P4 Pellet

Hydraulic schematics

P4 Pellet

Valued Froling Partner

Here at Froling we want to provide the environmentally friendly, economical and userfriendly energy system solutions that people want.

This brochure presents our range and offers orientation for planning or implementation of heating systems, and contains the most current variants.

We reserve the right to make technical changes without prior notice.

If you need more information or suggestions for hydraulic systems, our customer service department, and of course our internal technical department, will always bei happy to assist.

Froling G.m.b.H

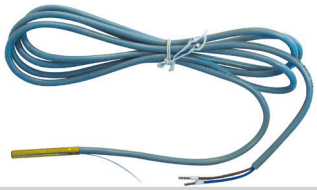
Contents

The following pages provide a general description of the most important components and sensor functions used in the systems.

! Due to the wide range of programming options with the Lambdatronic P 3200, the sensor descriptions may vary for specific systems that have been adapted for customers.

1) Sensors

1.1) General sensors

Immersion sensor	Collector sensor
e.g. as boiler-, DHW tank- or store-sensor	for solar systems
	
Contact sensor	**External sensor**
e.g. as return feed sensor or outfeed sensor	for weather-activated heating circuit control
	

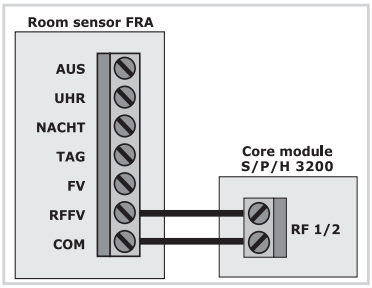
Technical specifications for the sensors listed above:

Resistance sensor type:	**KVT 20**; approx. 2kΩ at 20°C
Maximum cable length:	**40m** with shielded cable in the same building

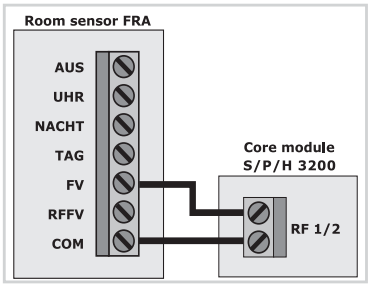
1.2) Room sensor FRA

Analogue room sensor (disengageable) with selector switch mode and adjusting wheel for temperature.

Connection with influence of room temperature:



Connection without influence of room temperature



Technical specifictions:

Resistance sensor type:	**FRA**; approx. 3,5kΩ at 20°C (switch set to automatic mode and rotating wheel in middle position)
Maximum cable length:	**40m** with shielded cable in the same building

2) Bus system

2.1) Heating circuit module

Wall casing with board for controlling

- **2 mixers**
- **2 heating circuit pumps**
- **2 analogue room sensors**
- **Bus connection to main control**
- **max. 8 units can be used per system**

A contact sensor for controlling a heating circuit is included.

2.2) Hydraulic module

Wall casing with board for controlling

- **2 pumps, using max. 6 sensors**
- **max. 8 units can be used per system**
  (1 hydraulic module with 1 immersion sensor is included in boiler delivery)

Additionally 2 immersion sensors are included, which can be used for the following purposes:

- **Storage tank management**
  for speed-controlled storage tank loading via 2 sensors. Top store sensor releases heating circuit pumps.
- **Differential temperature control for DHW-tank**
  for controlling the DHW-tank loading pump; depending on the top storage tank temperature and DHW-tank temperature.
- **Solar systems and feeder pumps**
- **Circulation pump**

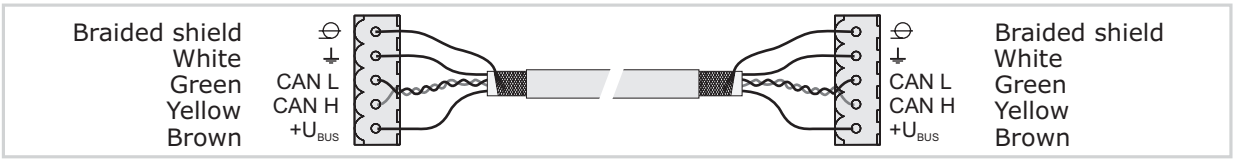
2.3) Room console RBG 3200 / RBG 3200 Touch

Digital multi-functional room device for easy operation of the heating system from the living area - for optimum room temperature and ease of use.
The latest data access using self-explanatory menu navigation.
Max. 7 units can be used per system.

2.4) Bus cable

- Maximum cable length: 500m
  (expandable with busrepeater / cascade module)
- Cable type LIYCY paired 2x2x0.5, CAT5 or CAT6 should be used for the bus connections between the individual modules (NOT TELEPHONE CABLE, such as type JY(ST)Y 2x2x0.6).

