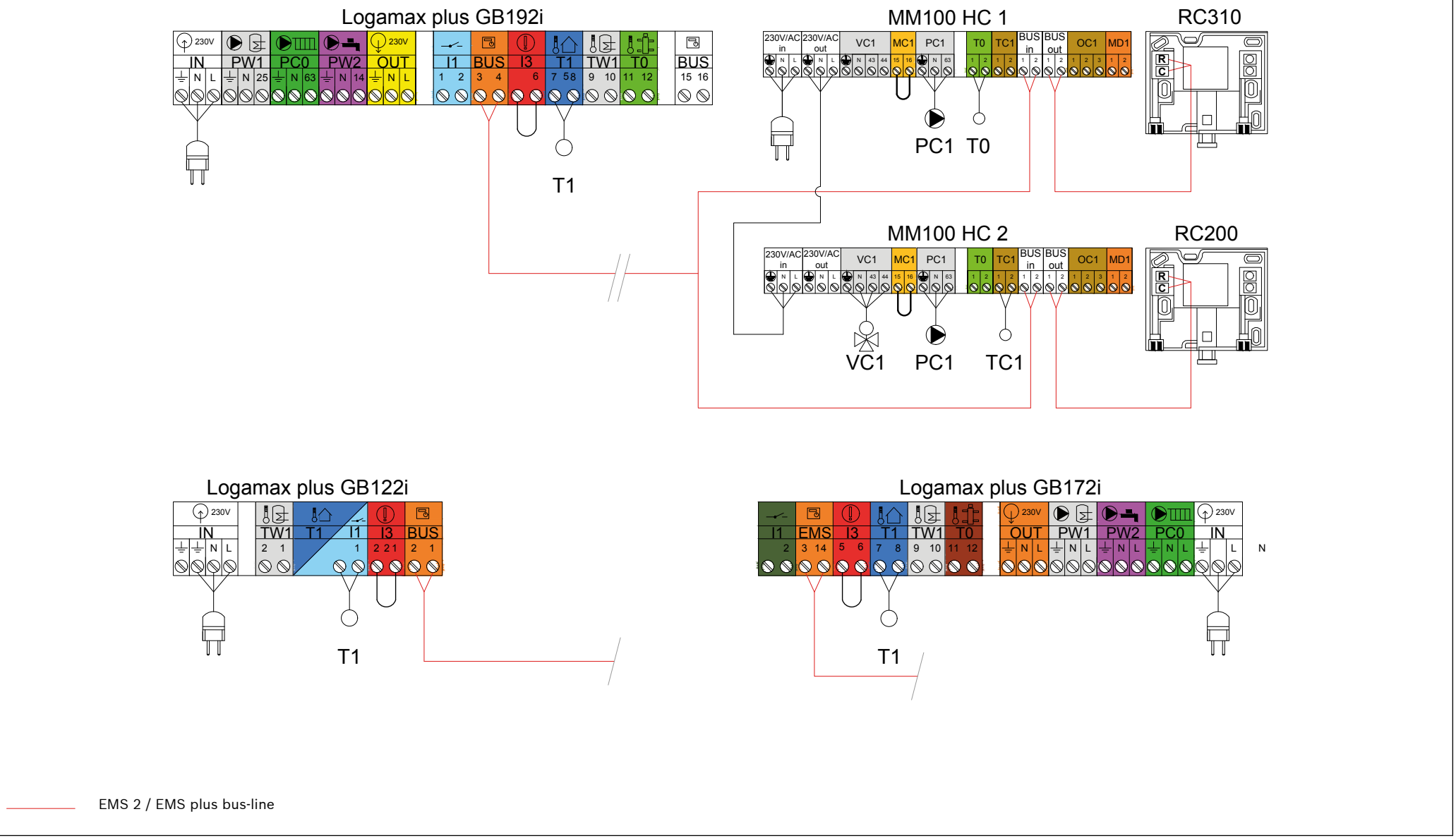


Fig. 5 Electrical diagram

System example

Buderus system gas boiler Logamax plus with one direct heating circuit and two mixed heating circuits.

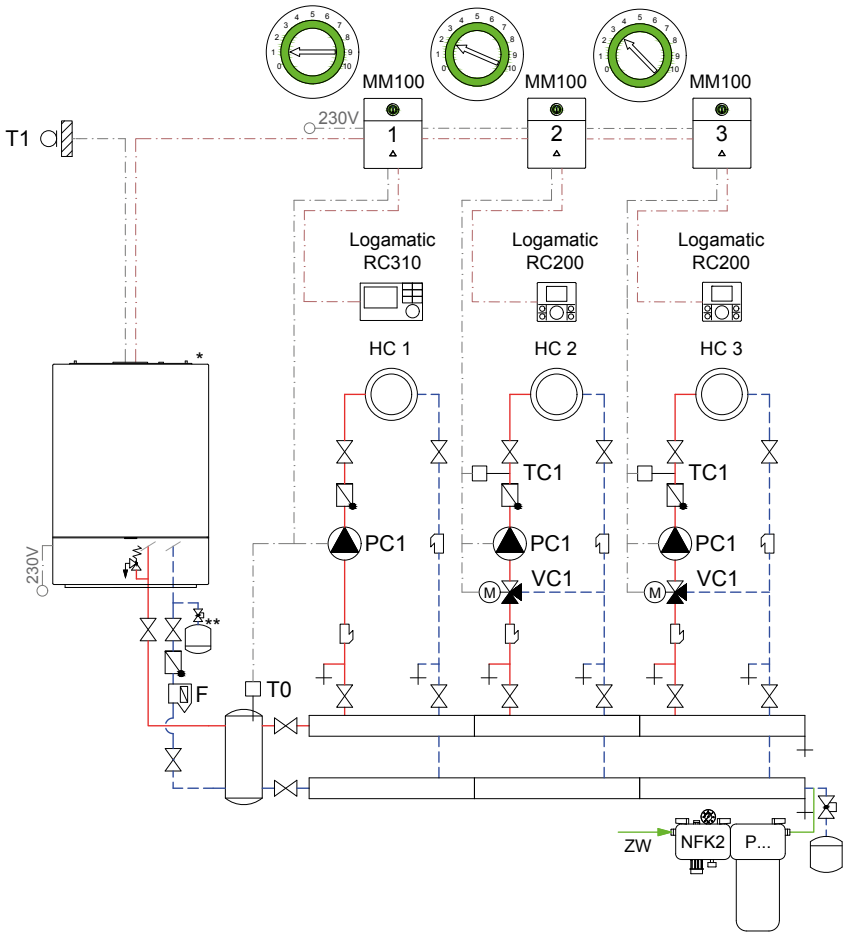
Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The Logamatic RC310 and RC200 control units can function as room regulators.

Installation	Product number
Gas boiler	
1× Logamax plus GB122i	Different types
or Logamax plus GB172i	Different types
or Logamax plus GB192i	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
2× Logamatic RC200 (option)	7738110073
3× MM100 module	7738110139
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× low loss header WHY 80/60 or WHY 120/80	8718599385 or 8718599386
3× pump group HS/HSM	Different types

Table 6



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 6 Hydraulic diagram

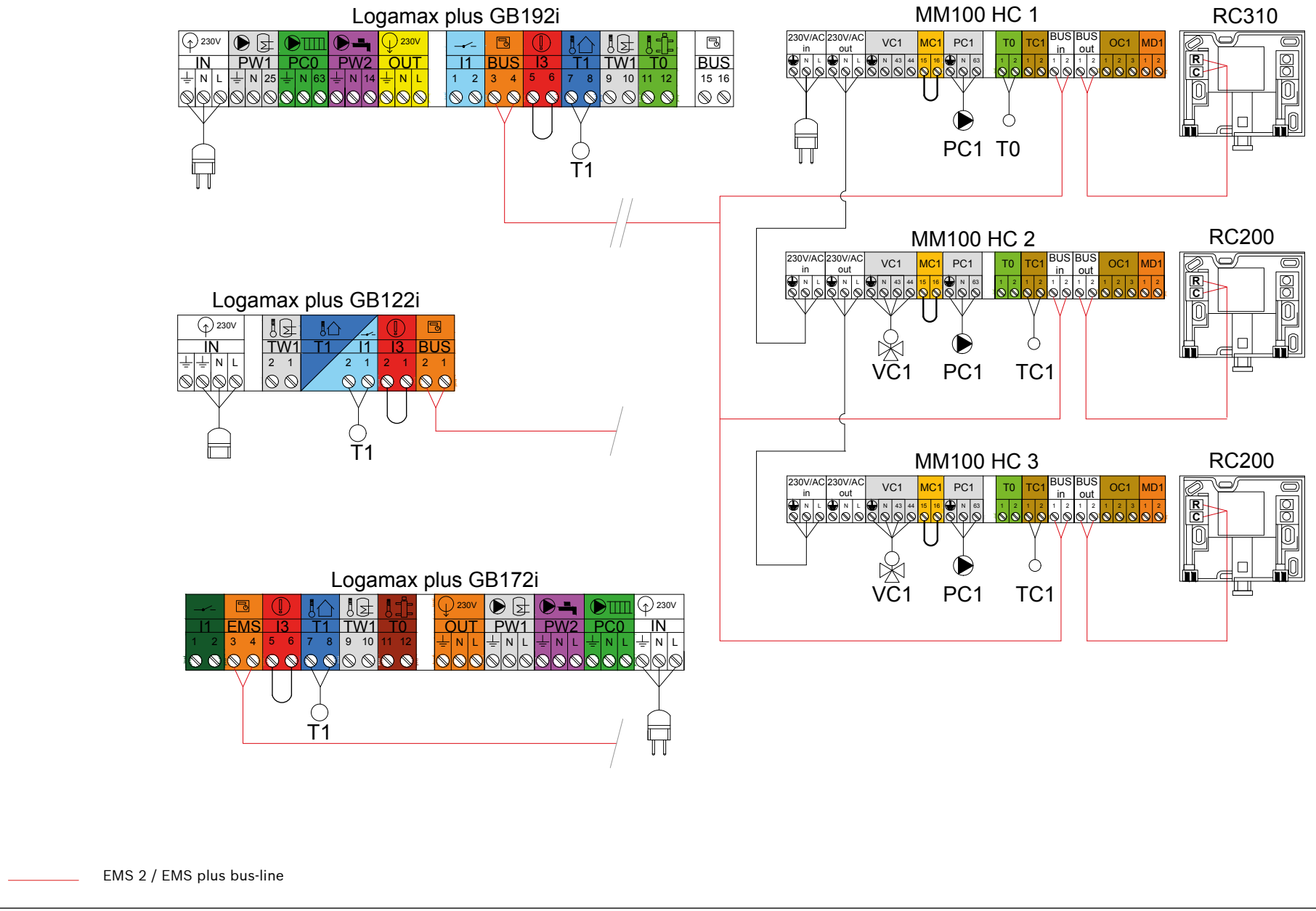


Fig. 7 Electrical diagram

System example

Buderus system gas boiler Logamax plus with one direct heating circuit and three mixed heating circuits.

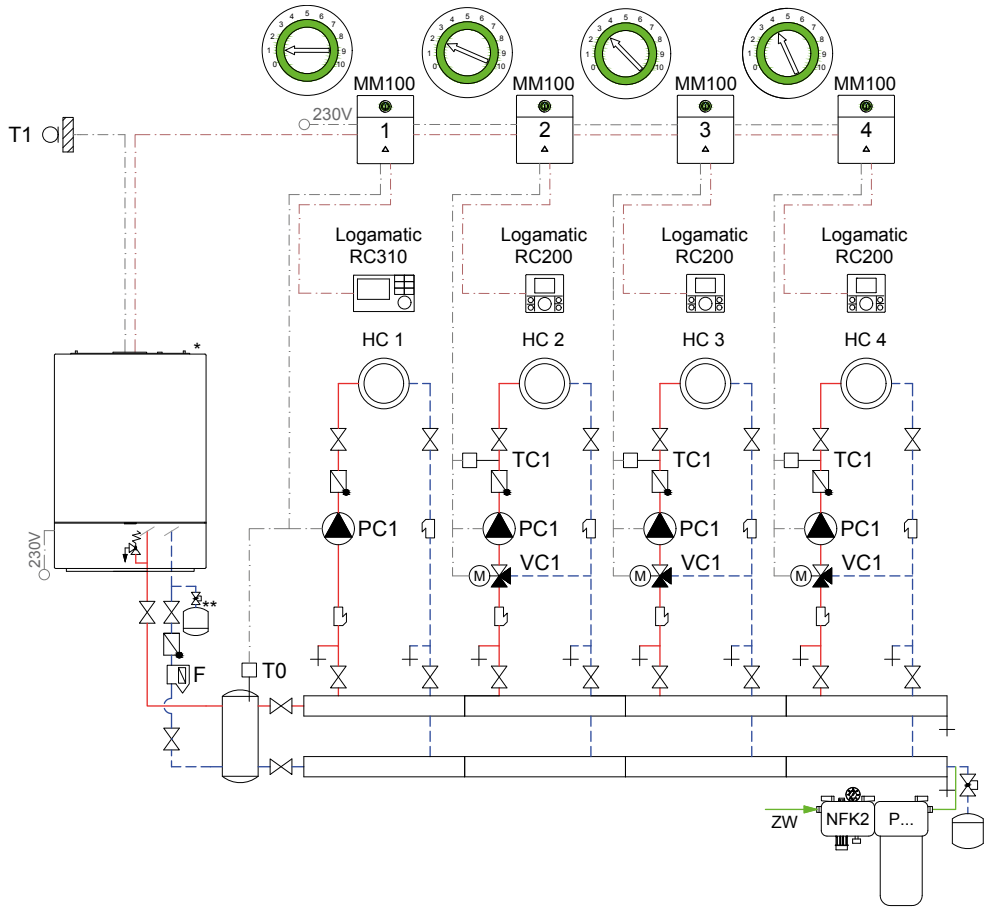
Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The Logamatic RC310 and RC200 control units can function as room regulators.

Installation	Product number
Gas boiler	
1× Logamax plus GB122i	Different types
or Logamax plus GB172i	Different types
or Logamax plus GB192i	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
3× Logamatic RC200 (option)	7738110073
4× MM100 module	7738110139
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× low loss header WHY 80/60 or WHY 120/80	8718599385 or 8718599386
4× pump group HS/HSM	Different types

Table 7



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 8 Hydraulic diagram

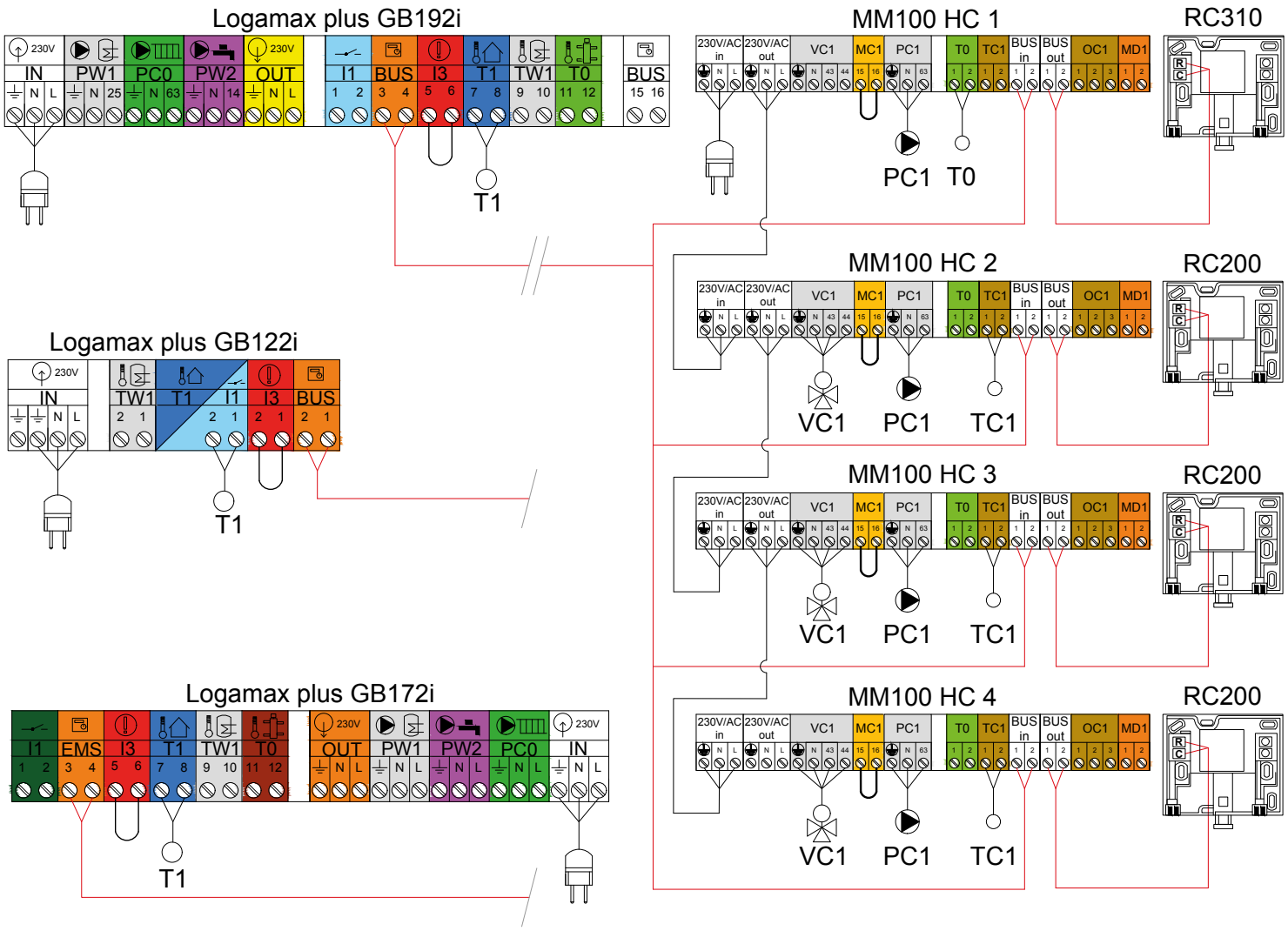


Fig. 9 Electrical diagram

System example

Buderus system gas boiler Logamax plus with one direct heating circuit and one hot water charging circuit.

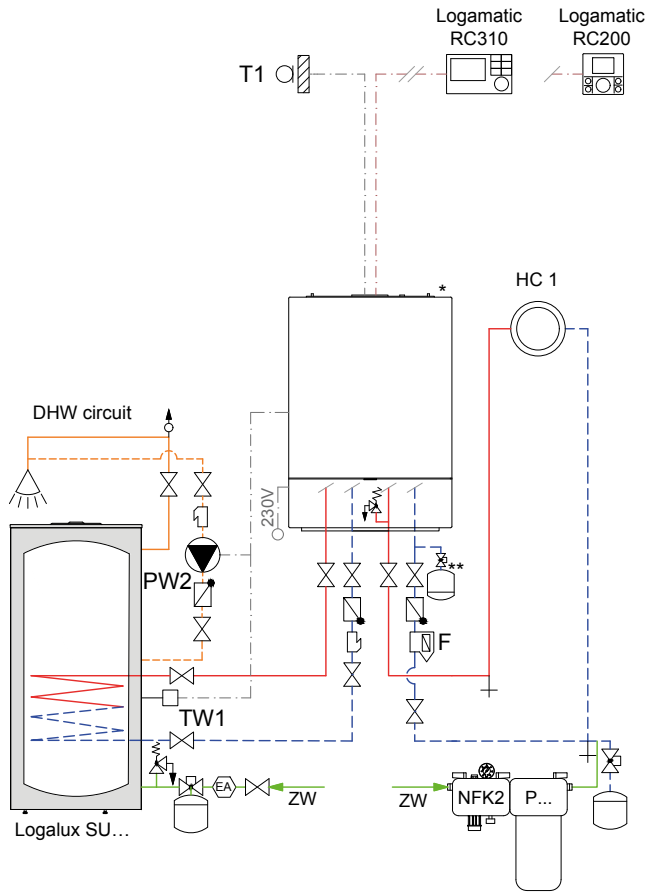
Description

The flow in the heating circuit is forced by the pump mounted on the heating installation. It is not possible to control an additional circulation pump. The heating system can be expanded with additional MM100 modules (see pages 14-15).

The system heating flow temperature depends on the outside temperature. The Logamatic RC310 and RC200 control units can function as room regulators. Domestic water is heated in a monovalent cylinder. The flow through the coil is controlled by a boiler built-in changeover valve. The DHW charging circuit has priority over the heating system. It is not possible to control the DHW circulation pump of GB122i boiler.

Installation	Product number
Gas boiler	
1× Logamax plus GB122i	Different types
or Logamax plus GB172i	Different types
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
or Logamatic RC200	7738110073
1× sensor T1 (FA) (only for RC200)	5991374
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator(F)	Different types
1× demineralization kit (P)	Different types

Table 8



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 10 Hydraulic diagram

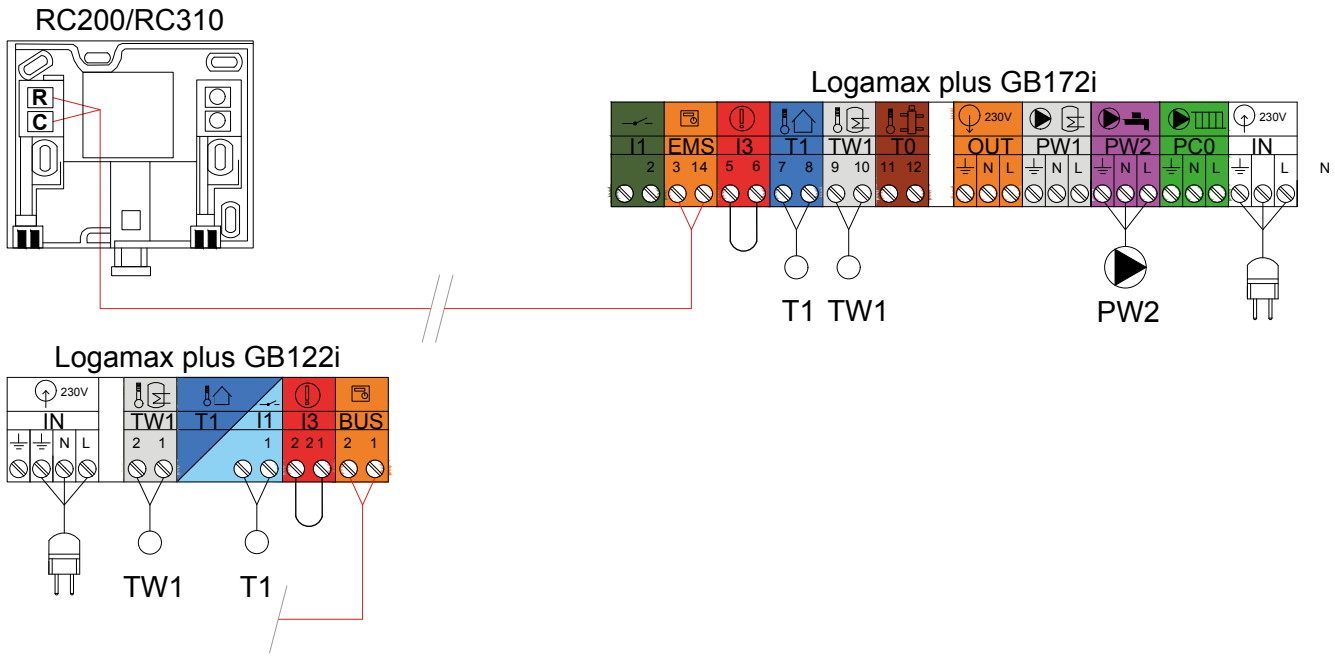


Fig. 11 Electrical diagram

System example

Buderus system gas boiler Logamax plus with one direct heating circuit, one mixed heating circuit and one DHW charging circuit.

Description

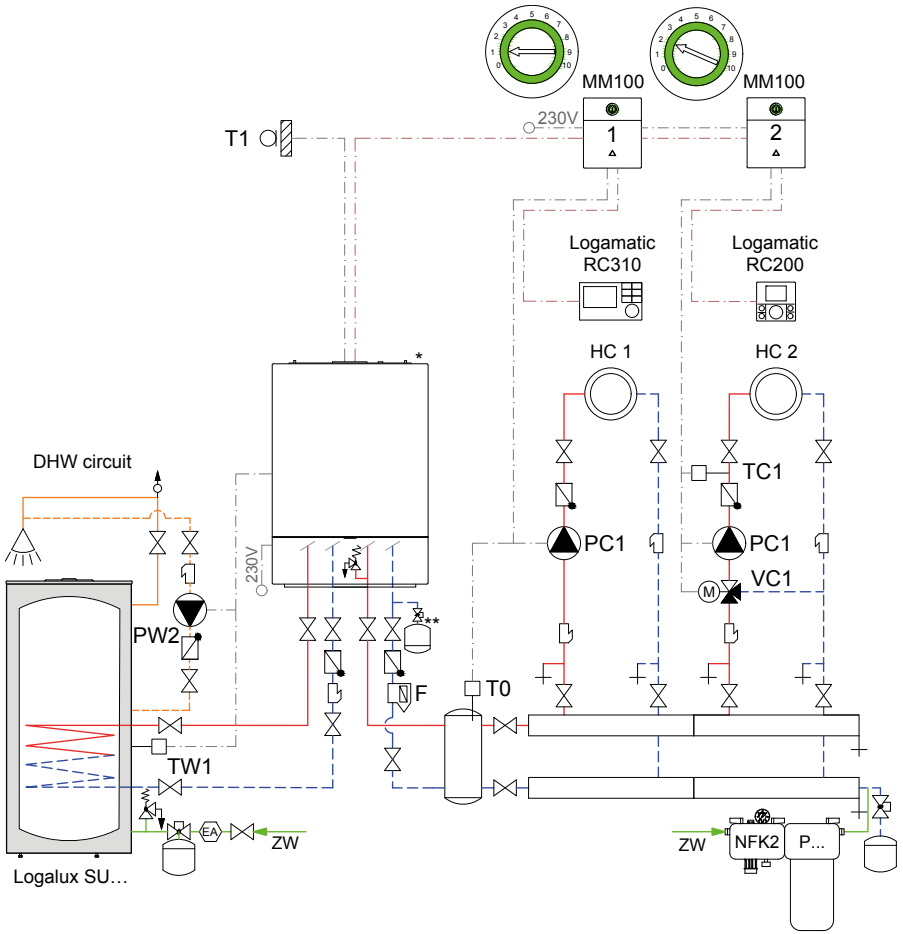
The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The Logamatic RC310 and RC200 control units can function as room regulators.

Domestic water is heated in a monovalent cylinder. The flow through the coil is controlled by a boiler built-in changeover valve. The DHW charging circuit has priority over the heating system. It is not possible to control the DHW circulation pump of GB122i boiler.

Installation	Product number
Gas boiler	
1× Logamax plus GB122i	Different types
or Logamax plus GB172i	Different types
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× Logamatic RC200 (option)	7738110073
2× MM100 module	7738110139
1× sensor T0	63043337
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× low loss header WHY 80/60 or WHY 120/80	8718599385 or 8718599386
2× pump group HS/HSM	Different types

Table 9



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 12 Hydraulic diagram

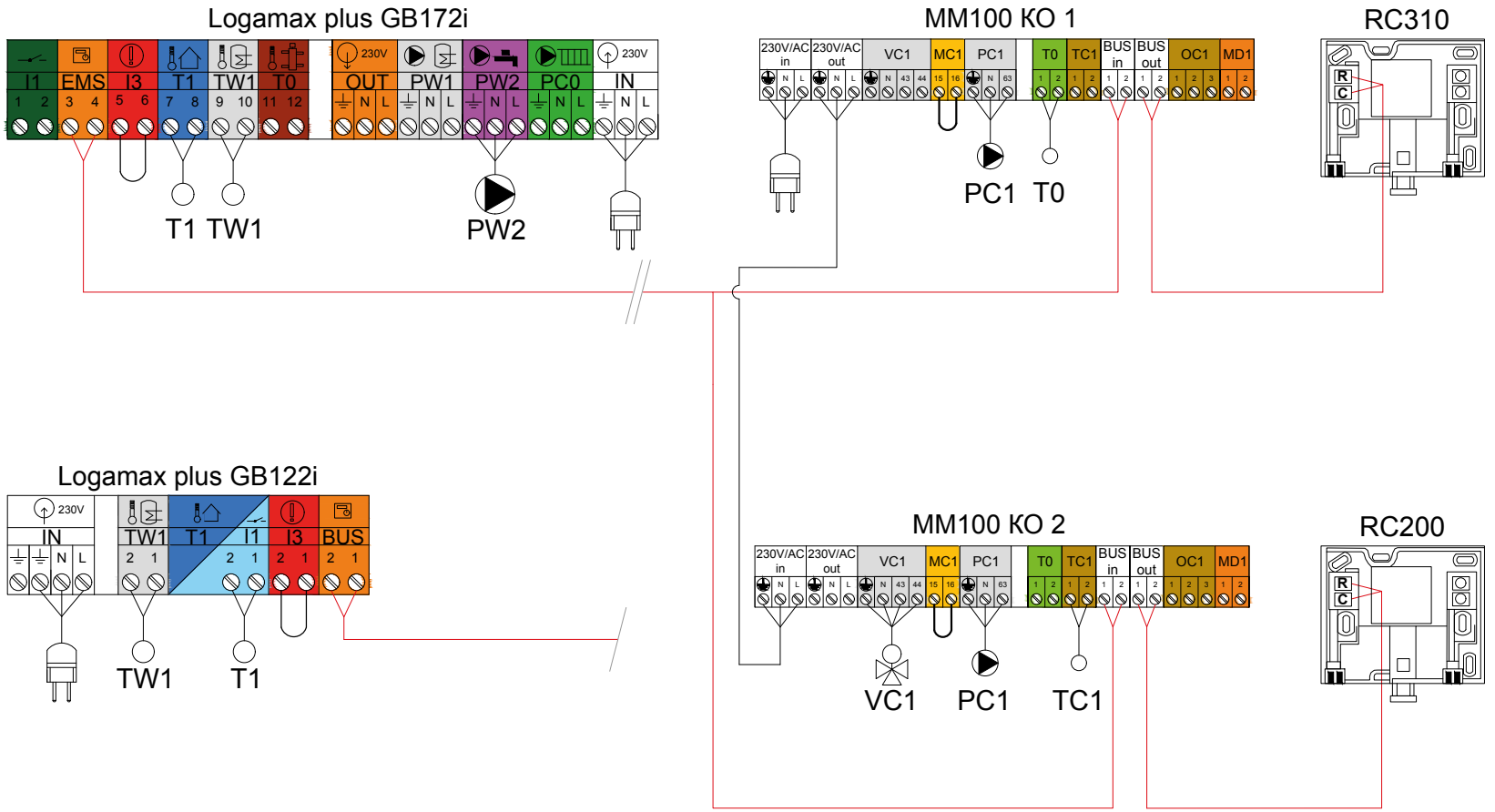


Fig. 13 Electrical diagram

System example

Buderus system gas boiler Logamax plus with one mixed heating circuit and DHW charging circuit, interacting with an additional heat source activated by a buffer tank.

Description

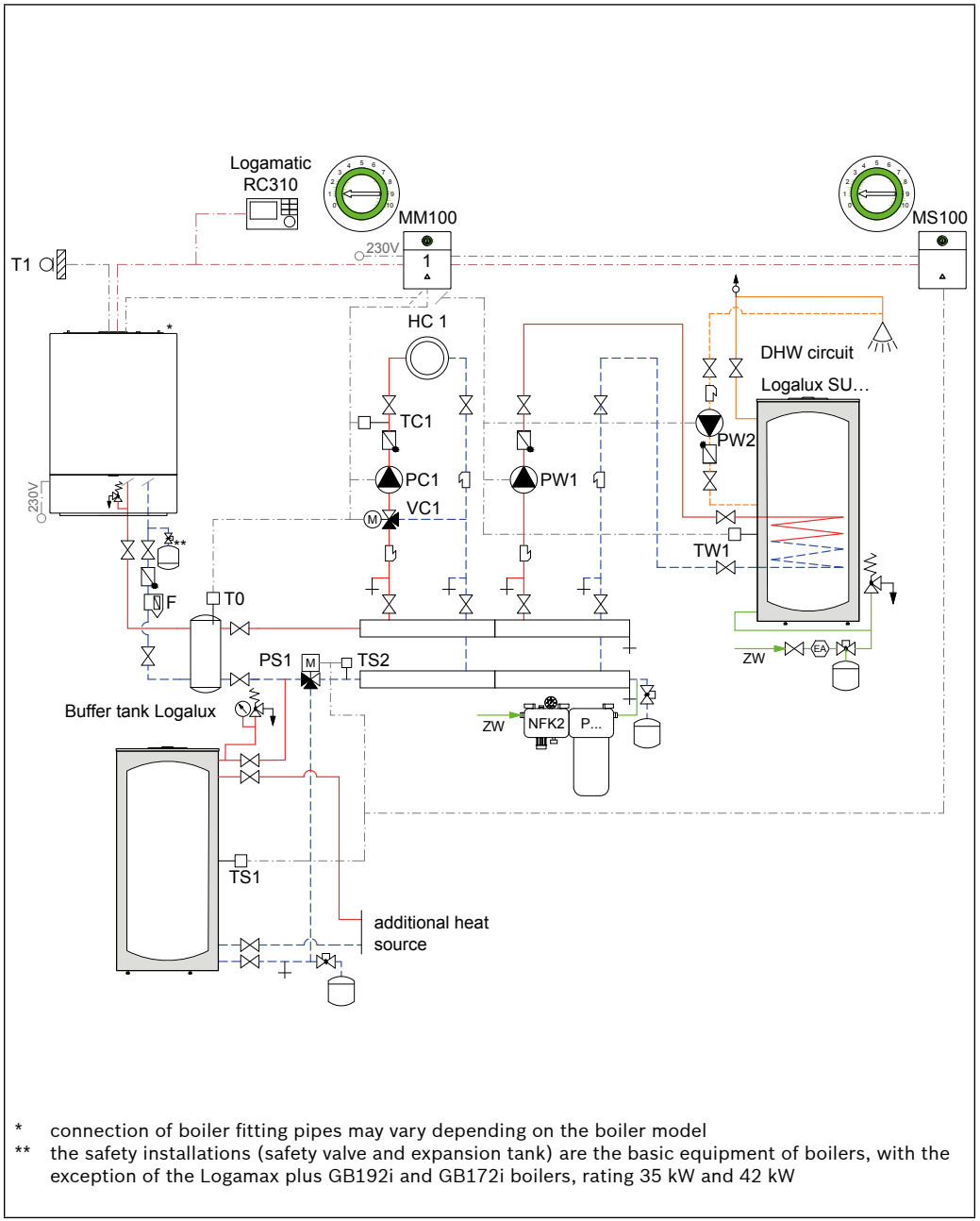
The system is equipped with a low loss header. The flow in the heating circuit is forced by a circulation pump.

A heat pump, a water-jacketed fireplace or a solid fuel boiler can be used as an additional heat source. The system requires the use of a buffer tank that is connected to the installation taking into account the of temperature difference. When the water temperature in the buffer tank (TS1) is higher than the return temperature of the system (TS2), the three-way valve (PS1) switches towards the buffer tank. This heats the water returning to the boiler (low loss header).

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by the boiler automatics (not available in GB122i, use additional MM100 module). Thanks to this design, you can use heat from an additional source to heat hot water. The DHW charging circuit has priority over the heating system. Parallel operation with the heating system is possible. The additional MM100 module must be used (see pages 40-41). It is not possible to control the DHW circulation pump of GB122i boiler.

Installation	Product number
Gas boiler	
1× Logamax plus	Different types
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MM100 module	7738110139
1× MS100 module	7738110123
1× sensor T0	63043337
1× sensor TW1	7735502288
Equipment	
1× buffer tank Logalux	Different types
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× low loss header WHY 80/60 or WHY 120/80	8718599385 or 8718599386
2× pump group HS/HSM	Different types

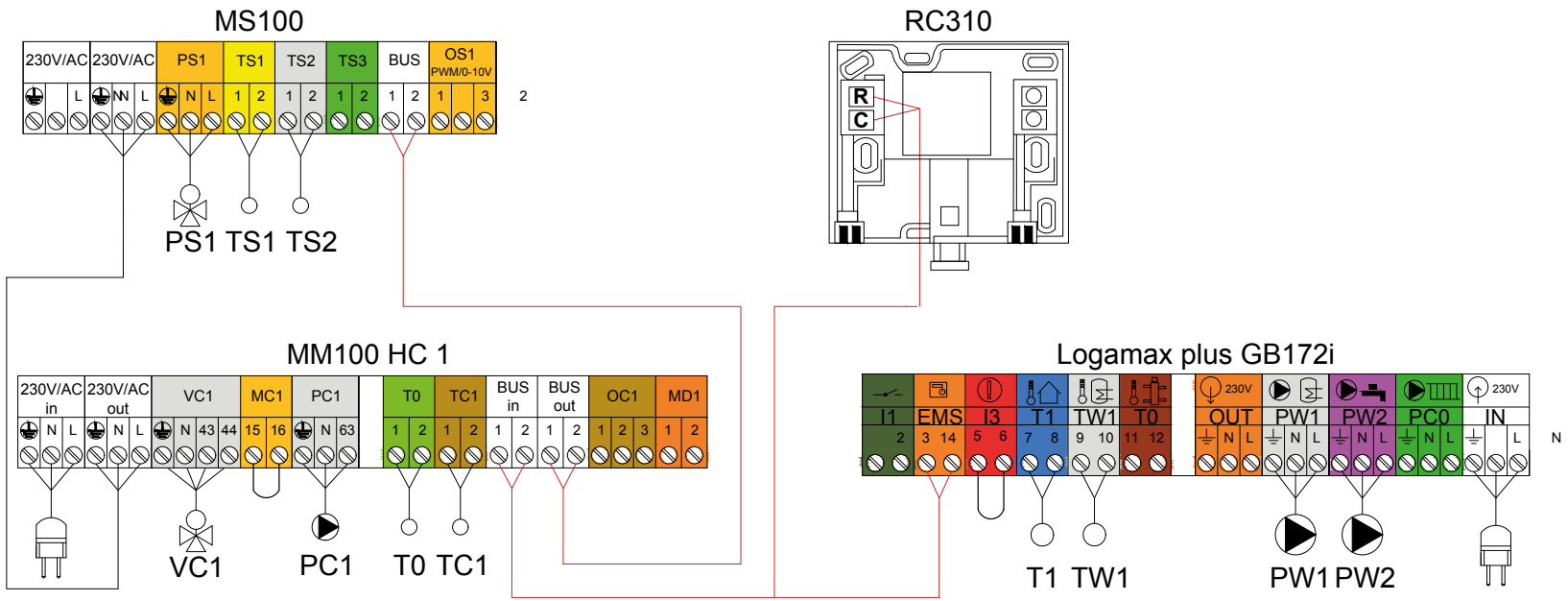
Table 10



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 14 Hydraulic diagram



EMS 2 / EMS plus bus-line

Fig. 15 Electrical diagram

System example

Buderus system gas boiler Logamax plus with one constant temperature heating circuit.

Description

The system is equipped with a low loss header. The flow in the heating circuit is forced by a circulation pump.

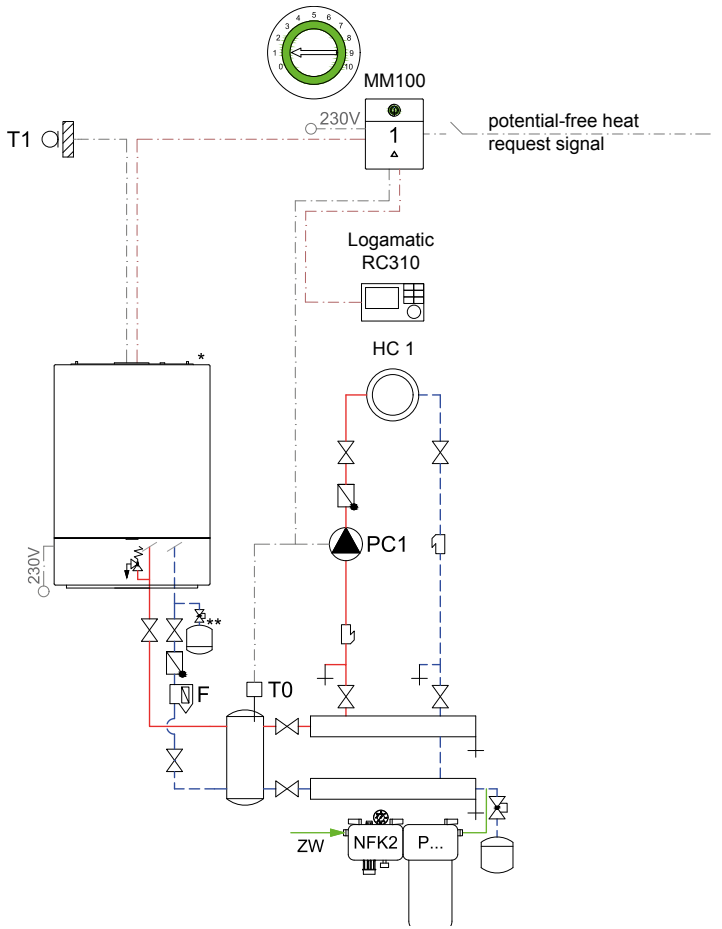
The heating circuit is controlled by the MM100 module. The boiler operates at a constant heating flow temperature. Such a system can be used for pool heating, in supply and exhaust heaters and other technological processes where a constant value is required regardless of the outside temperature or the season.

Charging is carried out after receiving a potential-free signal from an external system to the MD1 terminals.

A low loss header should be used in case there might be an infringement of the boiler operational conditions.

