



**Modular control system for
Buderus EMS boilers featuring:
indoor reset, outdoor reset,
DHW priority, multi-boiler cascades,
mixed zones, low loss header,
and solar DHW capability**

Table of Contents

1	General information	5		
1.1	This manual	5		
1.2	Standards regulations and directives	5		
1.3	System certification	5		
2	Safety	6		
2.1	Intended use	6		
2.2	Layout of the instructions	6		
2.3	Please follow these instructions	6		
2.4	Tools, materials and accessories	6		
2.5	Disposal	6		
3	Description of systems	7		
3.1	RC35 - User Interface	7		
3.2	MM10 - Mixed Heating Zone Module	8		
3.3	WM10 - Low Loss Header Module	8		
3.4	SM10 – Solar Module	8		
3.5	MCM10 – Cascade Module	9		
4	Systems	10		
4.1	Single zone, single temperature with DHW	11		
4.2	One mixed and one unmixed heating zones with DHW	13		
4.3	One mixed, one unmixed and one thermostatically controlled heating zone with DHW	15		
4.4	A single temperature heating system with solar thermal DHW generation	17		
4.5	One mixed and one unmixed heating zone with solar thermal DHW generation	19		
4.6	Cascade of three GB142 boilers	21		
4.7	Cascade of four GB162 boilers	23		
4.8	Cascade of more than four boilers	25		

1. General information

1.1. This manual

The RC35 is a room control system for wall hung and floor standing Buderus boilers using the EMS bus.
Models: GB142, GB162, GB312 Series Boilers

This manual contains applications design suggestions as well as information on the safe and appropriate installation of the RC35 control system.

It describes the components of the control system, its components and their accessories. It contains important design considerations and sample systems, and is intended for the installer during the planning phase and the actual installation.

These instructions are designed for specialists, who through their training and experience - are knowledgeable in the installation and servicing of heating systems and gas installations.

This document is a supplement to the boiler manuals and the instructions included with the control system and modules.

Each system consists of a hydraulic and a wiring diagram.

1.2. Standards, regulations and directives

It is the responsibility of the installer to ensure that the system corresponds to all current building codes and regulations.

1.3. System certification



The RC35 and accessories are certified for the USA and Canada by CSA International.

2. Safety

2.1. Intended use

The RC35 is a boiler, heating system and solar control for residential and small commercial applications. Use for the intended purpose only.

2.2. Layout of the instructions

Two levels of danger are identified and signified by the following terms:



WARNING! RISK OF FATAL INJURY
Identifies possible dangers emanating from a product, which might cause serious injury or death if appropriate care is not taken.



WARNING! RISK OF INJURY/SYSTEM DAMAGE
Indicates a potentially dangerous situation that could cause minor or moderately serious injuries and damage to property.

Additional symbols for identification of dangers and user instructions:



USER NOTE
User tips for optimal use of equipment and adjustment as well as other useful information.

2.3. Please follow these instructions



WARNING! RISK OF FATAL INJURY FROM ELECTRIC SHOCK.
Before opening the cover disconnect the boiler from electrical power by shutting off the heating system emergency shutoff switch on the boiler or outside the boiler room, or by disengaging the heating system circuit breaker. Take provisions to prevent accidental reconnection.



Only use original Buderus spare parts. Damage caused by the use of parts not supplied by Buderus is excluded from the Buderus warranty.

2.4. Tools, materials and accessories

For the installation of the control system, you will need standard tools used for central heating, boiler and DHW water systems, as well as electrical installation work.

Additional tools needed are described in the appropriate section of these instructions.

2.5. Disposal

- Dispose of the packaging of the control system in an environmentally responsible manner.
- Dispose of defunct components through an authorized agent in an environmentally responsible manner.

3 Description

3.1 RC35 - User Interface

Features:

- Indoor reset
- Outdoor reset
- Room, zone, low loss header and solar DHW capability
- Graphic display and user interface
- System diagnosis
- Error code display
- Programmable thermostat
- User level and service level
- Mounted in boiler or on wall as a room sensor
- DHW priority
- 4 independent heating zones, 3 of them mixed

Four available modules for added functionality:

	MM10	WM10	SM10	MCM10
Description	Mixing module	Low loss header module	Solar DHW module	Cascade module
Input 1	Temperature sensor FV	Low loss header sensor FK	Collector sensor FSK	Outdoor sensor
Input 2	N/A	N/A	Tank bottom sensor FSS	not used
Output 1	Pump PH	Pump PH	Solar pump PSS	not used
Output 2	120V mixing valve SH	N/A	N/A	not used
Notes	Max. 3 MM10 per system.	Max. 1 WM10 per system.	Max. 1 SM10 per system; Pump modulates 30-100% for best delta T.	Requires WM10 low loss header module. Max. 4 MCM10 modules to cascade up to 16 boilers.

3.3. MM10 –Mixed Heating Zone Module

The MM10 controls a motorized mixing valve and zone pump for a zone with a reduced water temperature compared to the system. It is designed for radiant or similar applications with an outdoor reset or room reset heating curve.

Up to three MM10 units can be installed in one RC35 system allowing for four independent heating zones, 3 of them mixed.



Fig. 1 MM10 Mixing Module

3.4. WM10 - Low Loss Header Module

The WM10 allows for a low loss header or hydraulic separation of one or multiple boilers from the system.

It connects a system temperature sensor and a system pump.



Fig. 2 WM10 Low Loss Header Module

3.5. SM10 – Solar Module

The SM10 controls a solar thermal system for generation of solar domestic hot water.



Fig. 3 SM10 Solar Module

3.6. MCM10 – Cascade Module

The MCM10 cascades 2 to 4 boilers each. Up to four modules with 16 boilers can be connected to a system altogether.

The MCM10 requires the use of a WM10 with primary - secondary piping or Low Loss Header.