The connection to the 5-pin plugs should be carried out according to the following diagram:



3) Sensor functions for standard systems

3.1) Top store (sensor 0.1)

- Heating circuit release for the connected heating circuits (standard value: 30°C)
- Heat source for difference control of the DHW tank loading pump(s)
- Start signal for storage tank management
- Release of a connected oil/gas boiler

3.2) Bottom store (sensor 0.2)

- Difference measurement of boiler sensor for pump switching conditions
- Stop signal for storage tank management

3.3) DHW tank (sensor 0.3)

- Start signal for DHW tank loading pump
- Difference measurement of heat source (boiler or storage tank system-dependent)

3.4) Bottom DHW tank (sensor 0.4)

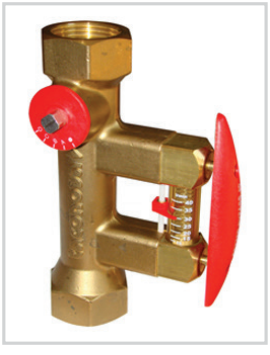
- Reference sensor for solar integration

3.5) Oil/gas boiler (sensor 0.5)

- Heating circuit release for oil/gas operation (system-dependent)
- Oil/gas boiler base temperature monitoring (switch valve / pump)

4) Balancing valve

If the systems are not correctly balanced there is normally an excessively high flow volume through the boiler. As a result there is a relatively low temperature difference between the boiler flow and return. The balancing valve SETTER Bypass SD, from the Froling product range enables precise and simple adjustment of the flow rate in l/min and thereby an optimal temperature difference.
There is only flow through the bypass if the handle is pressed. The volume flow rate in l/min can be set using the scale of the meter integrated to the bypass, reading from the lower edge of the floater. There is no need to spend time determining settings using diagrams and other aids.



4.1) Setting example

Pellet boiler P4 25kW, temperature difference 15K:

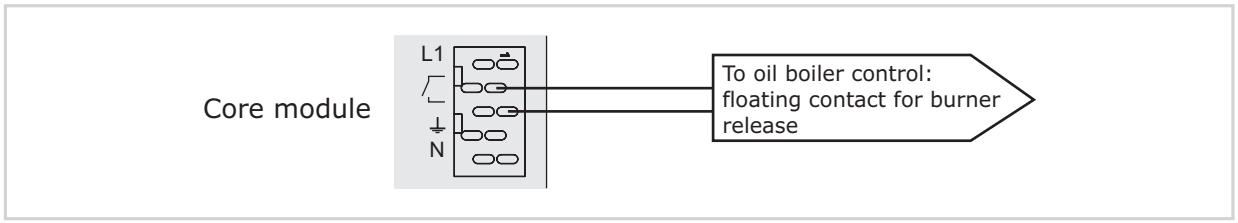
$$\dot{m} = \frac{Q_{Ges}}{c * \Delta T} = \frac{25\ kW}{1{,}163\ (kWh/m^3{*}K) * 15\ K}$$

$$\approx 1{,}43\ m^3/h = \underline{23{,}88\ l/min}$$

This means:
To get a temperature difference of 15 K it is almost possible to set the output in kW as the volume flow rate in l/min at the balancing valve.

5) Connection instructions

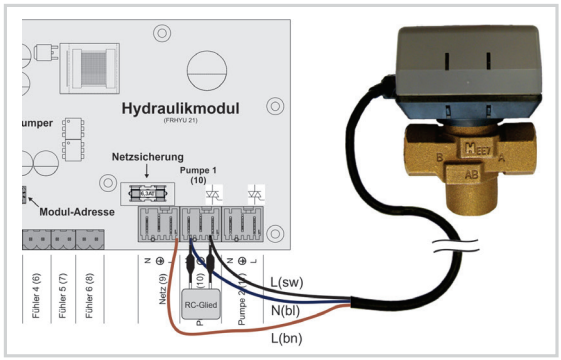
5.1) HKP0 - output for oil/gas boiler connections



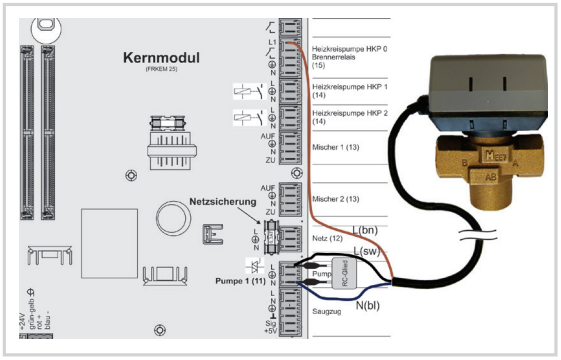
5.2) Isolating valve

If an isolating valve is connected to a speed-controlled pump outlet, an RC element must be used. Furthermore, the minimum speed for the pump outlet in use must be set to 100% in the control.

Connection hydraulic module:

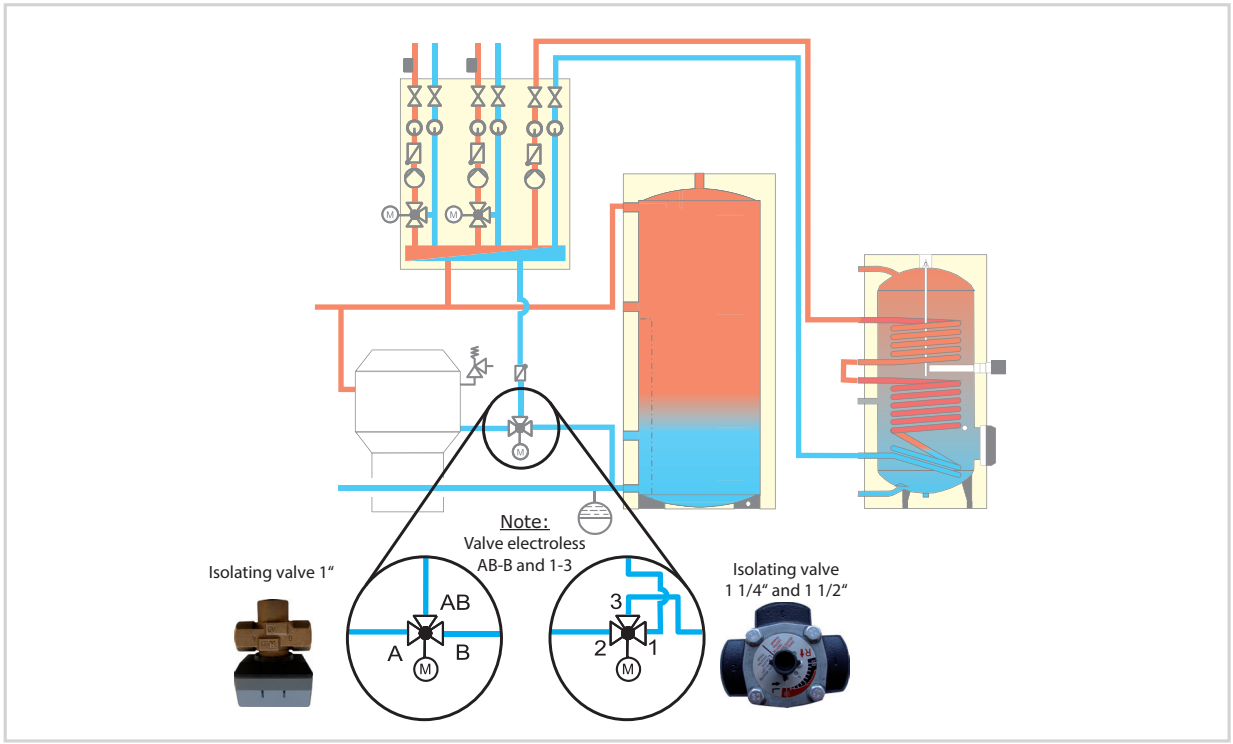


Connection core module:



Connect the outer cable L(bn):

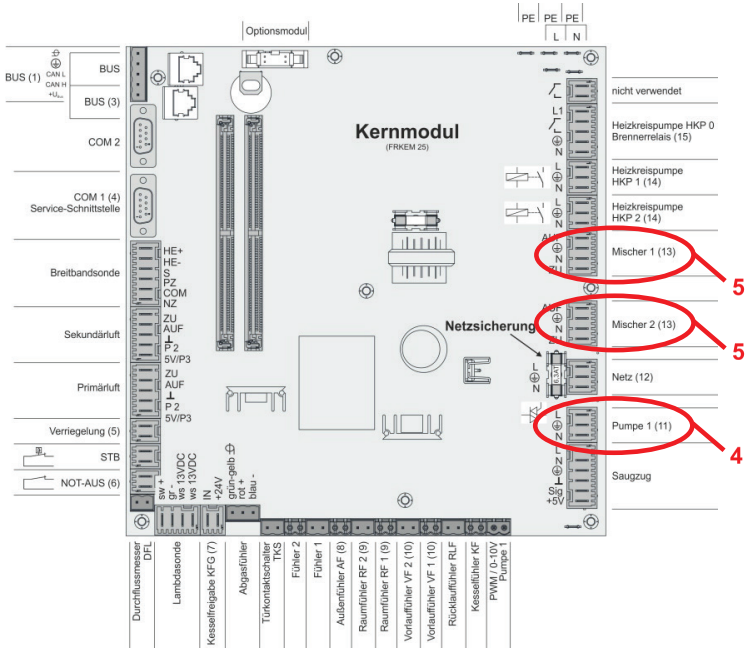
- to the outer cable of the respective mains supply of the module or
- to the core module, output HCP0/burner relay at pin "LV"



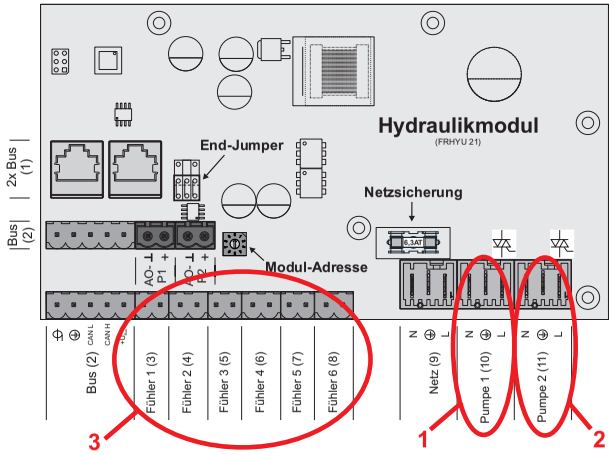
Suggested layout proposal!