Installation	Product number
Gas boiler	
1× Logamax plus GB122i	Different types
or Logamax plus GB172i	Different types
or Logamax plus GB192i	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MM100 module	7738110139
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× low loss header WHY 80/60 or WHY 120/80	8718599385 or 8718599386
1× pump group HS	Different types

Table 11



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 16 Hydraulic diagram

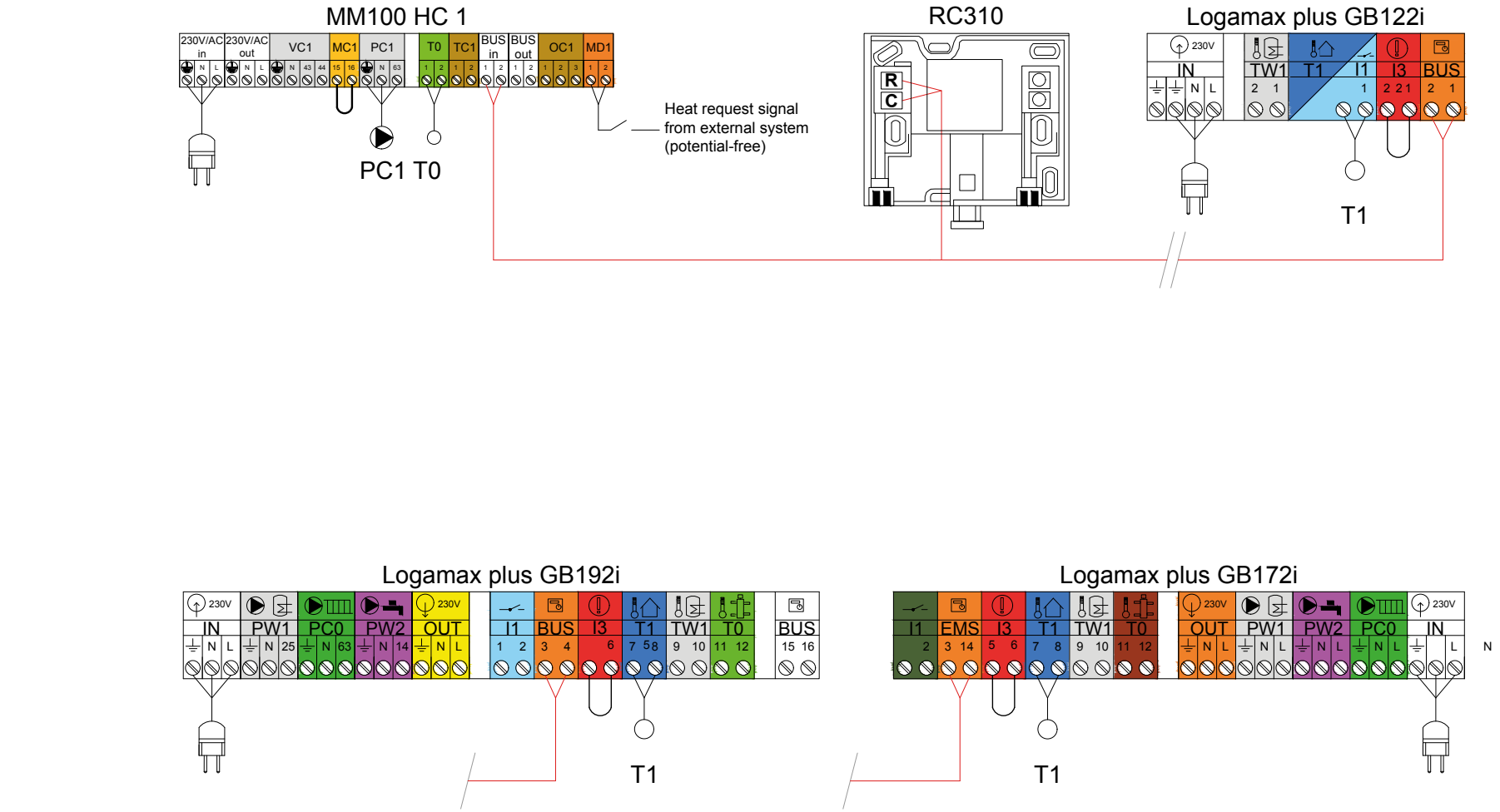


Fig. 17 Electrical diagram

System example

A cascade of two, three or four Buderus gas boilers Logamax plus with one direct heating circuit and one mixed heating circuit.

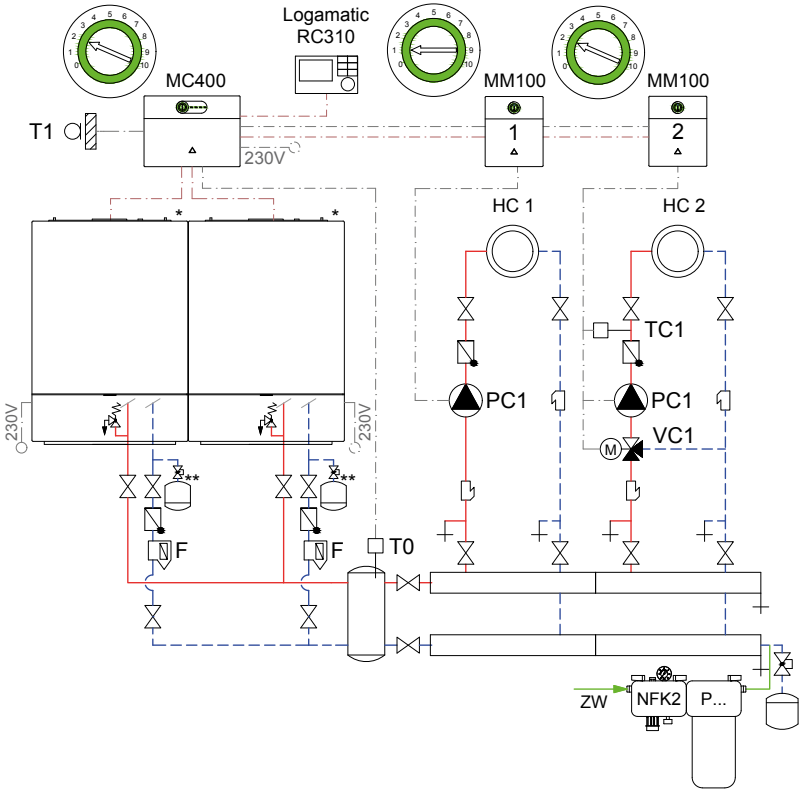
Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. A cascade of boilers is controlled by MC400 module. One module can be used to control 4 heat sources. Up to 16 devices can be arranged in a cascade with 5 MC400 modules (see pages 42-47). The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Installation	Product number
Gas boiler	
2 -4× Logamax plus GB122i	Different types
or Logamax plus GB172i	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MC400 module	7738111003
2× MM100 module	7738110139
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
2× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types

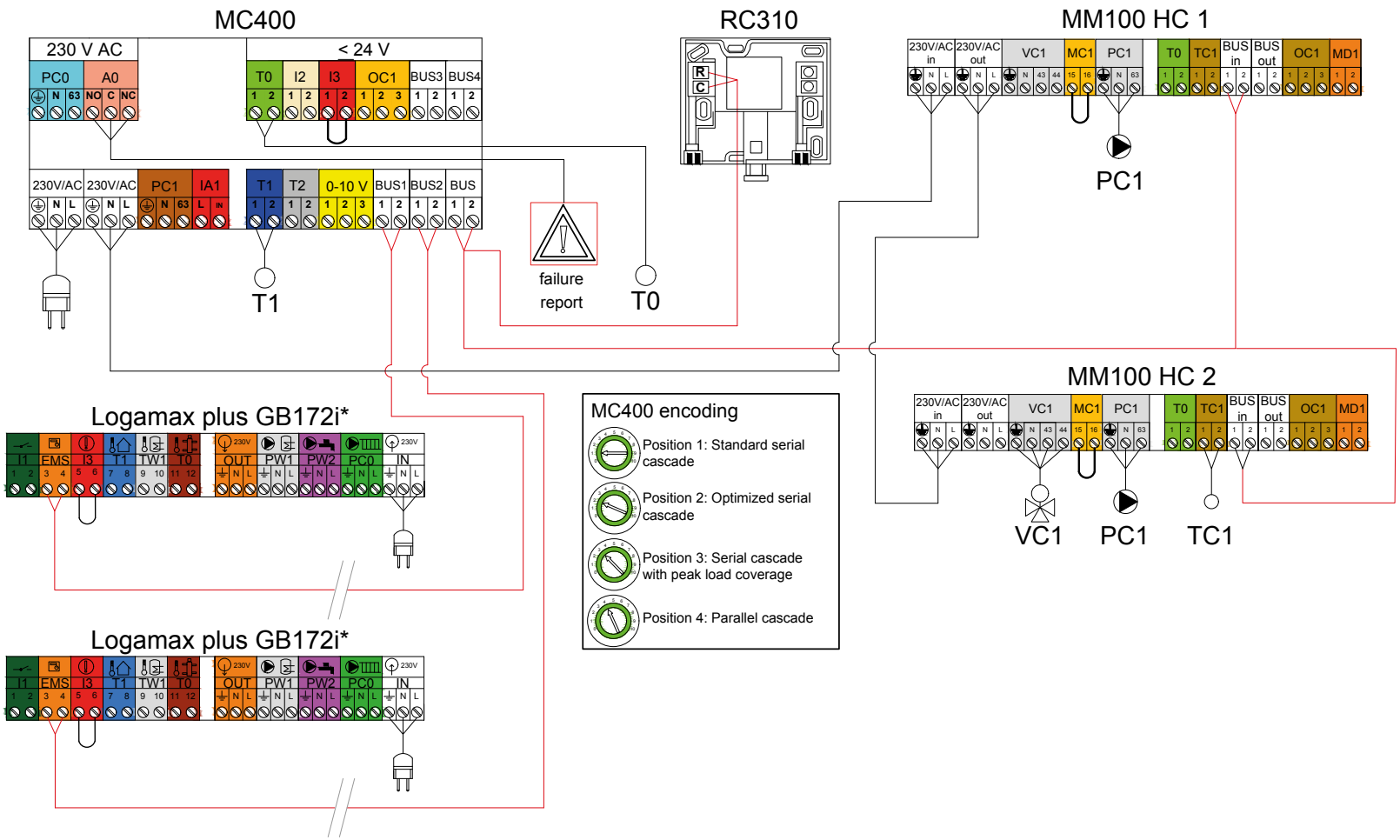
Table 12



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 18 Hydraulic diagram



* the method of connecting the boiler automatics is similarly applicable to other gas boilers

EMS 2 / EMS plus bus-line

Fig. 19 Electrical diagram

System example

A cascade of Buderus gas boilers Logamax plus with two mixed heating circuits and a DHW charging circuit.

Description

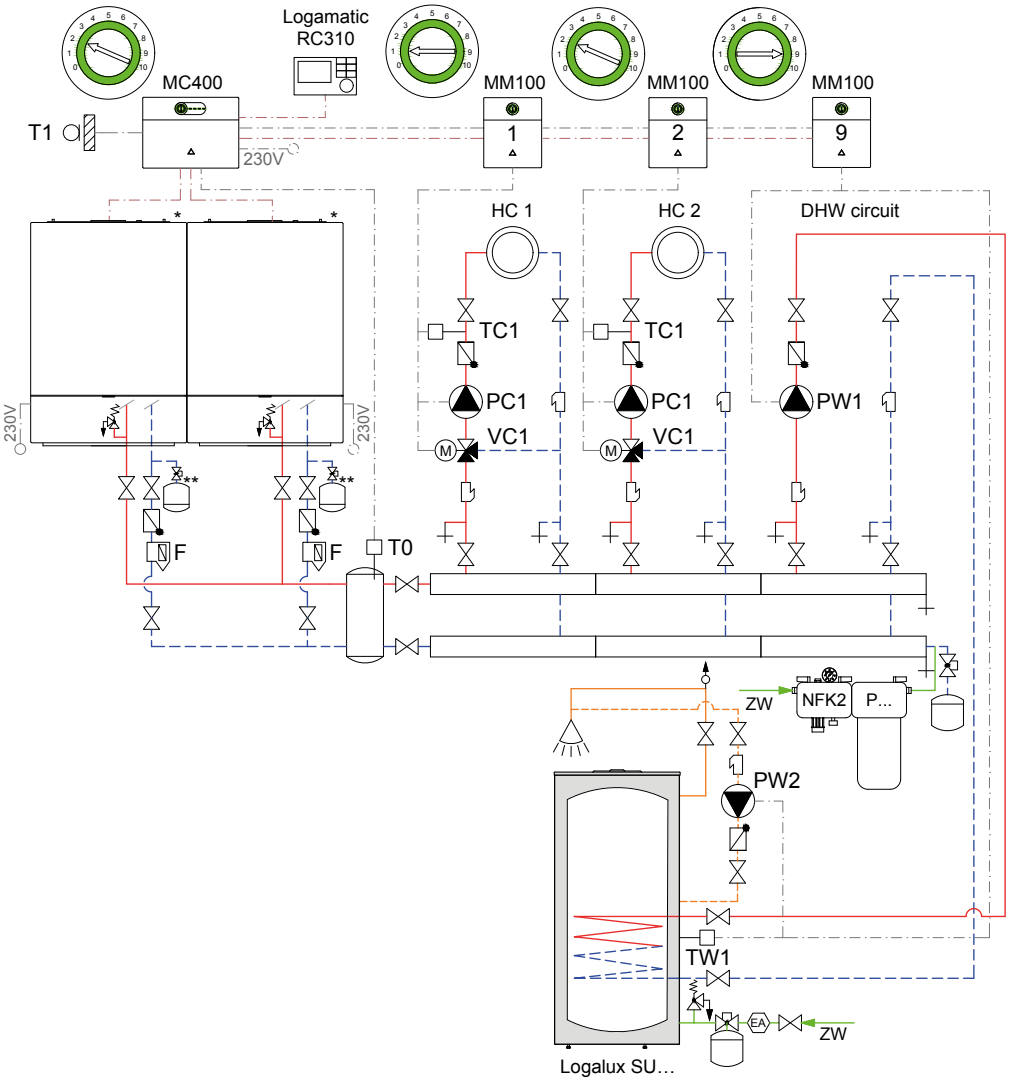
The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. A cascade of boilers is controlled by MC400 module. One module can be used to control 4 heat sources. Up to 16 devices can be arranged in a cascade with 5 MC400 modules (see pages 42-47). The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by MM100 module. The DHW charging circuit can operate in parallel or priority over the selected heating circuits, while parallel operation requires mixing valves in these circuits.

Installation	Product number
Gas boiler	
2× Logamax plus GB122i	Different types
or Logamax plus GB172i	Different types
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MC400 module	7738111003
3× MM100 module	7738110139
1× sensor T0	63043337
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
2× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types

Table 13



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 20 Hydraulic diagram

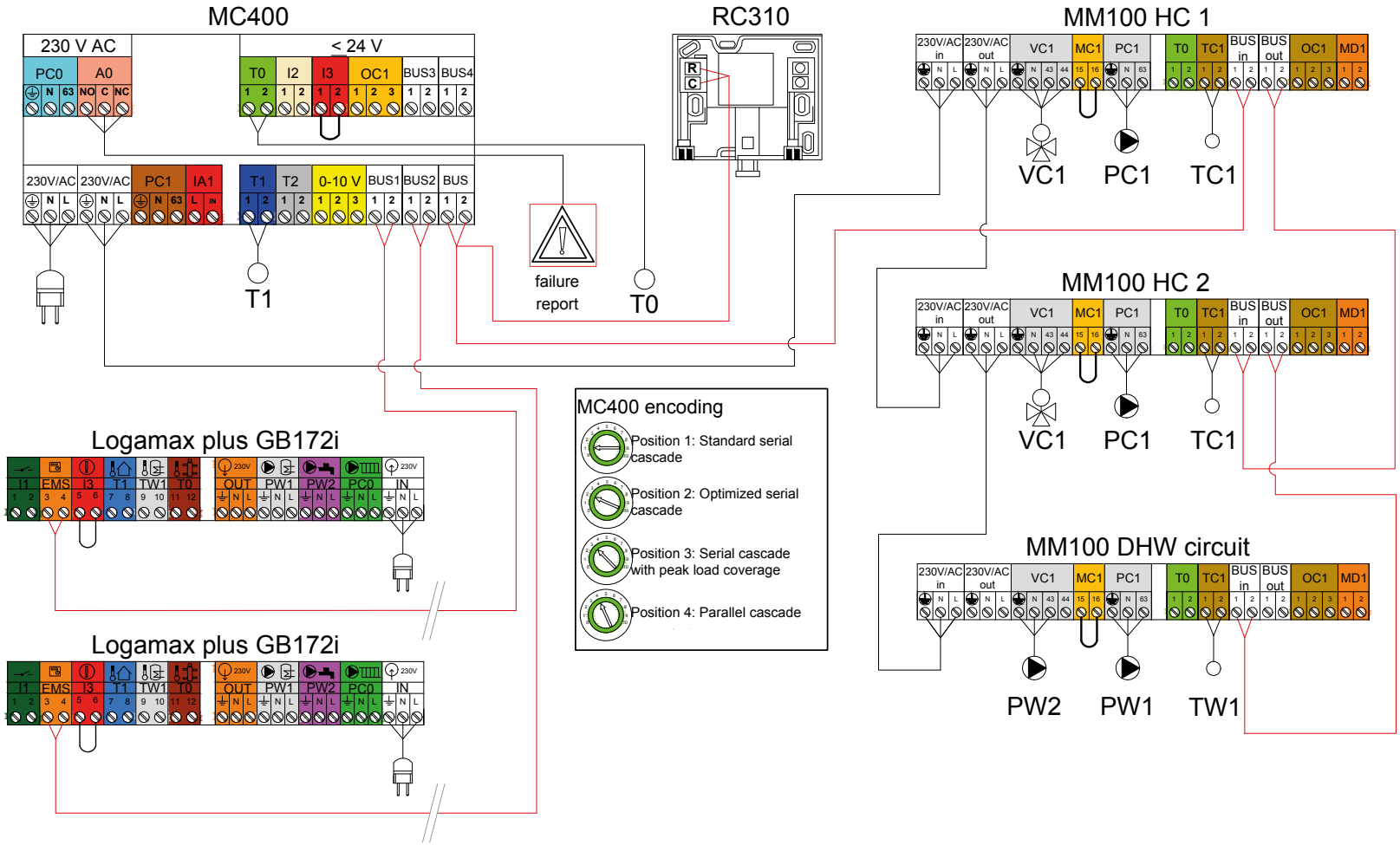


Fig. 21 Electrical diagram

System example

Buderus system gas boiler Logamax plus GB162V2 with one heating circuit.

Description

The flow in the heating circuit is forced by the pump mounted on the heating installation. It is not possible to control an additional circulation pump.

The system heating flow temperature depends on the outside temperature. The Logamatic RC310 and RC200 control units can function as room regulators. If the operating conditions of the boiler may be exceeded (flow through the boiler is up to 5 m³/h), use a low loss header and MM100 module to control the circulation pump on the secondary side of the low loss header.

Installation	Product number
Gas boiler	
1× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
1× pump group	7736700103
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
or Logamatic RC200	7738110073
1× sensor T1 (FA) (only for RC200)	5991374
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 14

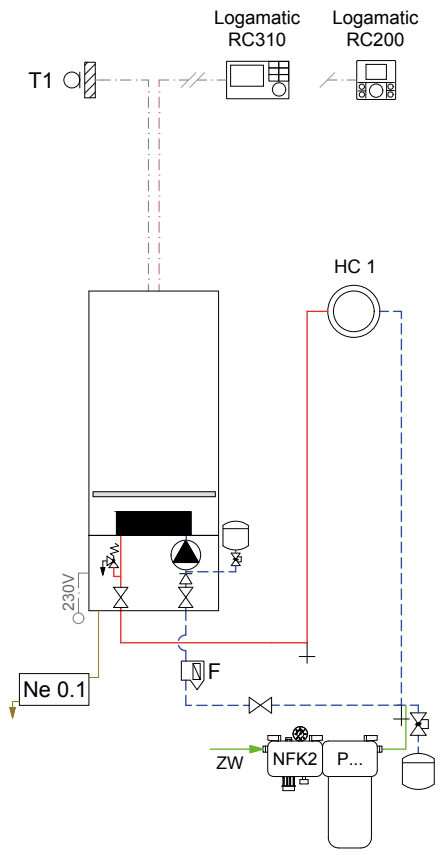
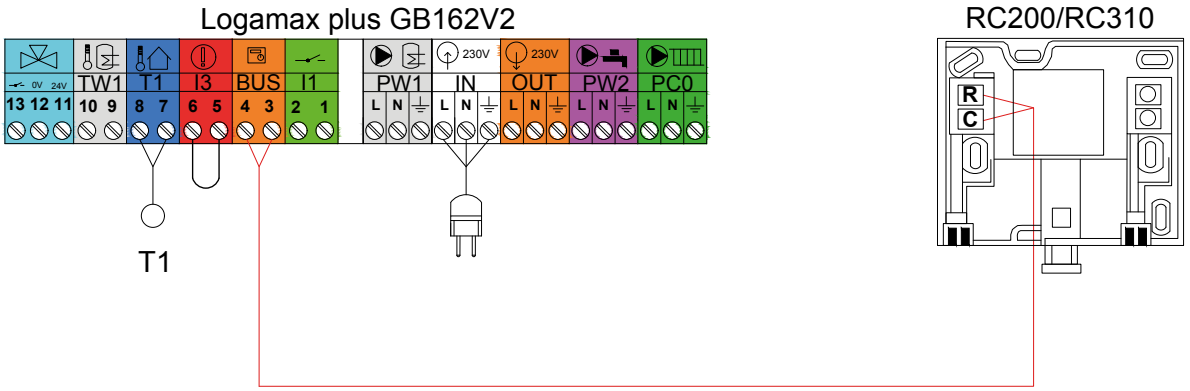


Fig. 22 Hydraulic diagram



EMS 2 / EMS plus bus-line

Fig. 23 Electrical diagram

System example

Buderus system gas boiler Logamax plus GB162V2 with one direct heating circuit and one mixed heating circuit.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The Logamatic RC310 and RC200 control units can function as room regulators.

Installation	Product number
Gas boiler	
1× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
1× pump group	7736700103
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× Logamatic RC200 (option)	7738110073
2× MM100 module	7738110139
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 15

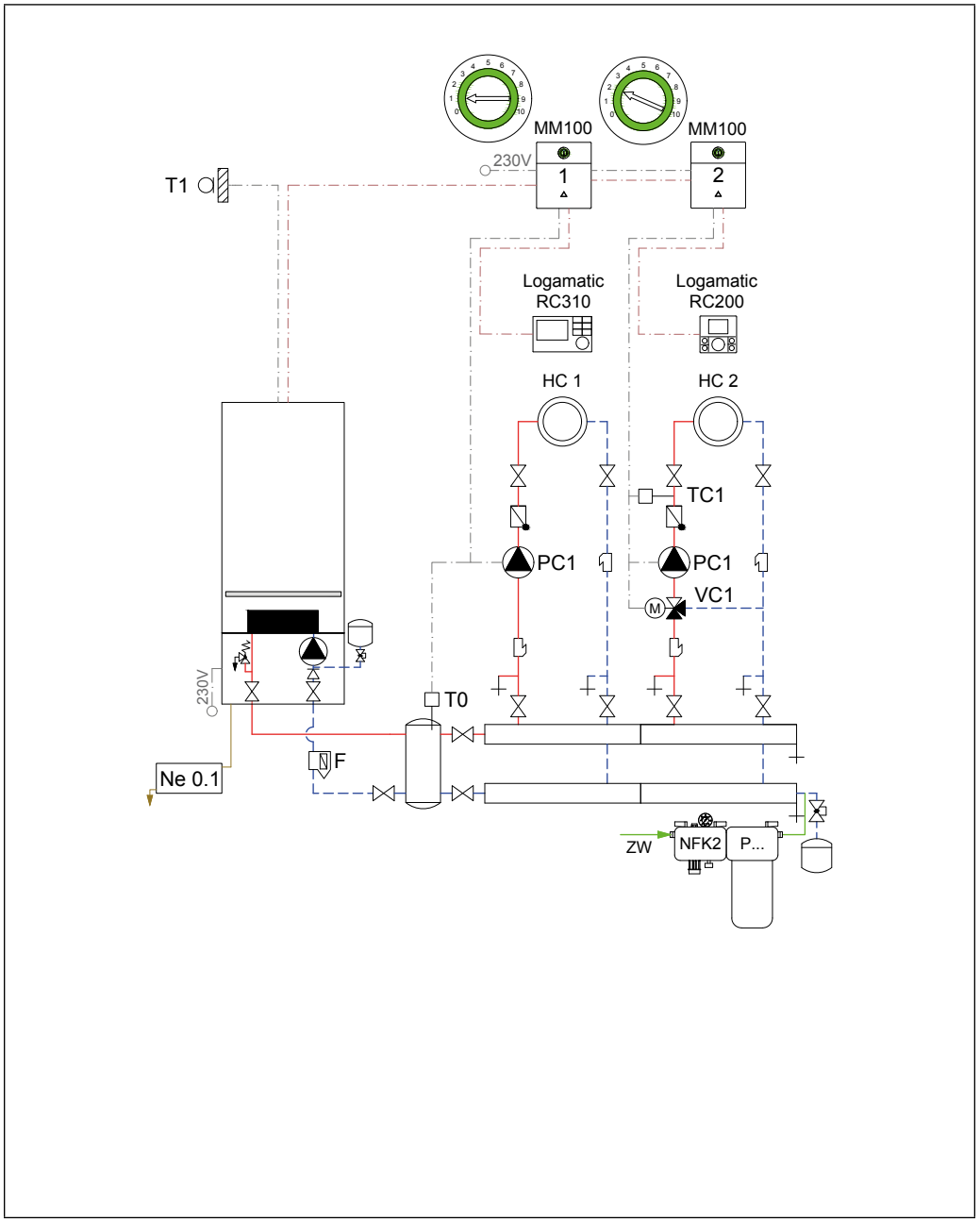


Fig. 24 Hydraulic diagram

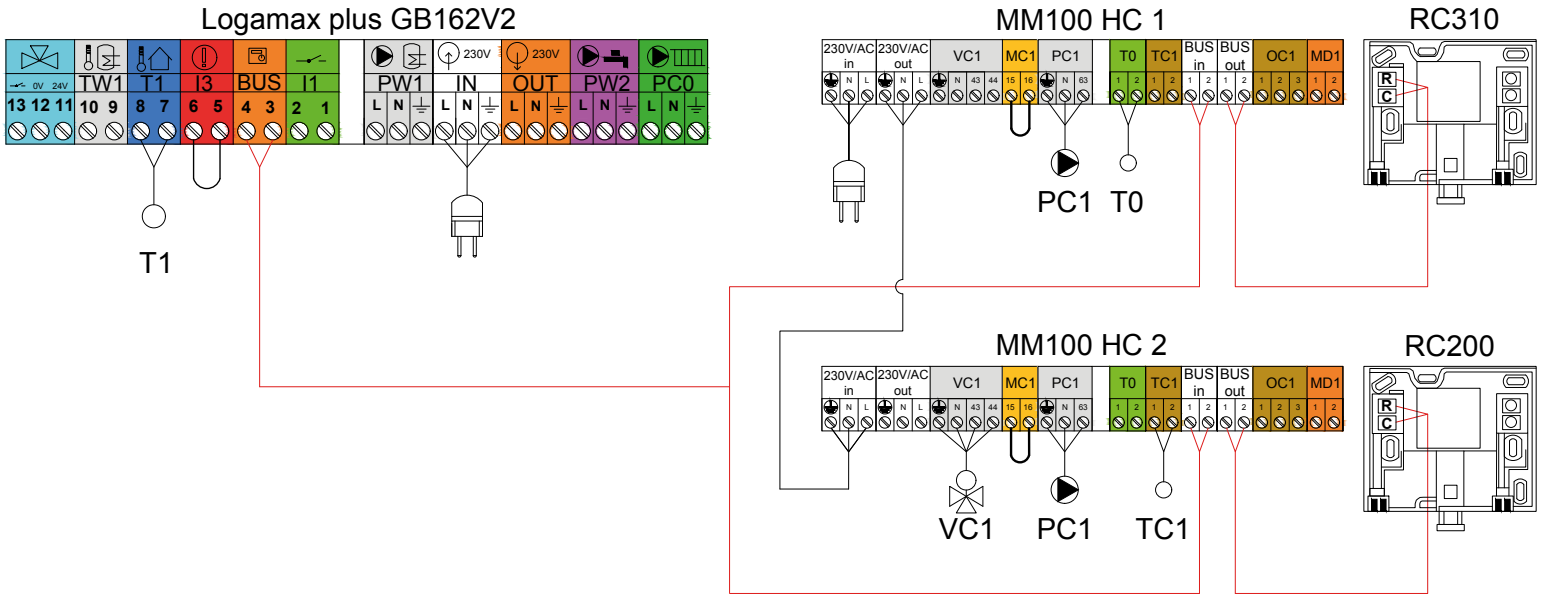


Fig. 25 Electrical diagram

System example

Buderus system gas boiler Logamax plus GB162V2 with one direct heating circuit and two mixed heating circuits.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The Logamatic RC310 and RC200 control units can function as room regulators.

Installation	Product number
Gas boiler	
1× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
1× pump group	7736700103
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
2× Logamatic RC200 (option)	7738110073
3× MM100 module	7738110139
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 16

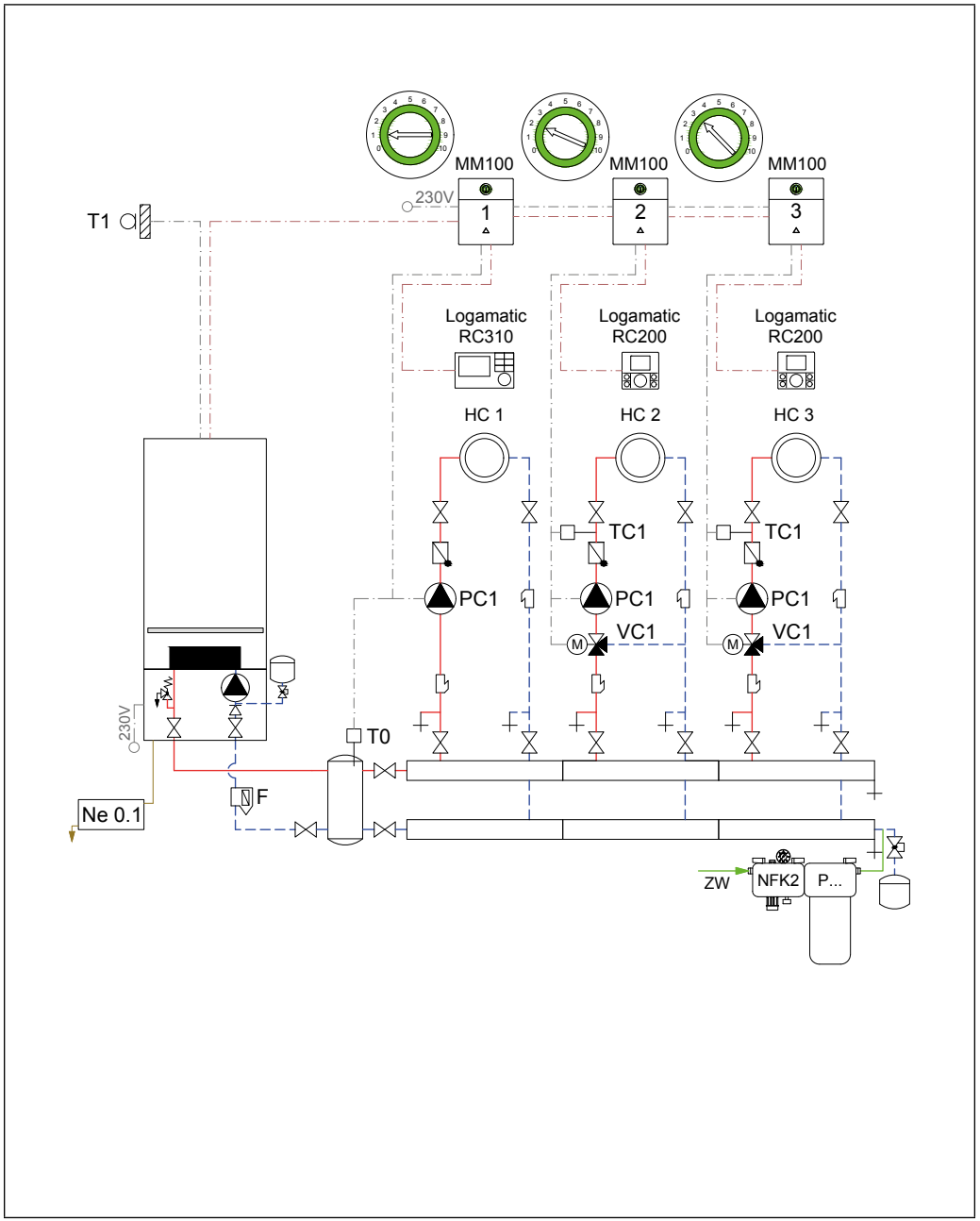


Fig. 26 Hydraulic diagram

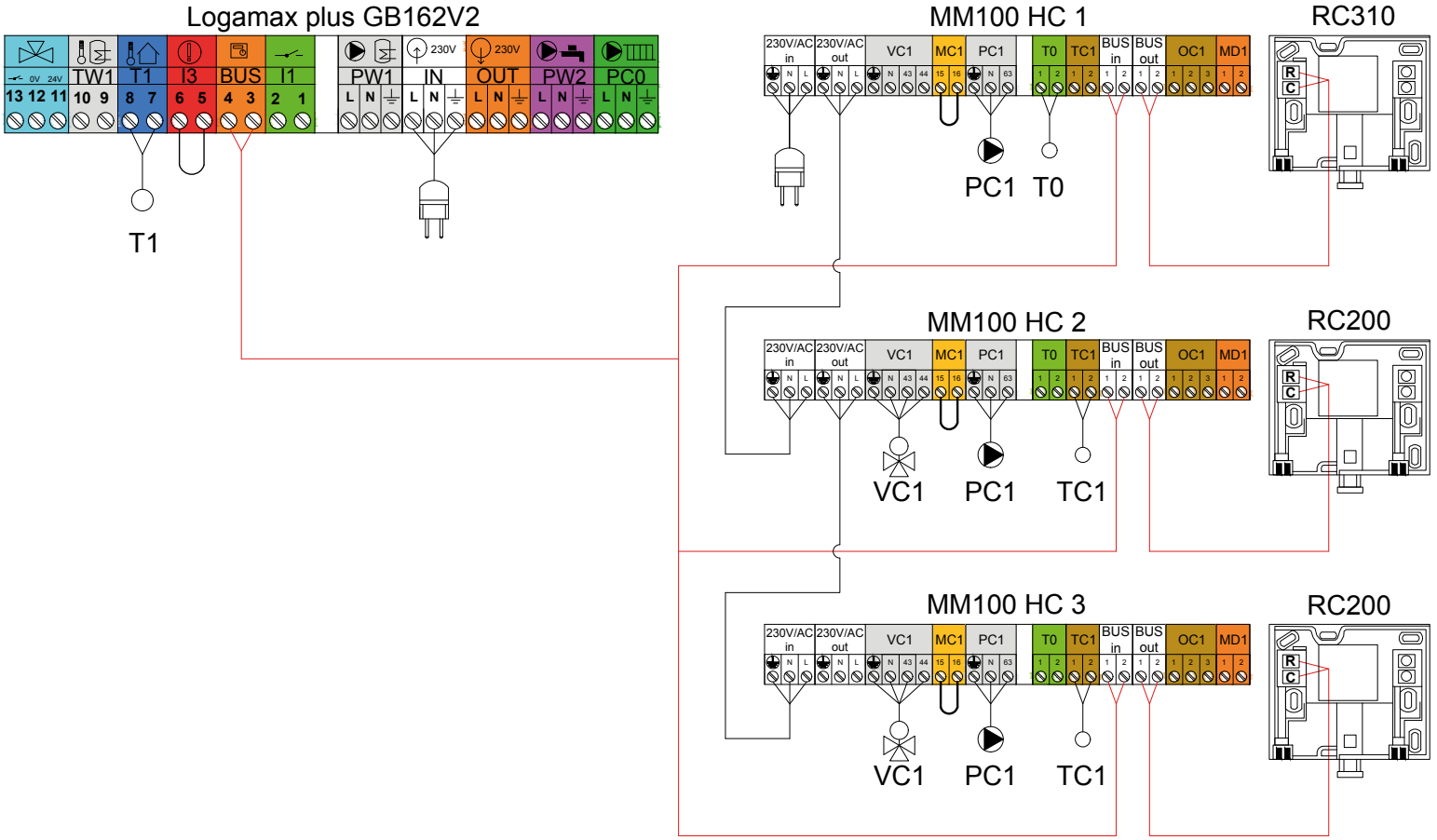


Fig. 27 Electrical diagram

System example

Buderus system gas boiler Logamax plus GB162V2 with one direct heating circuit and three mixed heating circuits.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The Logamatic RC310 and RC200 control units can function as room regulators.

Installation	Product number
Gas boiler	
1× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
1× pump group	7736700103
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
3× Logamatic RC200 (option)	7738110073
4× MM100 module	7738110139
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 17

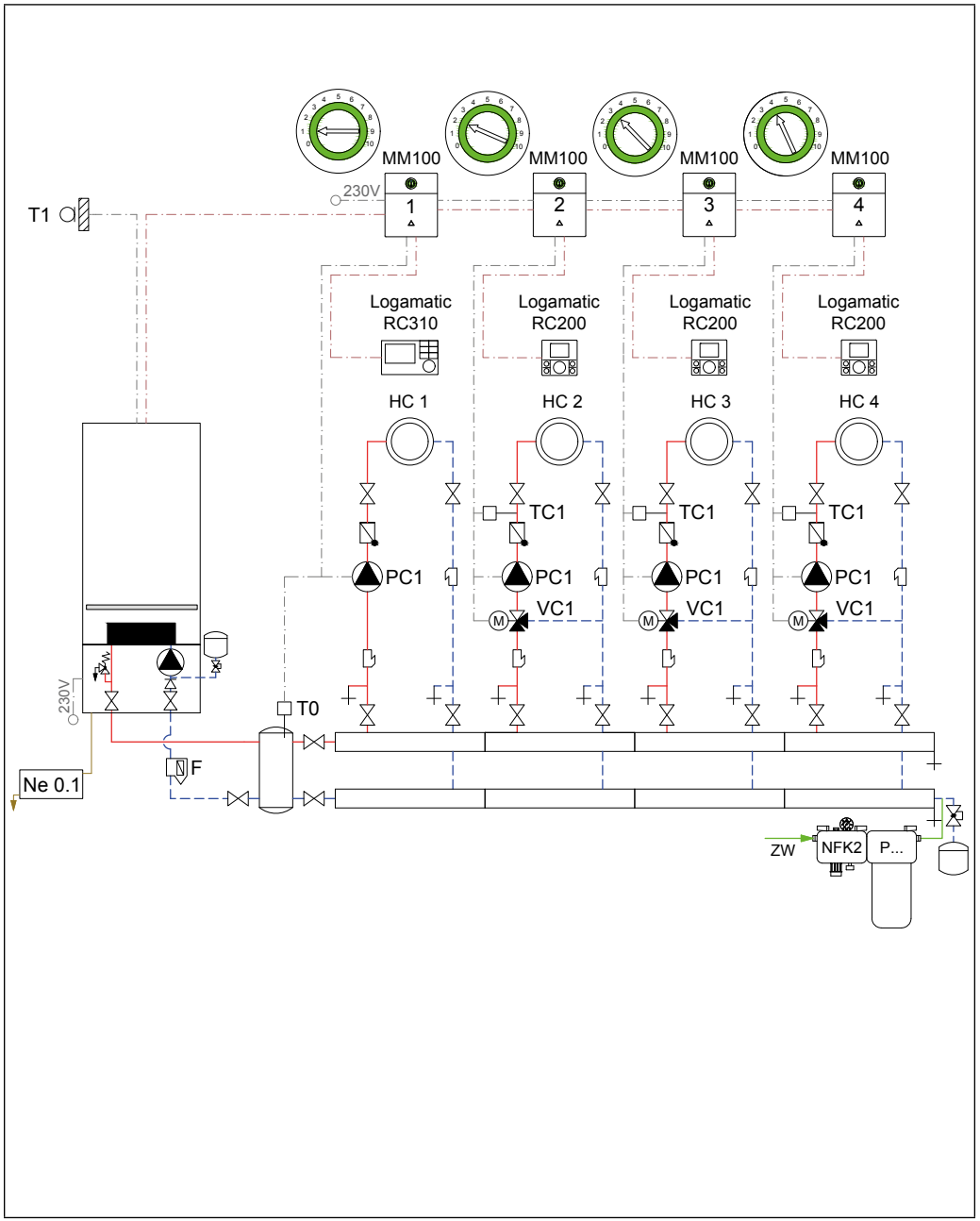


Fig. 28 Hydraulic diagram

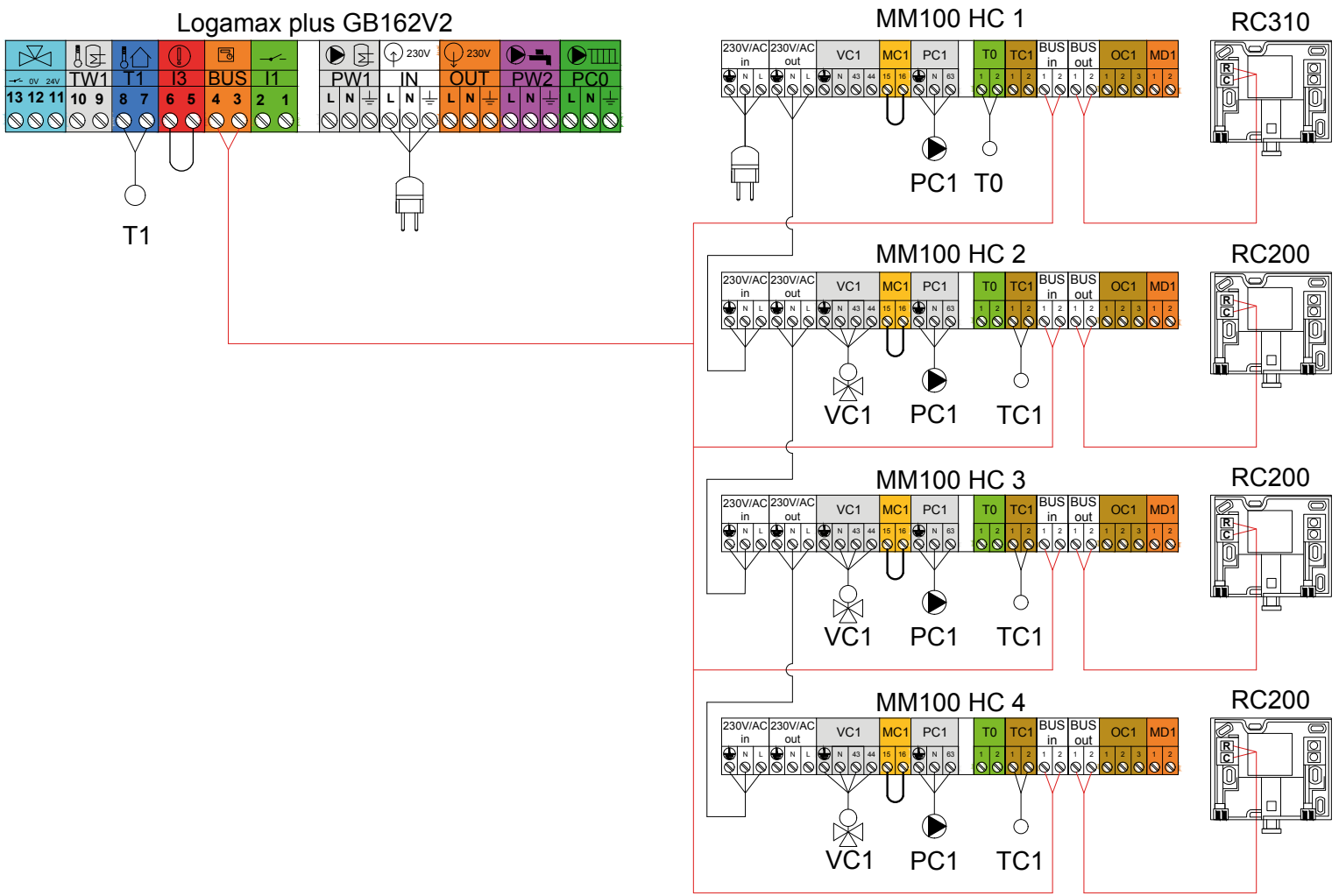


Fig. 29 Electrical diagram

System example

Buderus system gas boiler Logamax plus GB162-70V2 with one direct heating circuit and DHW charging circuit.