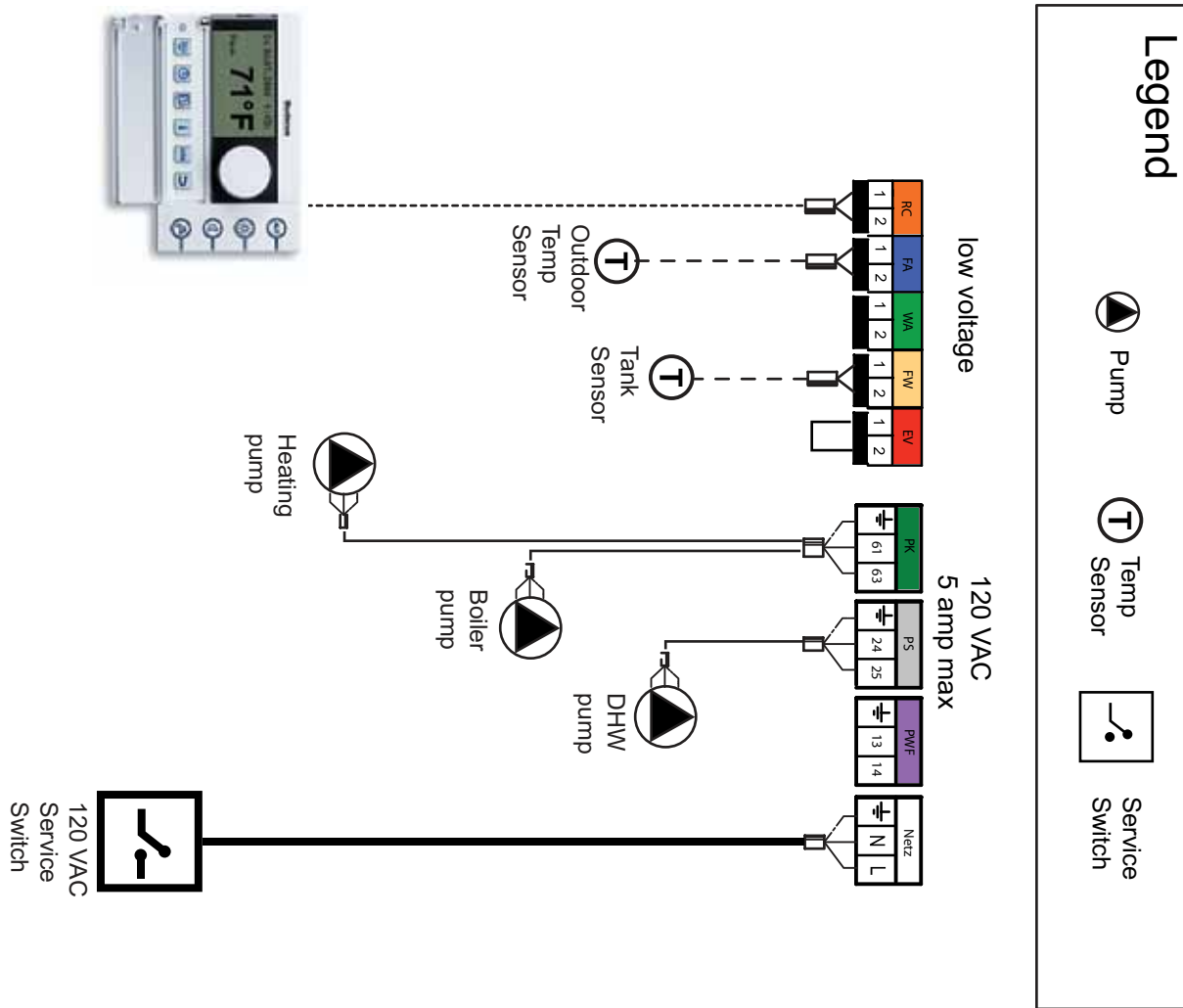


Fig. 4 MCM10 Cascade Module

4. Systems

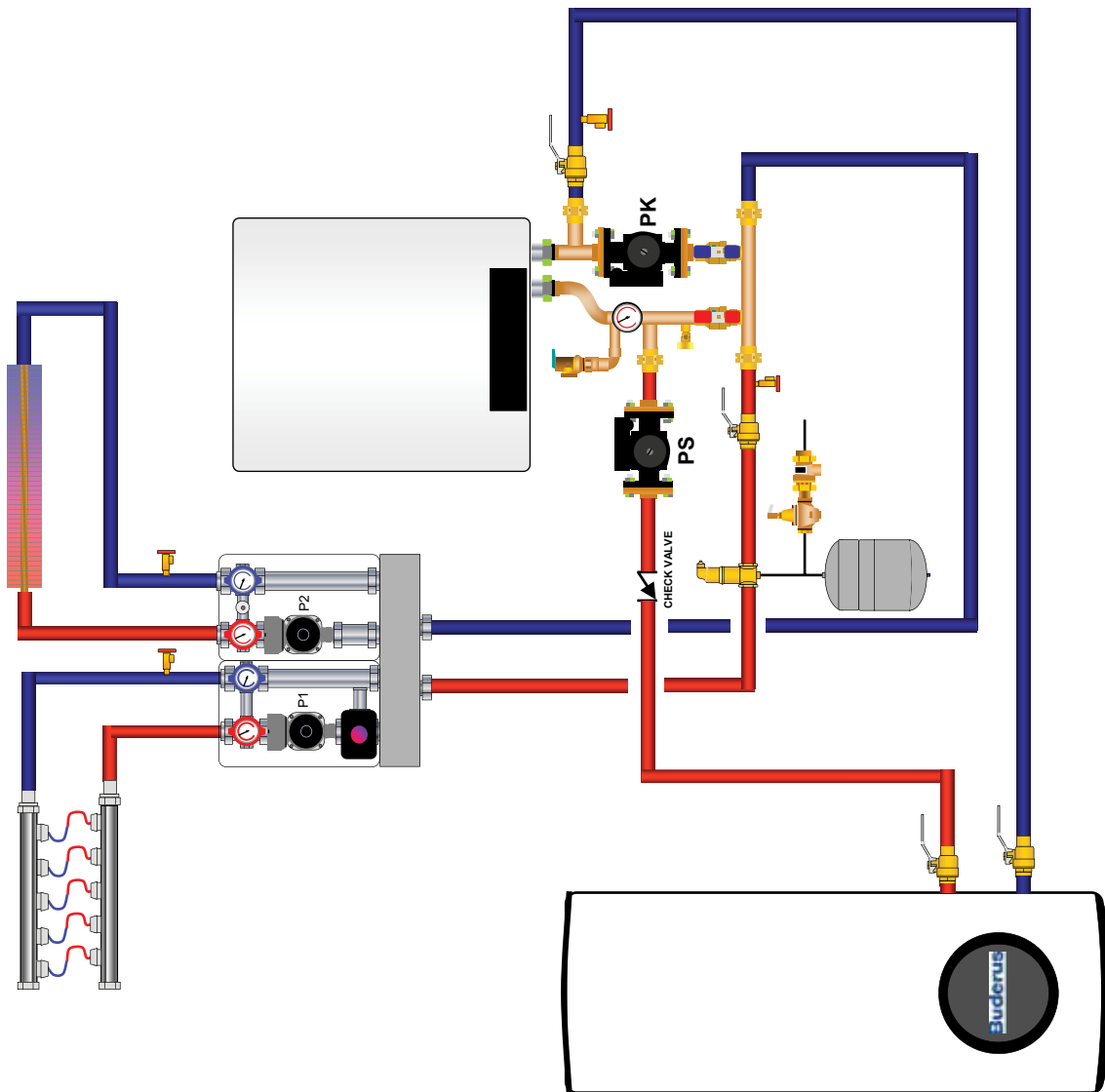
The following system examples show different installation scenarios for the RC35 control system. The capabilities of the controls are not limited to these systems, but are virtually endless through combination of the different components plus accessories.