Number	Name on connection board	Function	Connection board
1	Pumpe 1	Pump 0.1	Hydraulic module adress 0
2	Pumpe 2	Pump 0.2	Hydraulic module adress 0
3	Fühler 1 - 6	Temp. sensor 0.1 - 0.6	Hydraulic module adress 0
4	Pumpe 1	Pump 1	Core module
5	Mischer 1/2	Mixer 1/2	Core module
6	Mischer 1/2	Mixer 3-18	on each heating circuit module (max. 2 heating circuits are available)

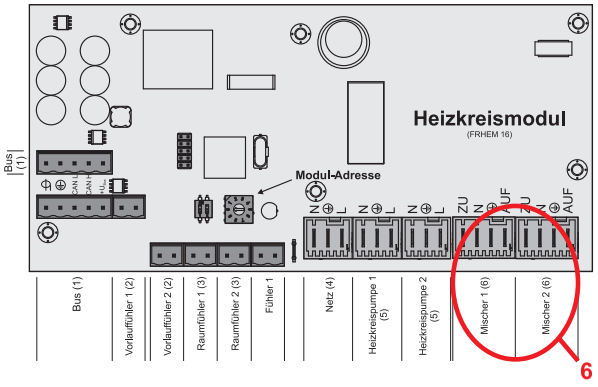
Core module



Hydraulic module



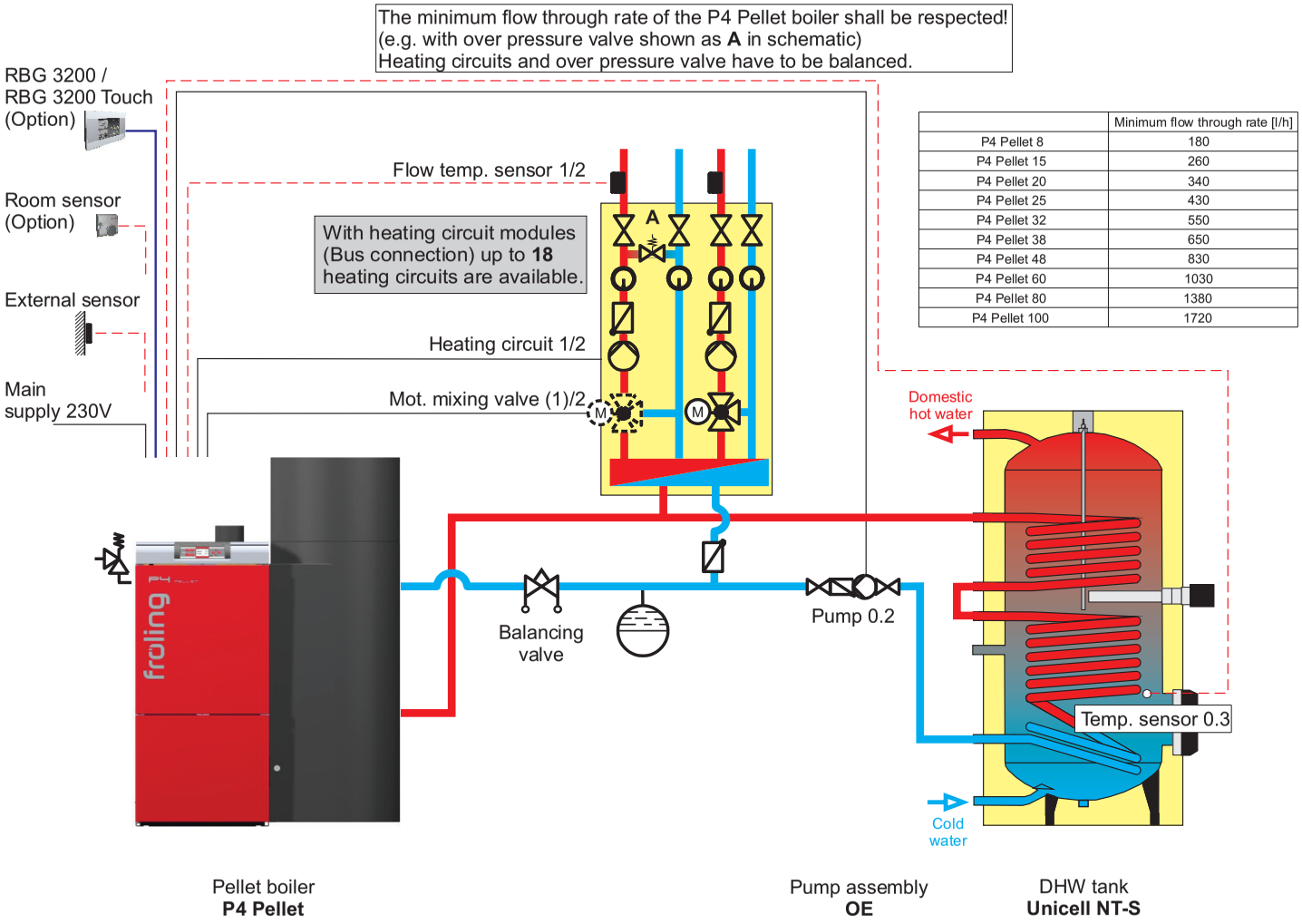
Heating circuit module



Note: Controller P3200, numbers in brackets: see operating instructions of the boiler controller

Suggested layout proposal!