Description

The flow in the heating circuit is forced by the pump mounted on the heating installation. It is not possible to control an additional circulation pump.

The system heating flow temperature depends on the outside temperature. The Logamatic RC310 and RC200 control units can function as room regulators. Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a pump group built-in changeover valve. The DHW charging circuit operates in parallel to the heating system.

This solution is applicable only to the GB162-70V2 boiler, while the permanent output of the water heater with a reduced heating water consumption must be at least 35 kW (SU400 and higher).

If the operating conditions of the boiler may be exceeded (flow through the boiler is up to 5 m³/h), use a low loss header and MM100 module to control the circulation pump on the secondary side of the low loss header.

Installation	Product number
Gas boiler	
1× Logamax plus GB162-70V2	7736701001
1× pump group	7736700103
1× three-way valve	7095583
Hot water cylinder	
1× cylinder Logalux SU... (starting SU400)	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
or Logamatic RC200	7738110073
1× sensor T1 (FA) (only for RC200)	5991374
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 18

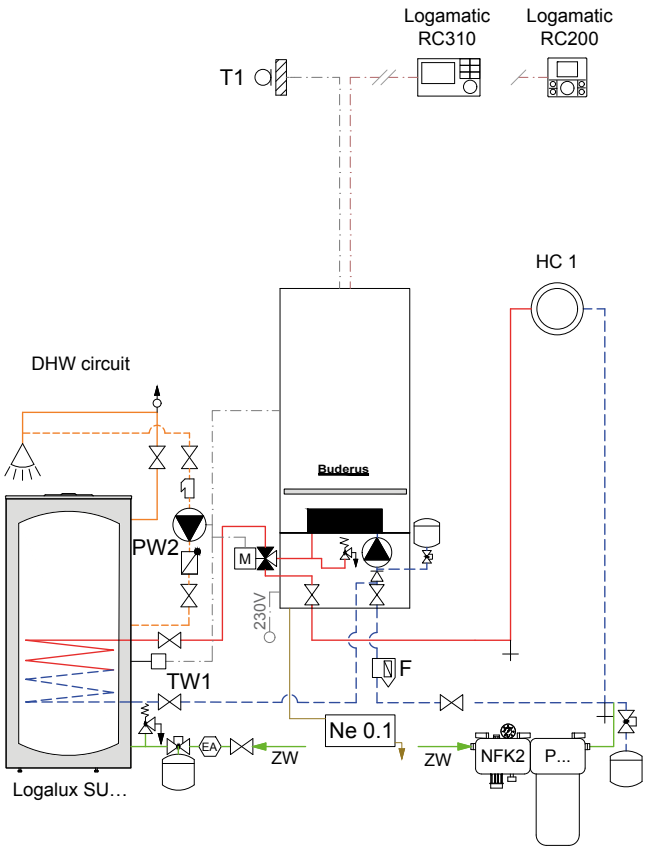
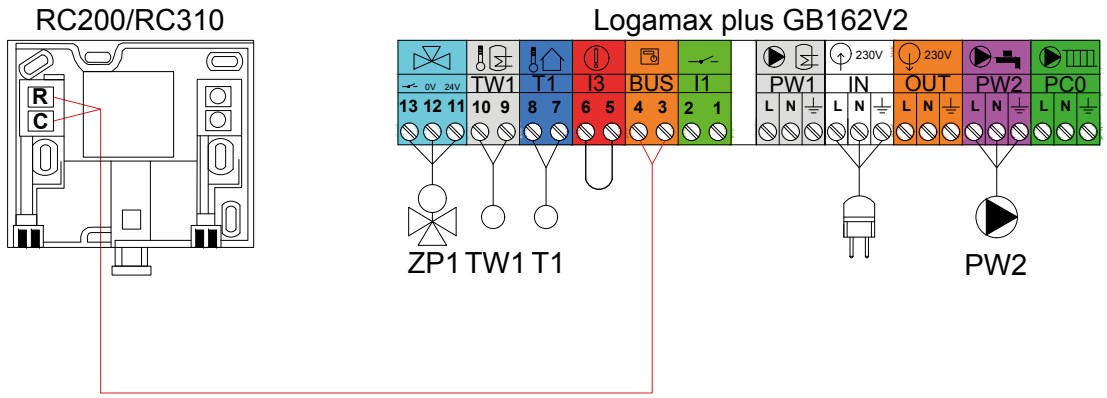


Fig. 30 Hydraulic diagram



EMS 2 / EMS plus bus-line

Fig. 31 Electrical diagram

System example

Buderus system gas boiler Logamax plus GB162V2 with one direct heating circuit and DHW charging circuit.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuit is controlled by the MM100 module. The system heating flow temperature depends on the outside temperature. The Logamatic RC310 control unit can act as a room regulator.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by boiler automatics. The DHW charging circuit has priority over the heating system. Parallel operation with the heating system is possible. An additional MM100 module has to be used and a mixer for the heating circuit (see pages 40-42).

Installation	Product number
Gas boiler	
1× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
1× pump group	7736700103
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MM100 module	7738110139
1× sensor T0	63043337
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 19

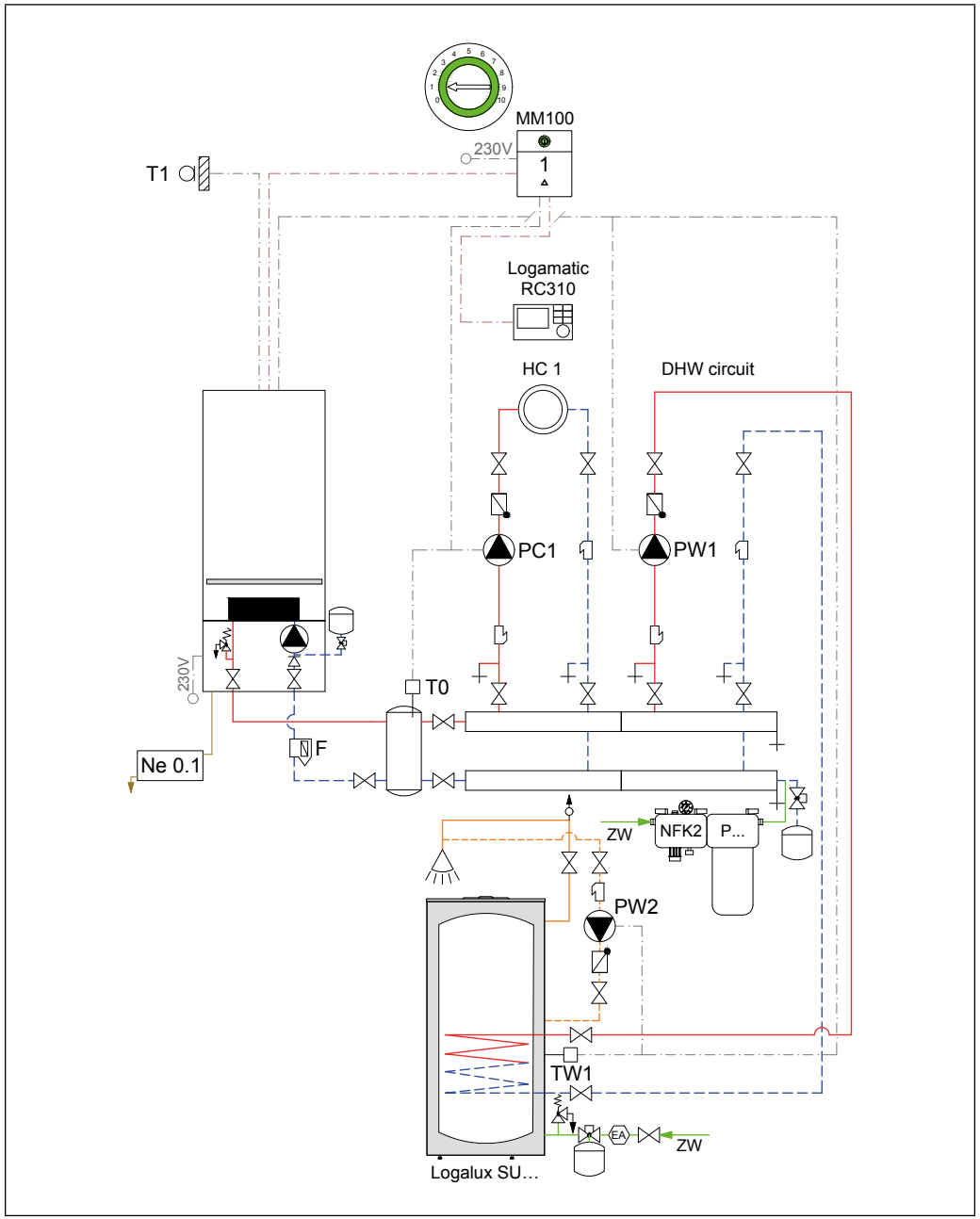


Fig. 32 Hydraulic diagram

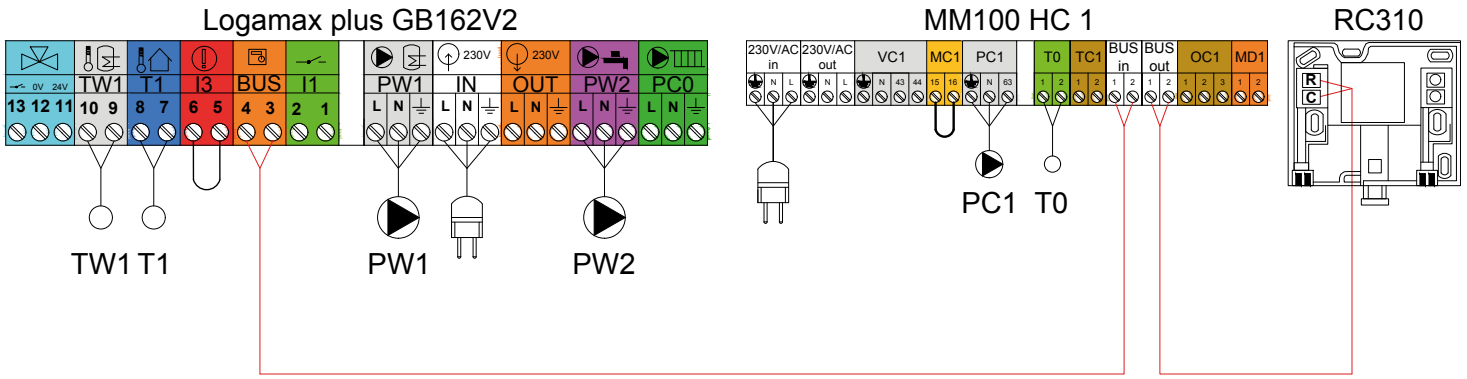


Fig. 33 Electrical diagram

System example

Buderus system gas boiler Logamax plus GB162V2 with two mixed heating circuits and DHW charging circuit.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The Logamatic RC310 and RC200 control units can function as room regulators.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by MM100 module. The DHW charging circuit operates in parallel to the heating system.

Installation	Product number
Gas boiler	
1× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
1× pump group	7736700103
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× Logamatic RC200 (option)	7738110073
3× MM100 module	7738110139
1× sensor T0	63043337
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 20

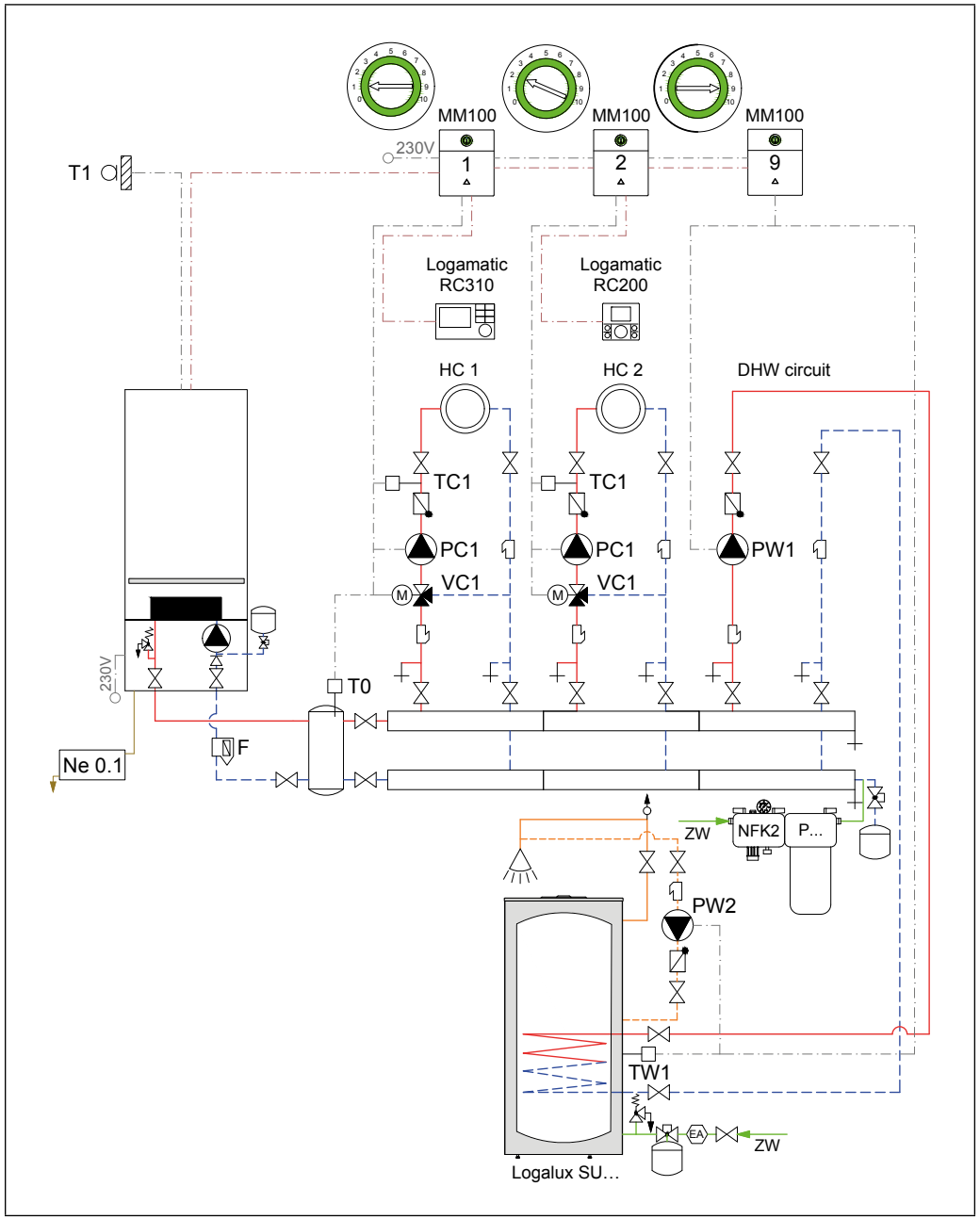


Fig. 34 Hydraulic diagram

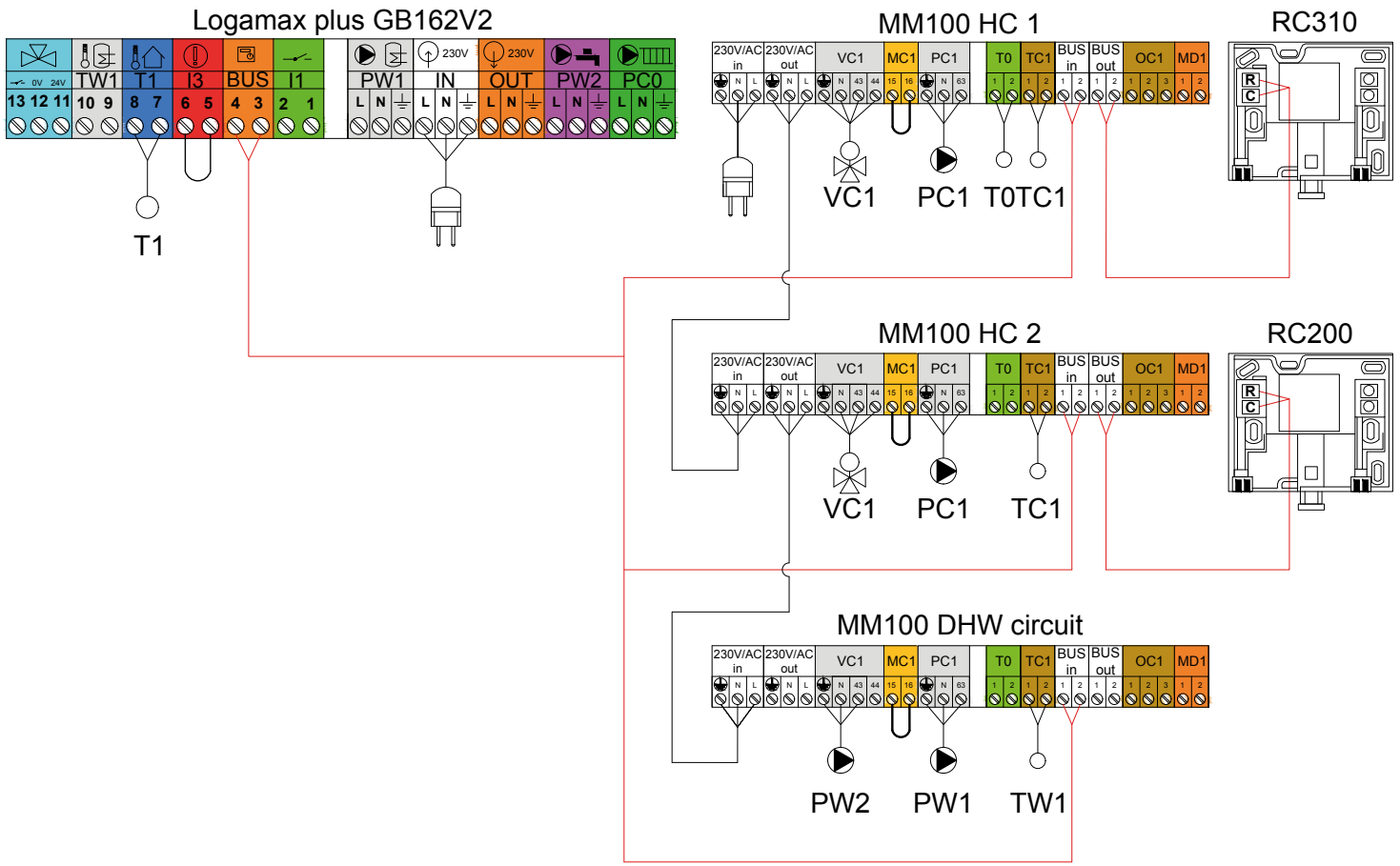


Fig. 35 Electrical diagram

System example

A cascade of two, three or four Buderus system gas boilers Logamax plus GB162V 2 with one direct heating circuit.

Description

The system is equipped with a low loss header. The flow through the heating circuit is forced by a loading pump controlled by MC400 cascade module. A cascade of boilers is controlled by MC400 module. One module can be used to control 4 heat sources. Boilers of various capacity can be connected in a cascade.

The system heating flow temperature depends on the outside temperature.

Installation	Product number
Gas boiler	
2 -4× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
2-4× pump group	7736700103
1× boiler cascade assembly kit	The type depends on the number and arrangement of the boilers.
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MC400 module	7738111003
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 21

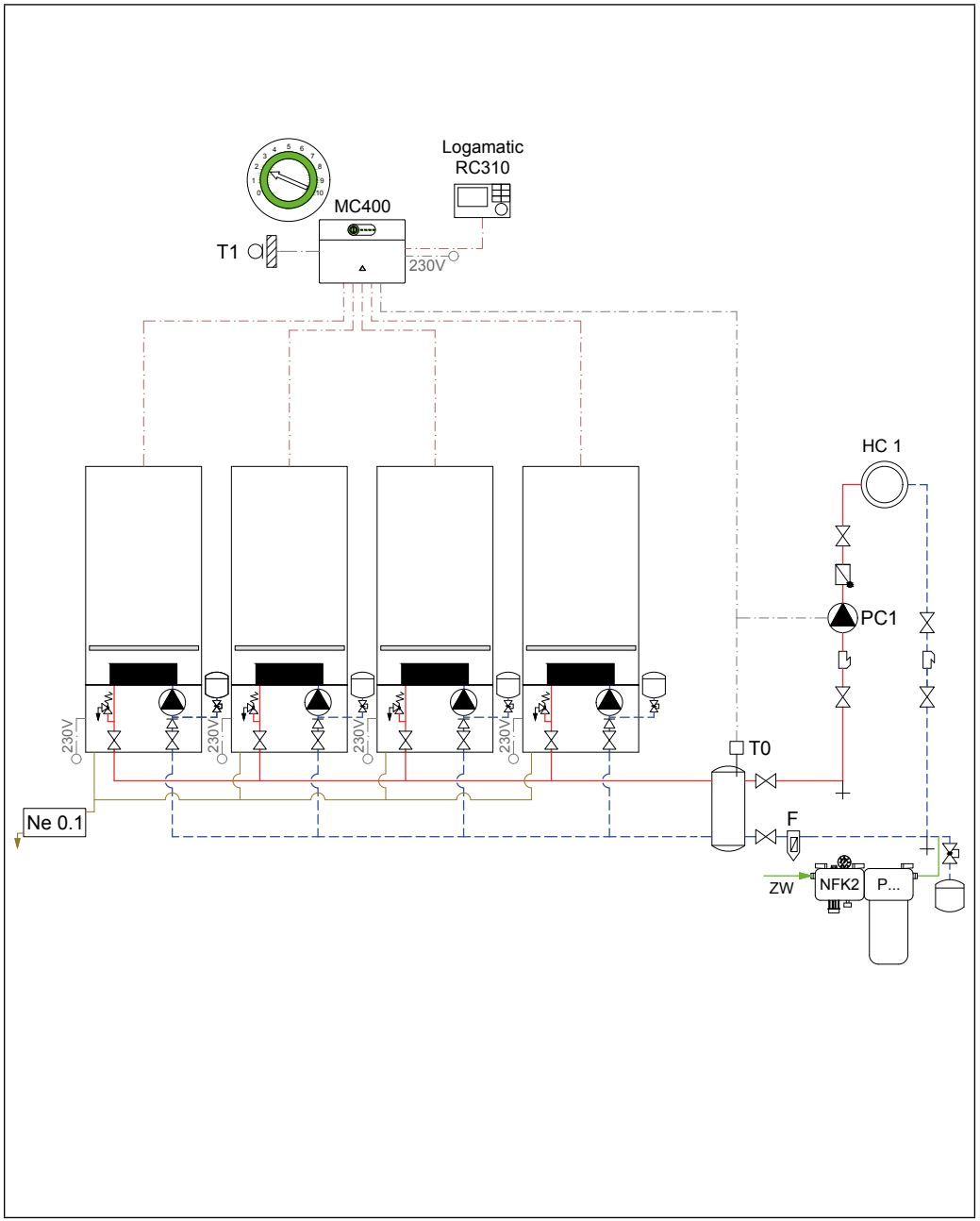


Fig. 36 Hydraulic diagram

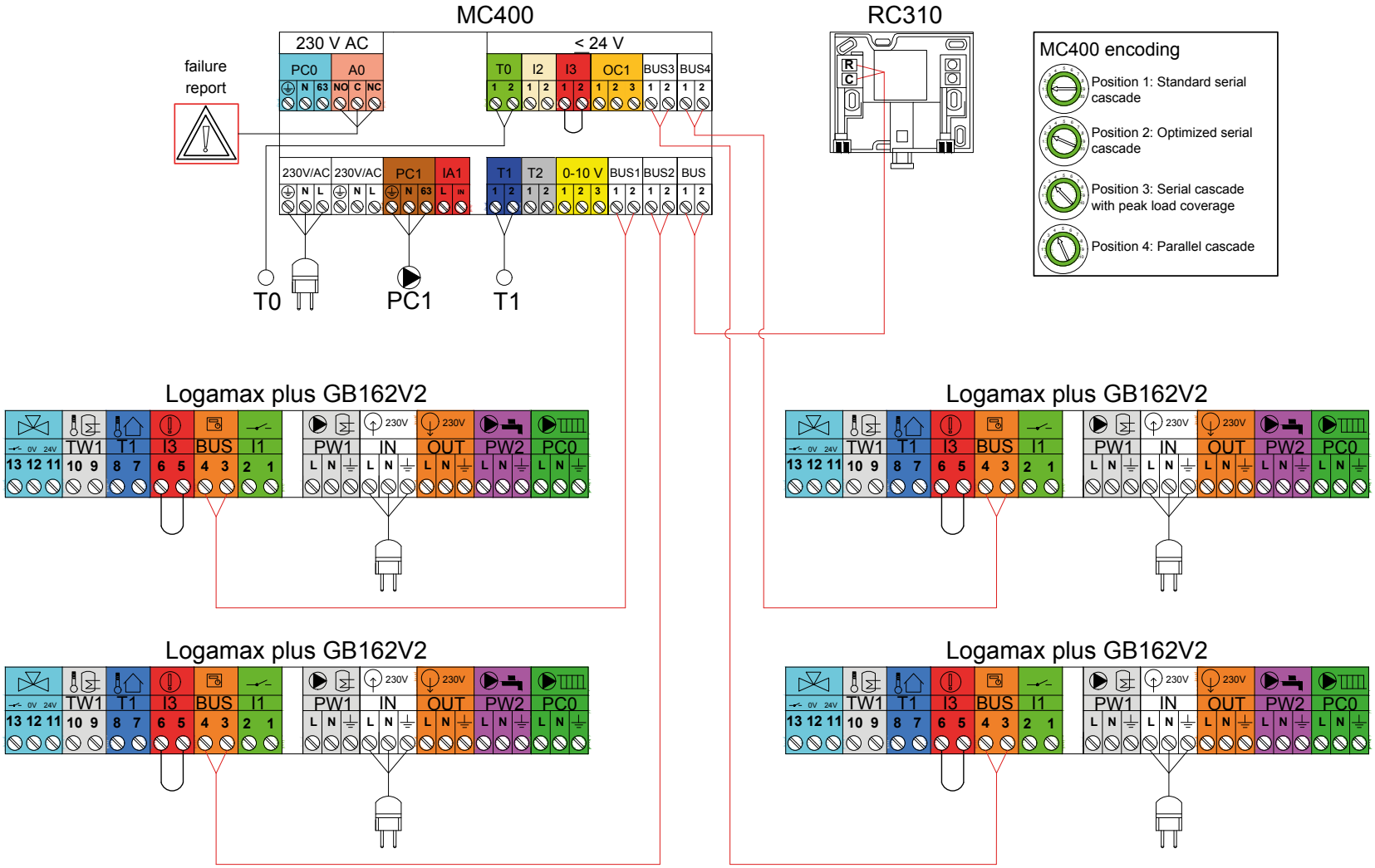


Fig. 37 Electrical diagram

System example

A cascade of five, six or seven Buderus system gas boilers Logamax plus GB162V 2 with one direct heating circuit.

Description

The system is equipped with a low loss header. The flow through the heating circuit is forced by a loading pump controlled by MC400 cascade module. A cascade of boilers is controlled by MC400 module. One module can be used to control 7 heat sources. Boilers of various capacity can be connected in a cascade.

The system heating flow temperature depends on the outside temperature.

Installation	Product number
Gas boiler	
2 -4× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
2-4× pump group	7736700103
1× boiler cascade assembly kit	The type depends on the number and arrangement of the boilers.
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MC400 module	7738111003
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 22

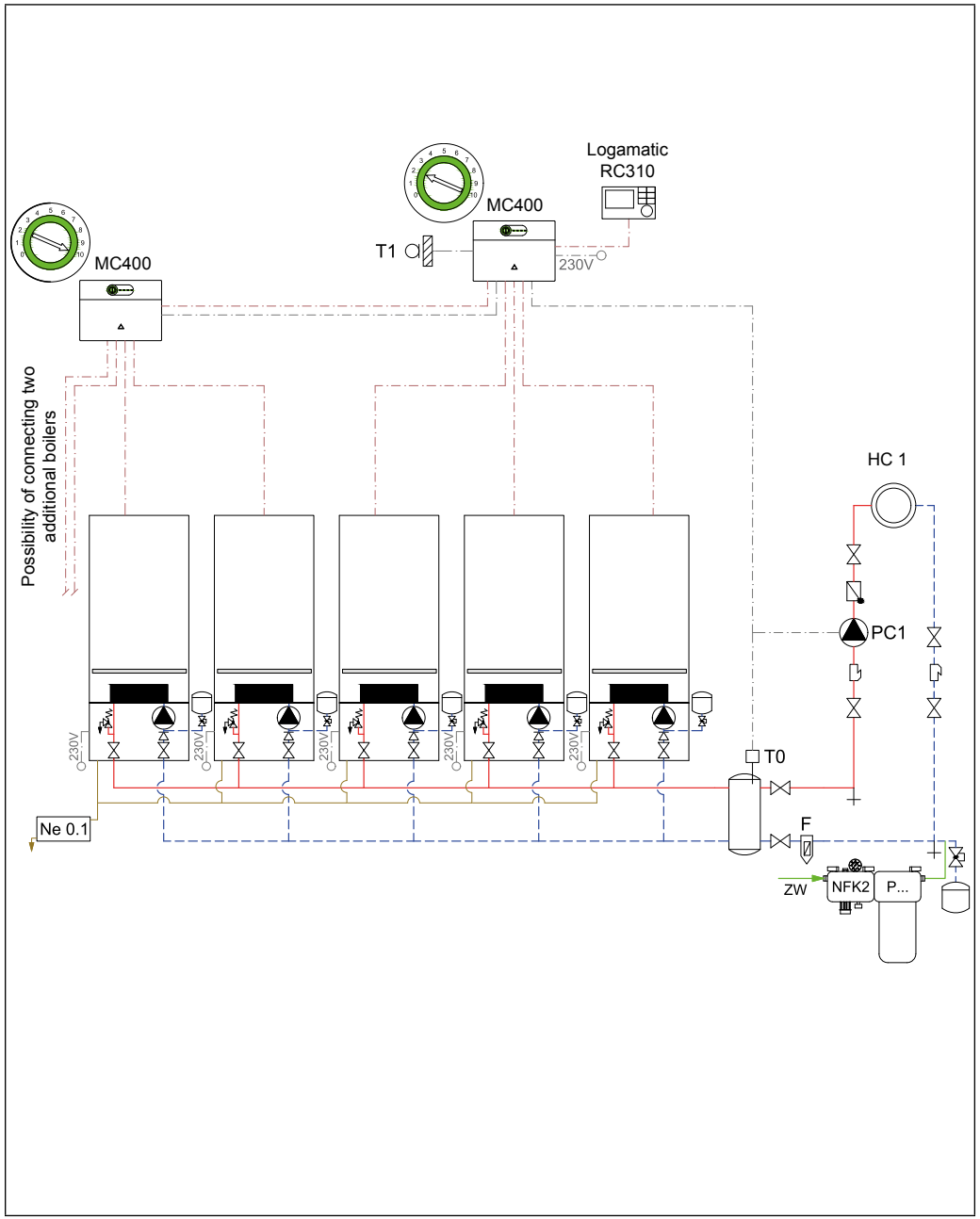


Fig. 38 Hydraulic diagram

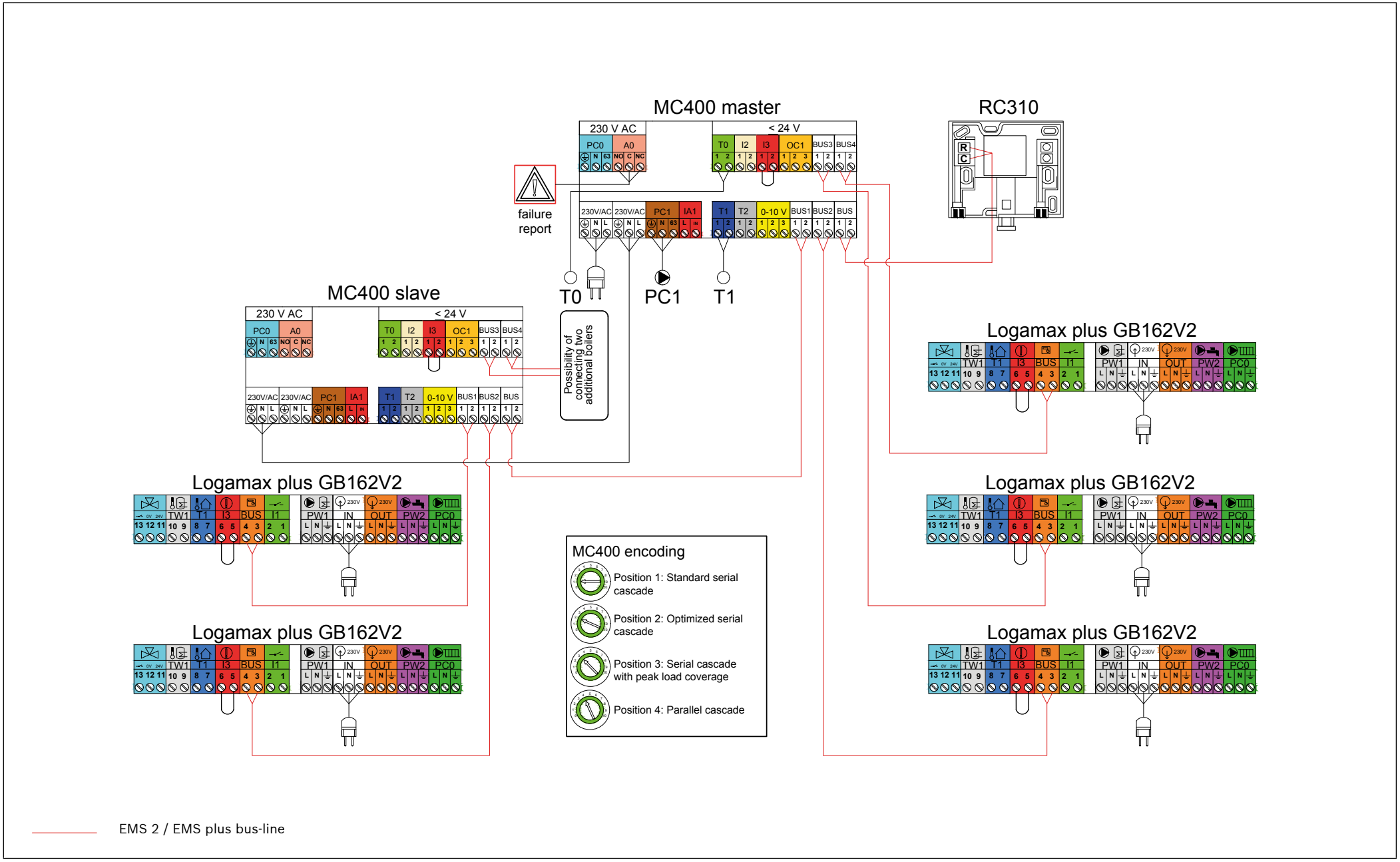


Fig. 39 Electrical diagram

System example

A cascade of eight to sixteen Buderus system gas boilers Logamax plus GB162V 2 with one direct heating circuit.

Description

The system is equipped with a low loss header. The flow through the heating circuit is forced by a loading pump controlled by MC400 cascade module. A cascade of boilers is controlled by MC400 module. No more than 16 heat sources in a cascade, depending on their number, an appropriate number of MC400 modules must be provided. Boilers of various capacity can be connected in a cascade.

The system heating flow temperature depends on the outside temperature.

Installation	Product number
Gas boiler	
8 -16× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
8-16× pumping group	7736700103
1× boiler cascade assembly kit	Up to 8 boilers
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
3× MC400 module – for 8-10 boilers	7738111003
or 4× MC400 module – for 11-13 boilers	7738111003
or 5× MC400 module – for 14-16 boilers	7738111003
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
Neutralizing kit: 1× NE 0.1 for up to 8 boilers or 2× NE 0.1 for 9 to 16 boilers	8718576749

Table 23

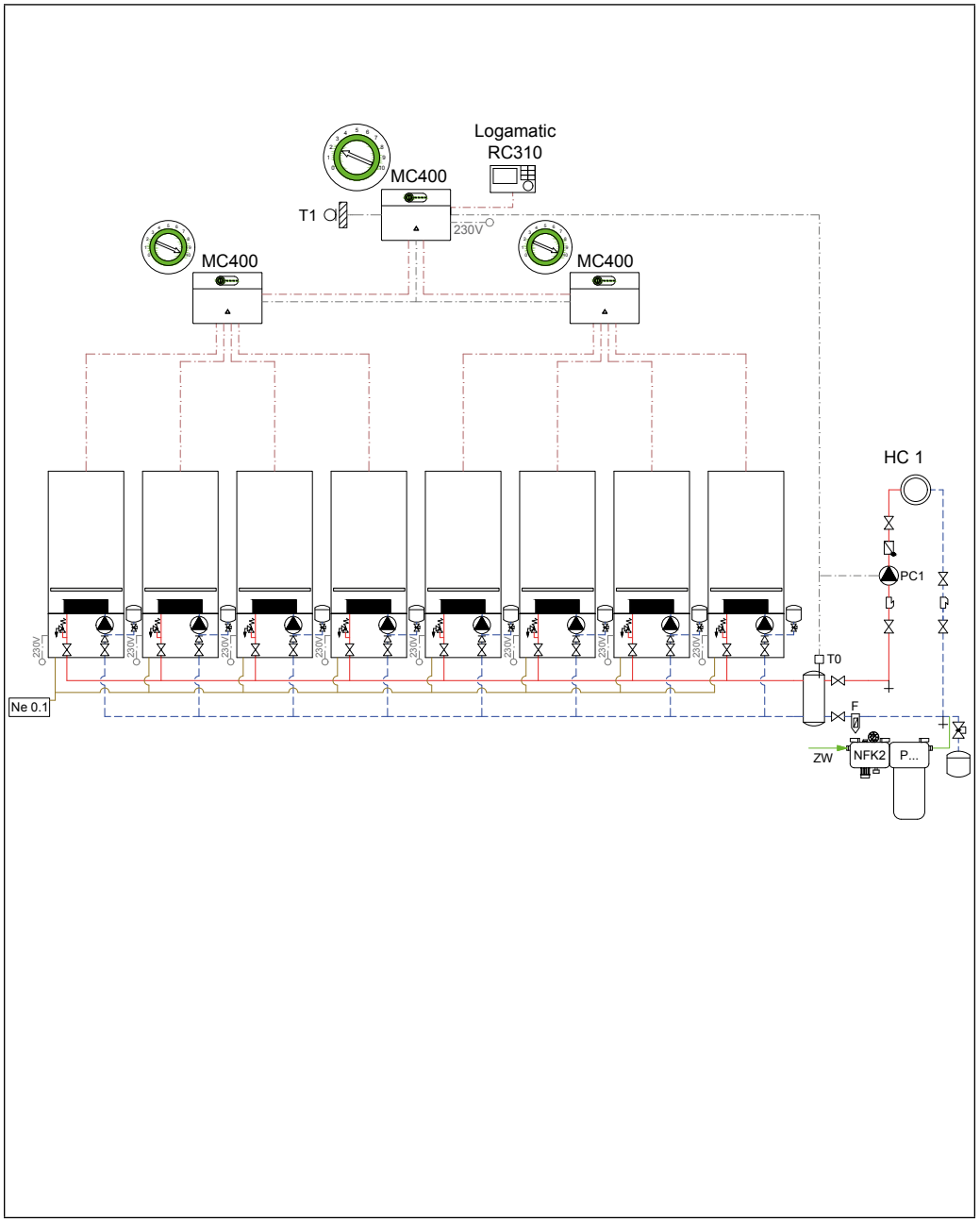


Fig. 40 Hydraulic diagram

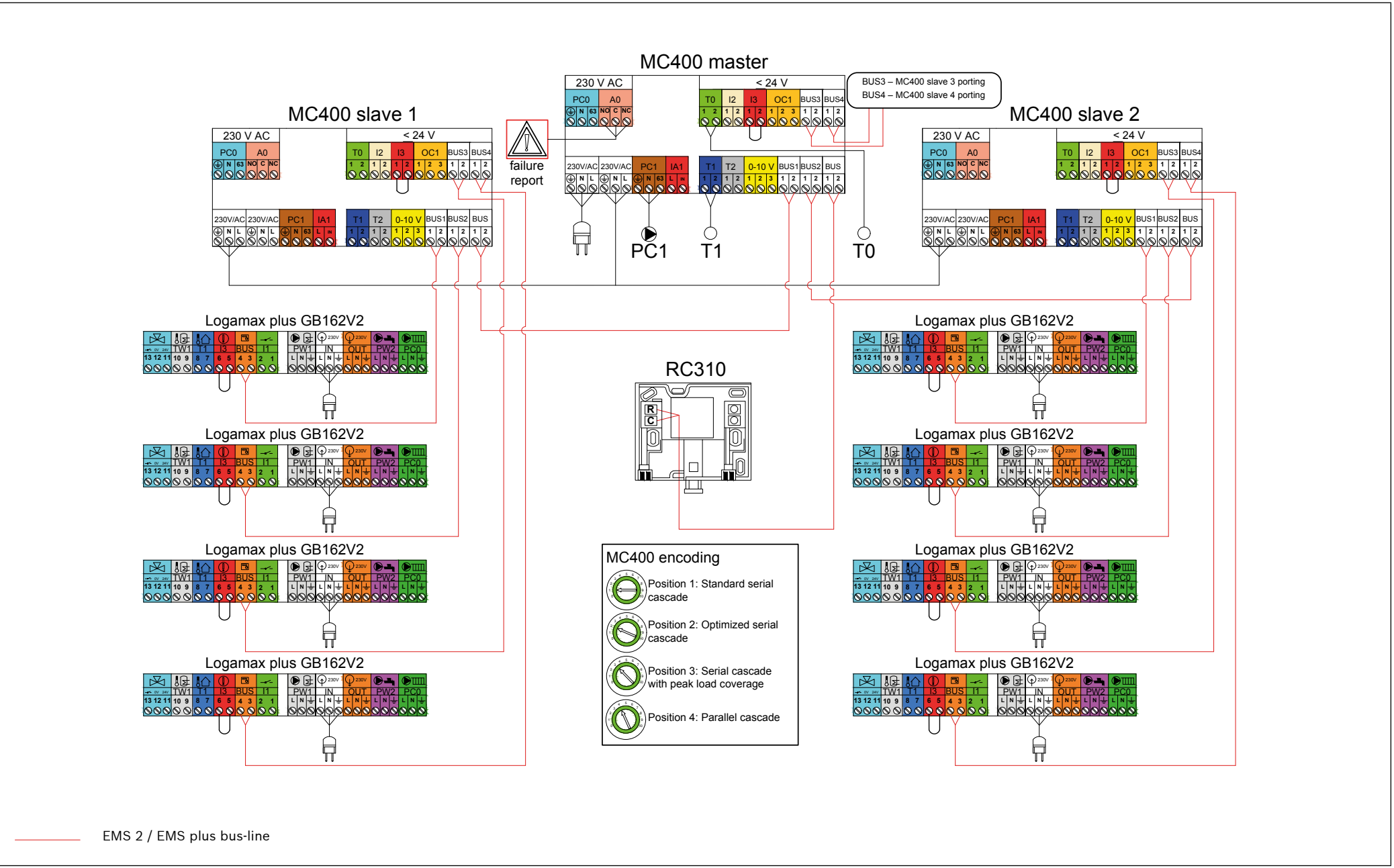


Fig. 41 Electrical diagram

System example

A cascade of two, three or four Buderus system gas boilers Logamax plus GB162V2 with one direct heating circuit and one mixed heating circuit.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. A cascade of boilers is controlled by MC400 module. One module can be used to control 4 heat sources. Up to 16 devices can be arranged in a cascade with 5 MC400 modules (see pages 42-47). The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Installation	Product number
Gas boiler	
2 -4× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
2-4× pump group	7736700103
1× boiler cascade assembly kit	The type depends on the number and arrangement of the boilers.
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
2× MM100 module	7738110139
1× MC400 module	7738111003
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 24