4.1.2 Wiring diagram

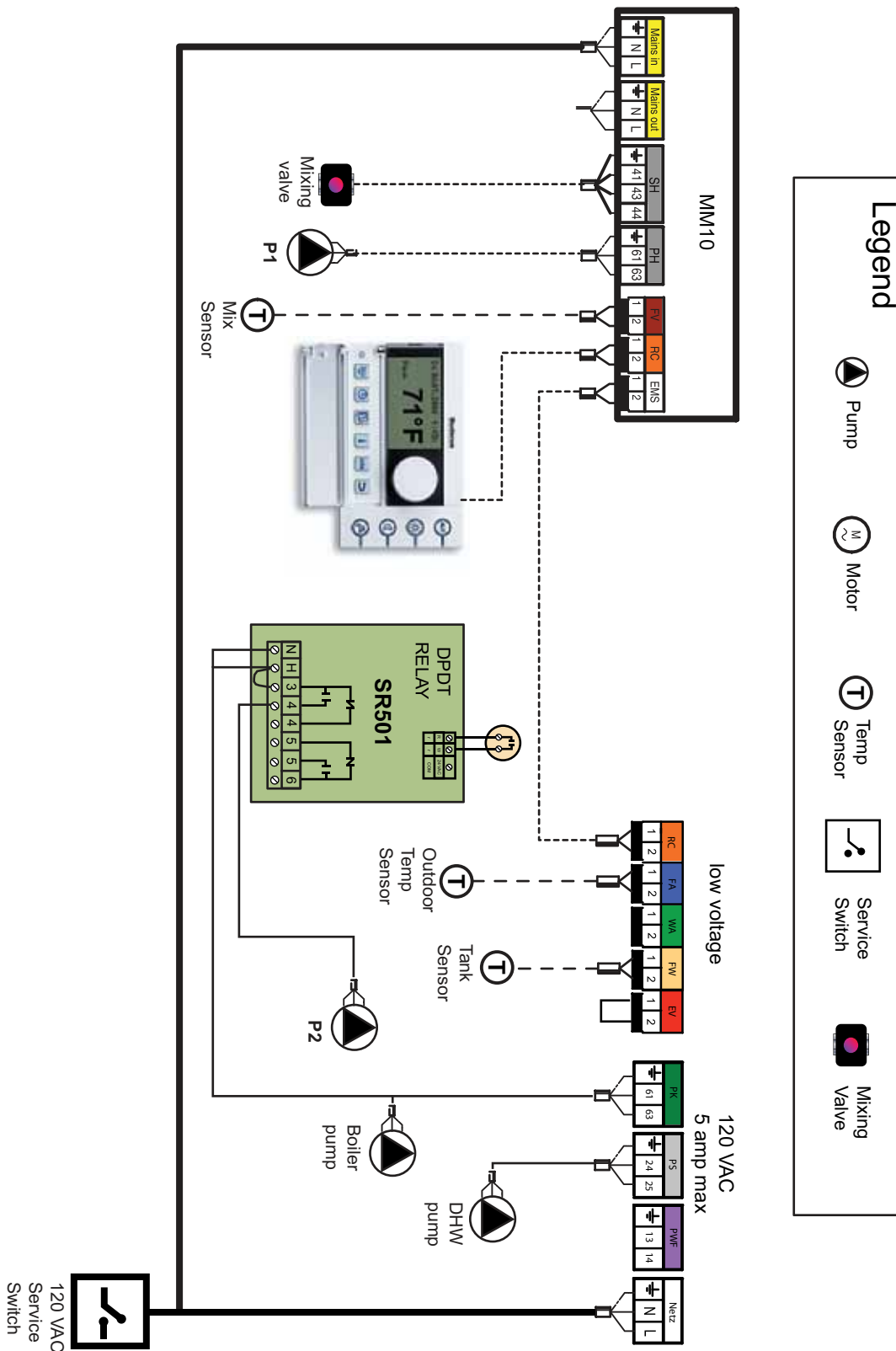


4.2. One mixed and one unmixed heating zones with DHW

4.2.1 Hydraulics

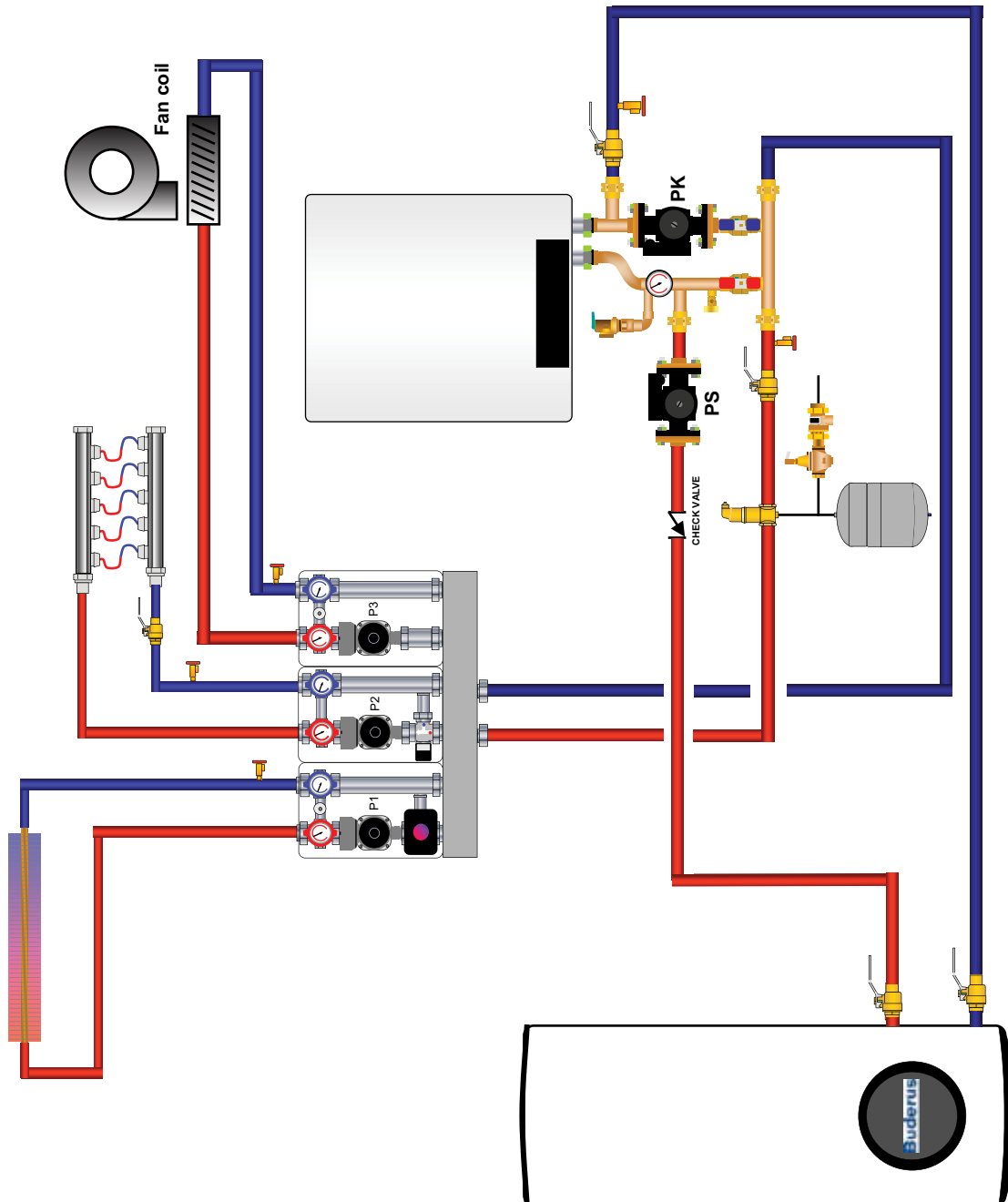


4.2.2 Wiring diagram