System 0.P001



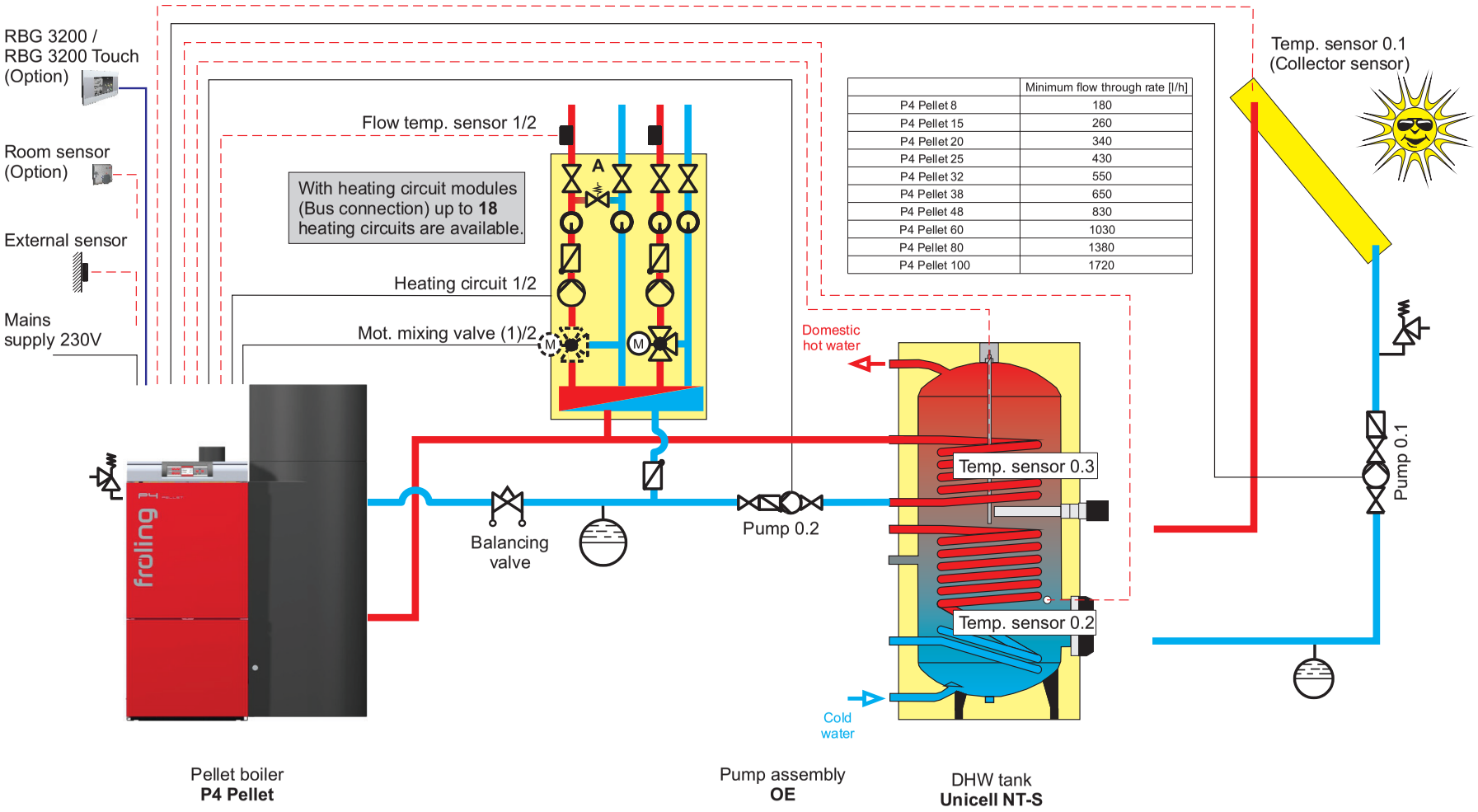
	Minimum flow through rate [l/h]
P4 Pellet 8	180
P4 Pellet 15	260
P4 Pellet 20	340
P4 Pellet 25	430
P4 Pellet 32	550
P4 Pellet 38	650
P4 Pellet 48	830
P4 Pellet 60	1030
P4 Pellet 80	1380
P4 Pellet 100	1720

Note: Please set DHW priority to “Yes”.
Controller P 3200.

Suggested layout proposal!

System 0.P002

The minimum flow through rate of the P4 Pellet boiler shall be respected!
(e.g. with over pressure valve shown as **A** in schematic)
Heating circuits and over pressure valve have to be balanced.



	Minimum flow through rate [l/h]
P4 Pellet 8	180
P4 Pellet 15	260
P4 Pellet 20	340
P4 Pellet 25	430
P4 Pellet 32	550
P4 Pellet 38	650
P4 Pellet 48	830
P4 Pellet 60	1030
P4 Pellet 80	1380
P4 Pellet 100	1720