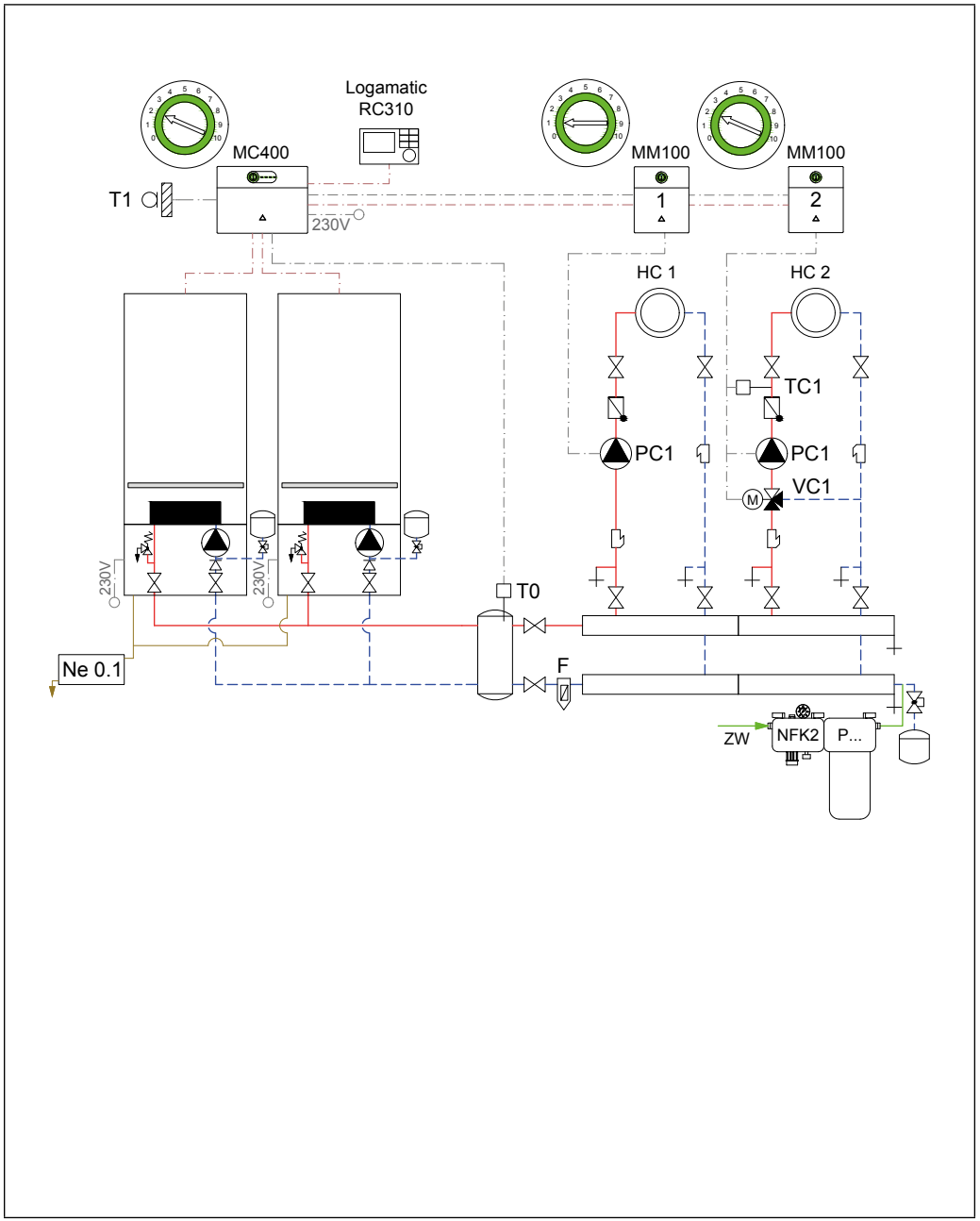


Fig. 42 Hydraulic diagram

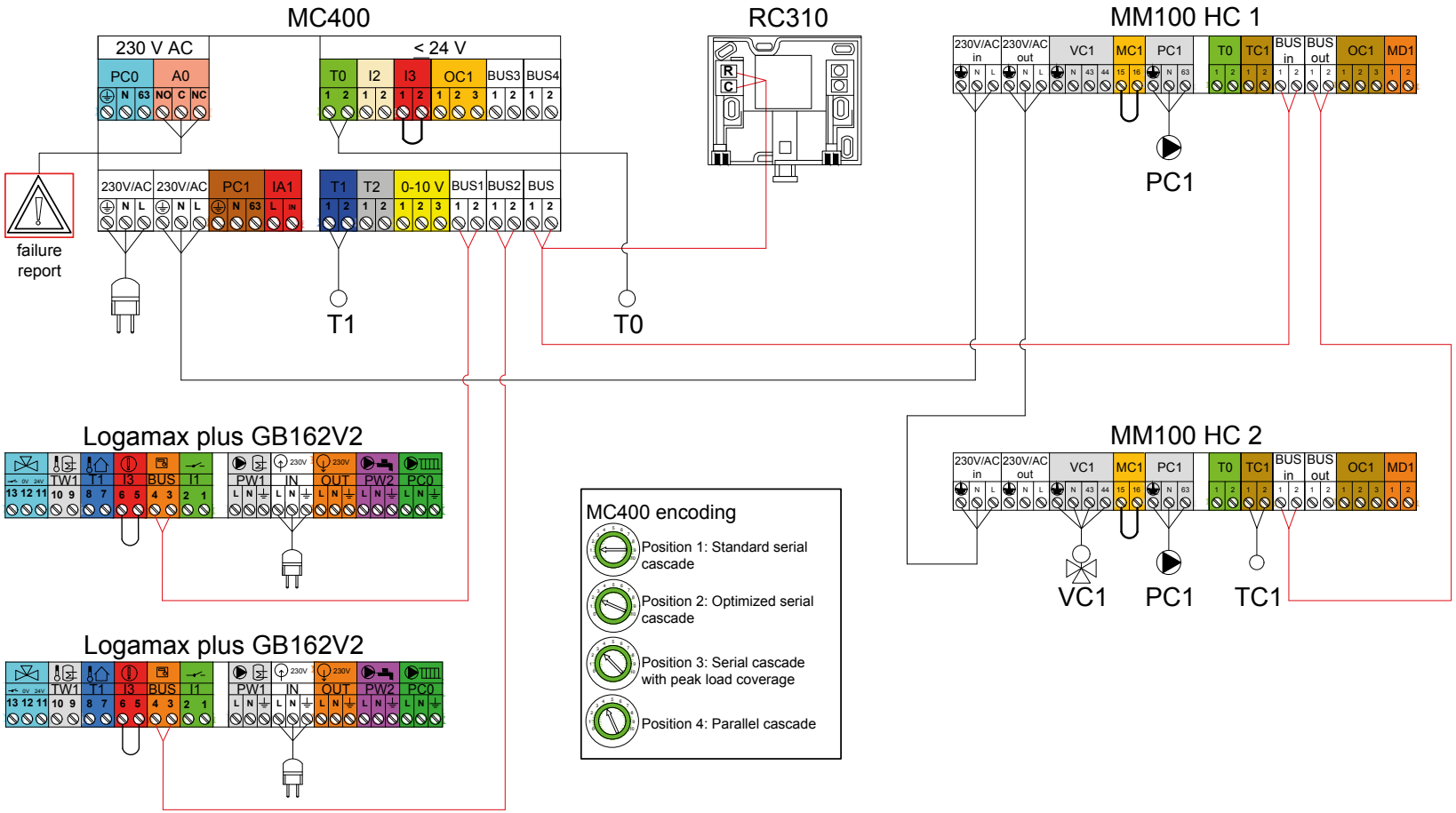


Fig. 43 Electrical diagram

System example

A cascade of two, three or four Buderus system gas boilers Logamax plus GB162V2 with one direct heating circuit and three mixed heating circuits.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. A cascade of boilers is controlled by MC400 module. One module can be used to control 4 heat sources. Up to 16 devices can be arranged in a cascade with 5 MC400 modules (see pages 42-47). The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Installation	Product number
Gas boiler	
2 -4× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
2-4× pump group	7736700103
1× boiler cascade assembly kit	The type depends on the number and arrangement of the boilers.
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
4× MM100 module	7738110139
1× MC400 module	7738111003
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 25

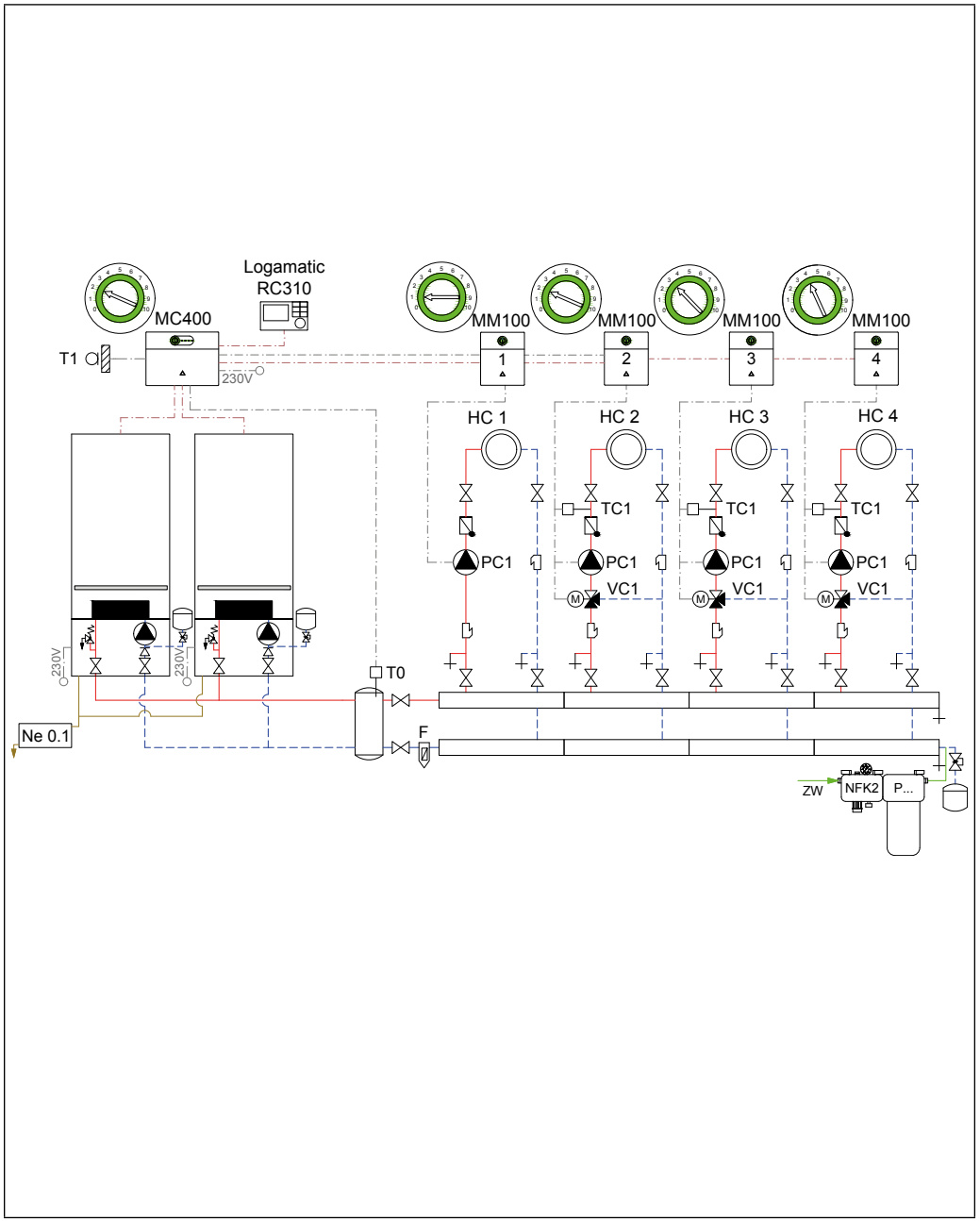


Fig. 44 Hydraulic diagram

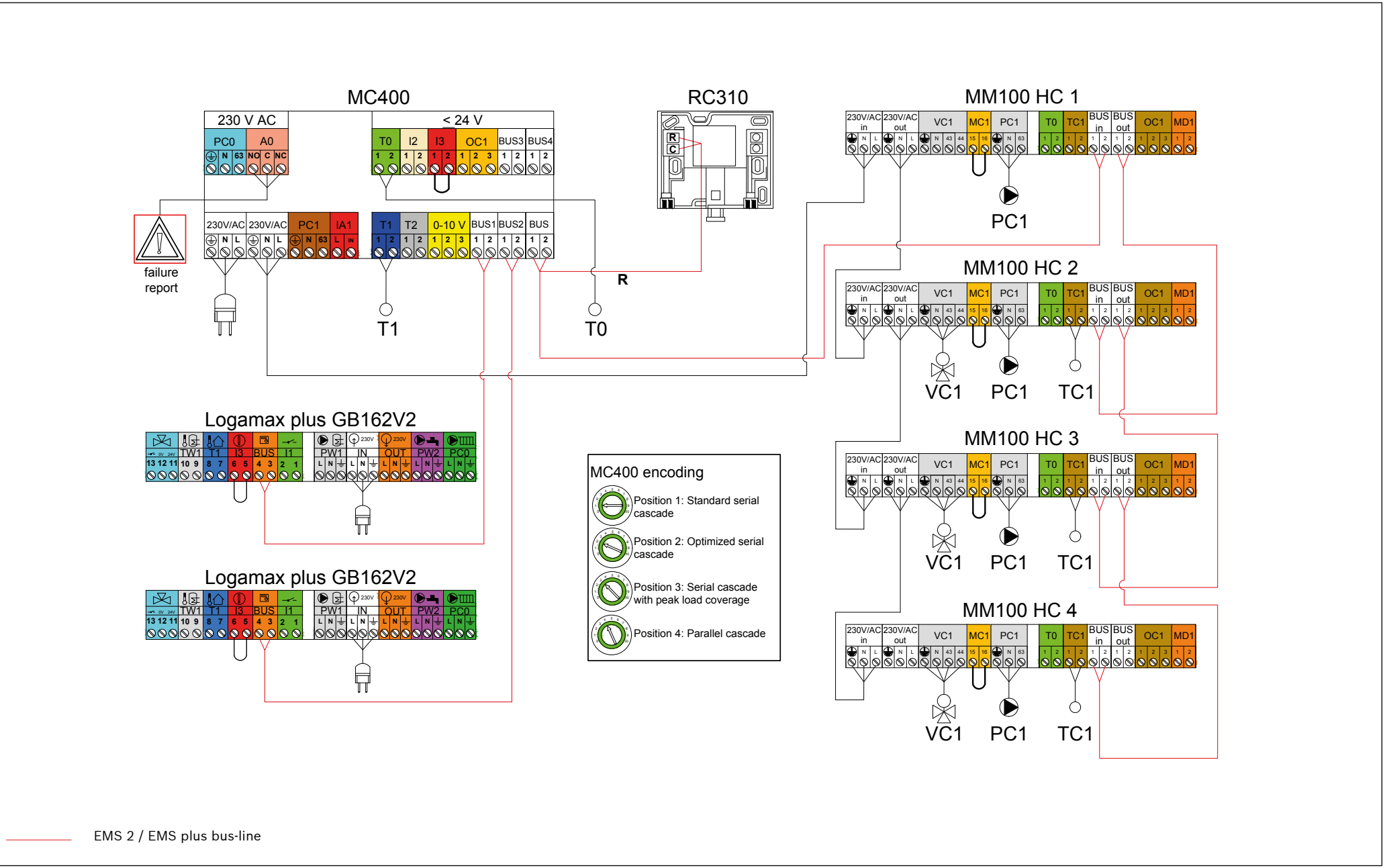


Fig. 45 Electrical diagram

System example

A cascade of two, three or four Buderus system gas boilers Logamax plus GB162V2 with two mixed heating circuits and DHW charging circuit.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. A cascade of boilers is controlled by MC400 module. One module can be used to control 4 heat sources. Up to 16 devices can be arranged in a cascade with 5 MC400 modules (see pages 42-47). The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by MM100 module. The DHW charging circuit can operate in parallel or priority over the selected heating circuits, while parallel operation requires mixing valves in these circuits.

Installation	Product number
Gas boiler	
2 -4× Logamax plus GB162-70V2	7736701001
or Logamax plus GB162-85V2	7736701002
or Logamax plus GB162-100V2	7736700894
2-4× pump group	7736700103
1× boiler cascade assembly kit	The type depends on the number and arrangement of the boilers.
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
3× MM100 module	7738110139
1× MC400 module	7738111003
1× sensor T0	63043337
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 26

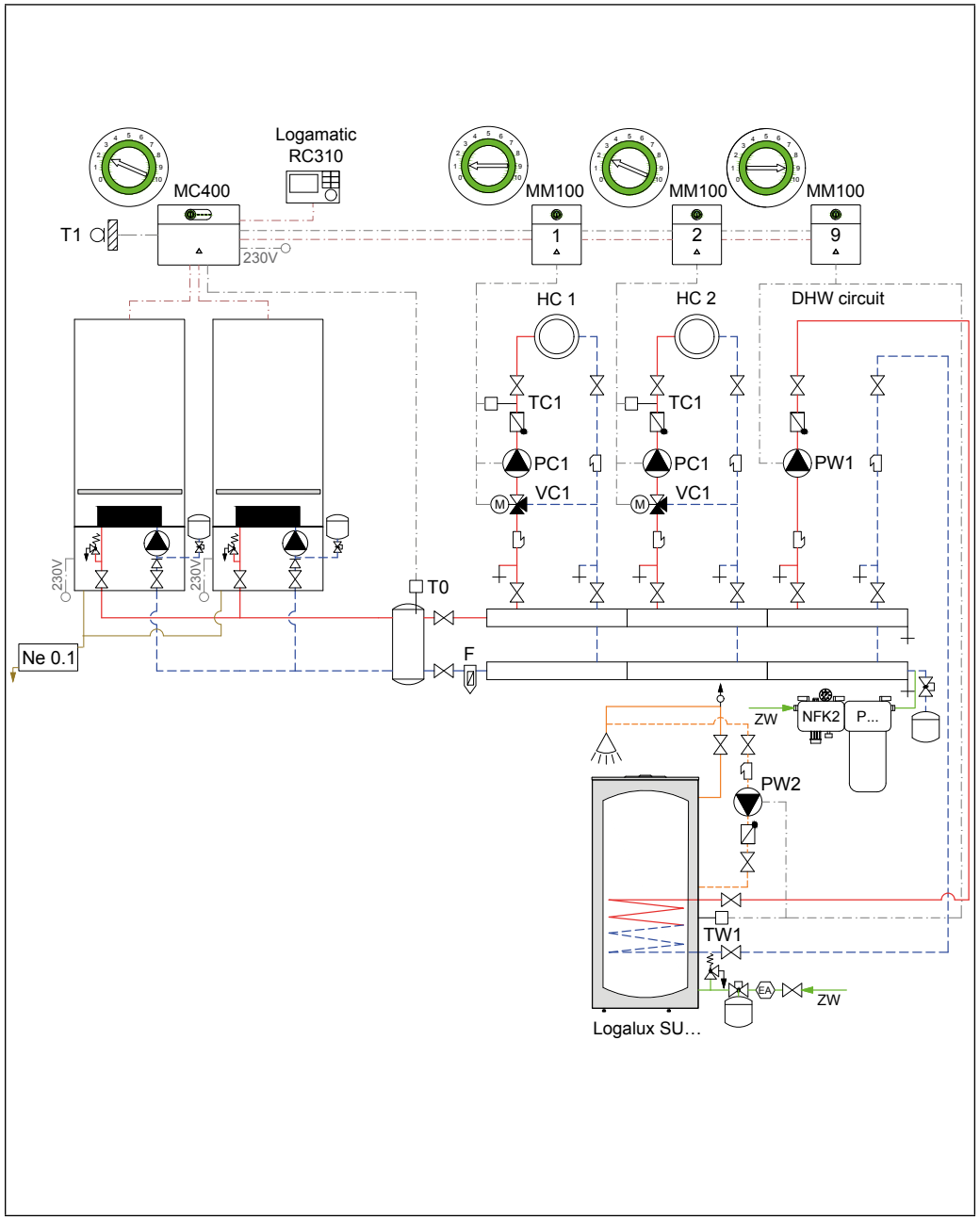


Fig. 46 Hydraulic diagram

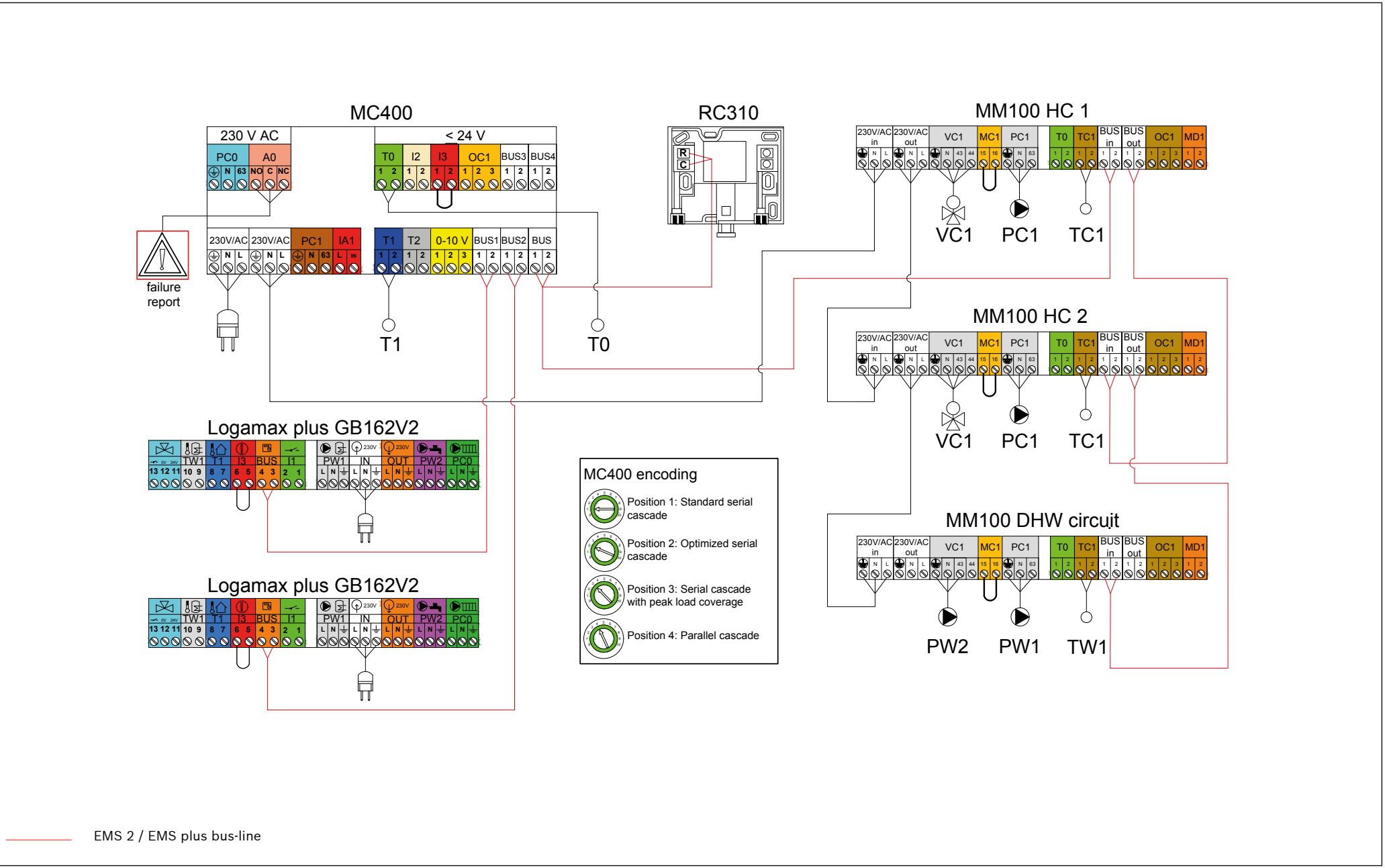


Fig. 47 Electrical diagram

System example

Solar collector system in conjunction with wall-mounted system gas boiler Logamax plus. Bivalent cylinder.

Description

Solar collectors are used to support hot water preparation. The system is equipped with a cylinder with two coils. The solar installation is connected to the bottom coil of the cylinder, which allows the entire cylinder to be heated. The solar collectors are controlled by the MS100 module. The PS1 pump starts depending on the temperature difference between the collector and the cylinder (TS1> TS2). The pump is controlled by a PWM signal.

If the solar installation cannot provide the required amount of energy, hot water is heated by a gas boiler connected to the upper coil of the cylinder.

The boiler operates in heating mode as well. The presented solar installation is universal for the solutions presented on pages 16-23, 30-31, 40-45, 54-55 for all gas boilers shown.

Installation	Product number
Boiler	
1× Logamax plus	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MS100 module	7738110123
1× sensor TW1	7735502288
Solar installation	
1× field solar collector	Different types
1× cylinder Logalux SM...	Different types
1× solar station KS01.../2	Different types
1× set of hydraulic connections	Depending on the configuration
1× roof mount kit	Depending on the configuration
1× heating transfer medium for solar installations	Depending on the configuration
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types

Table 28

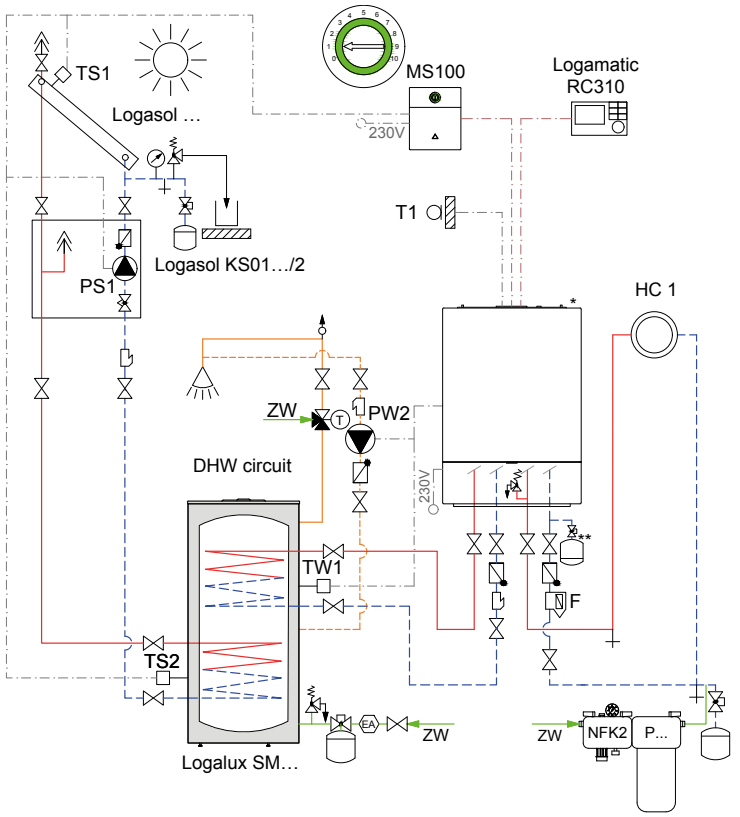
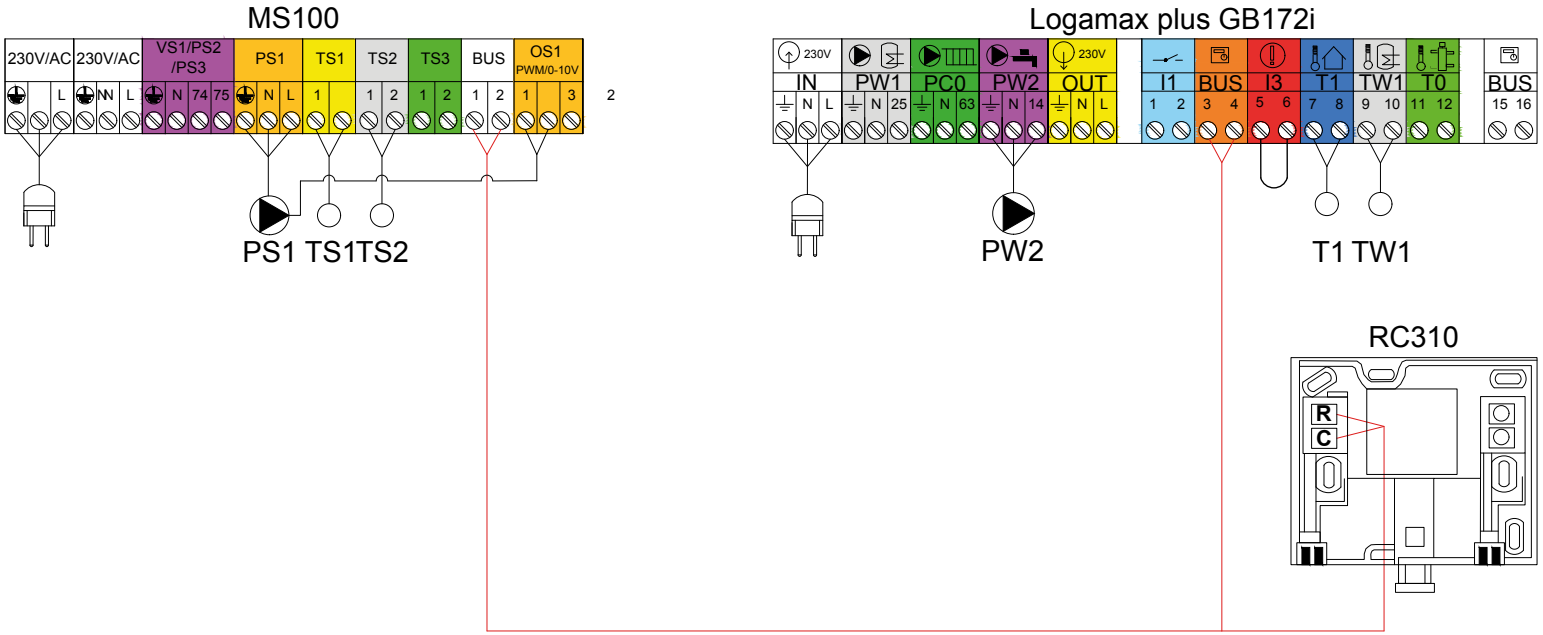


Fig. 50 Hydraulic diagram



* the method of connecting the boiler automatics is similarly applicable to other gas boilers

EMS 2 / EMS plus bus-line

Fig. 51 Electrical diagram

System example

Solar collector system in conjunction with wall-mounted system gas boiler Logamax plus. Two monovalent cylinders.

Description

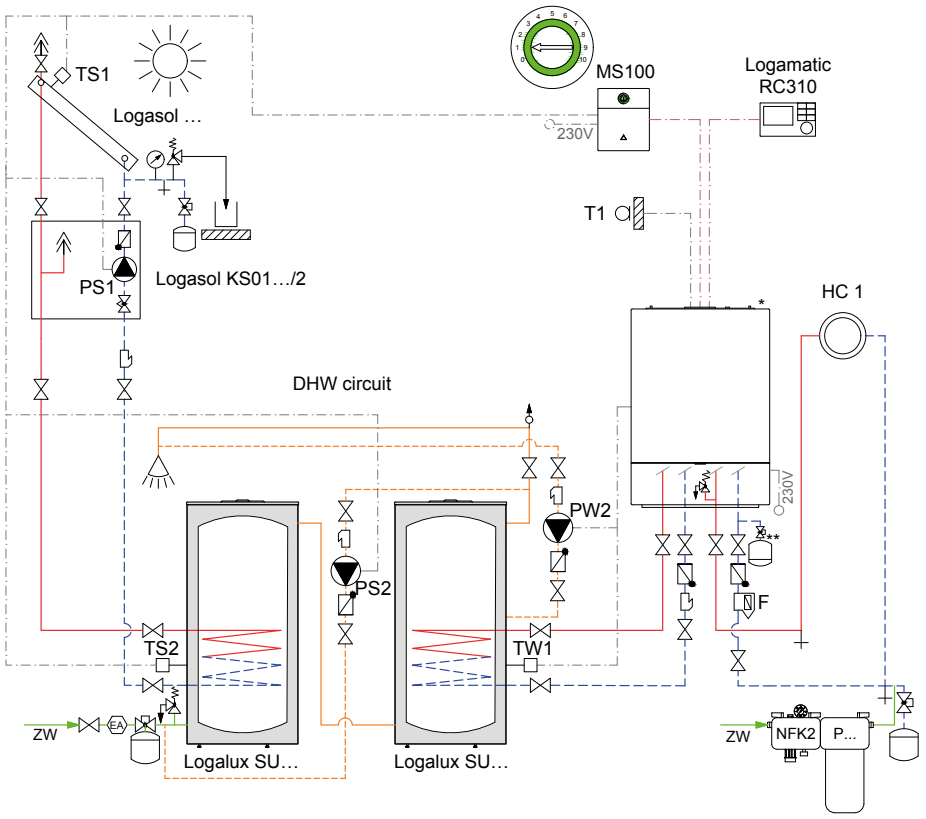
Solar collectors are used to support hot water preparation. The system is equipped with two hot water cylinders. The solar installation heats the inlet cylinder. The heated water enters the boiler cylinder, so the solar system can heat both cylinders. The cylinders should be of different capacities. The solar collectors are controlled by the MS100 module. The PS1 pump starts depending on the temperature difference between the collector and the cylinder (TS1> TS2). The pump is controlled by a PWM signal.

If the solar installation cannot provide the required amount of energy, the boiler cylinder is heated by the boiler.

The boiler operates in heating mode as well. The presented solar installation is universal for the solutions presented on pages 16-23, 30-31, 40-45, 54-55 for all gas boilers shown.

Installation	Product number
Boiler	
1× Logamax plus	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MS100 module	7738110123
1× sensor TW1	7735502288
Solar installation	
1× field solar collector	Different types
2× cylinder Logalux SU...	Different types
1× solar station KS01.../2	Different types
1× set of hydraulic connections	Depending on the configuration
1× roof mount kit	Depending on the configuration
1× heating transfer medium for solar installations	Depending on the configuration
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types

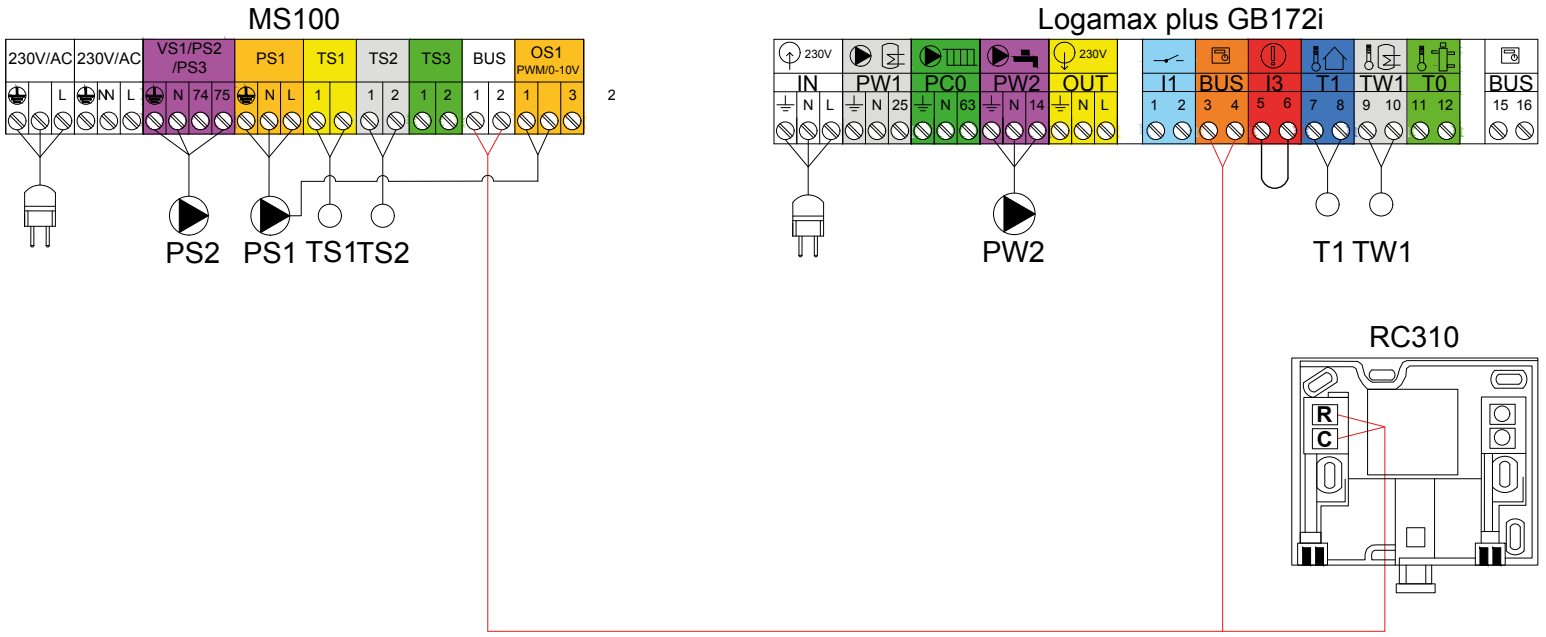
Table 29



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 52 Hydraulic diagram



* the method of connecting the boiler automatics is similarly applicable to other gas boilers

EMS 2 / EMS plus bus-line

Fig. 53 Electrical diagram

System example

Solar collector system in conjunction with wall-mounted system gas boiler Logamax plus. Bivalent cylinder and buffer tank.

Description

Solar collectors are used to support hot water preparation and heating. The installation has two storage receivers – a hot water cylinder and a buffer tank. The solar collectors are controlled by the MS200 module. The PS1 pump starts depending on the temperature difference between the collector and cylinders (TS1> TS2 or TS2). The pump is controlled by a PWM signal. When the temperature in the DHW cylinder (TS2) is reached, the changeover valve VS2 will switch towards the buffer tank.

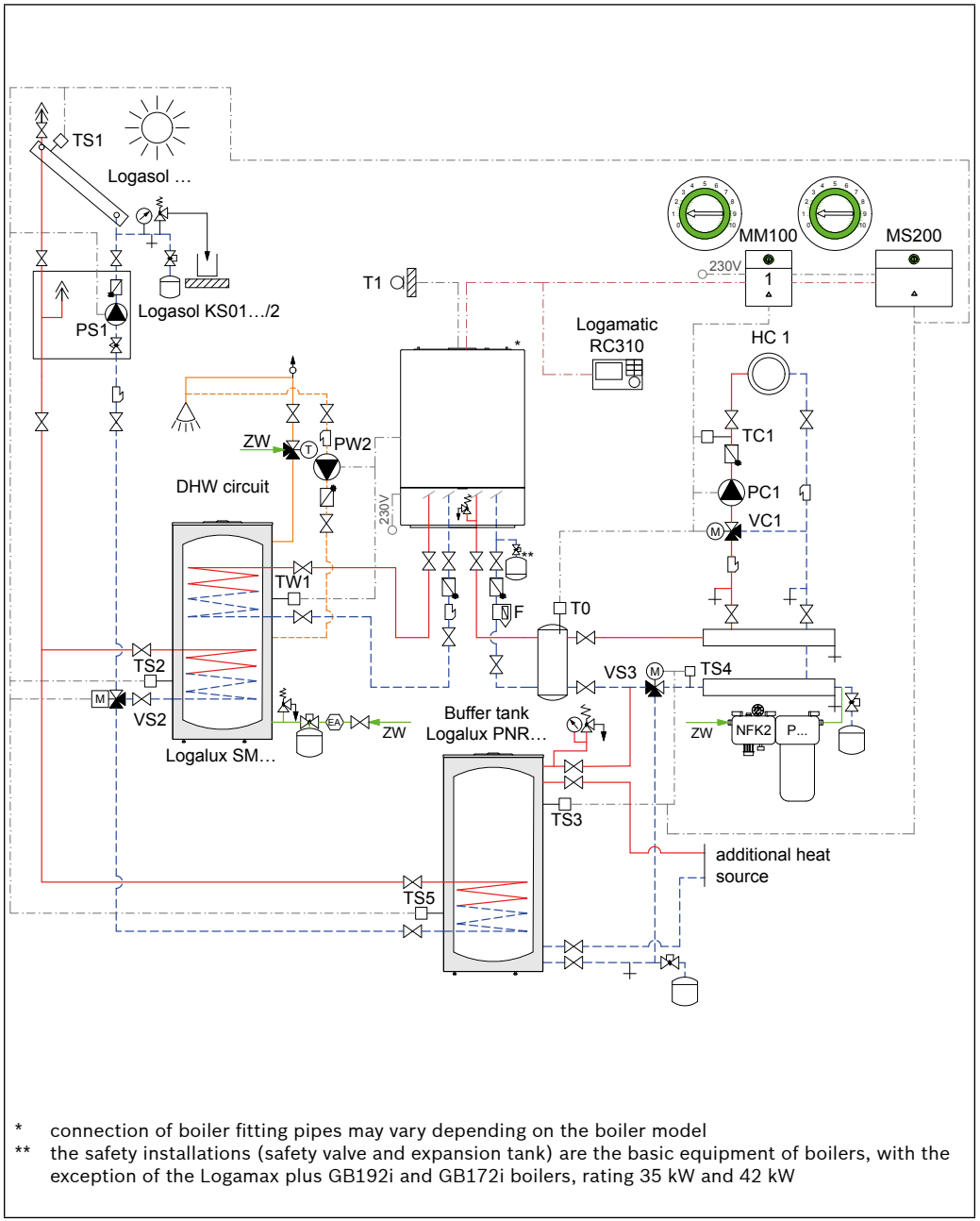
If the solar installation cannot provide the required amount of energy, the hot water is heated by the gas boiler.

The buffer tank is connected to the heating system based on the temperature difference. When the water temperature in the buffer tank (TS5) is higher than the return temperature of the system (TS4), the three-way valve (PS3) switches towards the buffer tank. This heats the water returning to the boiler (low loss header). An additional heat source can be connected to the buffer tank.

The boiler operates in heating mode as well. The presented solar installation is universal for the solutions presented on pages 16-23, 30-31, 40-45, 54-55 for all gas boilers shown.