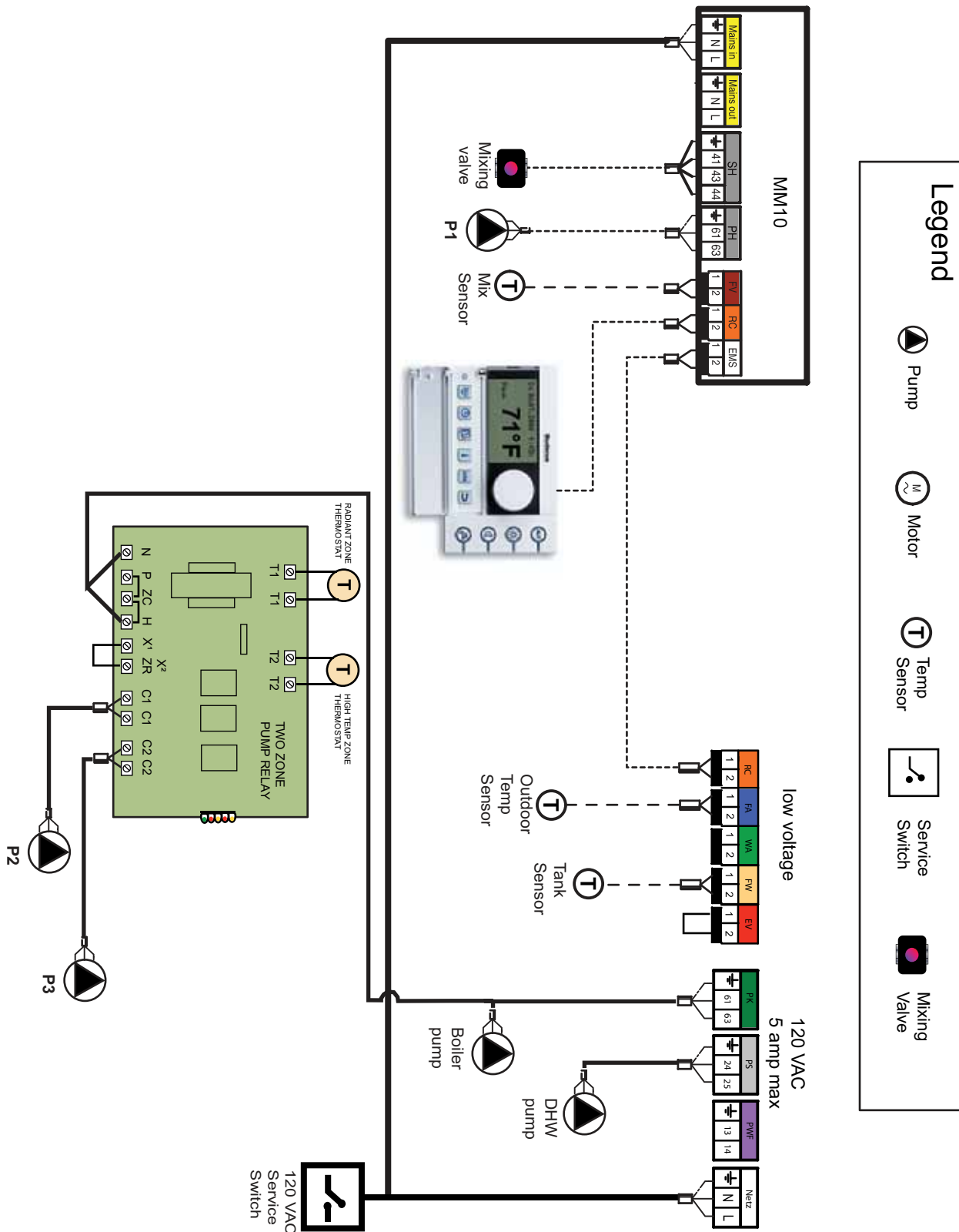


4.3. One mixed, one unmixed and one thermostatically controlled heating zone with DHW

4.3.1 Hydraulics

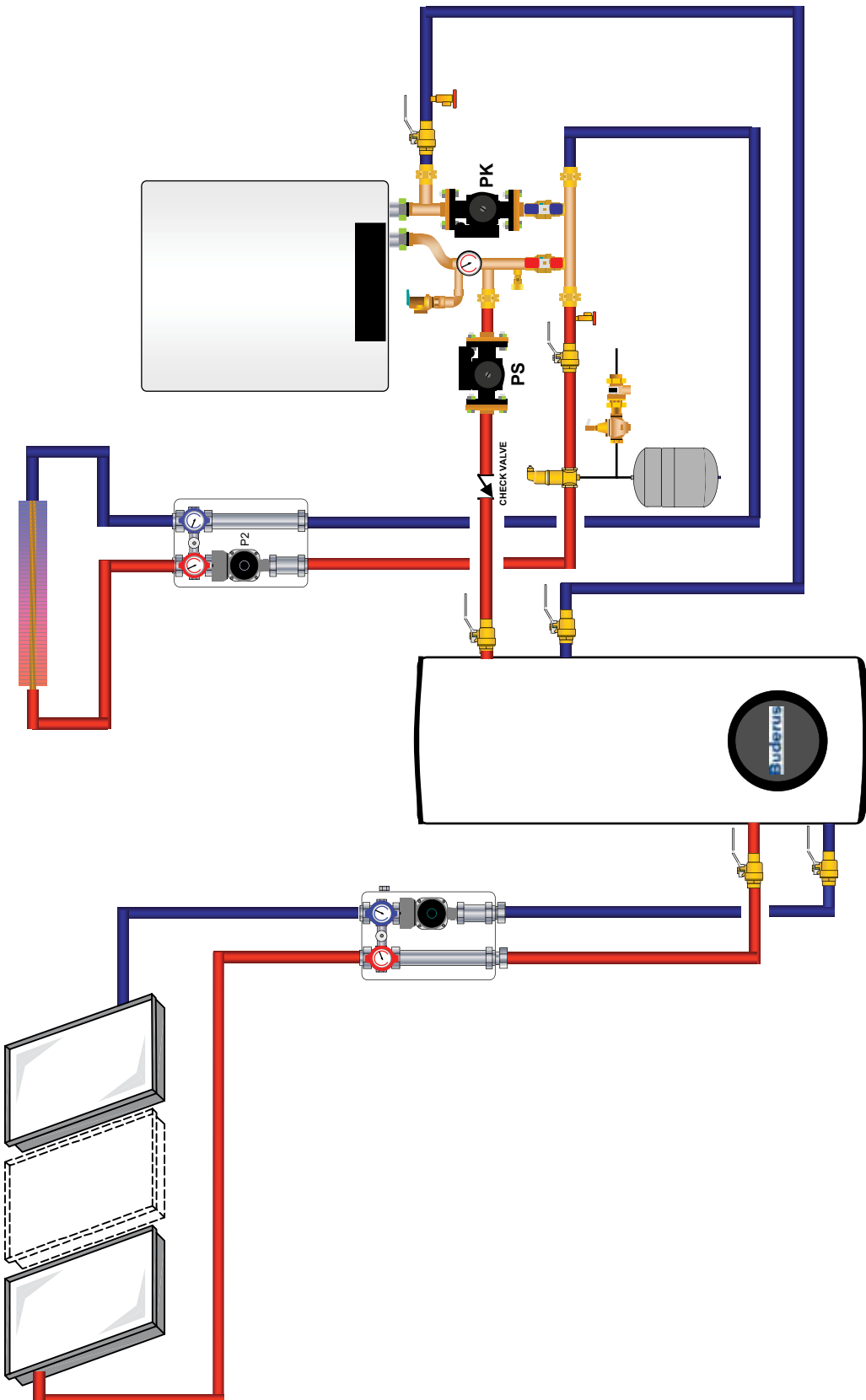


4.3.2 Wiring diagram