Pellet boiler
P4 Pellet

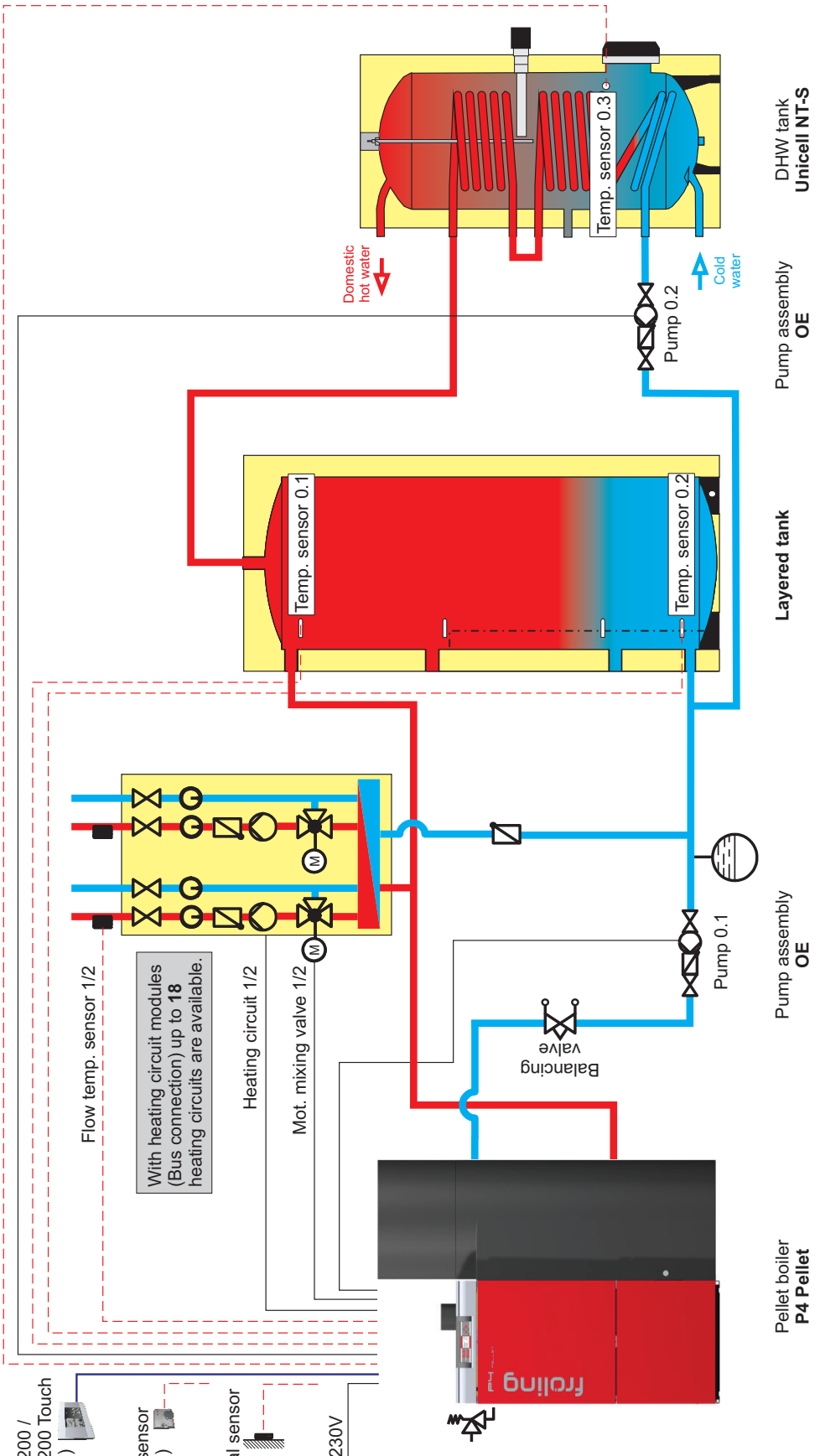
Pump assembly
OE

DHW tank
Unicell NT-S

Note: Please set parameter in menu SOLAR, item SERVICE, SOLAR SYSTEM to ”1”,
WHICH SENSOR IS USED FOR THE SOLAR COLLECTOR to ”0.1”,
WHICH SENSOR IS USED FOR BOTTOM DHW TANK to ”0.2”
WHICH PUMP IS USED FOR THE SOLAR COLLECTOR to ”0.1”.
Controller P3200