Installation	Product number
Boiler	
1× Logamax plus	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× MM100 module	7738110139
1× MS200 module	7738110124
2× sensor TW1	7735502288
2× sensor TS3/TS4 (FV/FZ)	5991376
1× sensor T0	63043337
Solar installation	
1× field solar collector	Different types
1× cylinder Logalux SM...	Different types
1× cylinder Logalux PNR...	Different types
1× solar station KS01.../2	Different types
1× set of hydraulic connections	Depending on the configuration
1× roof mount kit	Depending on the configuration
1× heating transfer medium for solar installations	Depending on the configuration
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types
1× demineralization kit (P)	Different types

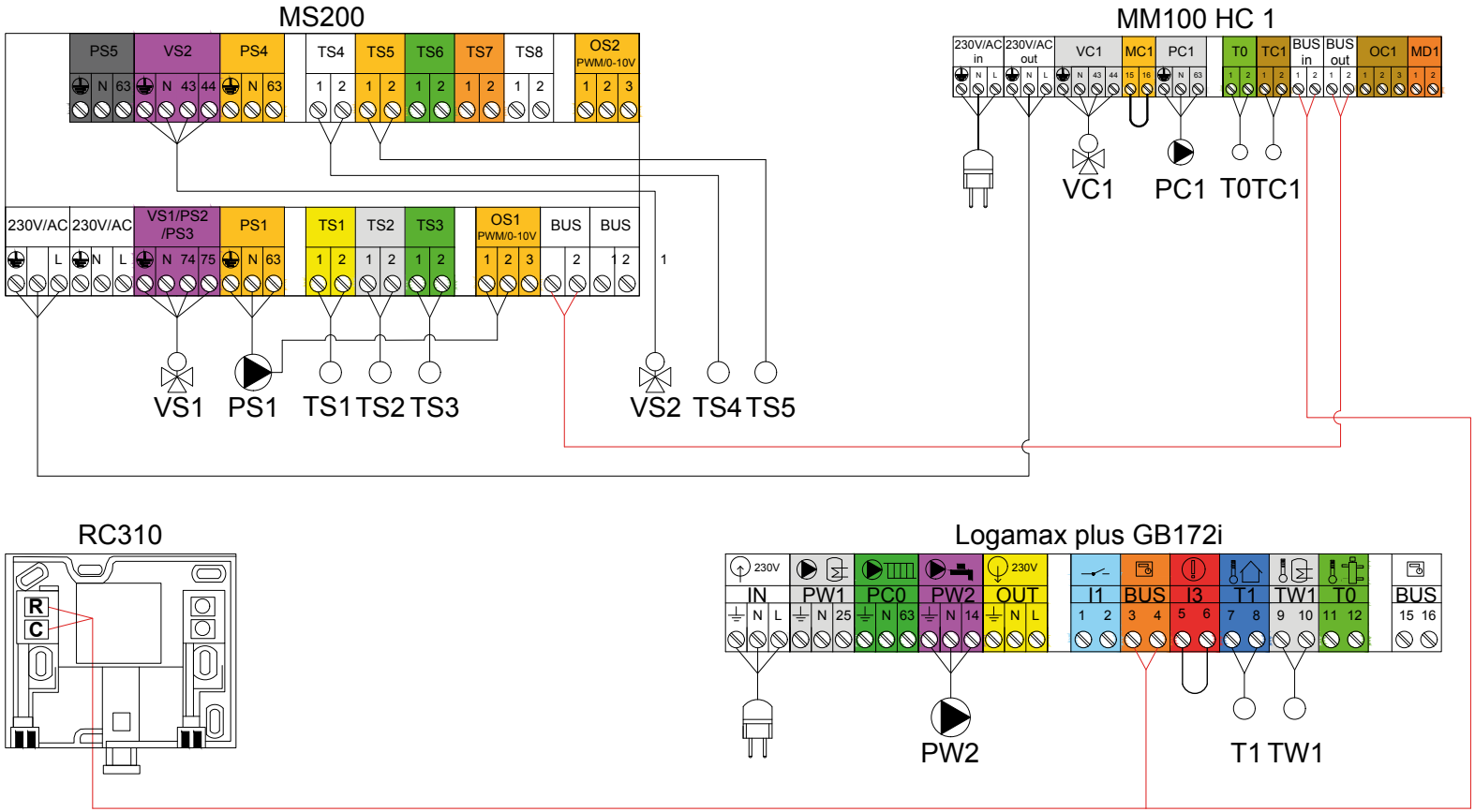
Table 30



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 54 Hydraulic diagram



* the method of connecting the boiler automatics is similarly applicable to other gas boilers

EMS 2 / EMS plus bus-line

Fig. 55 Electrical diagram

System example

Buderus system gas boiler Logamax plus works only for DHW preparation.

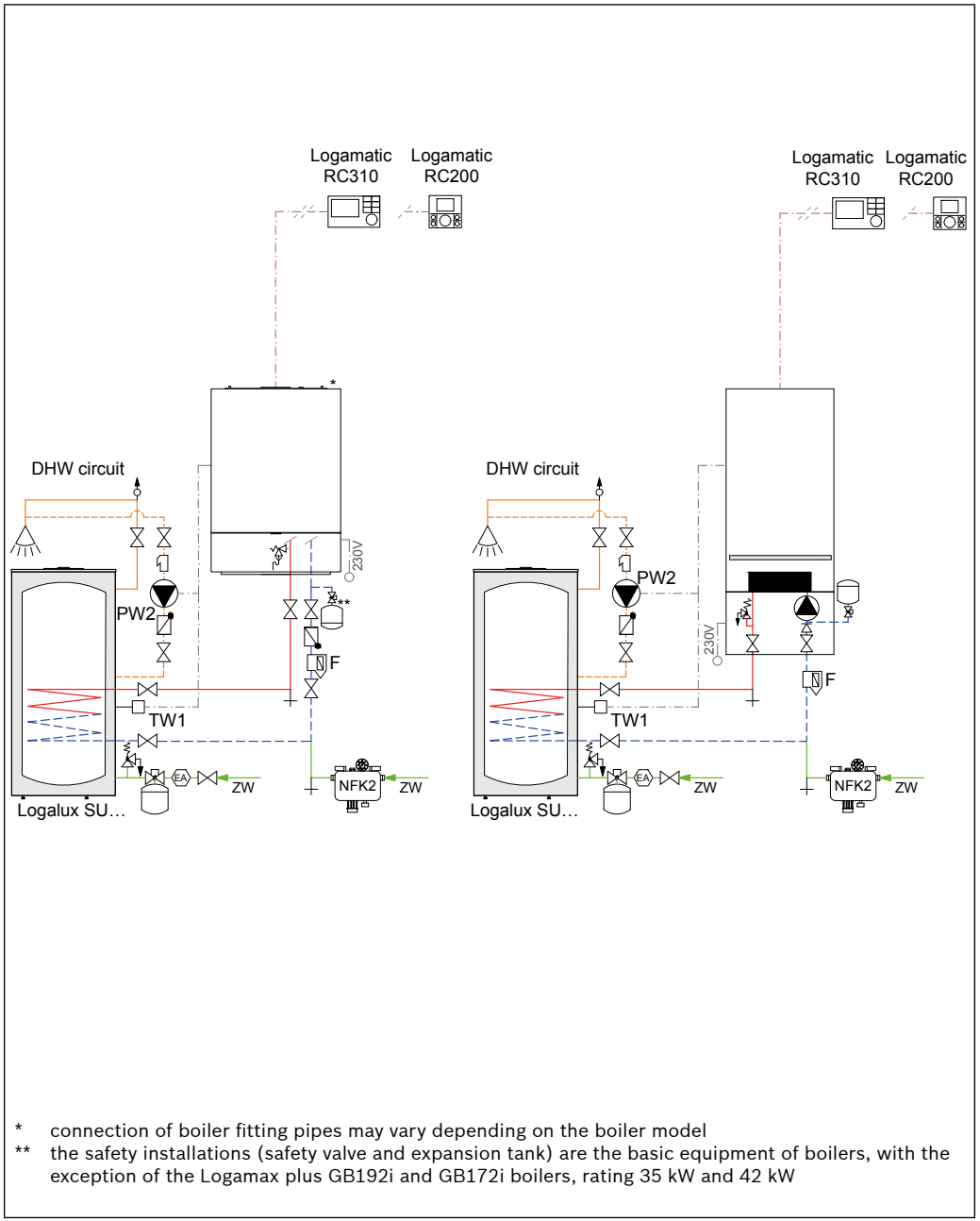
Description

The supply temperature to the DHW cylinder depends on the automatic settings.

Domestic water is heated in a monovalent cylinder. The DHW tank must have a coil that ensures the transfer of 30-40% of the boiler max. output. The flow through the coil is forced by a boiler pump.

Installation	Product number
Gas boiler	
1× Logamax plus GB122i	Different types
or Logamax plus GB172i	Different types
or Logamax plus GB162V2	Different types
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
or Logamatic RC200	7738110073
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× magnetic contaminant separator (F)	Different types

Table 31



* connection of boiler fitting pipes may vary depending on the boiler model

** the safety installations (safety valve and expansion tank) are the basic equipment of boilers, with the exception of the Logamax plus GB192i and GB172i boilers, rating 35 kW and 42 kW

Fig. 56 Hydraulic diagram

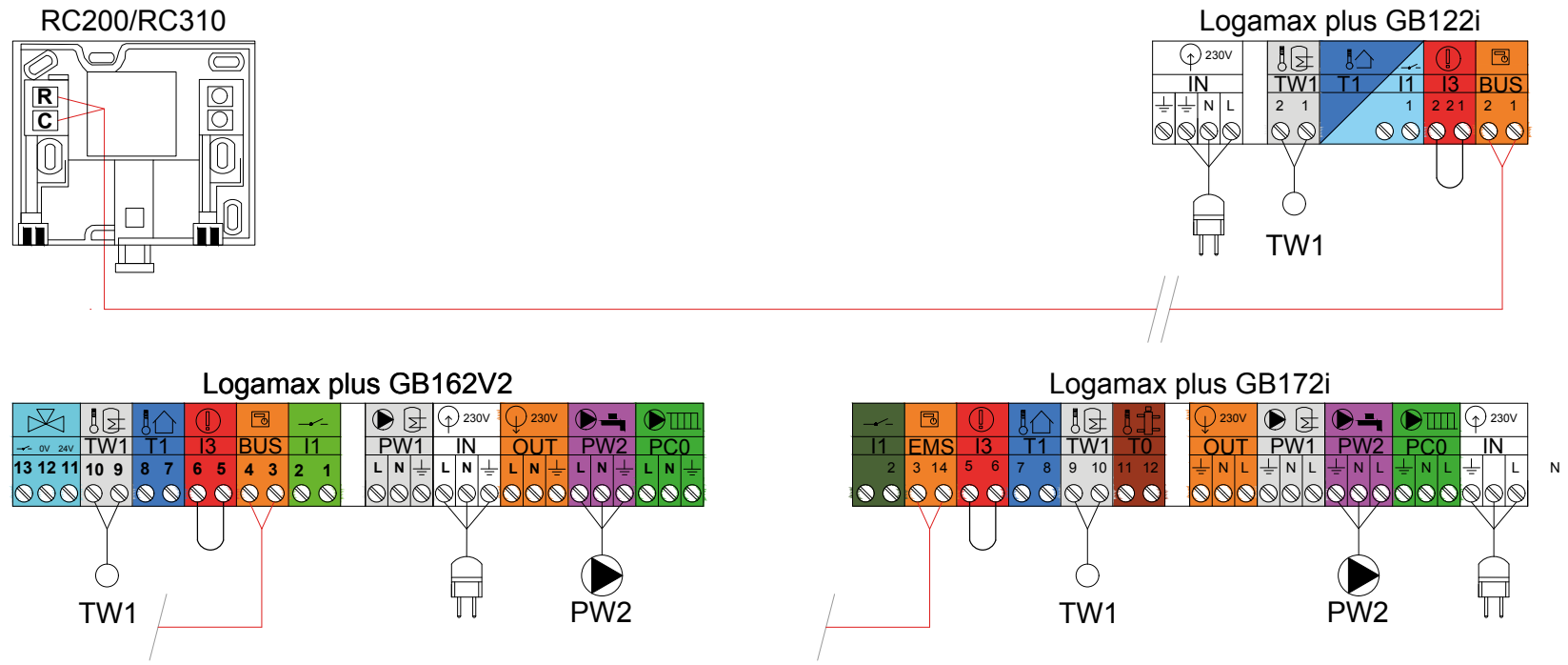


Fig. 57 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus KB372 with one heating circuit. Logamatic EMS Plus automatics.

Description

The flow in the heating circuit is forced by a circulation pump. It is not possible to control an additional circulation pump. The heating circuit pump is interchangeable with the boiler pump.

The system heating flow temperature depends on the outside temperature. If the operating conditions of the boiler may be exceeded (ΔT, max flow), use a low loss header and MM100 module to control the circulation pump on the secondary side of the low loss header.

Installation	Product number
Gas boiler	
1× Logano plus KB372 75/100/150/200/250/300	Different types
1× boiler safety group	Different types
1× drain valve	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× boiler automatics MC110	7736602700
1× operational module BC30E	7738112426
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 32

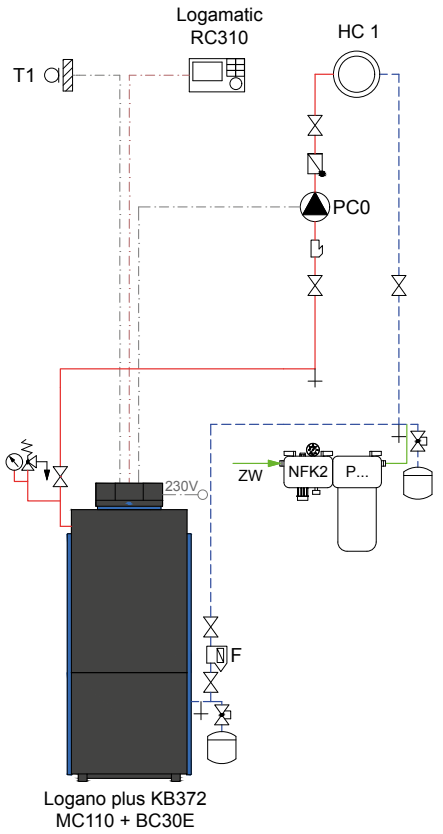
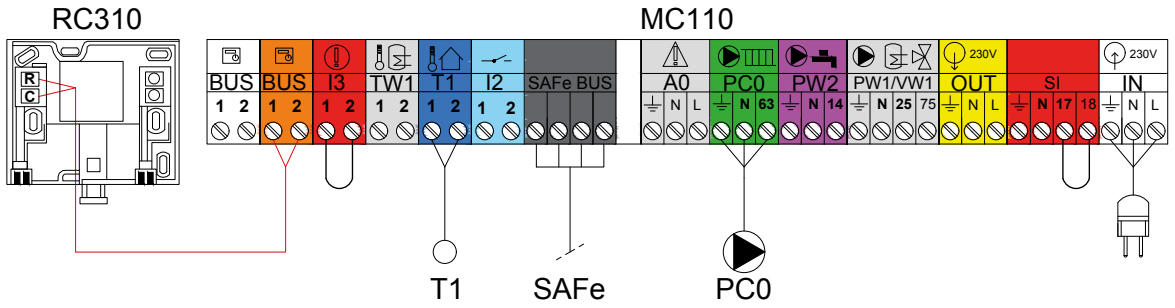


Fig. 58 Hydraulic diagram



EMS 2 / EMS plus bus-line

Fig. 59 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus KB372 with one heating circuit and DHW charging circuit. Logamatic EMS Plus automatics.

Description

The flow in the heating circuit is forced by a circulation pump. It is not possible to control an additional circulation pump. The heating circuit pump is interchangeable with the boiler pump. The system heating flow temperature depends on the outside temperature.

If the operating conditions of the boiler may be exceeded (ΔT, max flow), use a low loss header and MM100 module to control the circulation pump on the secondary side of the low loss header.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by Logamatic MC110 boiler automatics. The DHW charging circuit has priority over the heating system. The DHW cylinder must have a coil that ensures the transfer of 40% of the boiler max. output.

Installation	Product number
Gas boiler	
1× Logano plus KB372 75/100/150/200/250/300	Different types
1× boiler safety group	Different types
1× drain valve	Different types
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× boiler automatics MC110	7736602700
1× operational module BC30E	7738112426
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 33

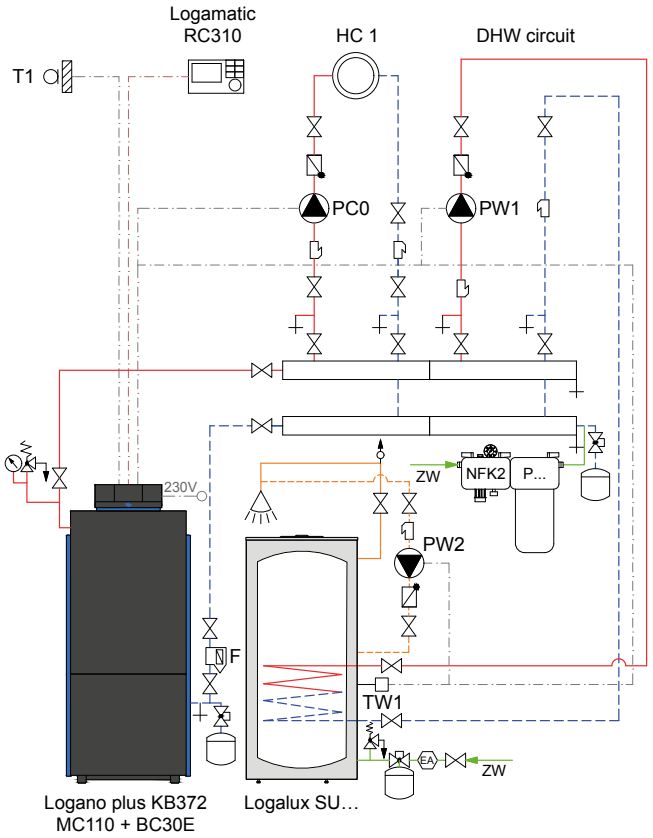
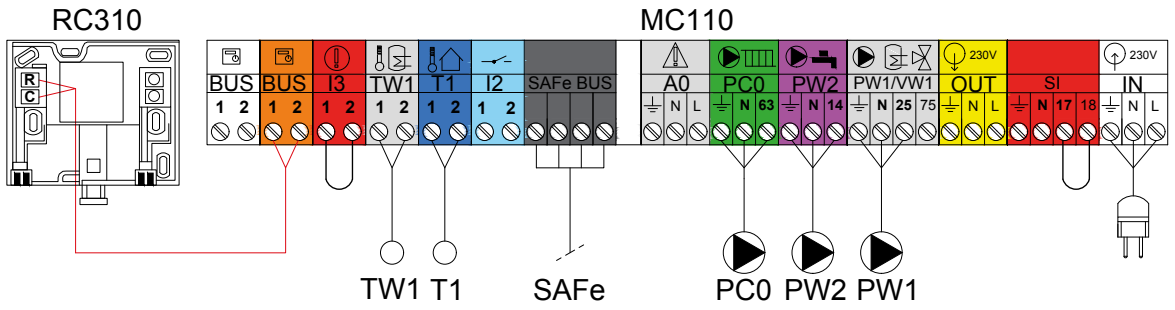


Fig. 60 Hydraulic diagram



EMS 2 / EMS plus bus-line

Fig. 61 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus KB372 with one direct heating circuit and one mixed heating circuit. Logamatic EMS Plus automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The boiler pump is controlled by the Logamatic MC110 automatics. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The heating system can be expanded with additional MM100 modules.

Installation	Product number
Gas boiler	
1× Logano plus KB372 75/100/150/200/250/300	Different types
1× boiler safety group	Different types
1× drain valve	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× boiler automatics MC110	7736602700
1× operational module BC30E	7738112426
2× MM100 module	7738110139
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 34

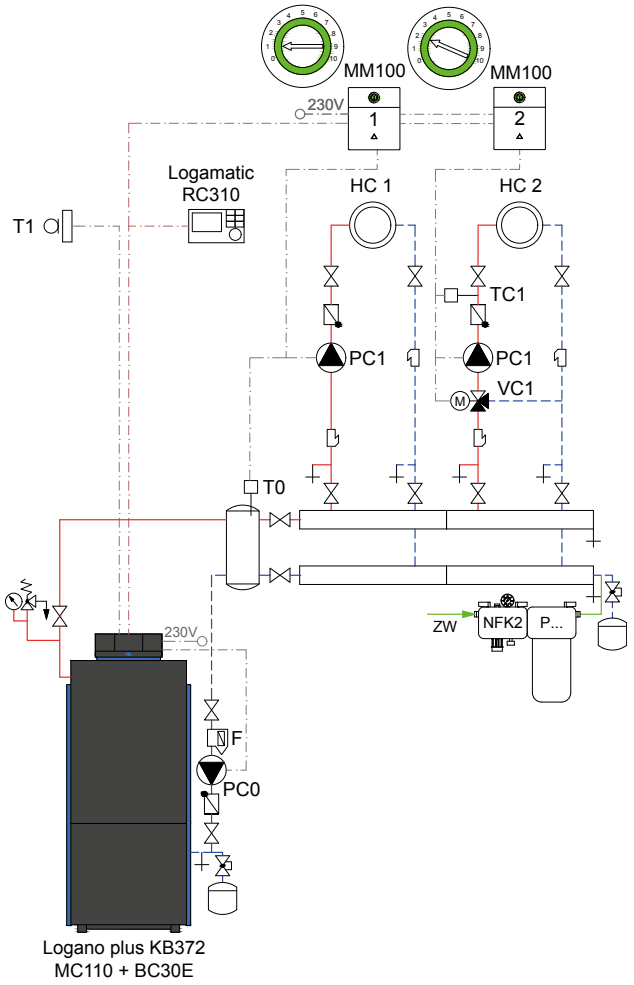


Fig. 62 Hydraulic diagram

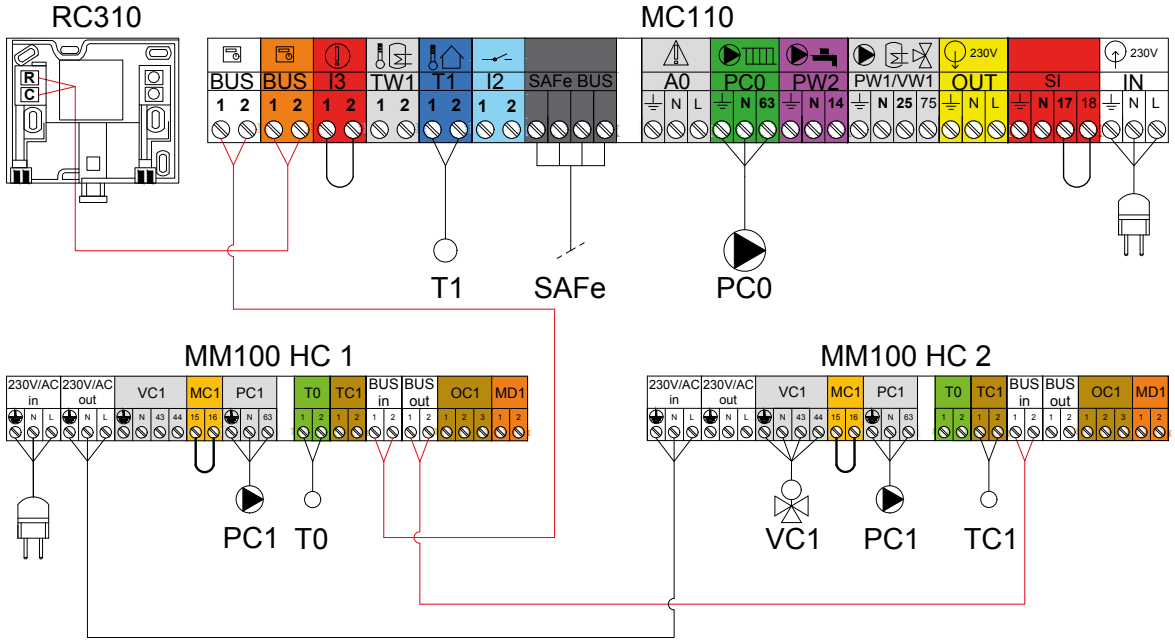


Fig. 63 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus KB372 with two mixed heating circuits and DHW charging circuit. Logamatic EMS Plus automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The boiler pump is controlled by the Logamatic MC110 automatics. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by MM100 module. The DHW charging circuit operates in parallel to the heating system.

The heating system can be expanded with additional MM100 modules.

Installation	Product number
Gas boiler	
1× Logano plus KB372 75/100/150/200/250/300	Different types
1× boiler safety group	Different types
1× drain valve	Different types
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× boiler automatics MC110	7736602700
1× operational module BC30E	7738112426
3× MM100 module	7738110139
1× sensor T0	63043337
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 35

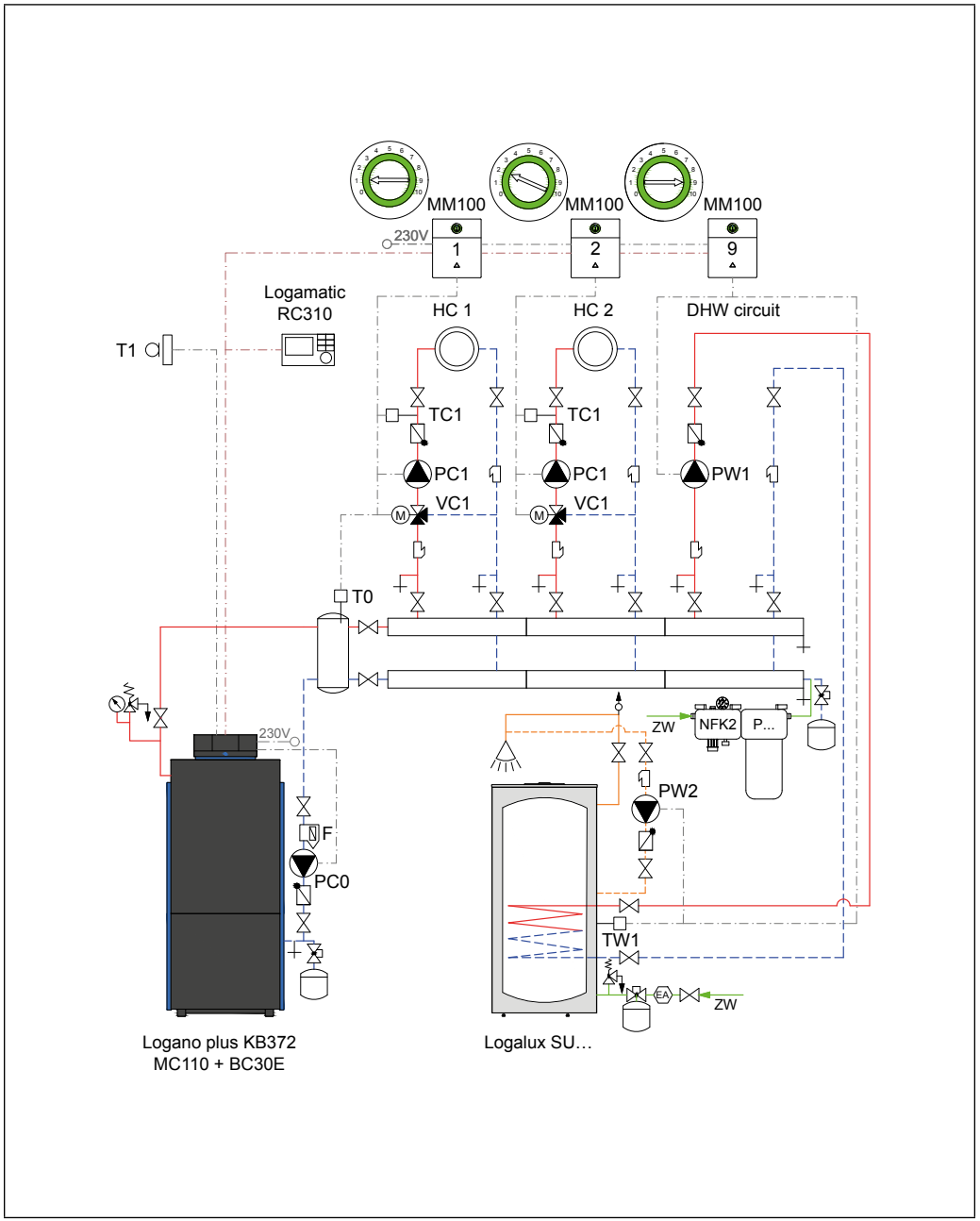


Fig. 64 Hydraulic diagram

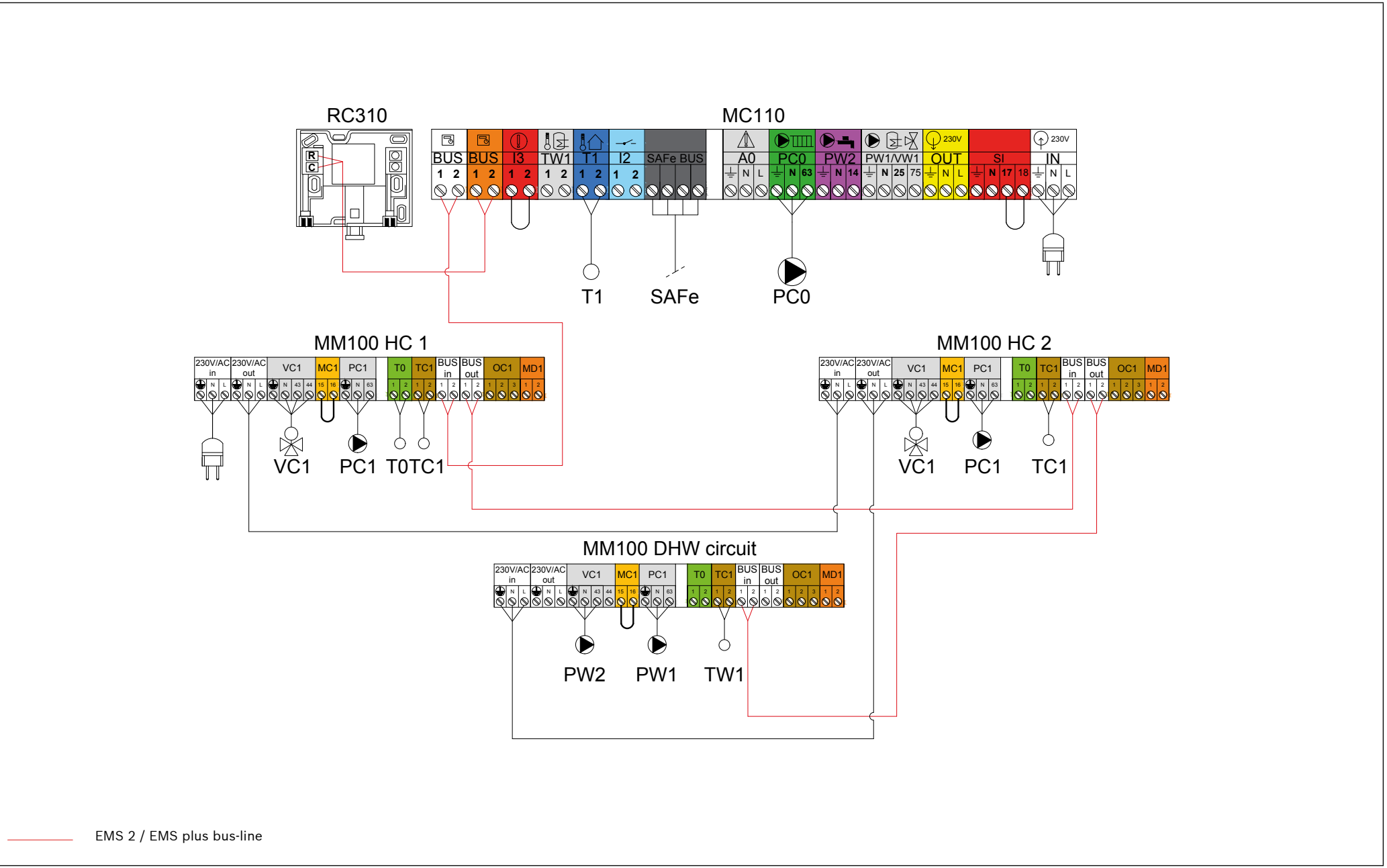


Fig. 65 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus KB372 with three mixed heating circuits and DHW charging circuit. Logamatic 5000 series automatics.

Description

The flow in the heating circuits is forced by circulation pumps. Heating circuits (mixed) 2 and 3 are controlled by FM-MM module, but circuit 1 – alternately by the boiler pump, from control unit R5313. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by R5313 control units. The DHW charging circuit can operate in parallel or priority over the selected heating circuits, while parallel operation requires mixing valves in these circuits. The DHW cylinder must have a coil that ensures the transfer of 40% of the boiler max. output.

Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
1× Logano plus KB372 75/100/150/200/250/300	Different types
1× boiler safety group	Different types
1× drain valve	Different types
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic R5313	7736602051
1× FM-MM module	8718598828
1× sensor FV (FV/FZ)	5991376
1× sensor FB	7735502288
3× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 36

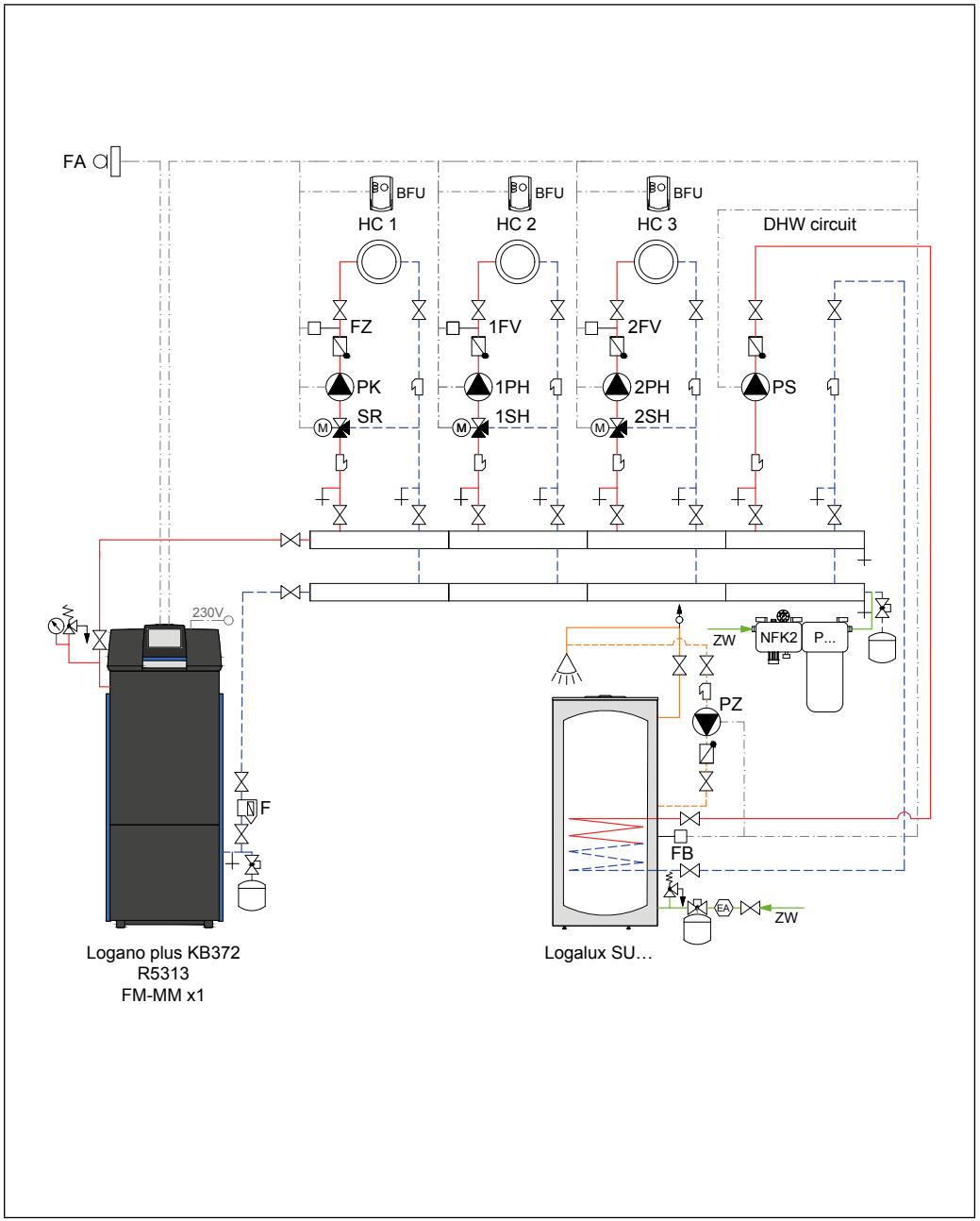


Fig. 66 Hydraulic diagram

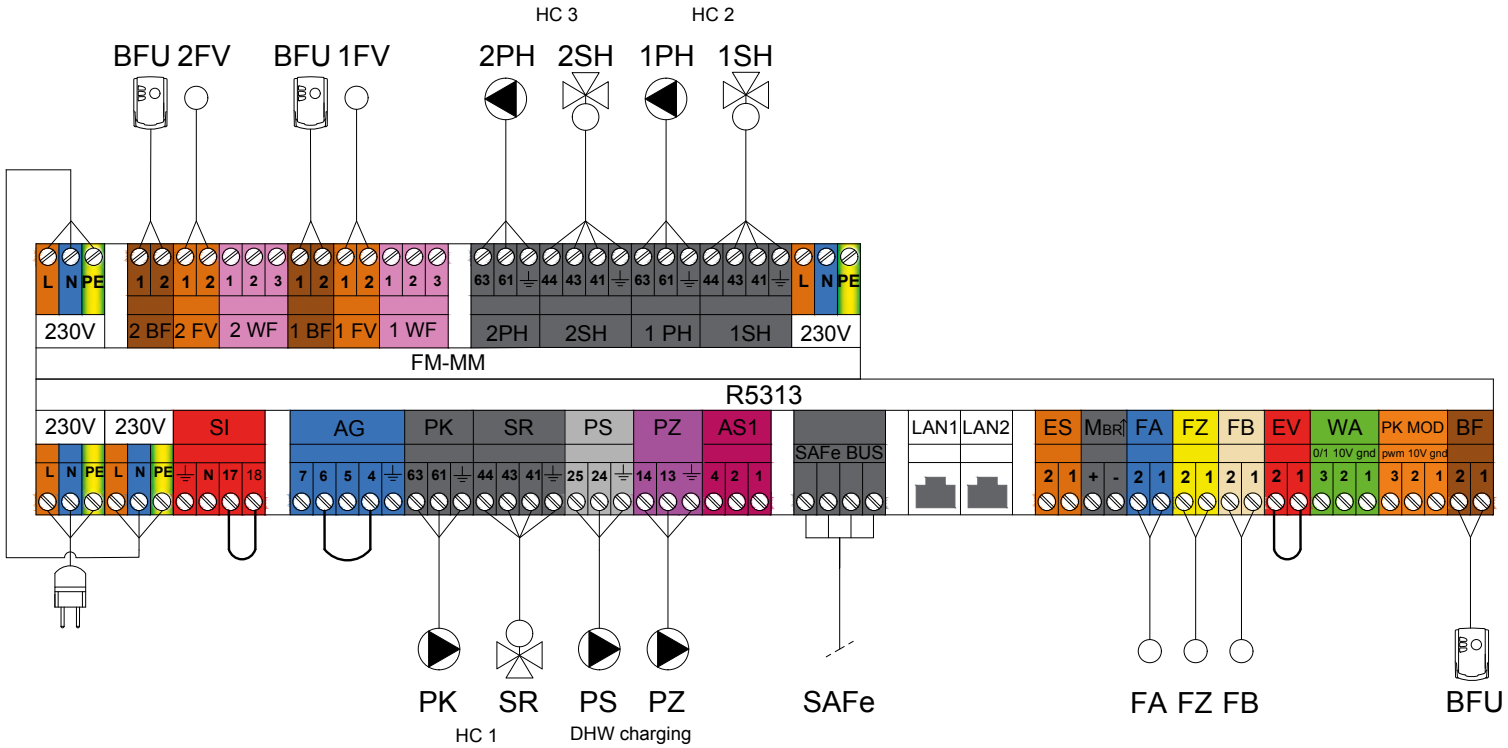


Fig. 67 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus KB372 with four mixed heating circuits and DHW charging circuit. Logamatic 5000 series automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by FM-MM modules. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The boiler pump is controlled by the Logamatic R5313 automatics with a 0-10 V signal.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by R5313 control units. The DHW charging circuit can operate in parallel or priority over the selected heating circuits, while parallel operation requires mixing valves in these circuits. Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
1× Logano plus KB372 75/100/150/200/250/300	Different types
1× boiler safety group	Different types
1× drain valve	Different types
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic R5313	7736602051
2× FM-MM module	8718598828
2× sensor FV (FV/FZ)	5991376
1× sensor FB	7735502288
4× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 37

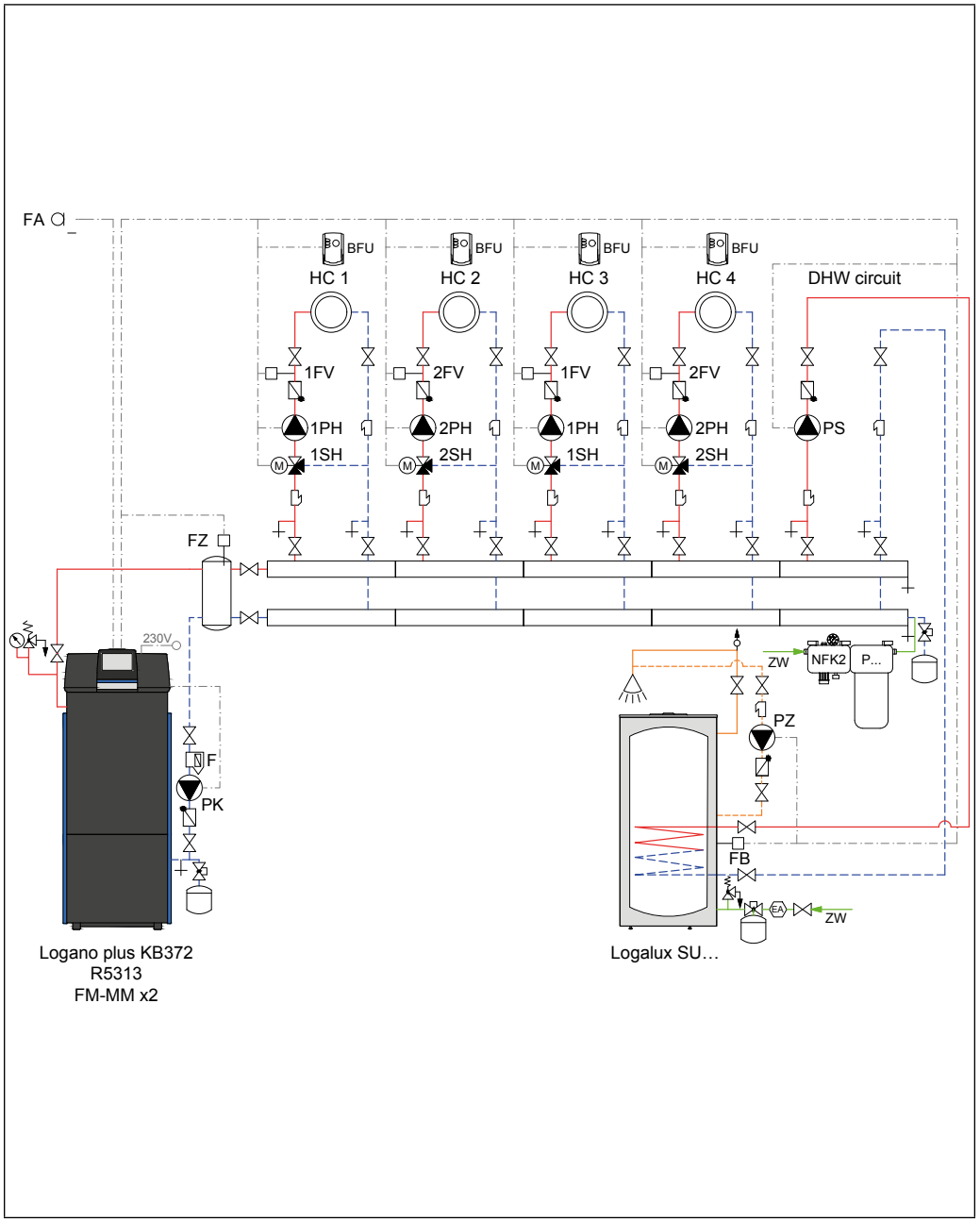


Fig. 68 Hydraulic diagram

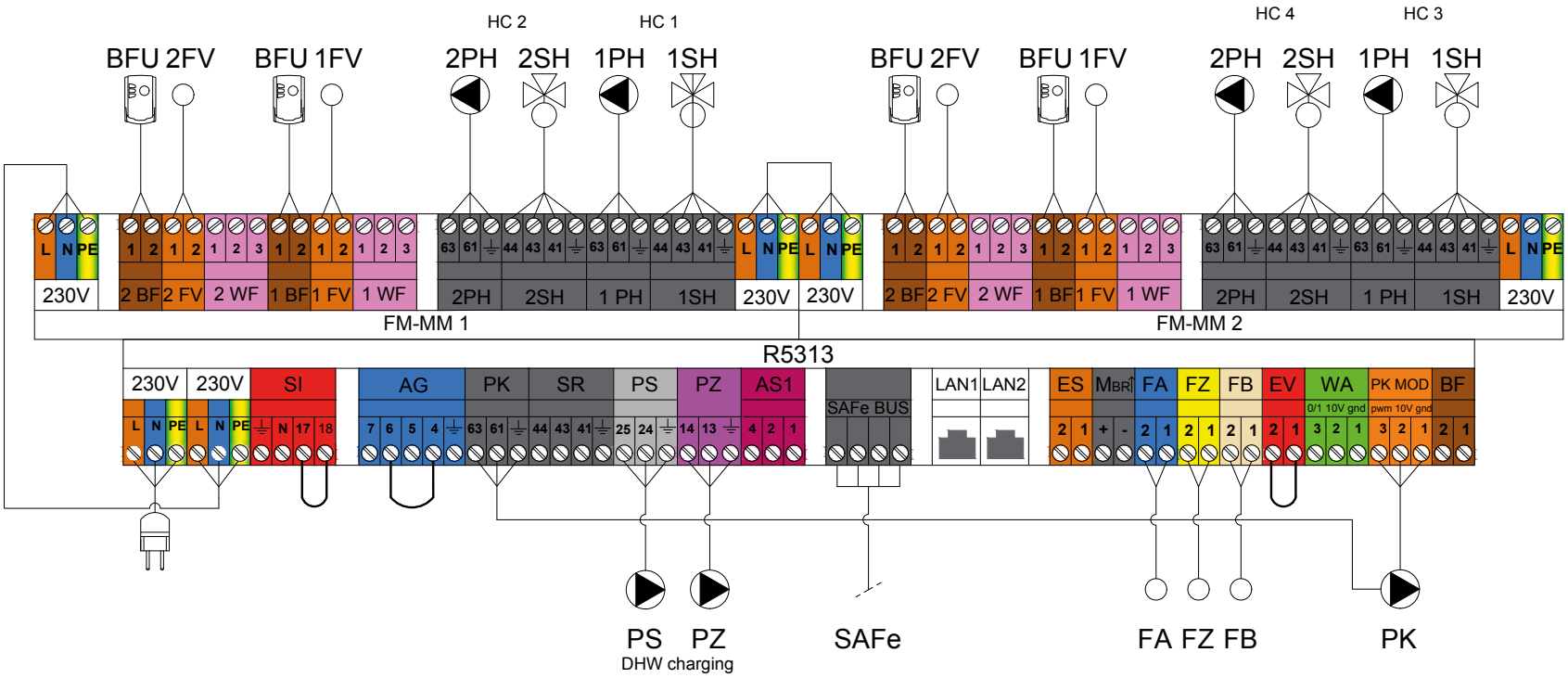


Fig. 69 Electrical diagram

System example

Floor-standing gas boiler Logamax plus KB372. Logamatic EMS Plus automatics interacts with external automatics.