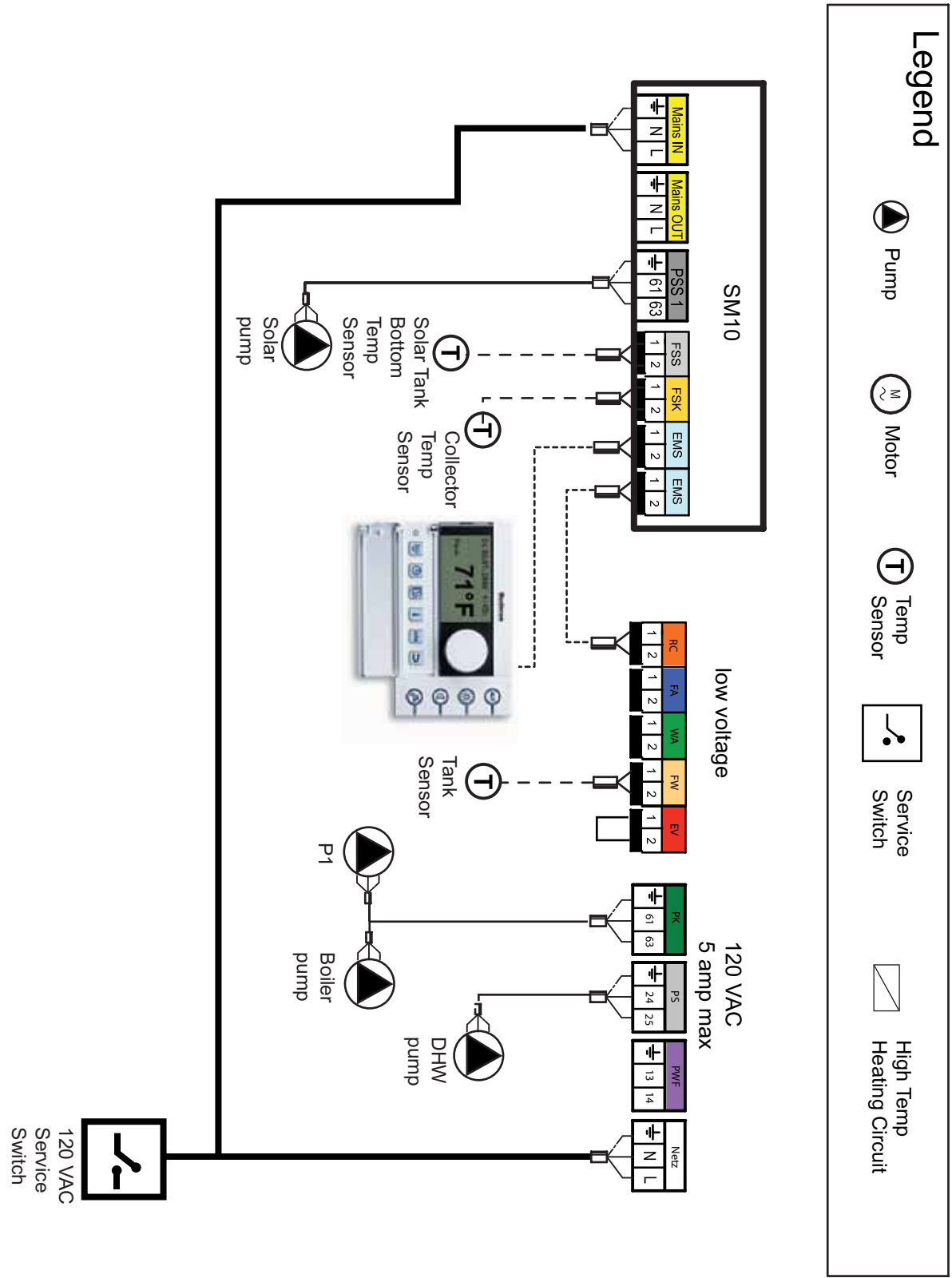


4.4. A single temperature heating system with solar thermal DHW generation

4.4.1 Hydraulics

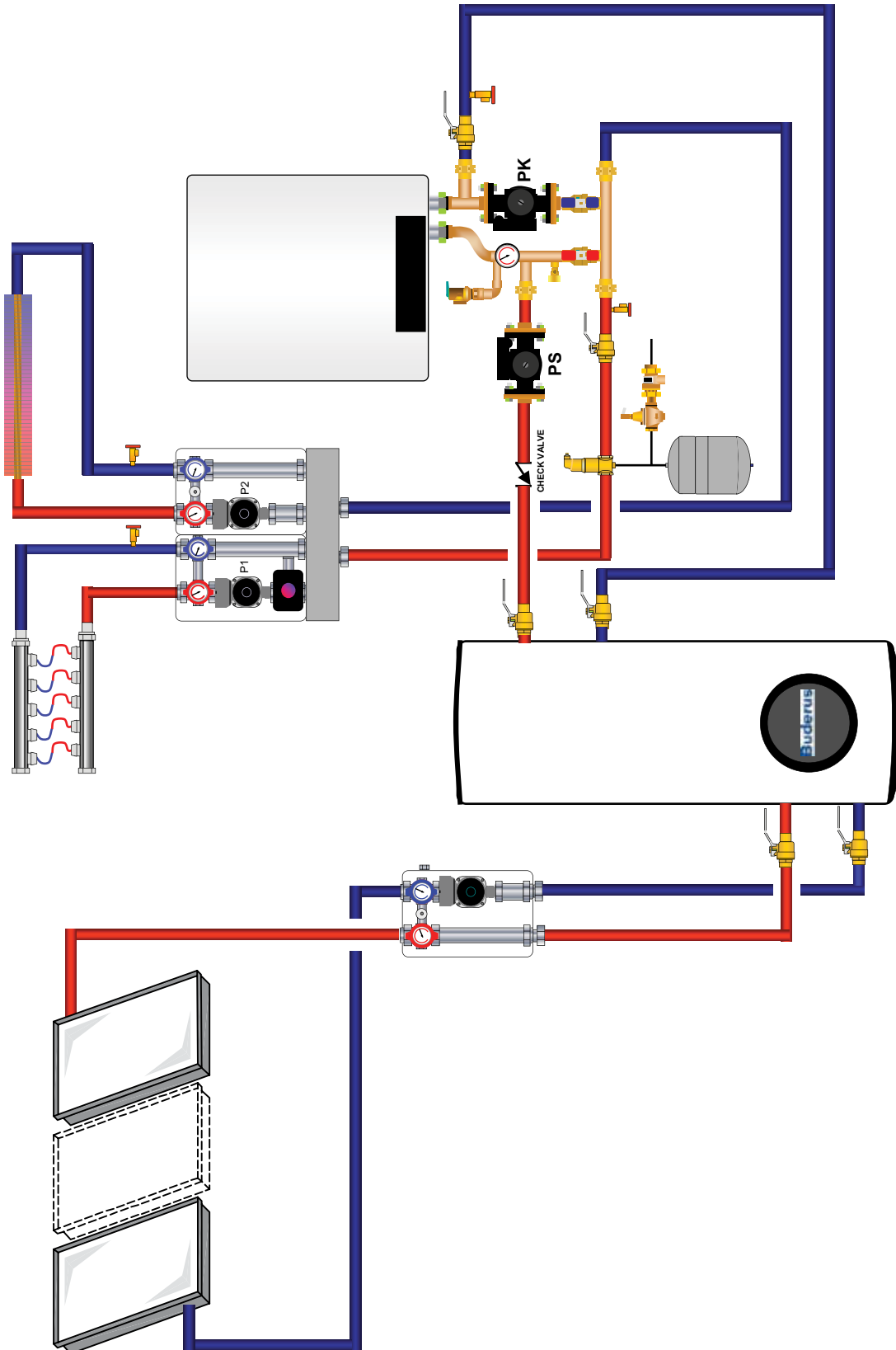


4.4.2 Wiring diagram