System 1.P001

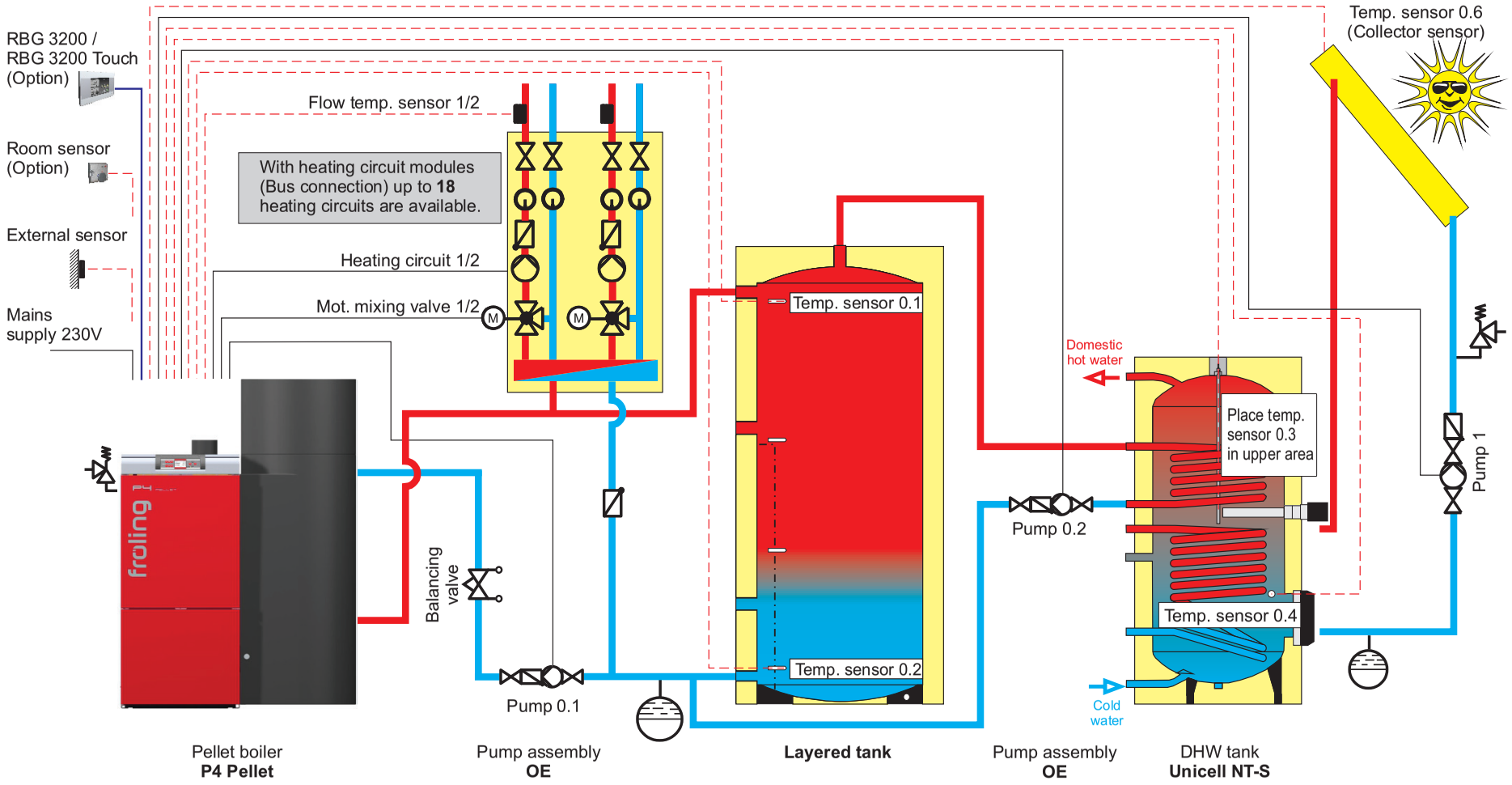
Suggested layout proposal!



Note: When a storage tank is used always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to "NO"!
Controller P 3200

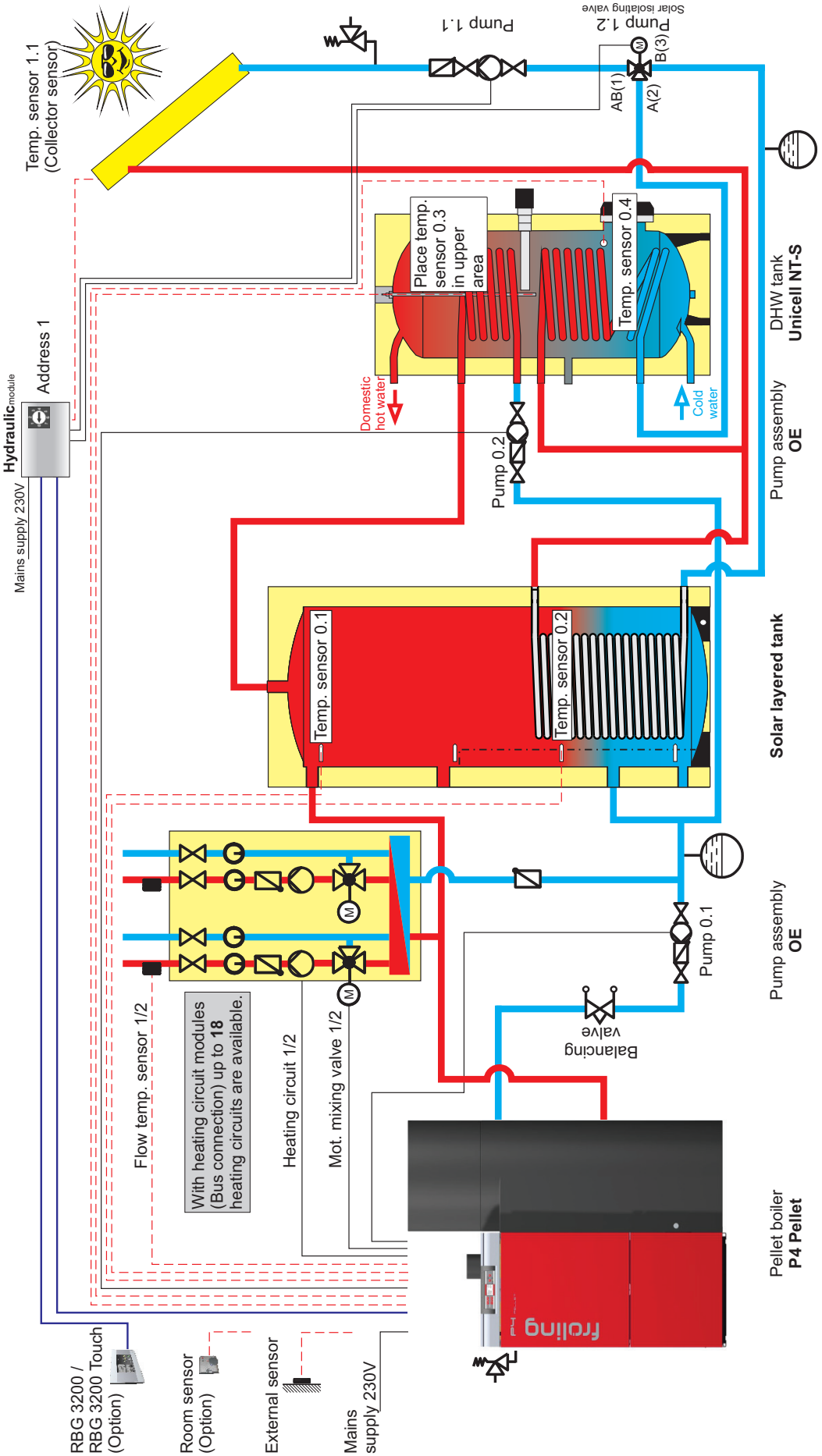
Suggested layout proposal!