Description

The flow in the heating circuits is forced by circulation pumps. The installation is controlled by an external system. The system adjusts the heating flow temperature or the boiler output according to the installation heat demand. Adjusting is carried out with the help of 0-10 V signal. The boiler safety systems (e.g. start-up characteristics, timing) have priority over the request of the external system.

If the operating conditions of the boiler may be exceeded (ΔT, max flow), use a low loss header; the boiler pump can be controlled by MC100 automatics.

Installation	Product number
Gas boiler	
1× Logano plus KB372 75/100/150/200/250/300	Different types
1× boiler safety group	Different types
1× drain valve	Different types
Control	
1× boiler automatics MC110	7736602700
1× operational module BC30E	7738112426
or Logamatic RC310 (black)	7738111127
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 38

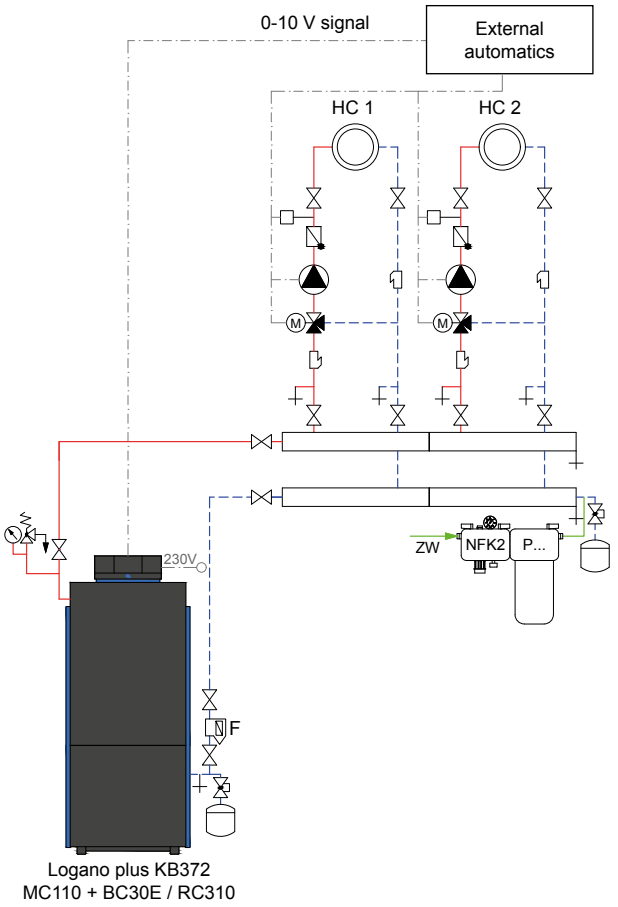


Fig. 70 Hydraulic diagram

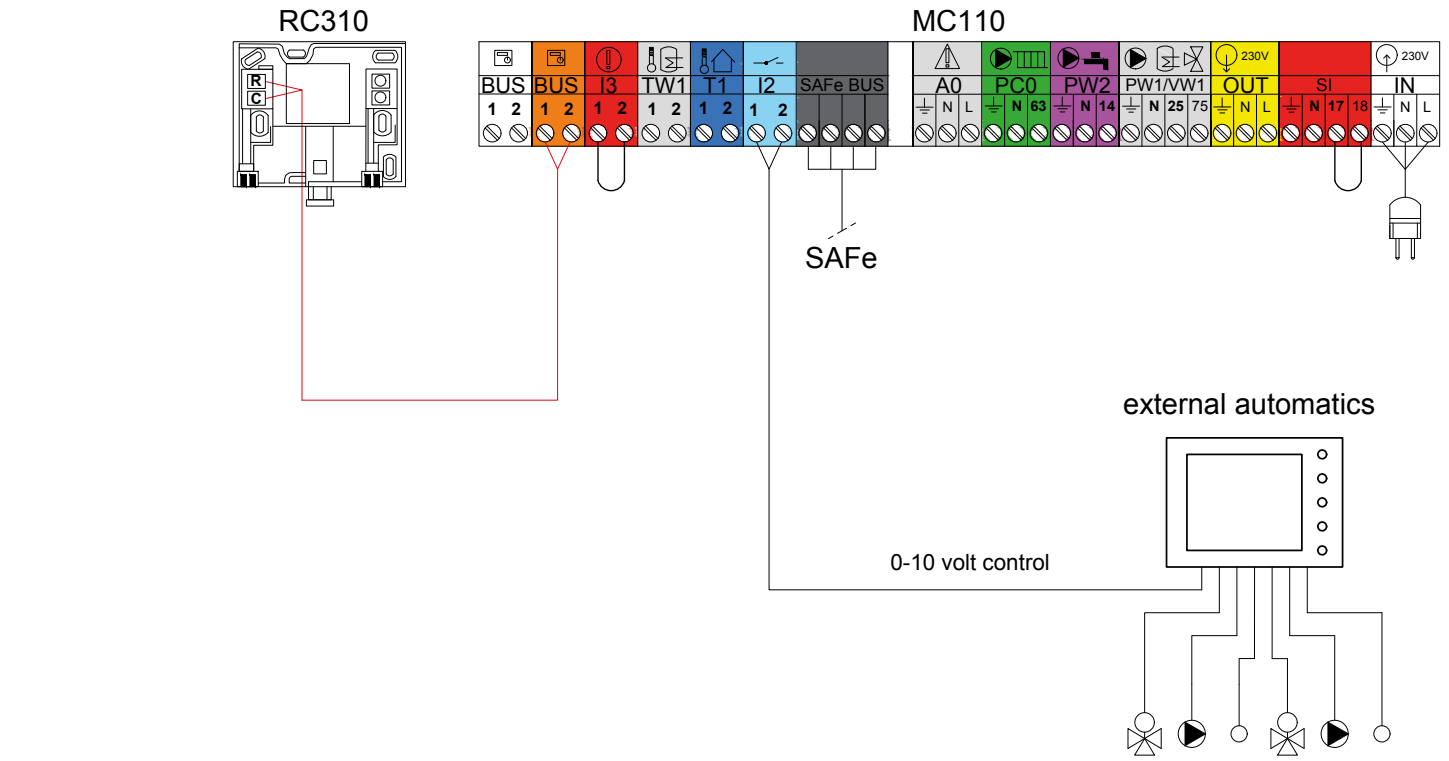


Fig. 71 Electrical diagram

System example

A cascade of Buderus floor-standing gas boilers Logamax plus KB372 with one direct heating circuit and one mixed heating circuit. Logamatic EMS Plus automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The boiler pumps are controlled by the Logamatic MC110 automatics. A cascade of boilers is controlled by MC400 module. One module can be used to control 4 heat sources. Up to 16 devices can be arranged in a cascade with 5 MC400 modules (see pages 42-47). The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

The heating system can be expanded with additional MM100 modules.

Installation	Product number
Gas boiler	
2× Logano plus KB372 75/100/150/200/250/300	Different types
2× boiler safety group	Different types
2× drain valve	Different types
1× hydraulic kit with circulation pumps (only for two boilers)	The type depends on boiler output
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
2× boiler automatics MC110	7736602700
2× operational module BC30E	7738112426
2× MM100 module	7738110139
1× MC400 module	7738111003
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1 (up to 800 kW)	8718576749

Table 39

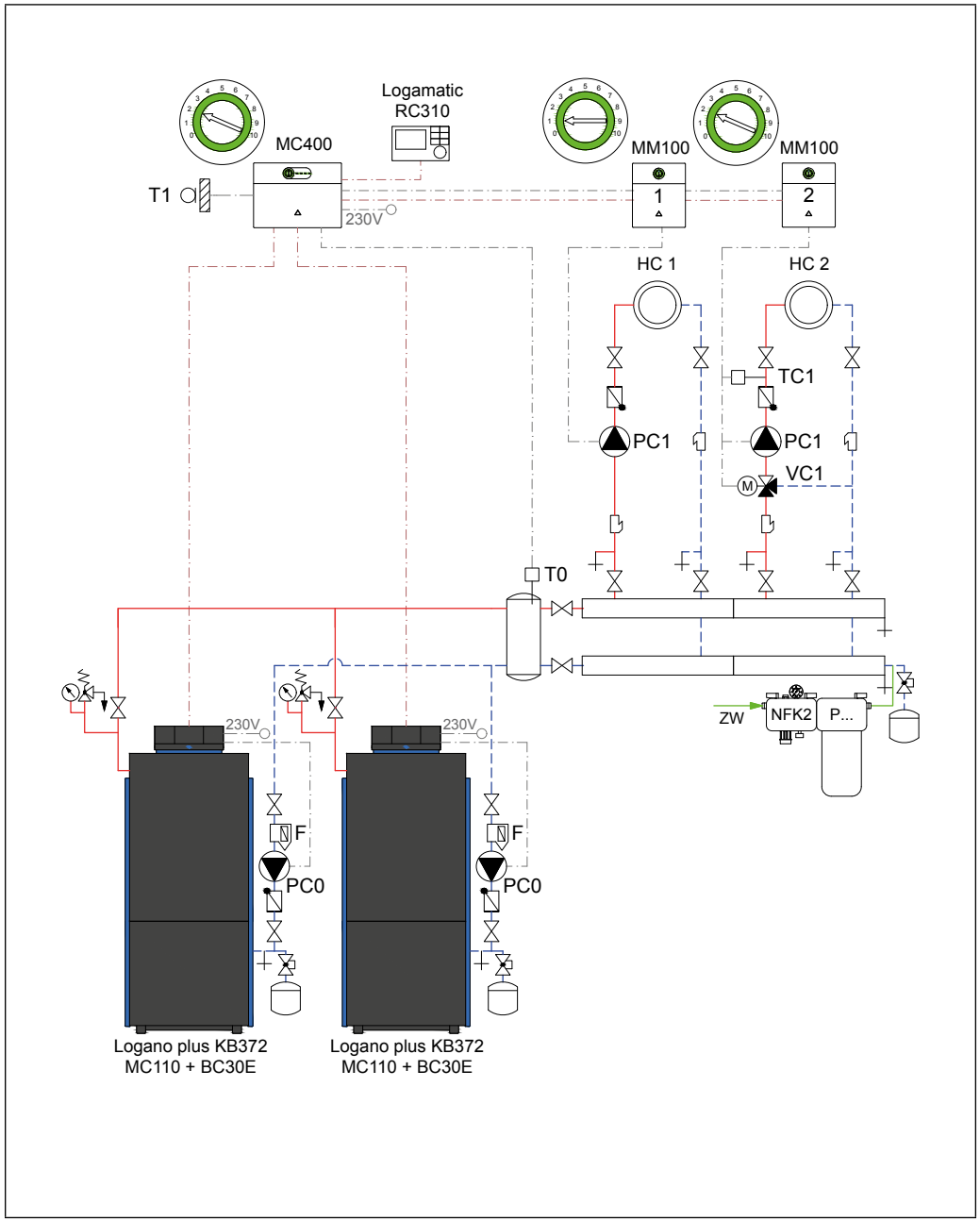


Fig. 72 Hydraulic diagram

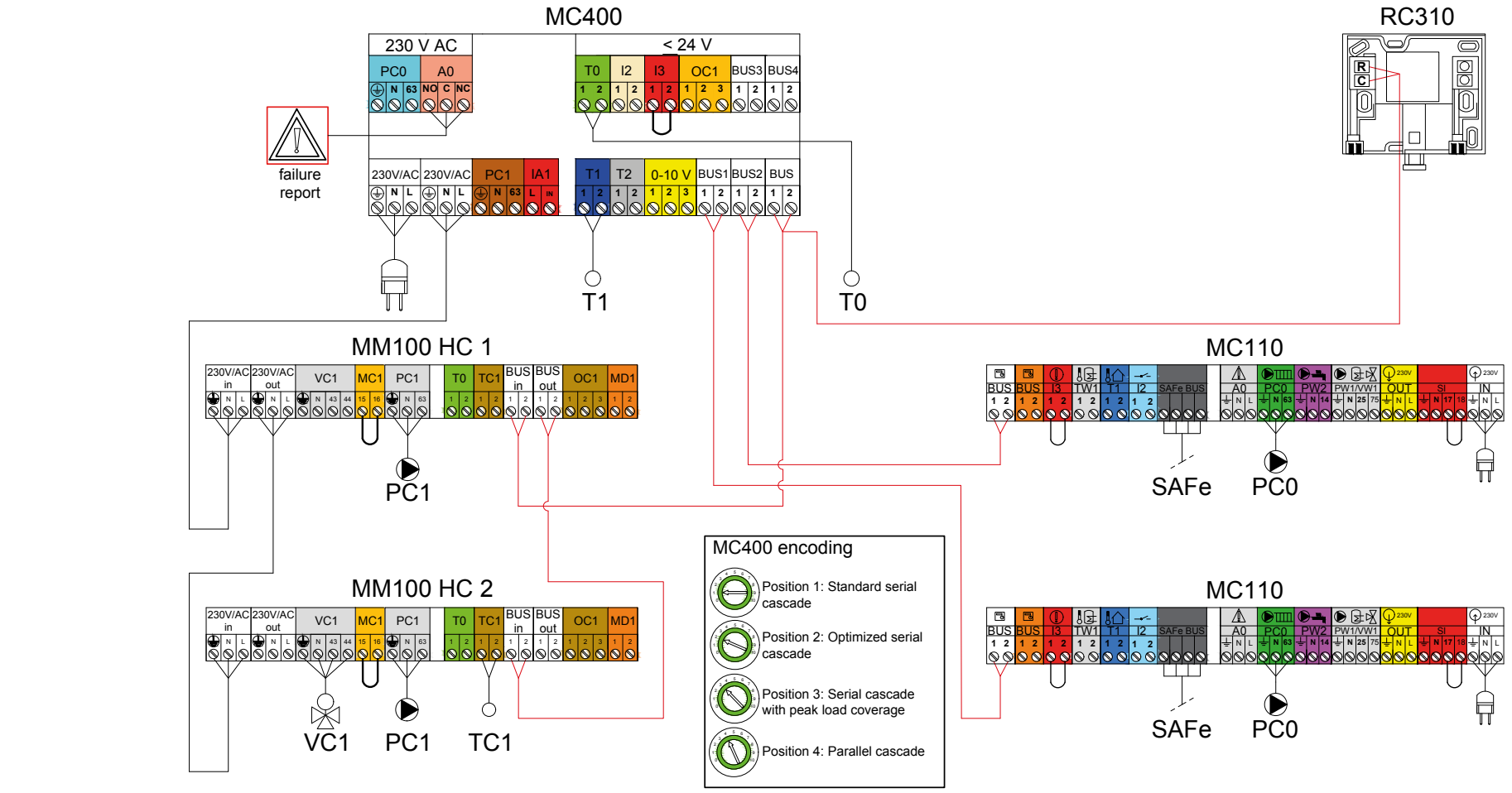


Fig. 73 Electrical diagram

System example

A cascade of Buderus floor-standing gas boilers Logamax plus KB372 with one direct heating circuit, one mixed heating circuit and one DHW charging circuit. Logamatic EMS Plus automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by MM100 modules. No more than one direct circuit is recommended. The boiler pumps are controlled by the Logamatic MC110 automatics. A cascade of boilers is controlled by MC400 module. One module can be used to control 4 heat sources. Up to 16 devices can be arranged in a cascade with 5 MC400 modules (see pages 42-47). The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by MM100 module. The DHW charging circuit can operate in parallel or priority over the selected heating circuits, while parallel operation requires mixing valves in these circuits. The heating system can be expanded with additional MM100 modules.

Installation	Product number
Gas boiler	
2× Logano plus KB372 75/100/150/200/250/300	Different types
2× boiler safety group	Different types
2× drain valve	Different types
1× hydraulic kit with circulation pumps (only for two boilers)	The type depends on boiler output
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
2× boiler automatics MC110	7736602700
2× operational module BC30E	7738112426
3× MM100 module	7738110139
1× MC400 module	7738111003
1× sensor T0	63043337
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1 (up to 800 kW)	8718576749

Table 40

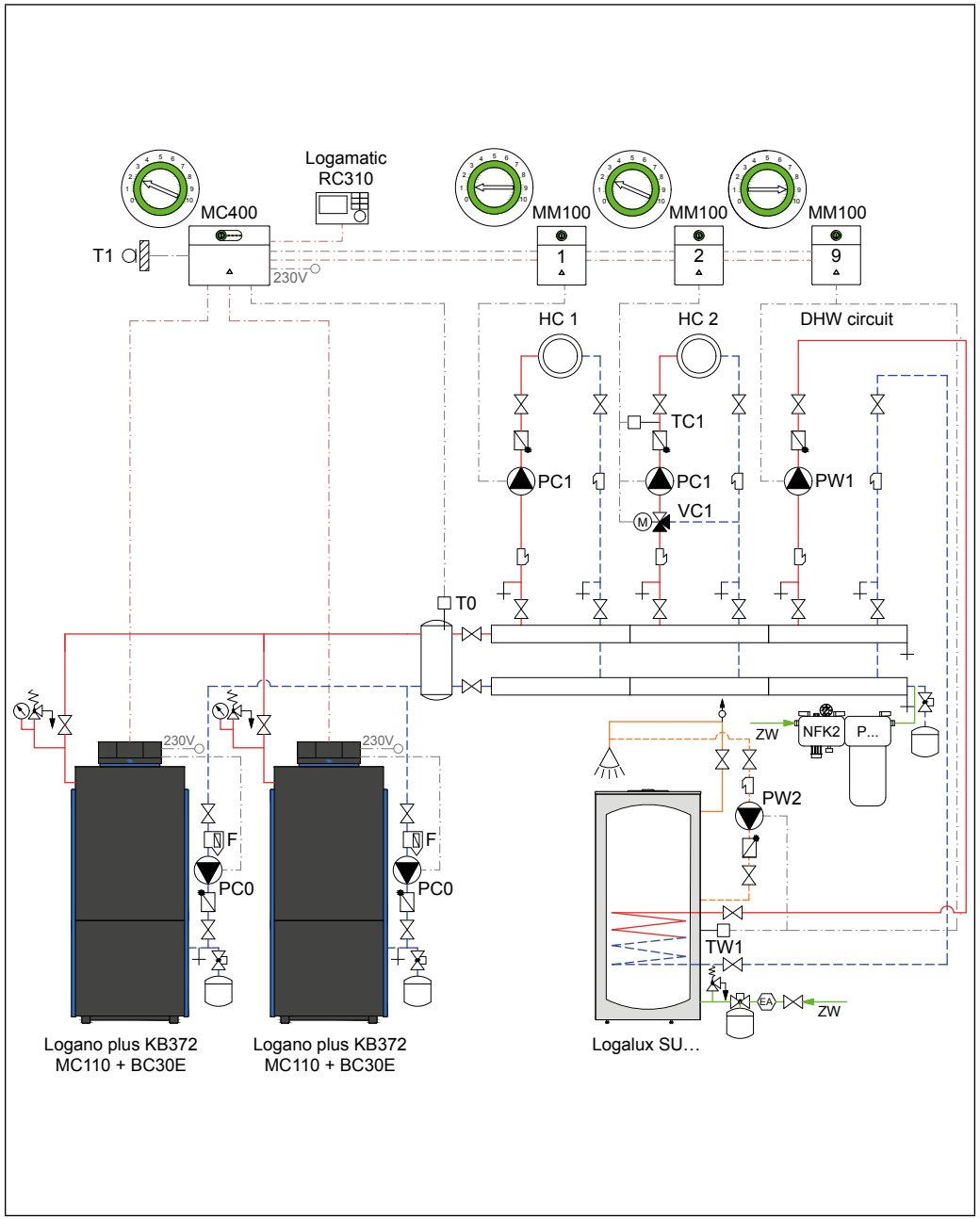


Fig. 74 Hydraulic diagram

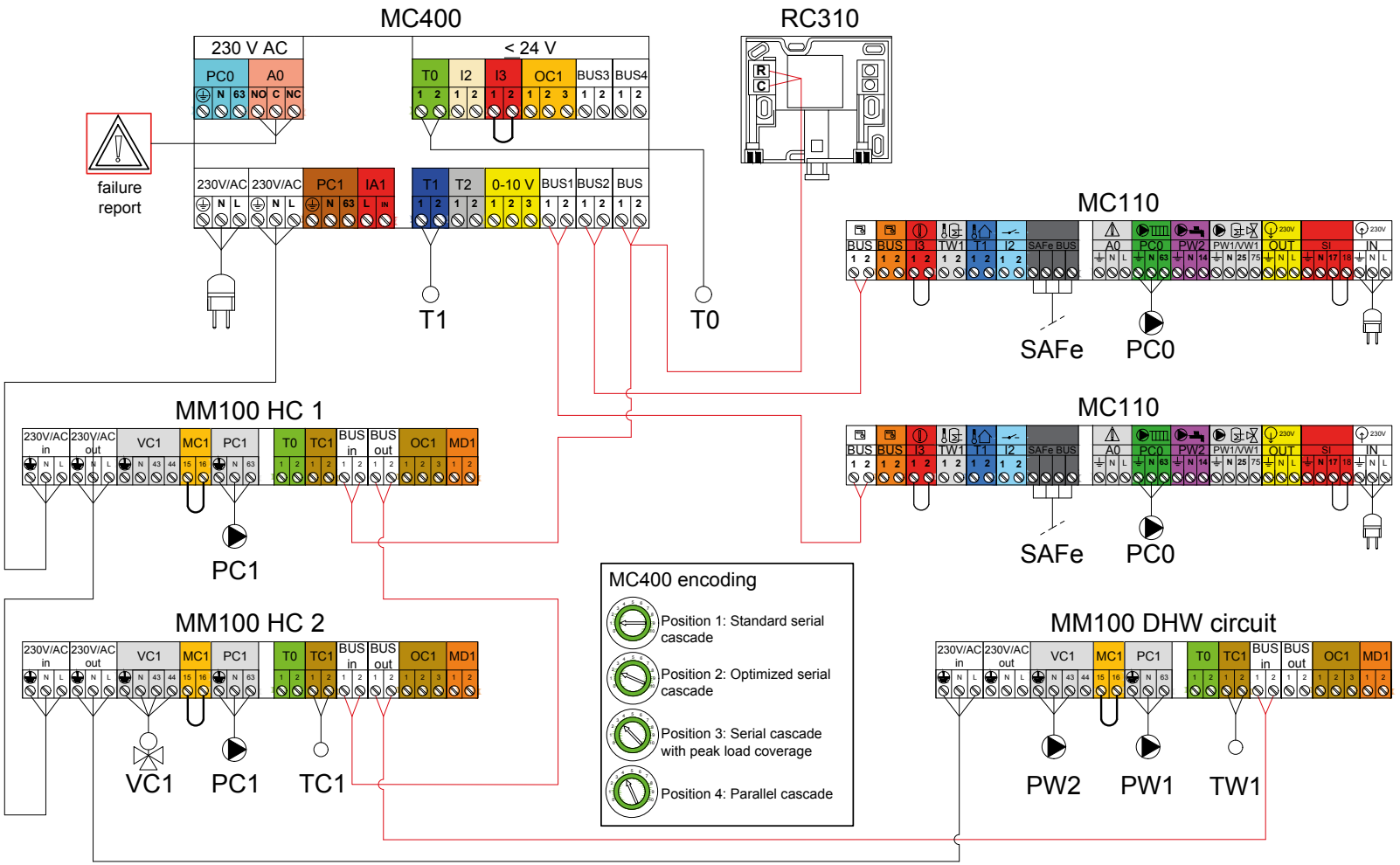


Fig. 75 Electrical diagram

System example

A cascade of Buderus floor-standing gas boilers Logamax plus KB372 with one direct heating circuit and one mixed heating circuit. Logamatic 5000 series automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by FM-MM modules. The boiler pump is controlled by the Logamatic R5313 automatics with a 0-10 V signal.

A cascade of boilers is controlled by FM-CM module. One module can be used to control 4 heat sources. A maximum of 4 cascade modules can be used in one installation, which allows to control 16 devices. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
2× Logano plus KB372 75/100/150/200/250/300	Different types
2× boiler safety group	Different types
2× drain valve	Different types
1× hydraulic kit with circulation pumps (only for two boilers)	The type depends on boiler output
Control	
2× Logamatic R5313	7736602051
1× FM-MM module	8718598828
1× FM-CM module	7736602092
2× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1 (up to 800 kW)	8718576749

Table 41

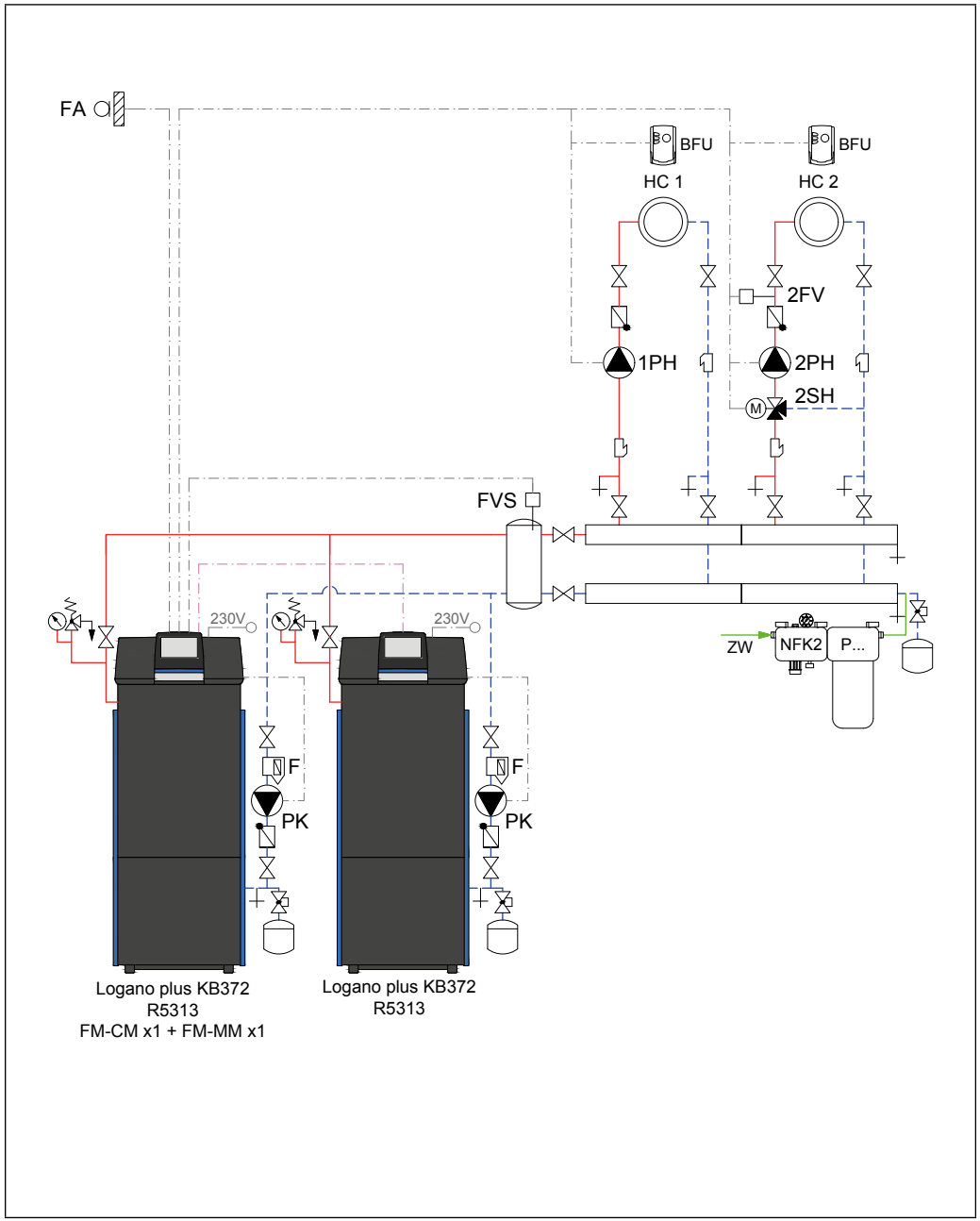


Fig. 76 Hydraulic diagram

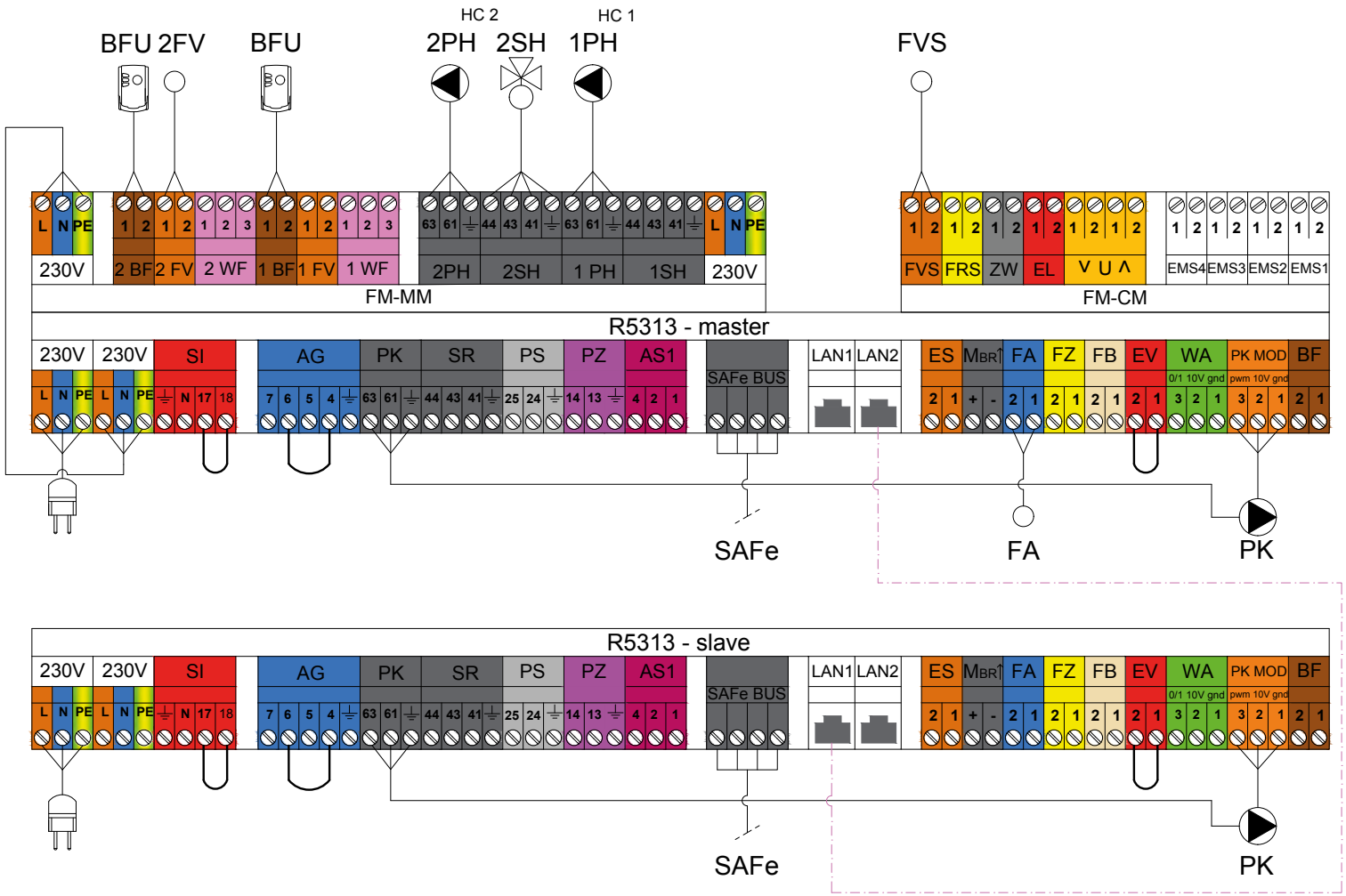


Fig. 77 Electrical diagram

System example

A cascade of Buderus floor-standing gas boilers Logamax plus KB372 with one direct heating circuit and one mixed heating circuit. Logamatic 5000 series automatics.

Description

The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by FM-MM modules. The boiler pump is controlled by the Logamatic R5313 automatics with a 0-10 V signal. One module can be used to control 4 heat sources. A maximum of 4 cascade modules can be used in one installation, which allows to control 16 devices. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
2× Logano plus KB372 75/100/150/200/250/300	Different types
2× boiler safety group	Different types
2× drain valve	Different types
1× hydraulic kit with circulation pumps (only for two boilers)	The type depends on boiler output
Control	
2× Logamatic R5313	7736602051
1× FM-MM module	8718598828
1× FM-CM module	7736602092
2× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1 (up to 800 kW)	8718576749

Table 42

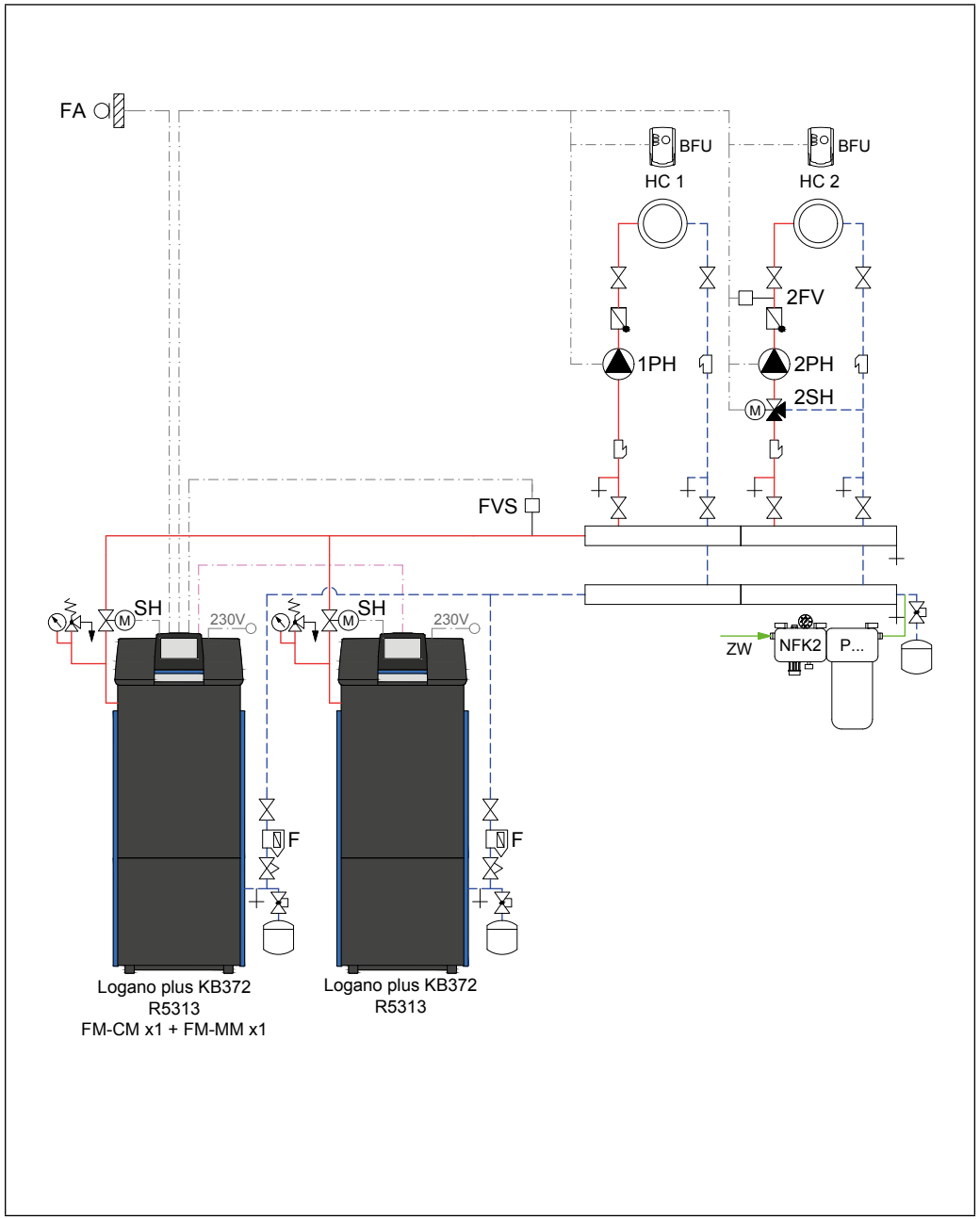


Fig. 78 Hydraulic diagram

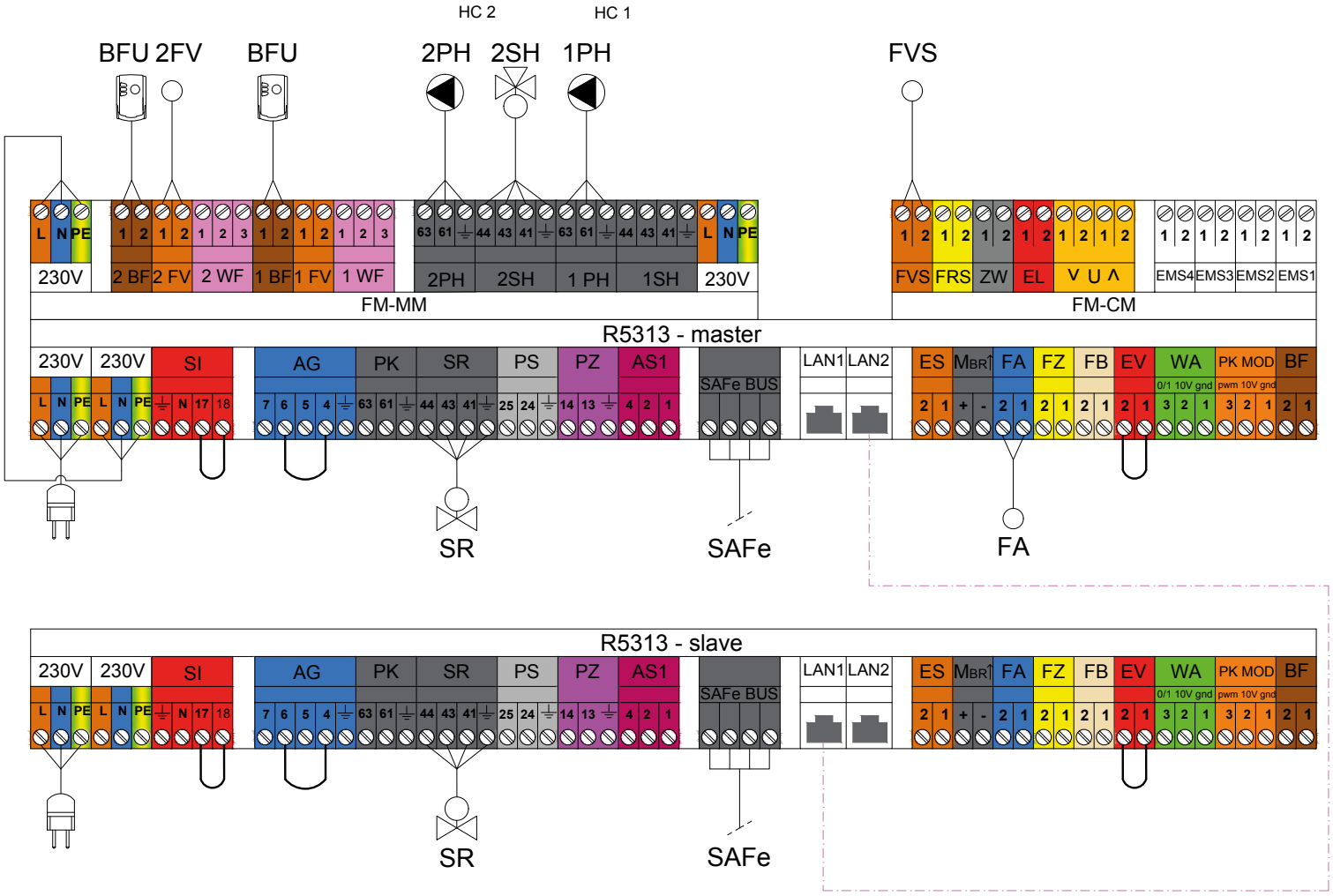


Fig. 79 Electrical diagram

System example

A cascade of Buderus floor-standing gas boilers Logamax plus KB372. Logamatic EMS Plus automatics interacts with external automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The installation is controlled by an external system. The system adjusts the heating flow temperature or the output of cascade boilers according to the installation heat demand. Adjusting is carried out with the help of 0-10 V signal. The boiler safety systems (e.g. start-up characteristics, timing) have priority over the request of the external system.