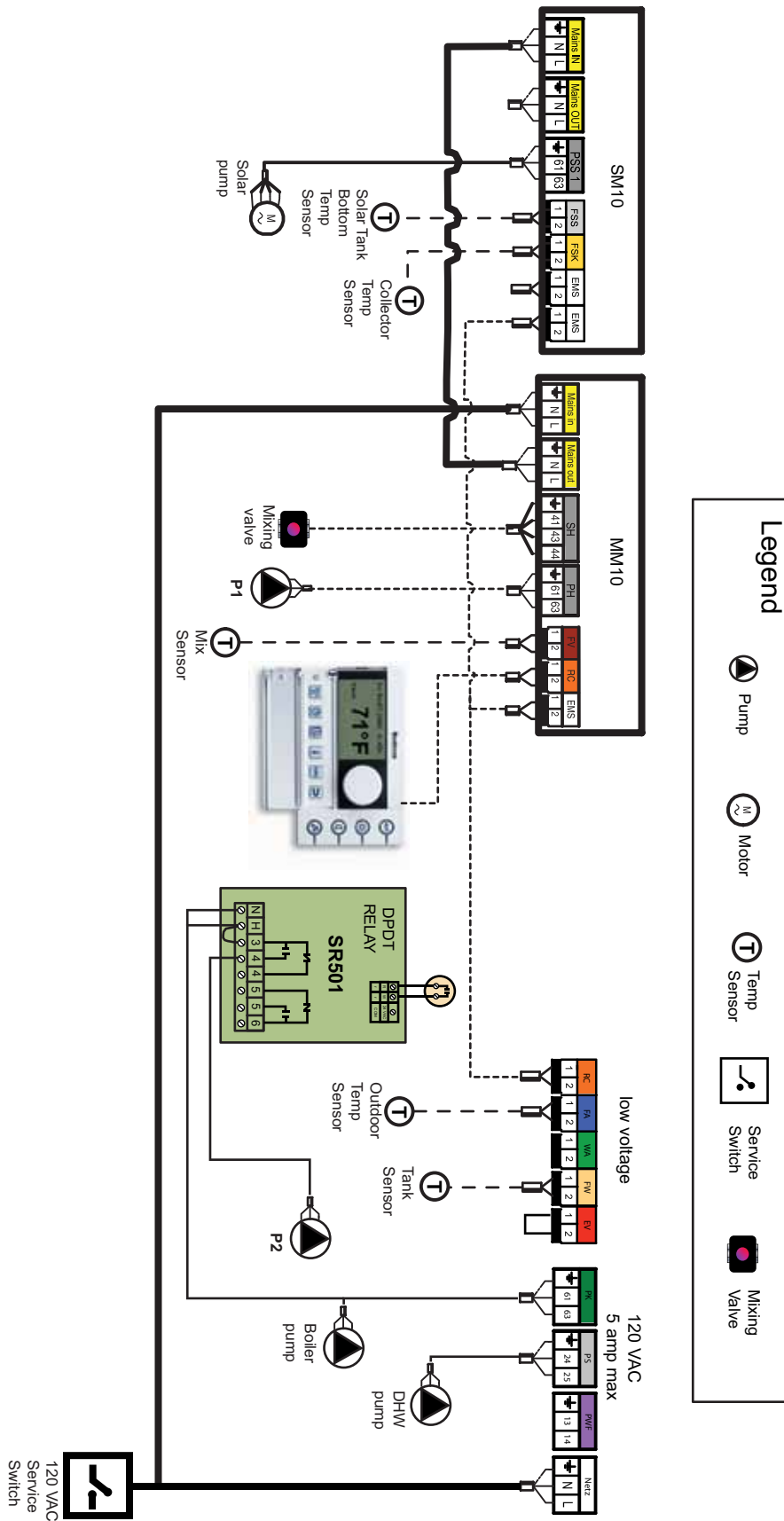


4.5. One mixed and one unmixed heating zone with solar thermal DHW generation

4.5.1 Hydraulics

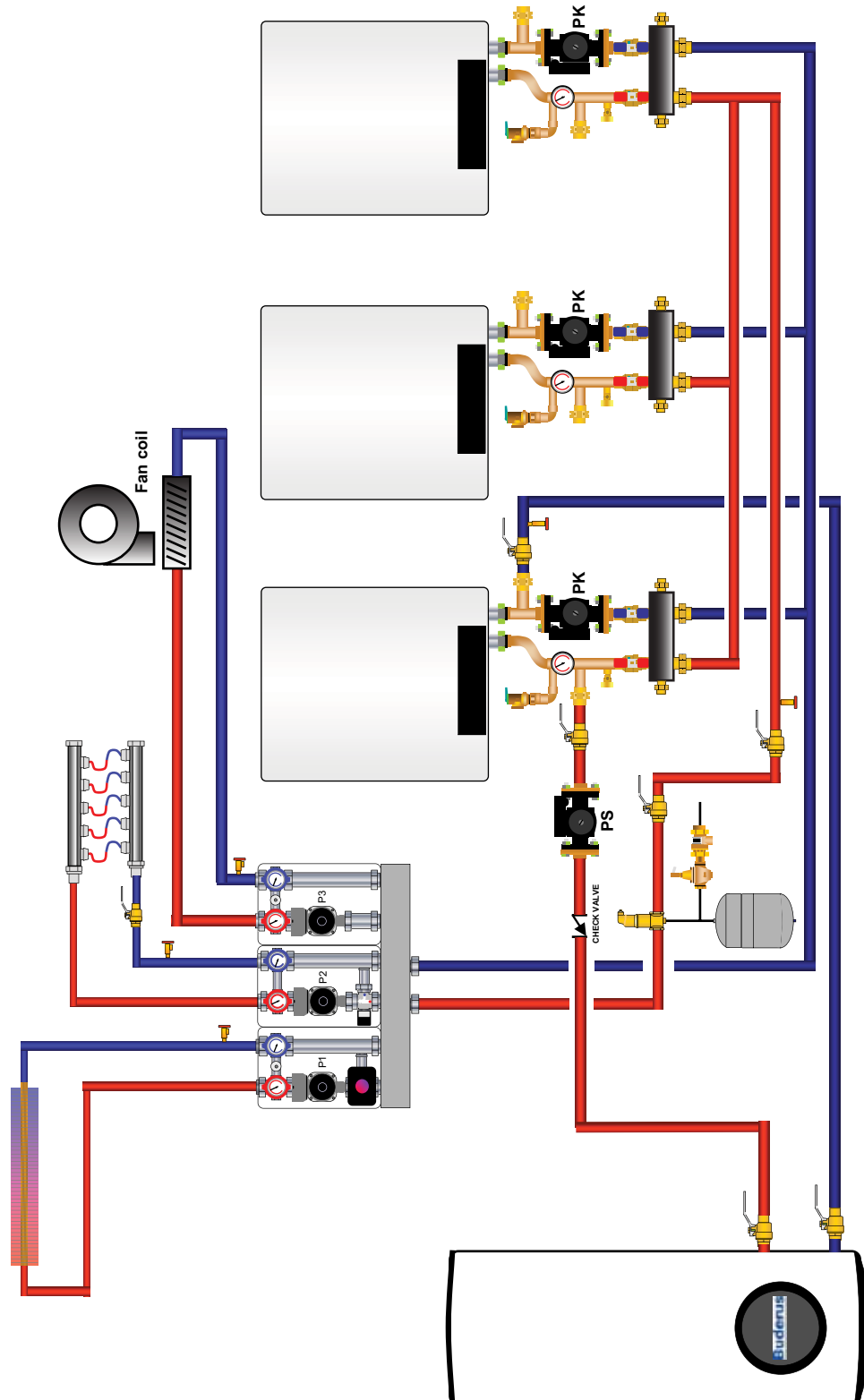


4.5.1 Wiring diagram

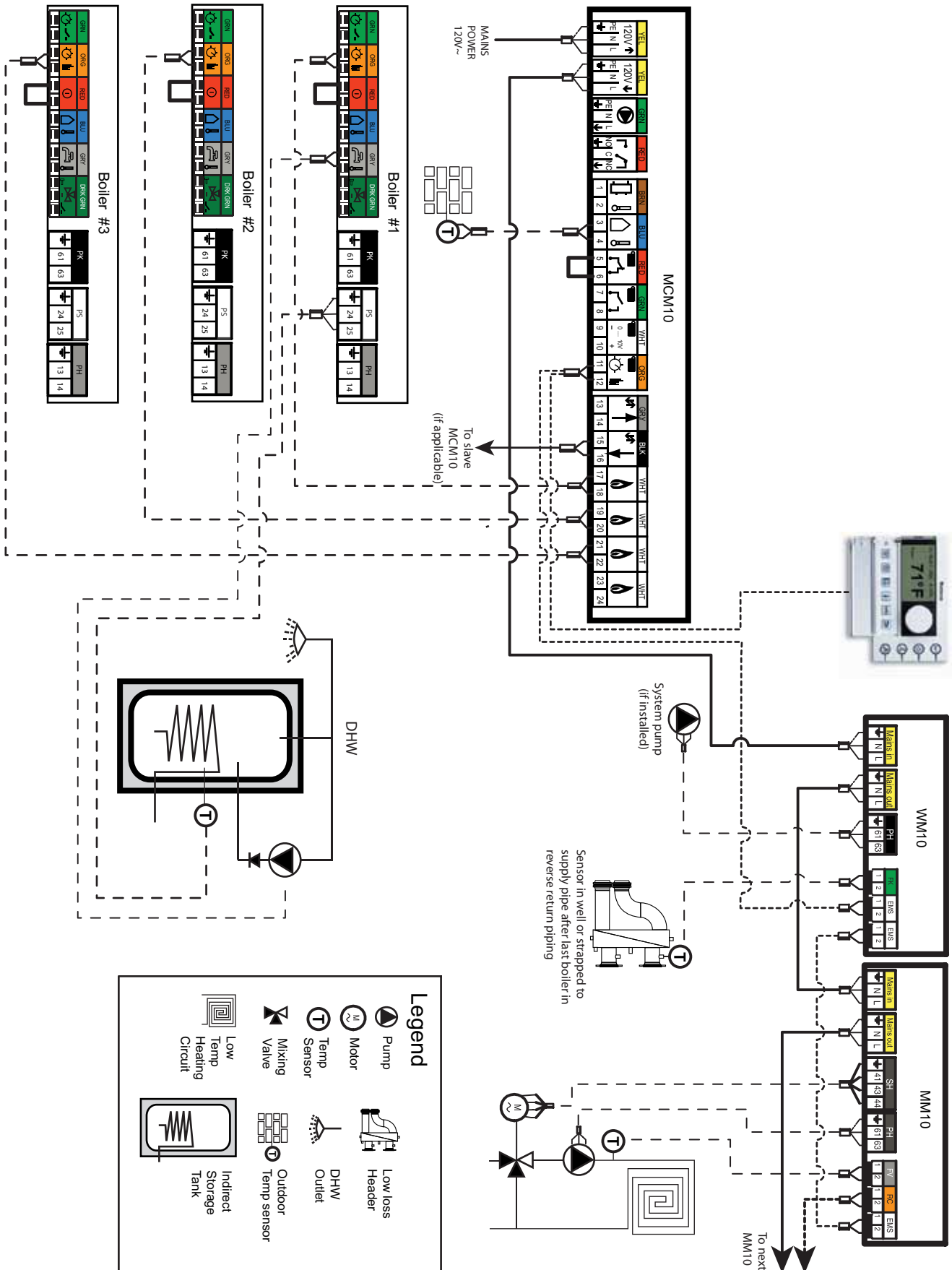


4.6. Cascade of three GB142 boilers

4.6.1 Hydraulics

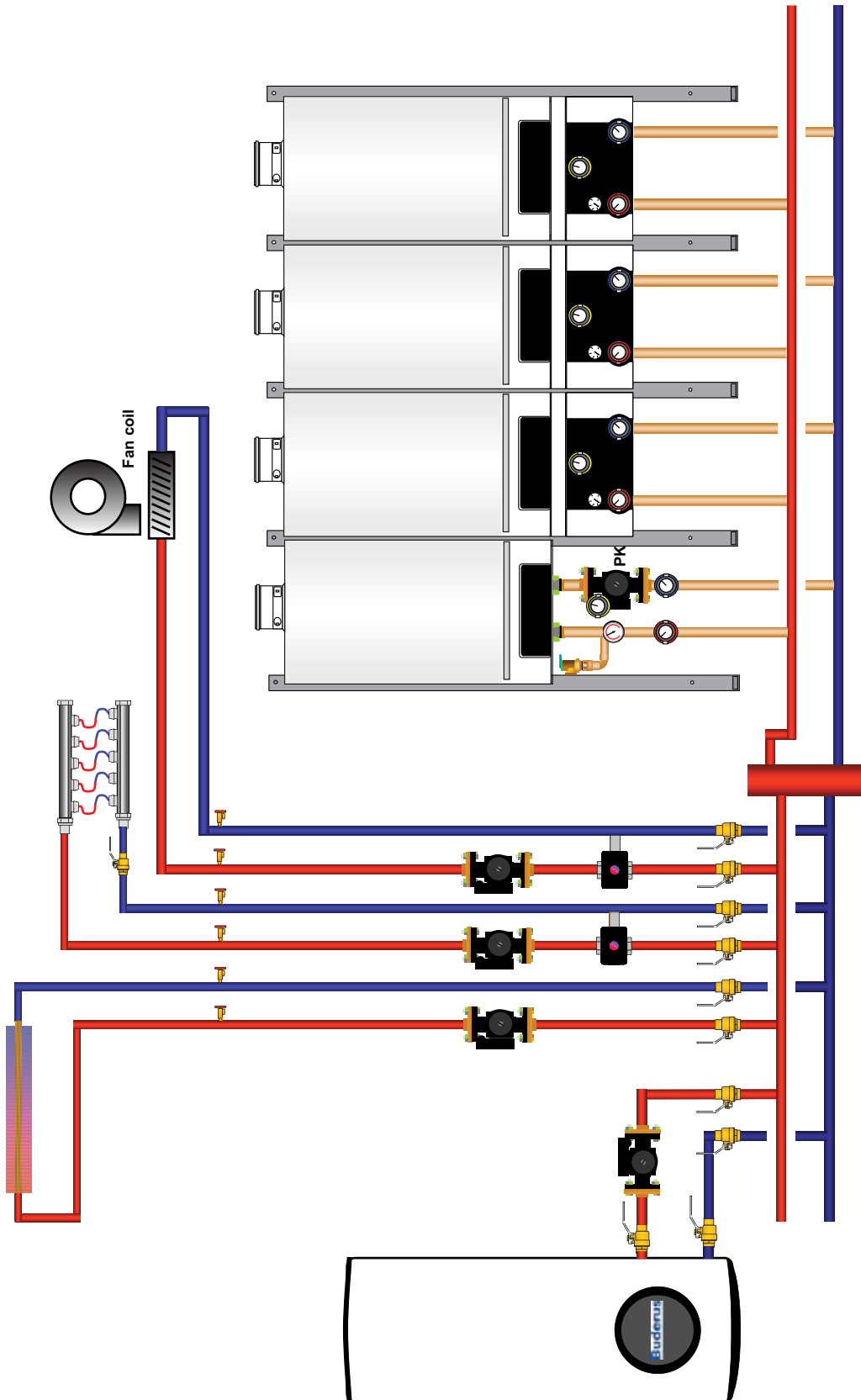


4.6.2 Wiring Diagram

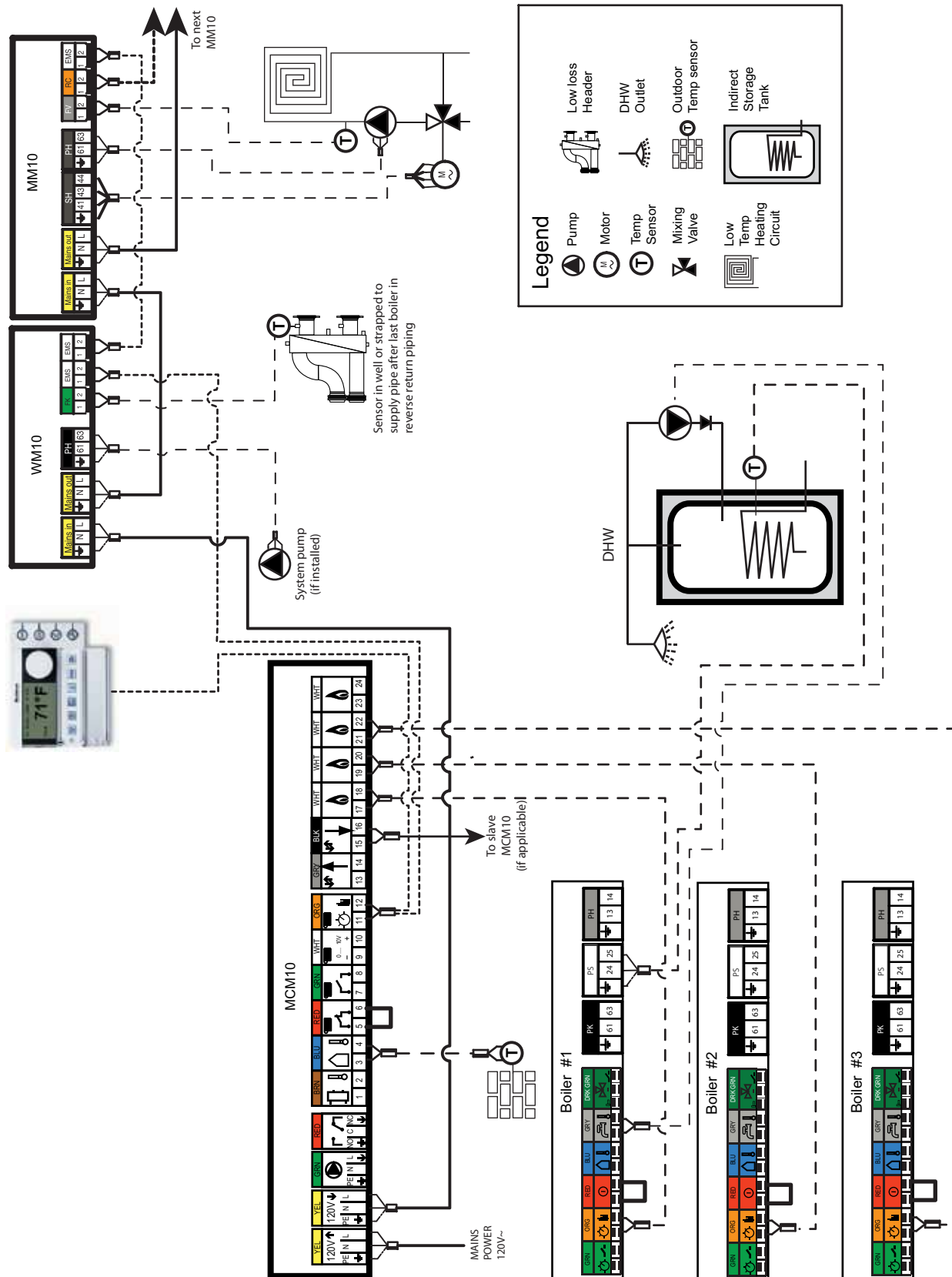


4.7. Cascade of four GB162 boilers