Installation	Product number
Gas boiler	
2× Logano plus KB372 75/100/150/200/250/300	Different types
2× boiler safety group	Different types
2× drain valve	Different types
1× hydraulic kit with circulation pumps (only for two boilers)	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
2× boiler automatics MC110	7736602700
2× operational module BC30E	7738112426
1× MC400 module	7738111003
1× sensor T0	63043337
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1 (up to 800 kW)	8718576749

Table 43

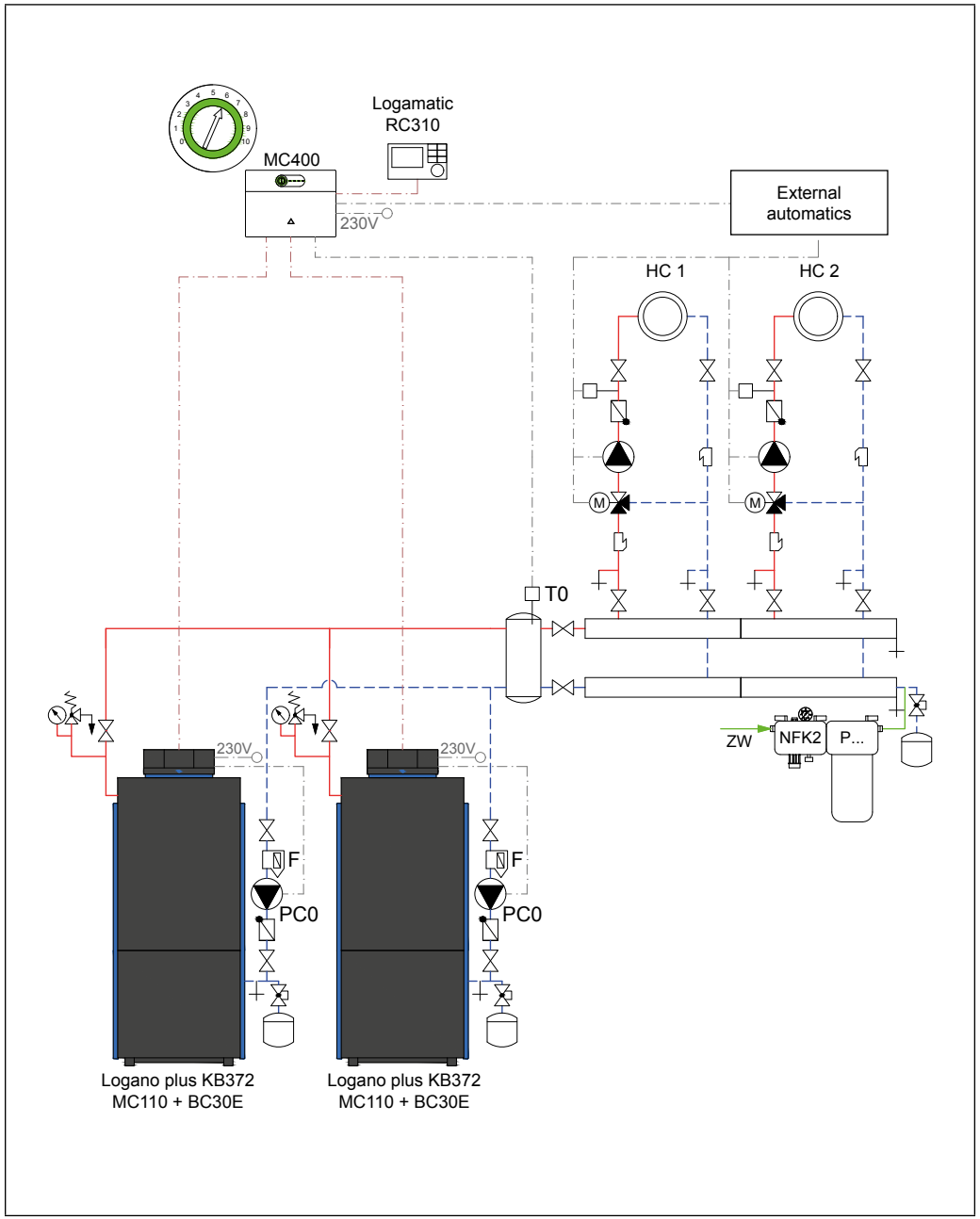


Fig. 80 Hydraulic diagram

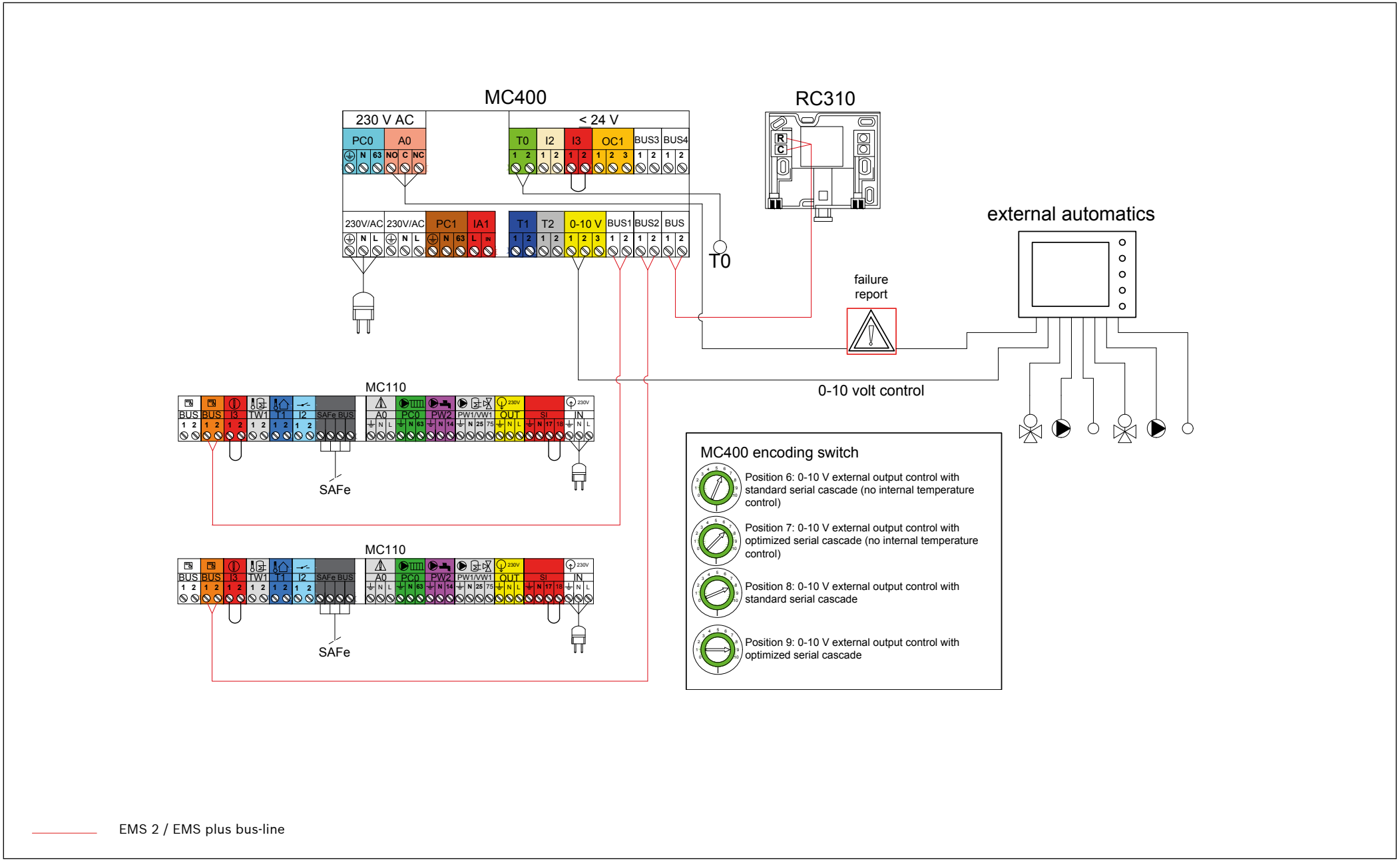


Fig. 81 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus GB402 with one heating circuit. Logamatic EMS Plus automatics.

Description

The flow in the heating circuit is forced by a circulation pump. It is not possible to control an additional circulation pump. The heating circuit pump is interchangeable with the boiler pump.

The system heating flow temperature depends on the outside temperature. If the operating conditions of the boiler may be exceeded (ΔT, max flow), use a low loss header and MM100 module to control the circulation pump on the secondary side of the low loss header.

Installation	Product number
Gas boiler	
1× Logano plus GB402-395/470/545/620	Different types
1× manifold for the safety group	8718572719
1× bar for safety valves	8718572302
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× boiler automatics MC110	7736602700
1× operational module BC30E	7738112426
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 44

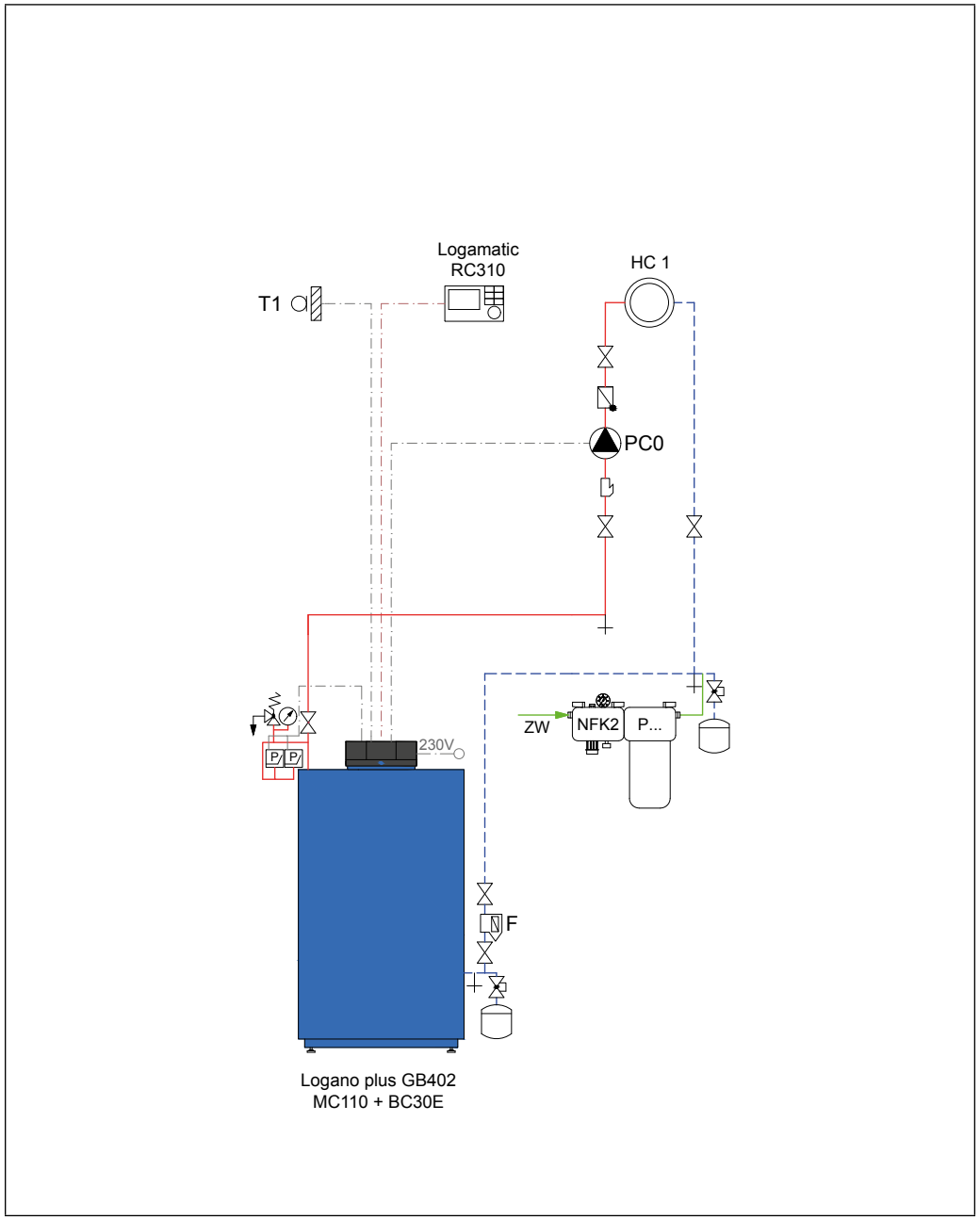
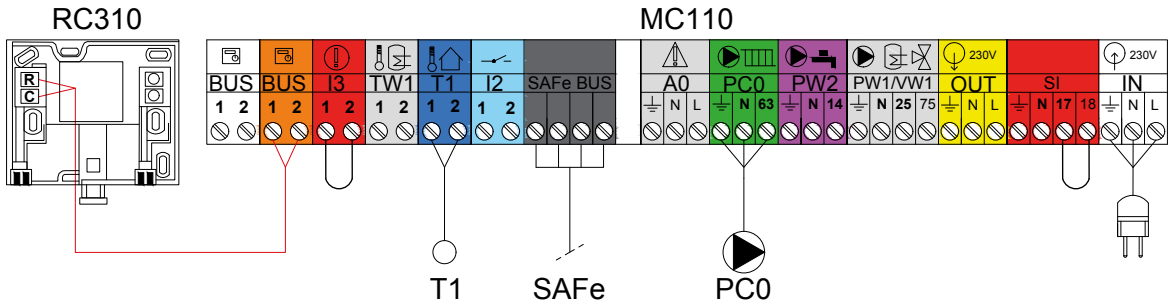


Fig. 82 Hydraulic diagram



EMS 2 / EMS plus bus-line

Fig. 83 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus GB402 with one direct heating circuit and DHW charging circuit. Logamatic EMS Plus automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuit is controlled by the MM100 module. The boiler pump is controlled by the Logamatic MC110 automatics. The system heating flow temperature depends on the outside temperature.

Domestic water is heated in a monovalent cylinder. The flow through the coil is is forced by a loading pump controlled by Logamatic MC110 boiler automatics. The DHW charging circuit has priority over the heating system. Parallel operation with the heating system is possible. An additional MM100 module has to be used and a mixer for the heating circuit.

The heating system can be expanded with additional MM100 modules.

Installation	Product number
Gas boiler	
1× Logano plus GB402-395/470/545/620	Different types
1× manifold for the safety group	8718572719
1× bar for safety valves	8718572302
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic RC310 (white or black)	7738111127 or ...128
1× boiler automatics MC110	7736602700
1× operational module BC30E	7738112426
1× MM100 module	7738110139
1× sensor T0	63043337
1× sensor TW1	7735502288
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 45

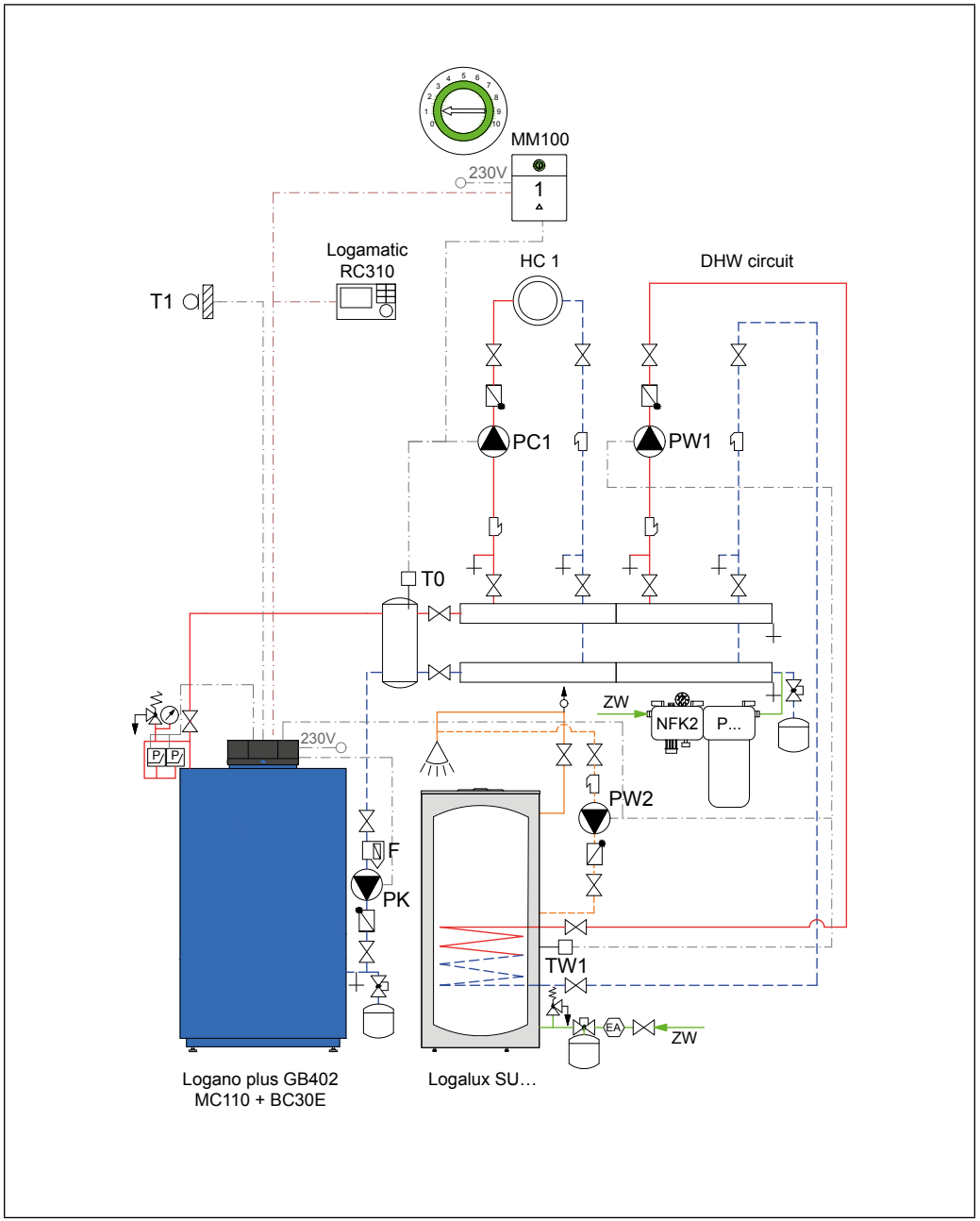


Fig. 84 Hydraulic diagram

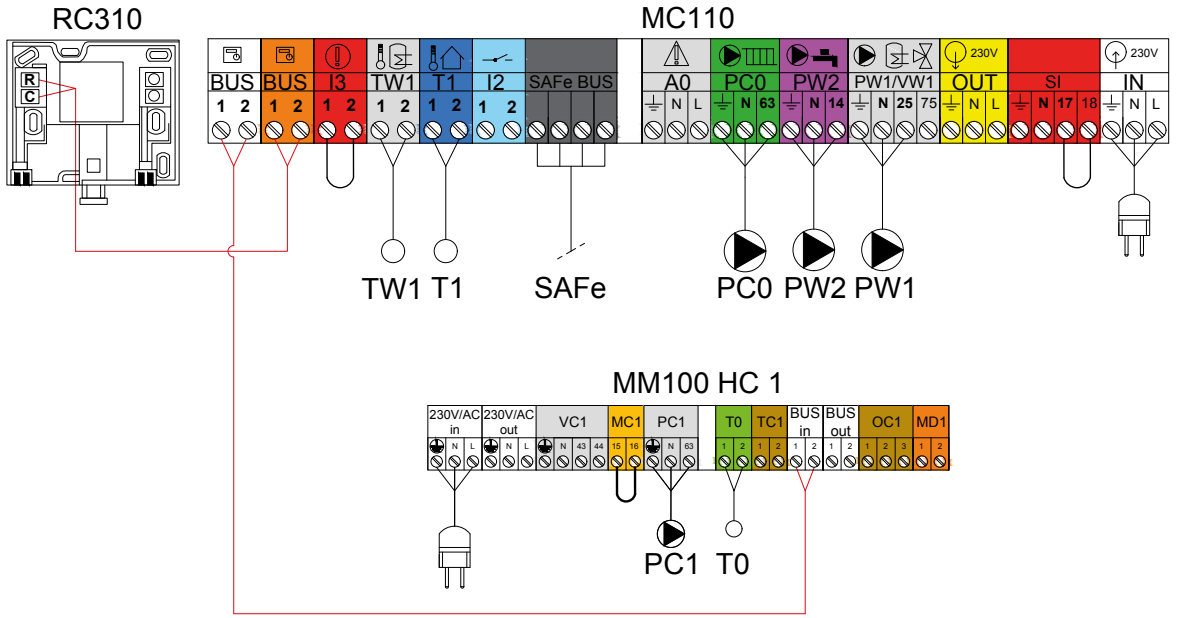


Fig. 85 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus GB402 with two mixed heating circuits. Logamatic 5000 series automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The mixed heating circuits are controlled by FM-MM modules. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The boiler pump is controlled by the Logamatic R5313 automatics with a 0-10 V signal.

Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
1× Logano plus GB402-395/470/545/620	Different types
1× manifold for the safety group	8718572719
1× bar for safety valves	8718572302
Control	
1× Logamatic R5313	7736602051
1× FM-MM module	8718598828
1× sensor FV (FV/FZ)	5991376
2× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 46

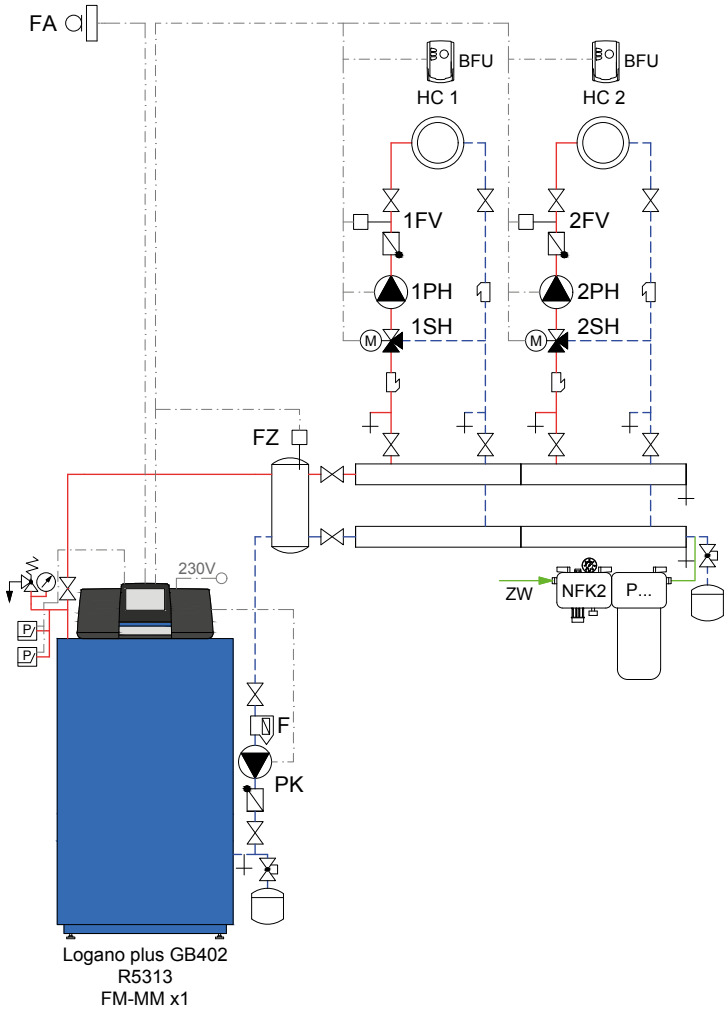


Fig. 86 Hydraulic diagram

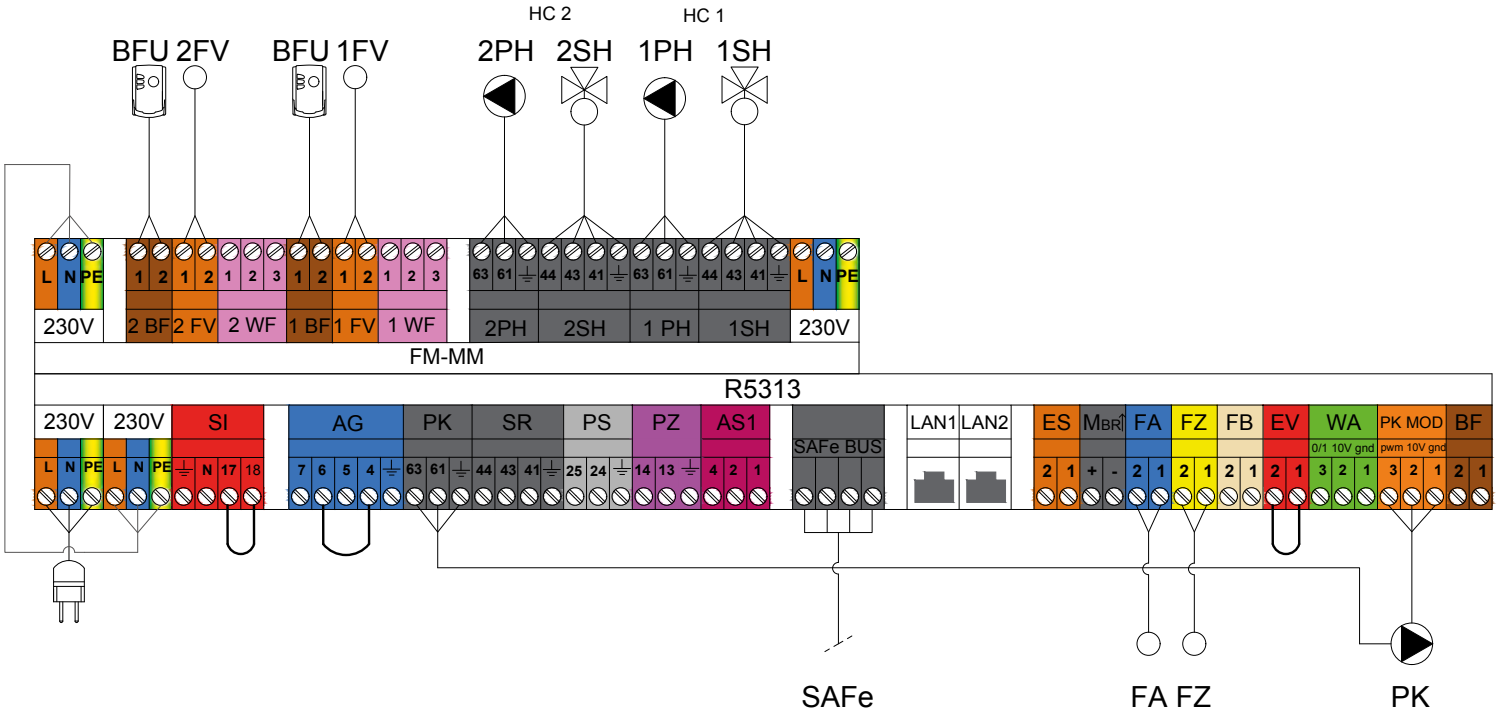


Fig. 87 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus GB402 with two mixed heating circuits and DHW charging circuit. Logamatic 5000 series automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The mixed heating circuits are controlled by FM-MM modules. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The boiler pump is controlled by the Logamatic R5313 automatics with a 0-10 V signal.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by R5313 control units. The DHW charging circuit can operate in parallel or priority over the selected heating circuits, while parallel operation requires mixing valves in these circuits. Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
1× Logano plus GB402-395/470/545/620	Different types
1× manifold for the safety group	8718572719
1× bar for safety valves	8718572302
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× Logamatic R5313	7736602051
1× sensor FB	7735502288
1× sensor FV (FV/FZ)	5991376
2× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 47

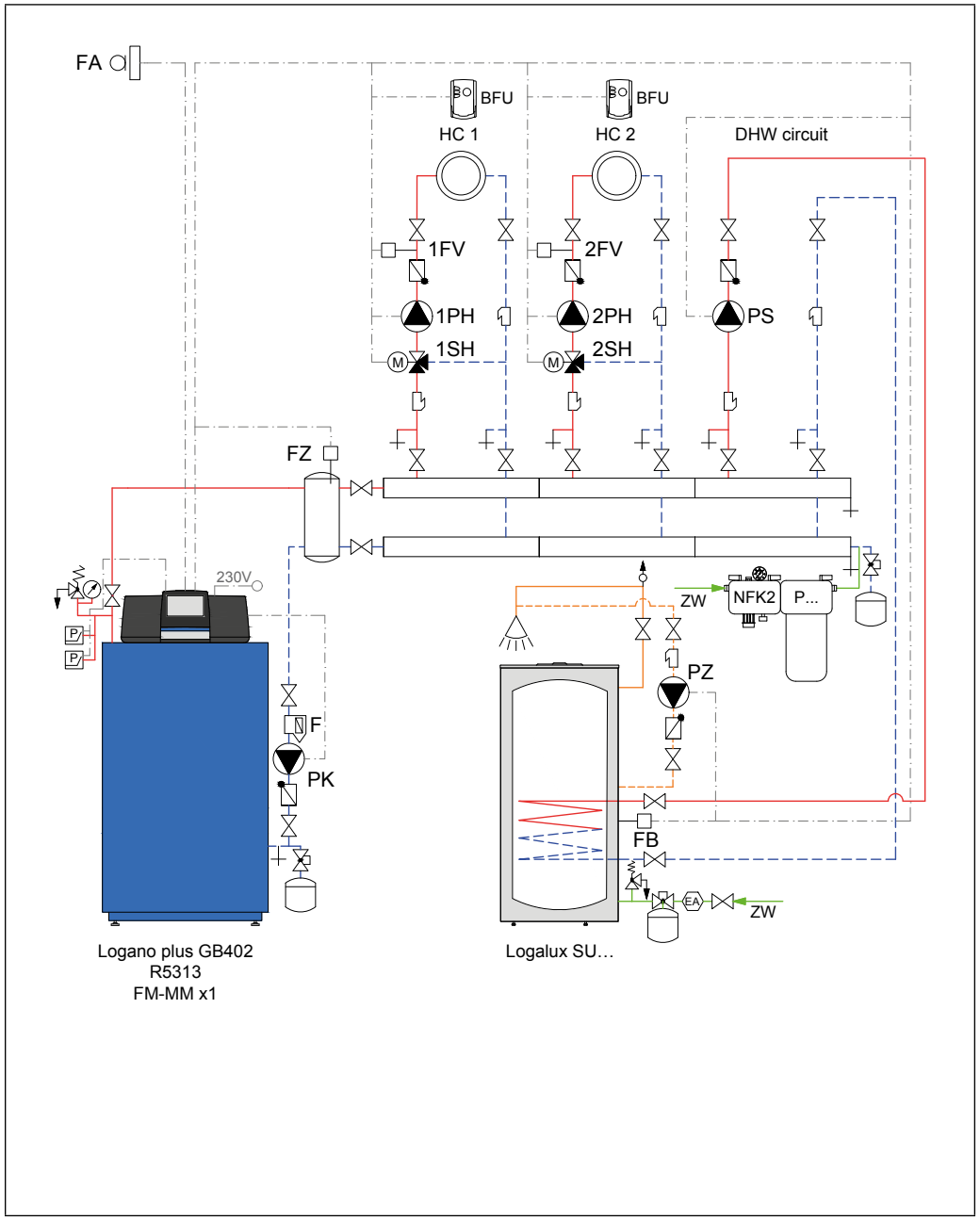


Fig. 88 Hydraulic diagram

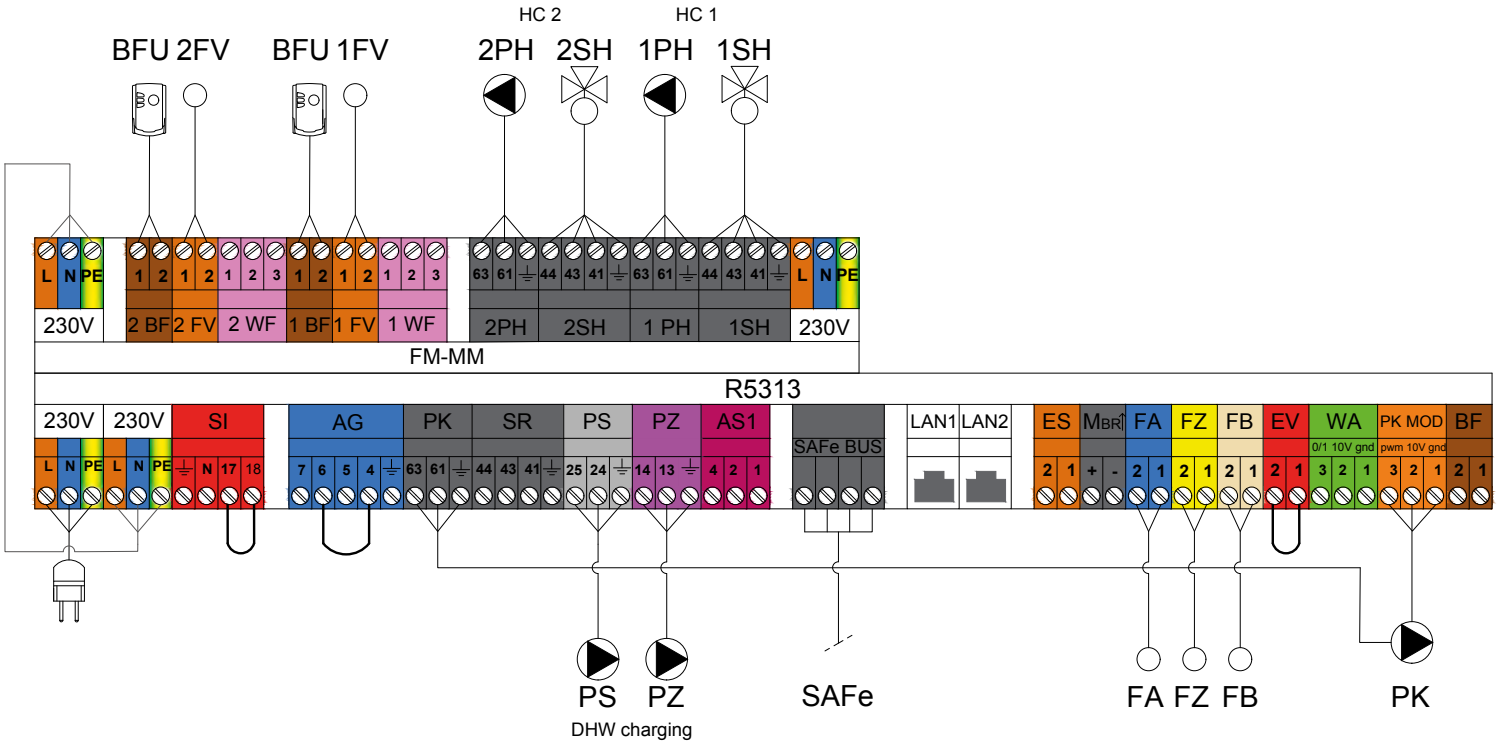


Fig. 89 Electrical diagram

System example

Buderus floor-standing gas boiler Logamax plus GB402 with four mixed heating circuits. Logamatic 5000 series automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits and boiler circuit is forced by circulation pumps.

Heating circuits are controlled by FM-MM modules, the system heating flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature. The boiler pump is controlled by the Logamatic R5313 automatics with a 0-10 V signal.

Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
1× Logano plus GB402-395/470/545/620	Different types
1× manifold for the safety group	8718572719
1× bar for safety valves	8718572302
Control	
1× Logamatic R5313	7736602051
2× FM-MM module	8718598828
2× sensor FV (FV/FZ)	5991376
4× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 48

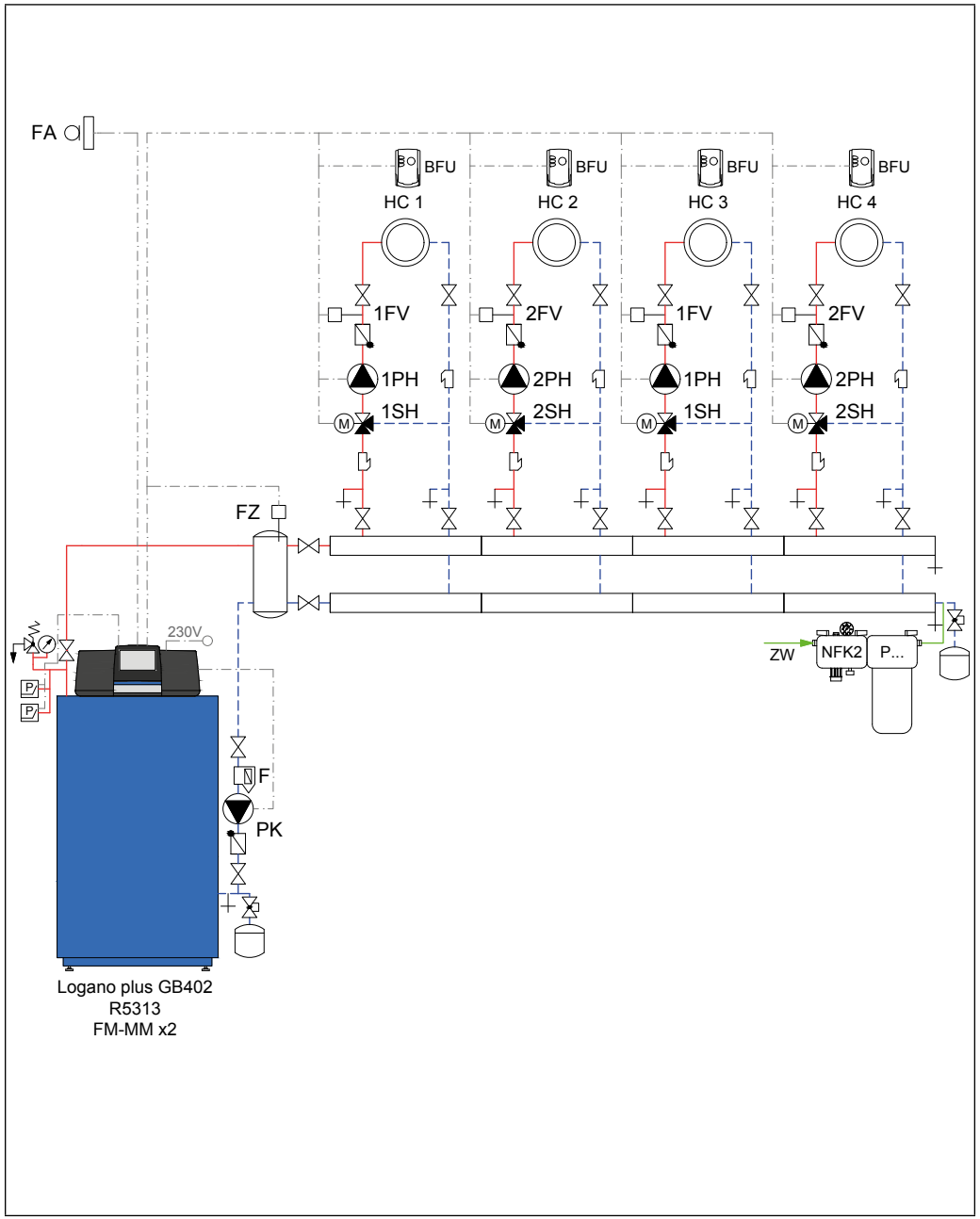


Fig. 90 Hydraulic diagram

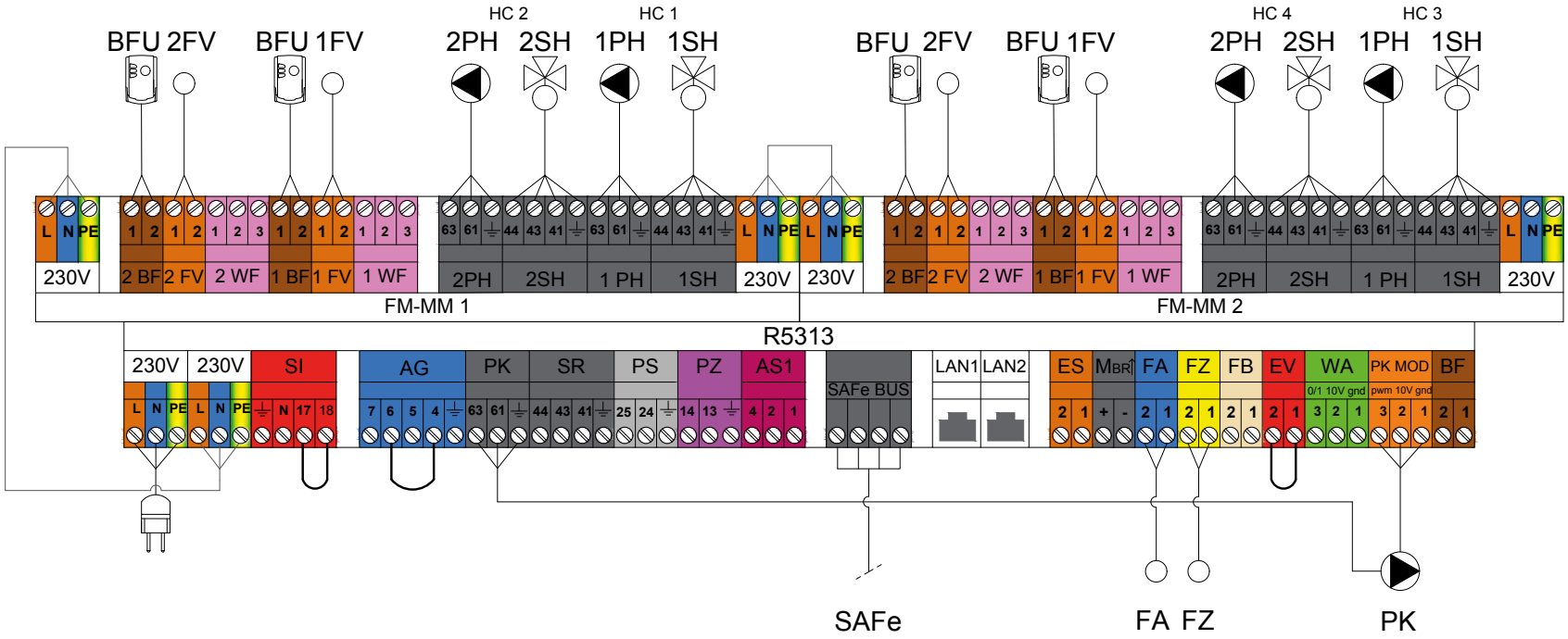


Fig. 91 Electrical diagram

System example

Floor-standing gas boiler Logamax plus GB402. Logamatic EMS Plus automatics interacts with external automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The installation is controlled by an external system. The system adjusts the heating flow temperature or the boiler output according to the installation heat demand. Adjusting is carried out with the help of 0-10 V signal. The boiler safety systems (e.g. start-up characteristics, timing) have priority over the request of the external system.