4.7.1 Hydraulics

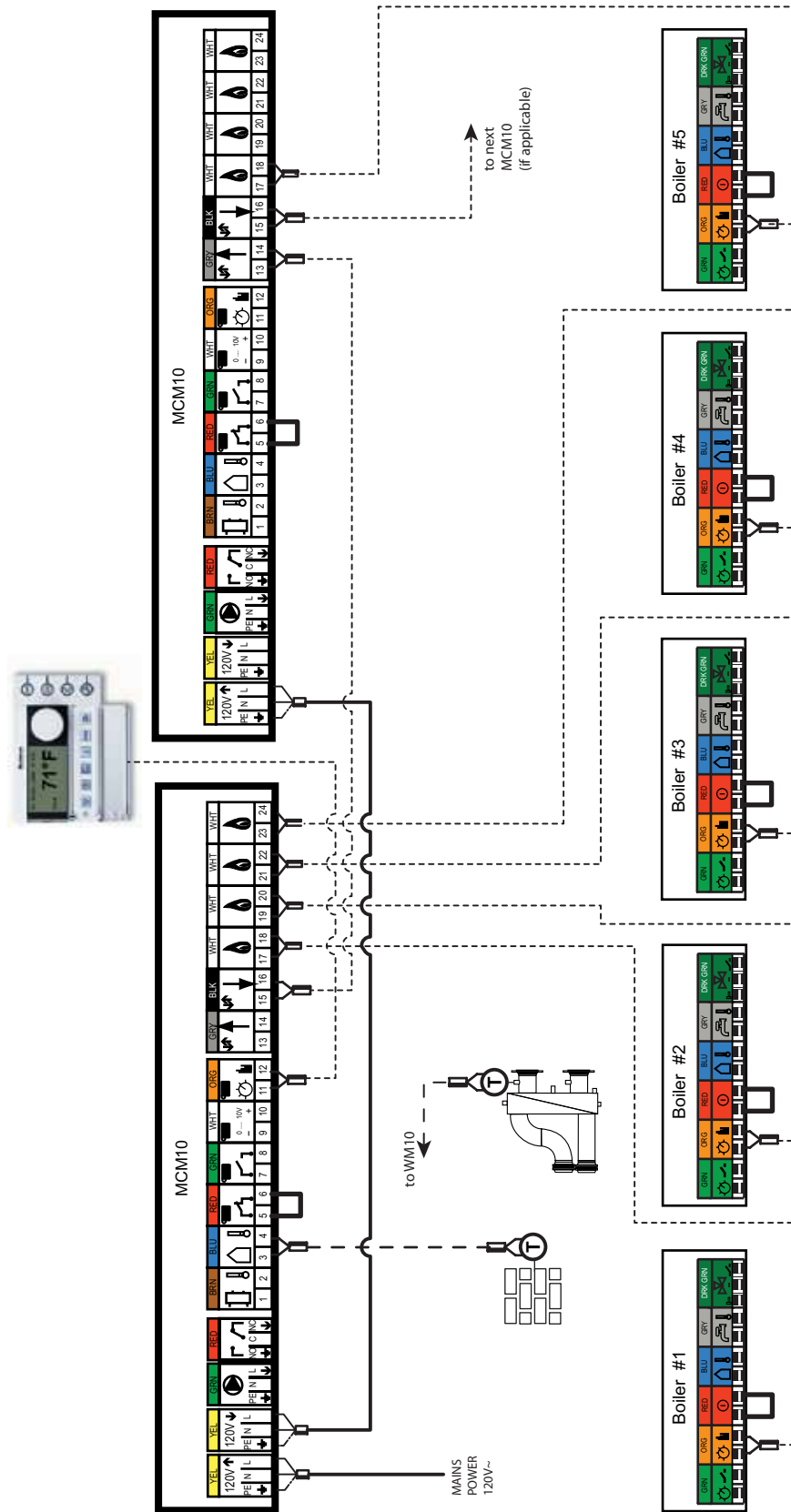


4.7.2 Wiring Diagram



4.8. Cascade of more than four boilers

4.8.1 Wiring Diagram



NOTES:

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