Installation	Product number
Gas boiler	
1× Logano plus GB402-395/470/545/620	Different types
1× manifold for the safety group	8718572719
1× bar for safety valves	8718572302
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
1× boiler automatics MC110	7736602700
1× operational module BC30E	7738112426
or Logamatic RC310 (black)	7738111127
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
1× neutralizing kit NE 0.1	8718576749

Table 49

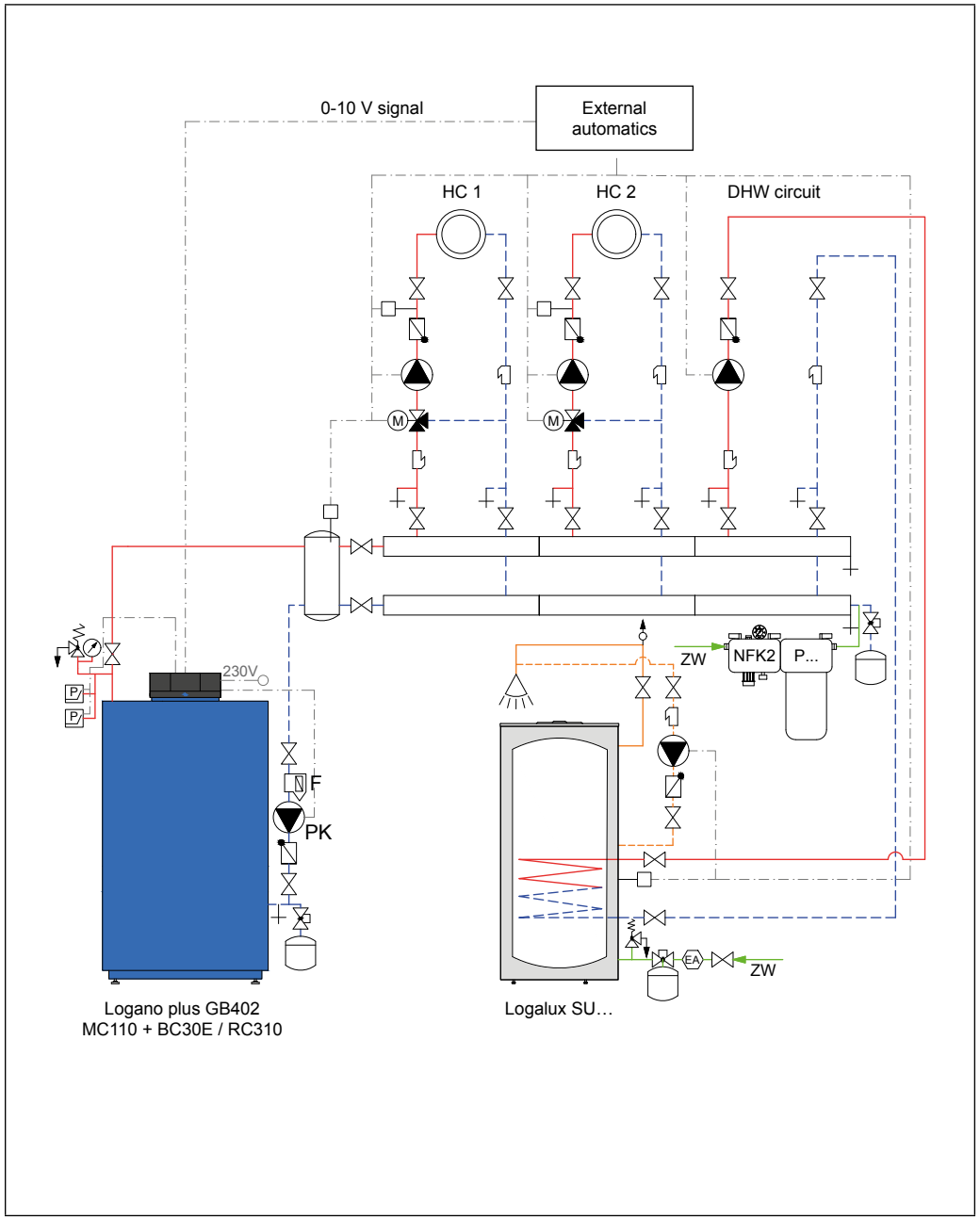


Fig. 92 Hydraulic diagram

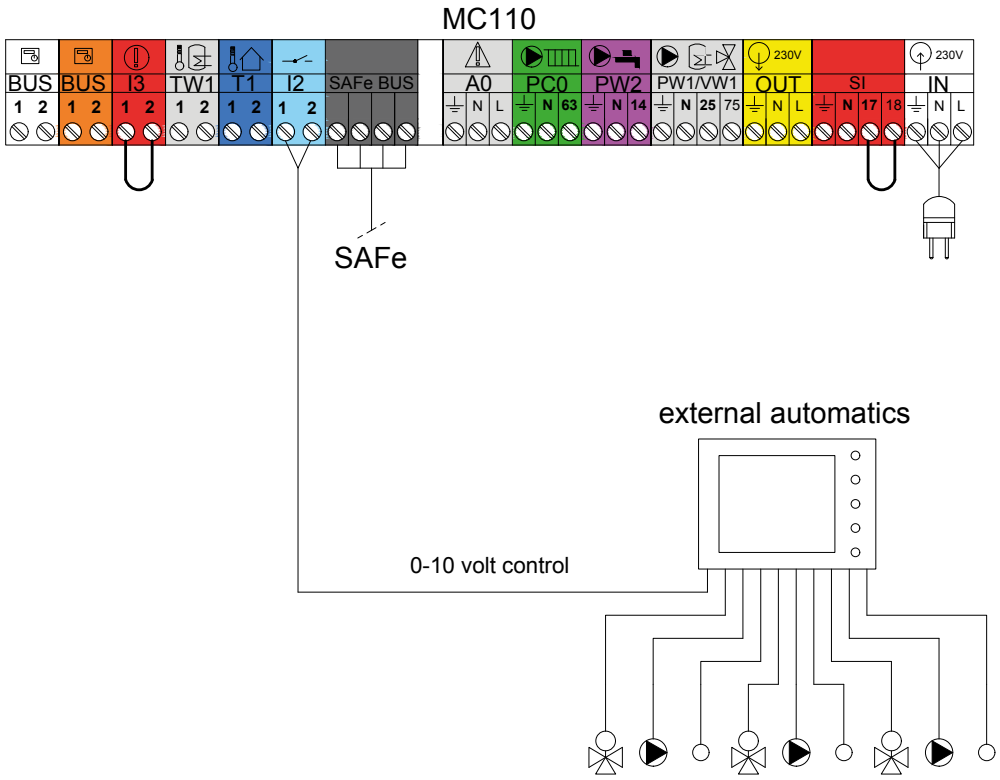


Fig. 93 Electrical diagram

System example

A cascade of Buderus floor-standing gas boilers Logamax plus GB402 with two mixed heating circuits. Logamatic 5000 series automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by FM-MM module. The boiler pump is controlled by the Logamatic R5313 automatics with a 0-10 V signal.

A cascade of boilers is controlled by FM-CM module. One module can be used to control 4 heat sources. A maximum of 4 cascade modules can be used in one installation, which allows to control 16 devices. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
2× Logano plus GB402-395/470/545/620	Different types
2× manifold for the safety group	8718572719
2× bar for safety valves	8718572302
Control	
2× Logamatic R5313	7736602051
1× FM-MM module	8718598828
1× FM-CM module	7736602092
1× sensor FV (FV/FZ)	5991376
2× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
2× neutralizing kit NE 0.1	8718576749

Table 50

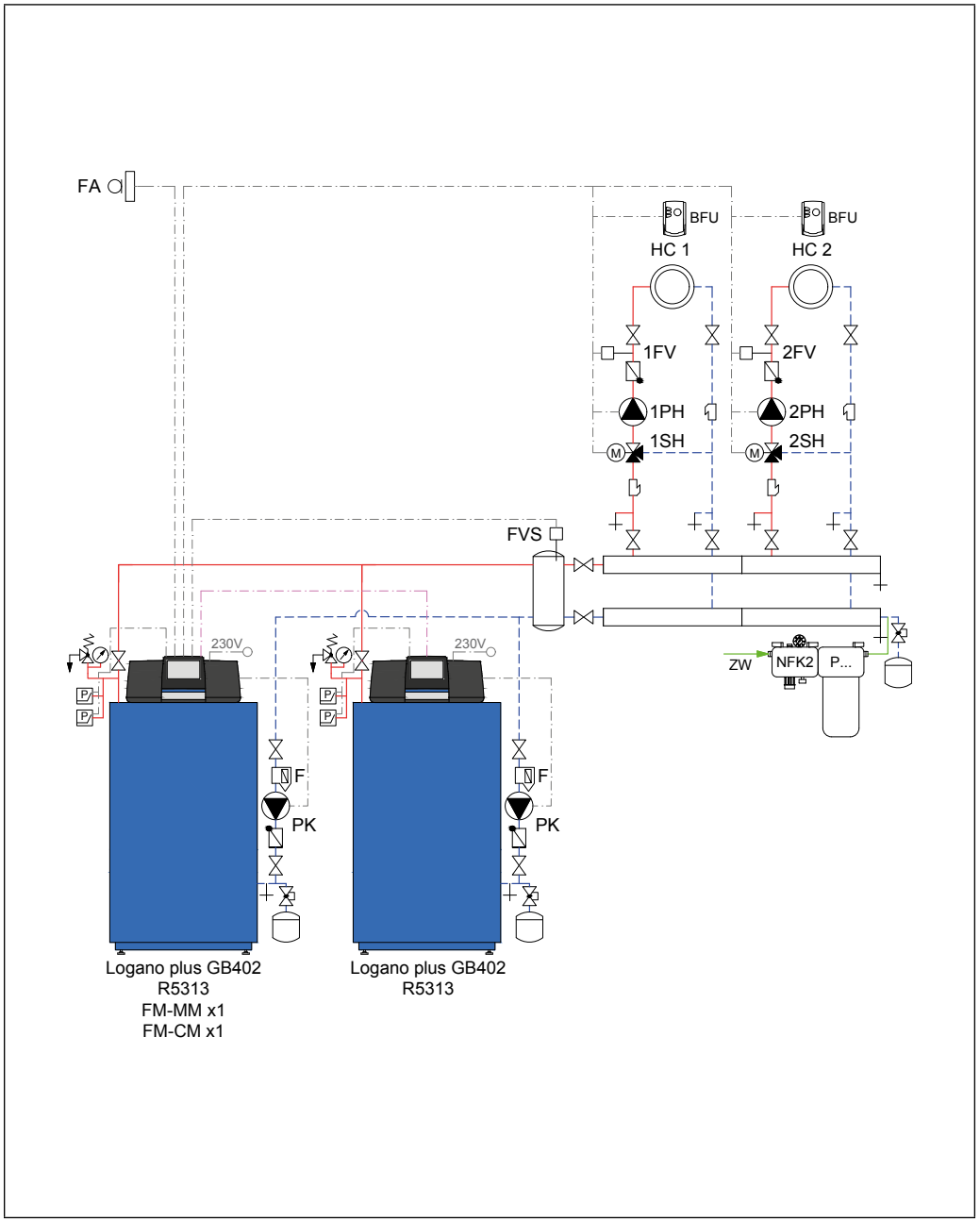


Fig. 94 Hydraulic diagram

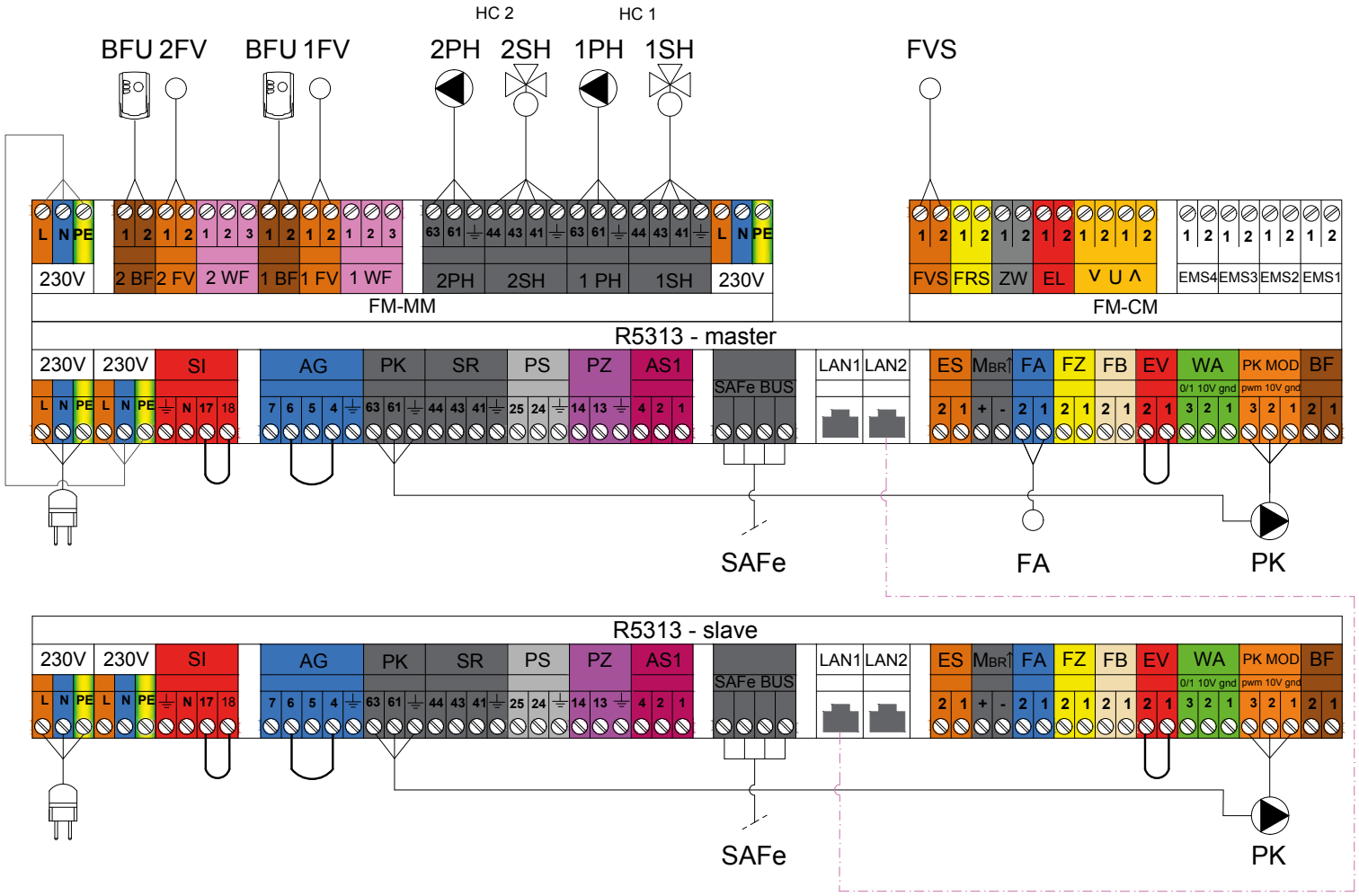


Fig. 95 Electrical diagram

System example

A cascade of Buderus floor-standing gas boilers Logamax plus GB402 with one mixed heating circuit and a DHW charging circuit. Logamatic 5000 series automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by FM-MM modules. The boiler pump is controlled by the Logamatic R5313 automatics with a 0-10 V signal.

A cascade of boilers is controlled by FM-CM module. One module can be used to control 4 heat sources. A maximum of 4 cascade modules can be used in one installation, which allows to control 16 devices. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Domestic water is heated in a monovalent cylinder. The flow through the coil is forced by a loading pump controlled by R5313 control units. The DHW charging circuit can operate in parallel or priority over the selected heating circuits, while parallel operation requires mixing valves in these circuits. Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
2× Logano plus GB402-395/470/545/620	Different types
2× manifold for the safety group	8718572719
2× bar for safety valves	8718572302
Hot water cylinder	
1× cylinder Logalux SU...	Different types
Control	
2× Logamatic R5313	7736602051
1× FM-MM module	8718598828
1× FM-CM module	7736602092
1× sensor FB	7735502288
2× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
2× neutralizing kit NE 0.1	8718576749

Table 51

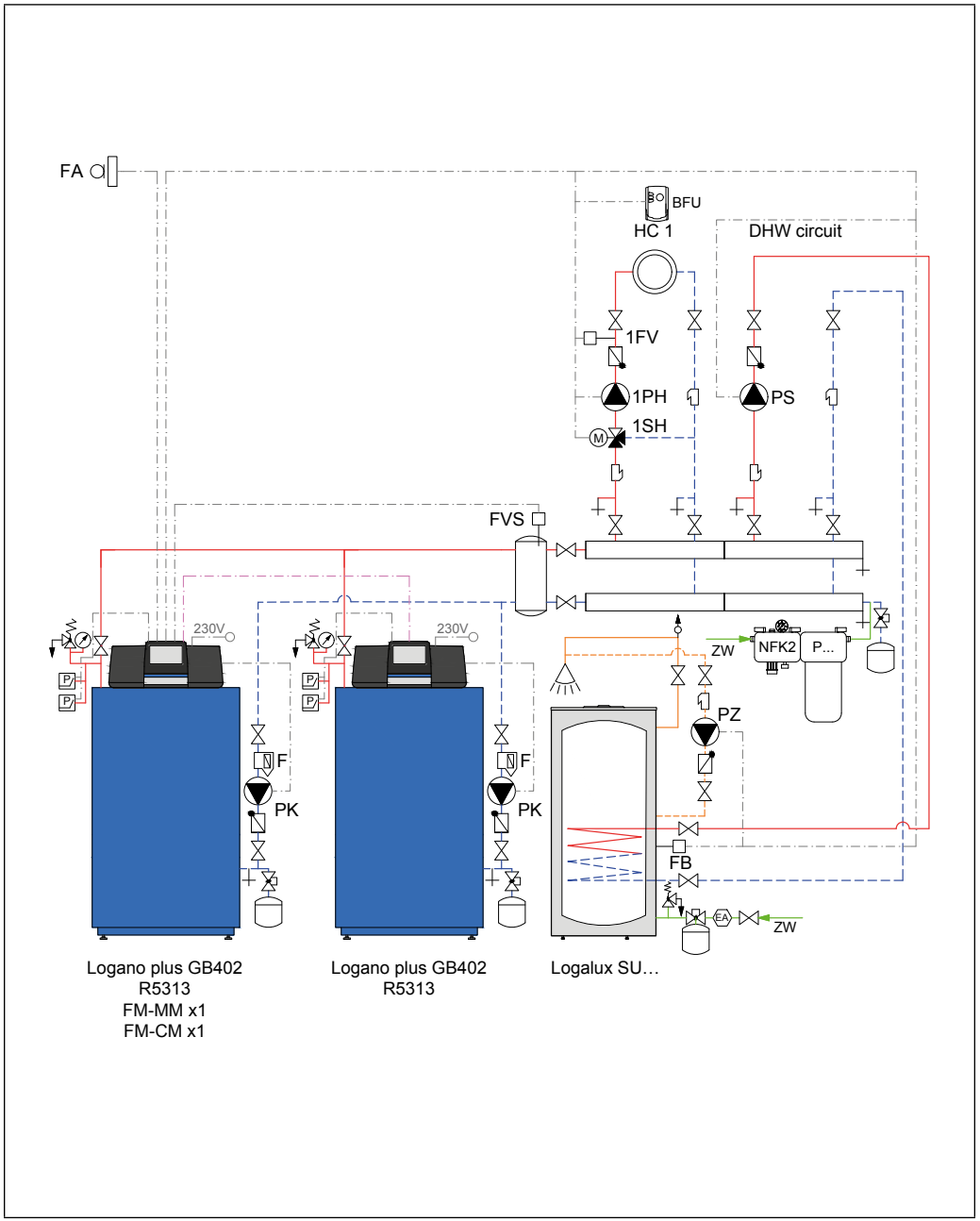


Fig. 96 Hydraulic diagram

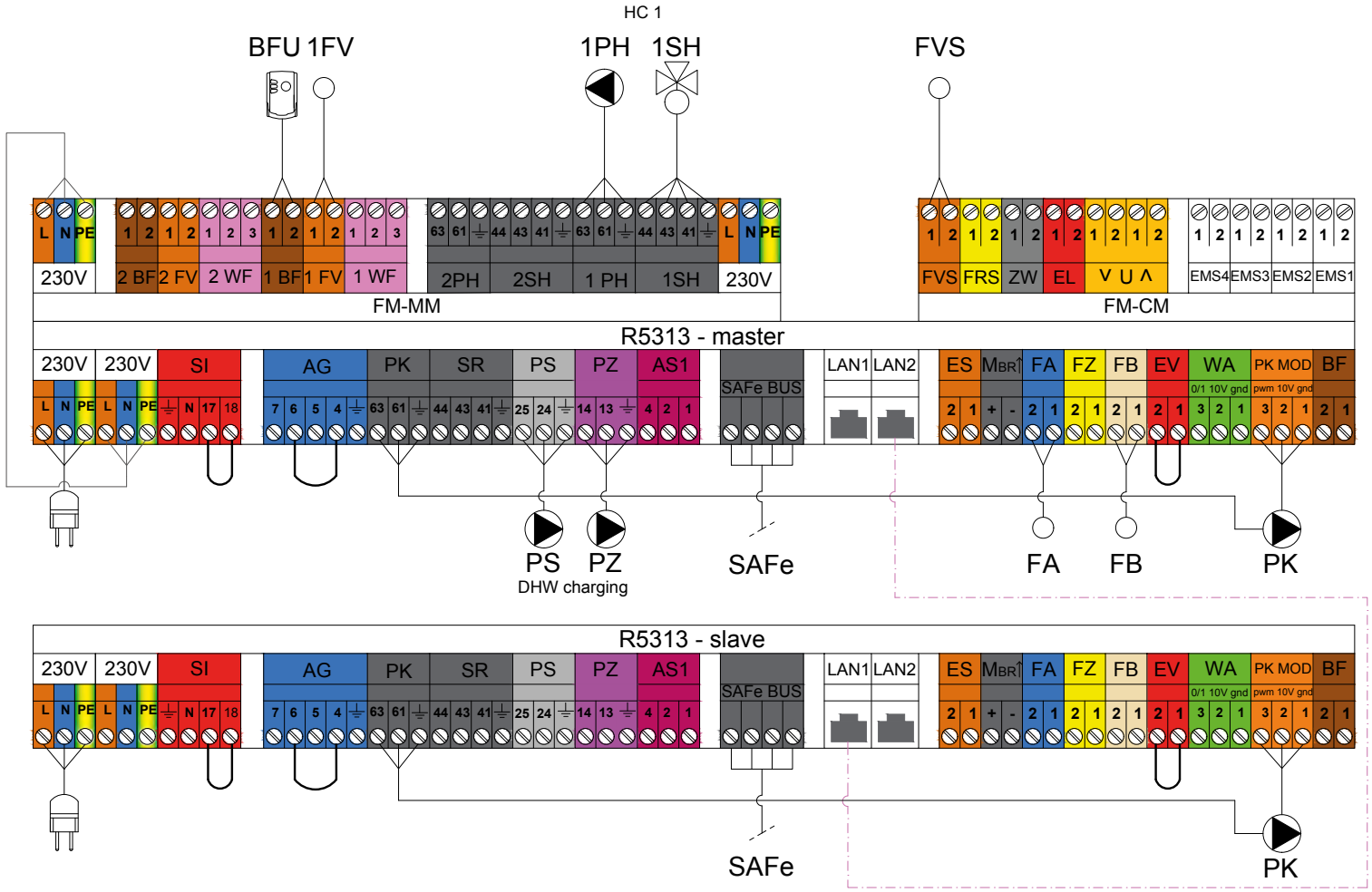


Fig. 97 Electrical diagram

System example

A cascade of Buderus floor-standing gas boilers Logamax plus GB402 with one mixed heating circuit and two independent DHW charging circuits. Logamatic 5000 series automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The heating circuits are controlled by FM-MM modules. The boiler pump is controlled by the Logamatic R5313 automatics with a 0-10 V signal.

A cascade of boilers is controlled by FM-CM module. One module can be used to control 4 heat sources. A maximum of 4 cascade modules can be used in one installation, which allows to control 16 devices. The system flow temperature is defined as a function of the outdoor temperature and the heating curve of the circuit with the highest flow temperature.

Domestic water is heated in two independent monovalent cylinders. The flow through the coil is forced by a loading pump controlled by R5313 control units. Both DHW charging circuits can operate in parallel or priority over the selected heating circuits, while parallel operation requires mixing valves in these circuits. Max two independent DHW circuits can be controlled by one R5313 control unit, but in this case the FM-MW module has to be used.

Function modules FM... must be installed in the R5313 control unit. The system can be expanded with the help of additional modules (see tab. 1, page 4).

Installation	Product number
Gas boiler	
2× Logano plus GB402-395/470/545/620	Different types
2× manifold for the safety group	8718572719
2× bar for safety valves	8718572302
Hot water cylinder	
2× cylinder Logalux SU...	Different types
Control	
2× Logamatic R5313	7736602051
1× FM-MM module	8718598828
1× FM-CM module	7736602092
2× sensor FB	7735502288
1× control unit BFU (optional)	30002256
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
2× neutralizing kit NE 0.1	8718576749

Table 52

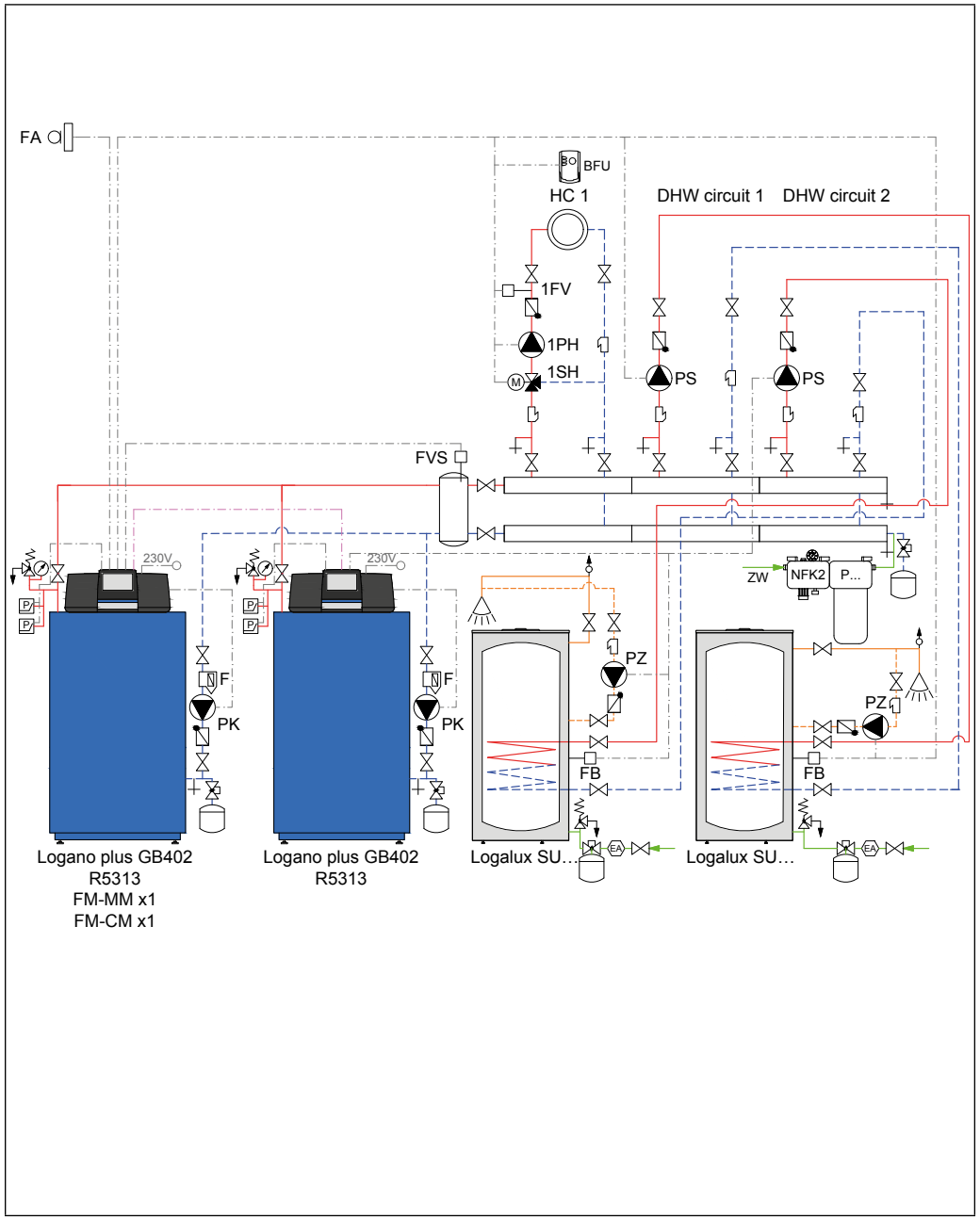


Fig. 98 Hydraulic diagram

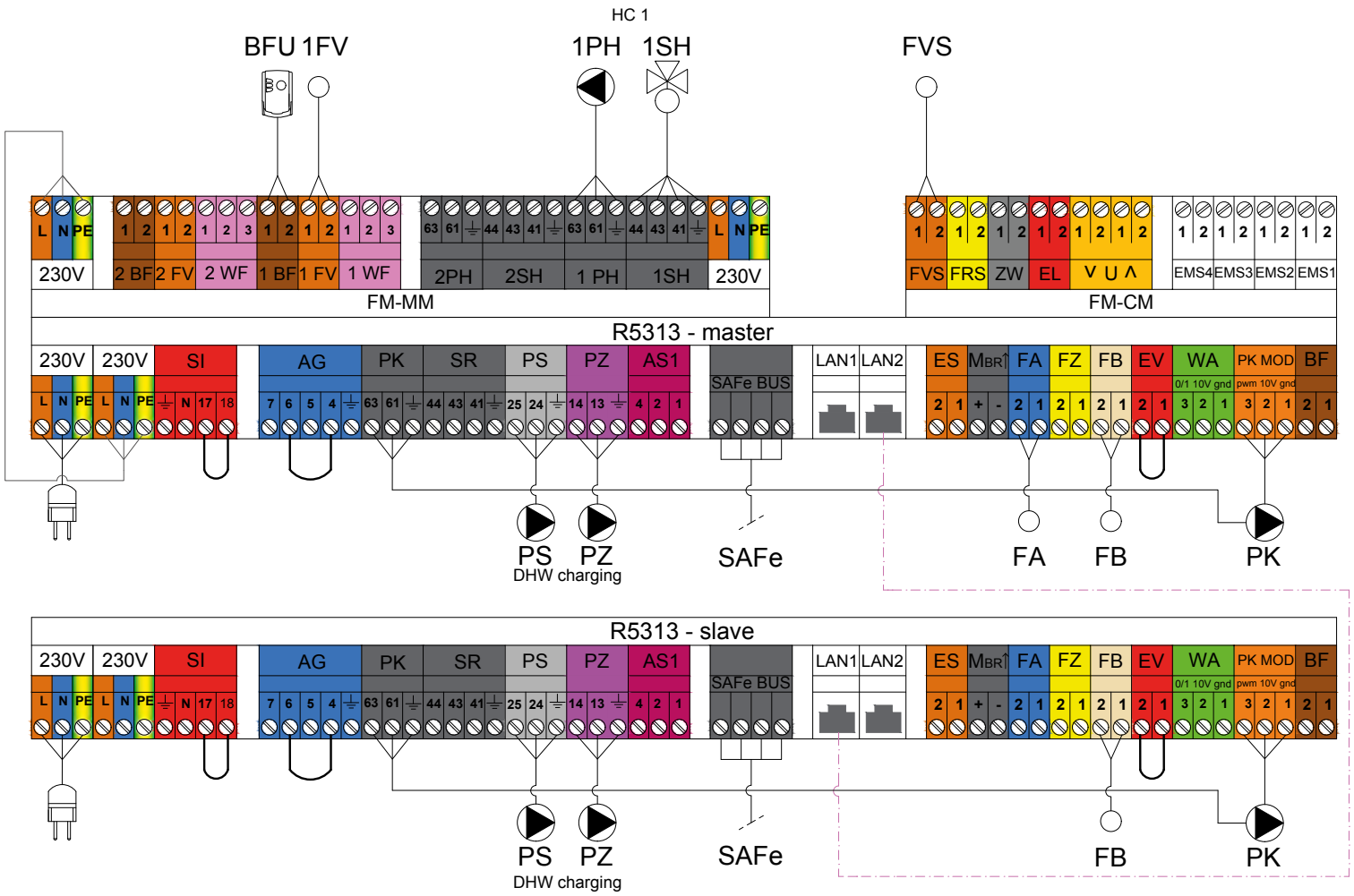


Fig. 99 Electrical diagram

System example

A cascade of Buderus floor-standing gas boilers Logamax plus GB402. Logamatic 5000 series automatics interacts with external automatics.

Description

The system is equipped with a low loss header. The flow in the heating circuits is forced by circulation pumps.

The installation is controlled by an external system. The system adjusts the heating flow temperature or the output of cascade boilers according to the installation heat demand. Adjusting is carried out with the help of 0-10 V signal. The boiler safety systems (e.g. start-up characteristics, timing) have priority over the request of the external system.

Installation	Product number
Gas boiler	
2× Logano plus GB402-395/470/545/620	Different types
2× manifold for the safety group	8718572719
2× bar for safety valves	8718572302
Control	
2× Logamatic R5313	7736602051
1× FM-CM module	7736602092
Equipment	
1× system filling device	Different types
1× demineralization kit (P)	Different types
2× neutralizing kit NE 0.1	8718576749

Table 53

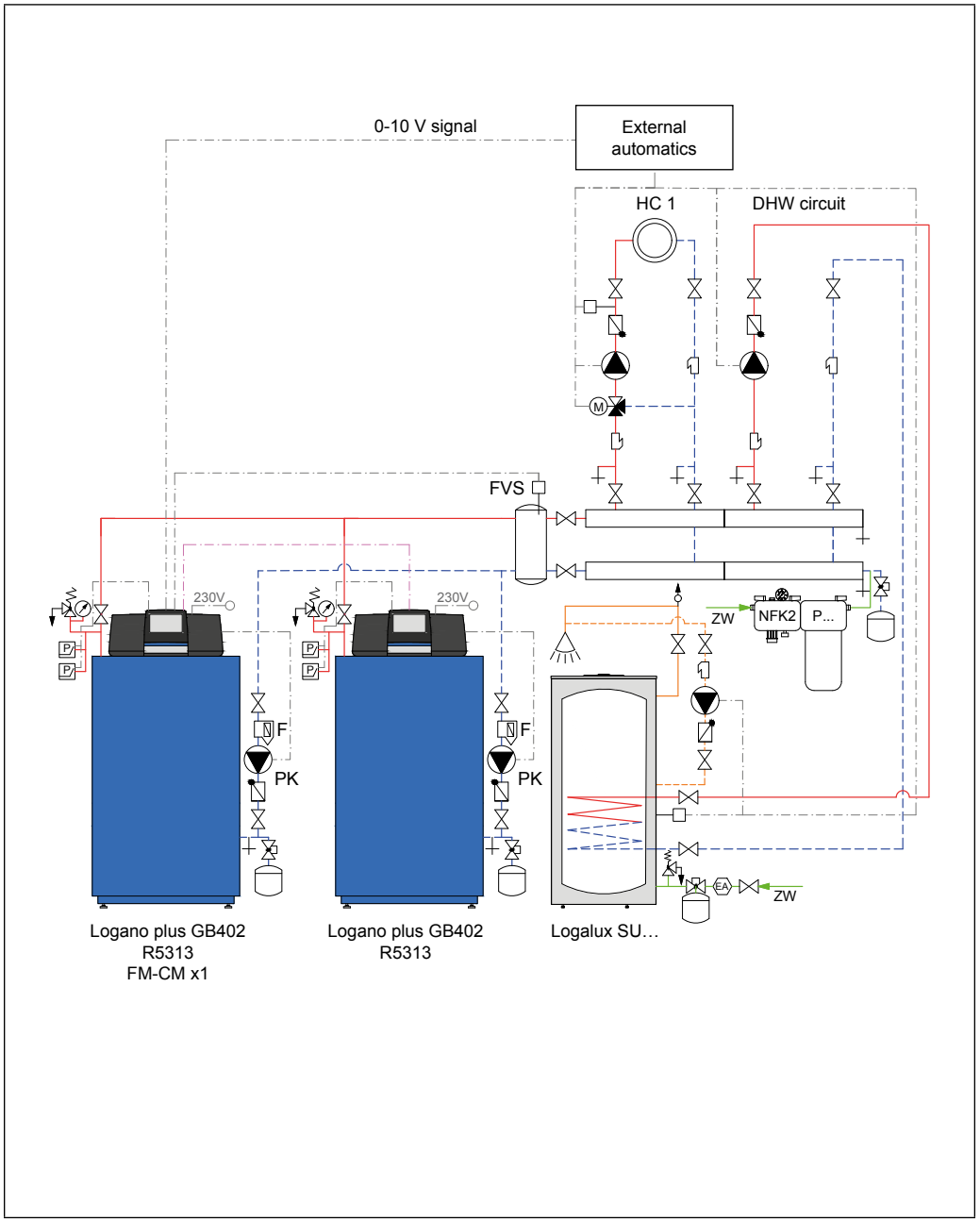


Fig. 100 Hydraulic diagram

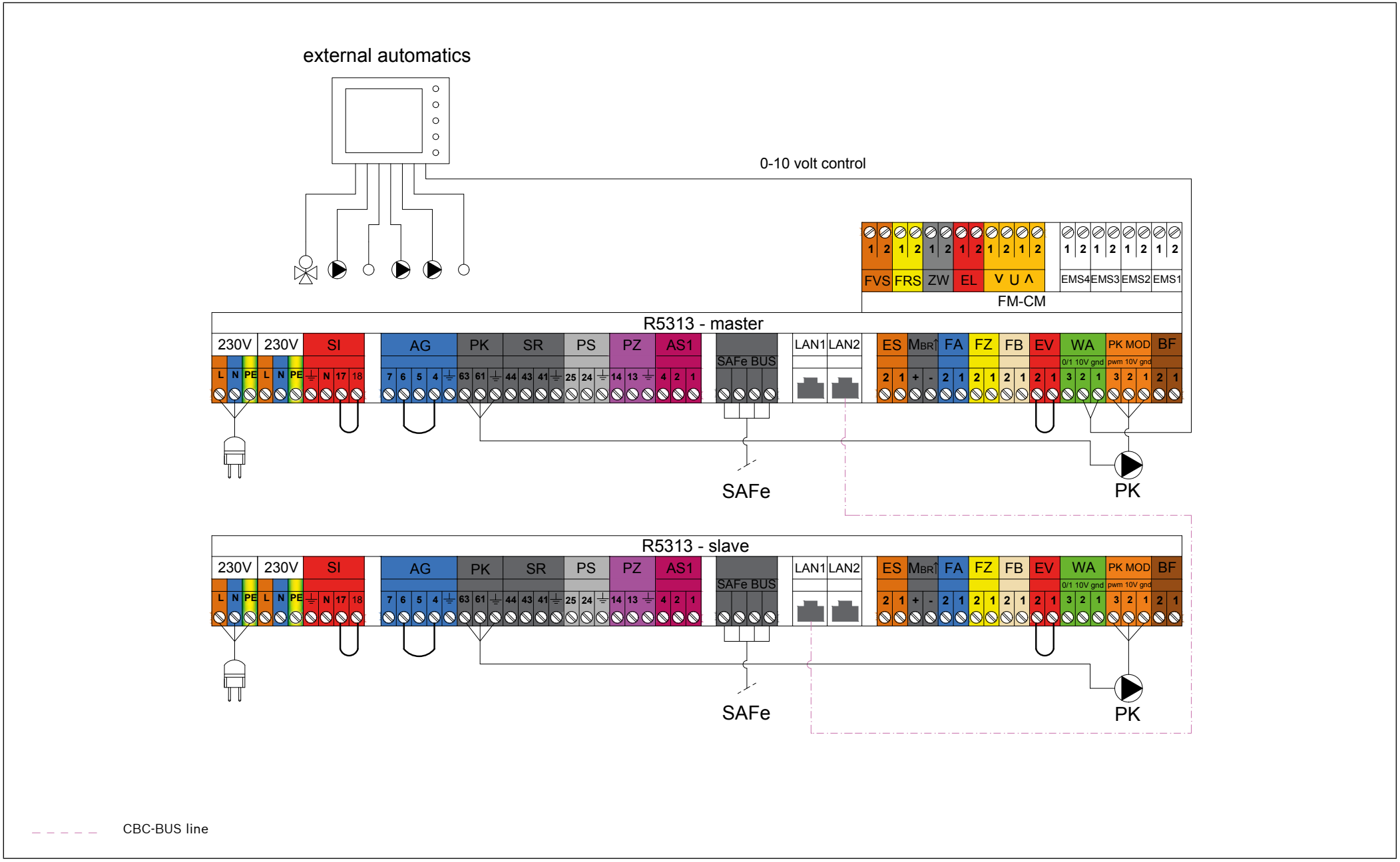


Fig. 101 Electrical diagram

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