System 1.P002



Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to “NO”!
Set parameter in menu SOLAR, item SERVICE, SOLAR SYSTEM to “1”, WHICH SENSOR IS USED FOR THE SOLAR COLLECTOR to “0.6”, WHICH PUMP IS USED FOR THE SOLAR COLLECTOR to “Pump 1”.
Controller P 3200, Since version 50.04 B04.08

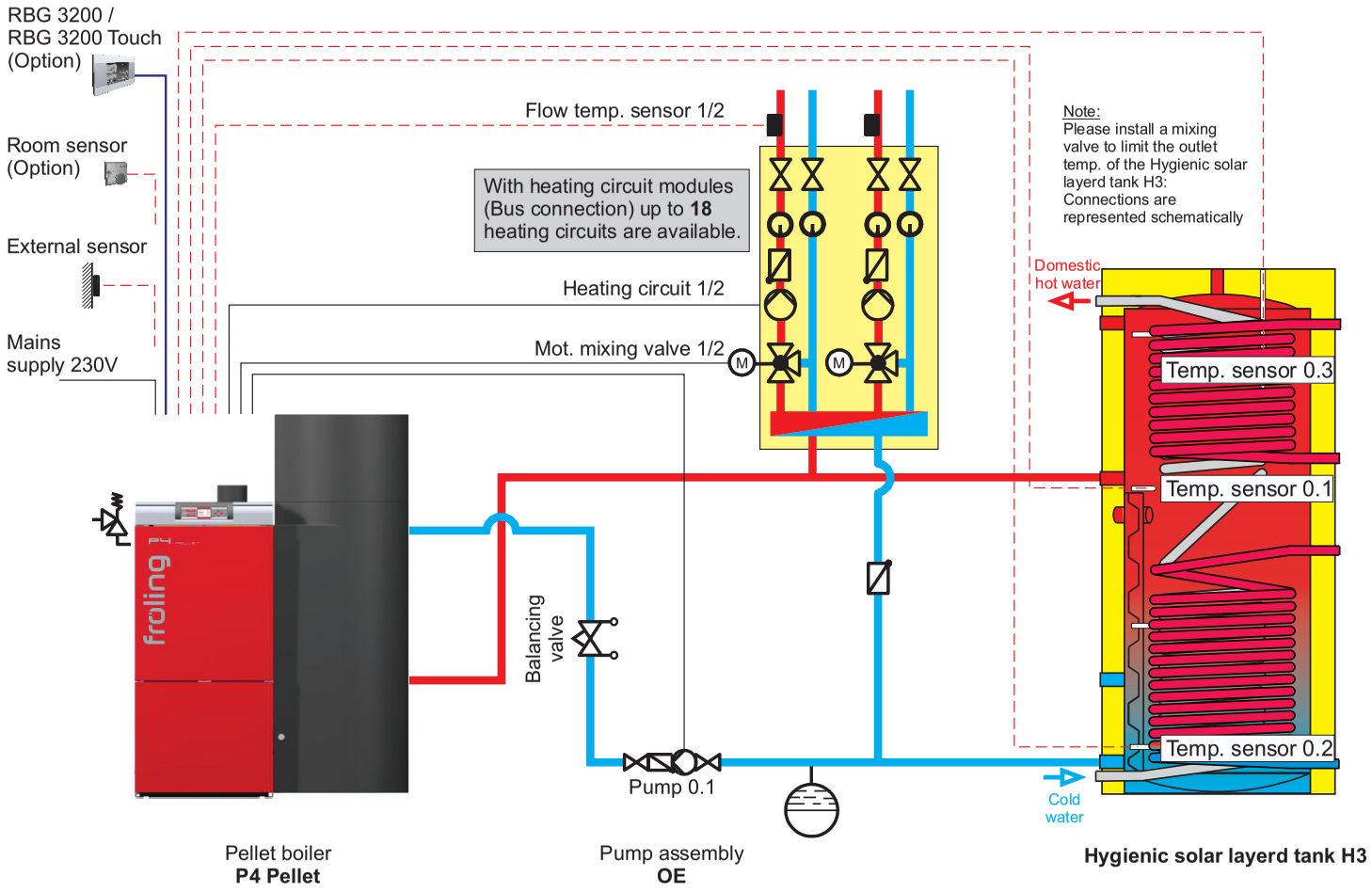
System 1.P003



Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to "NO"!
Set parameter in menu SOLAR, item SERVICE, SOLAR SYSTEM to "3".
Controller P3200, Since version 50.04 B04.08

Suggested layout proposal!

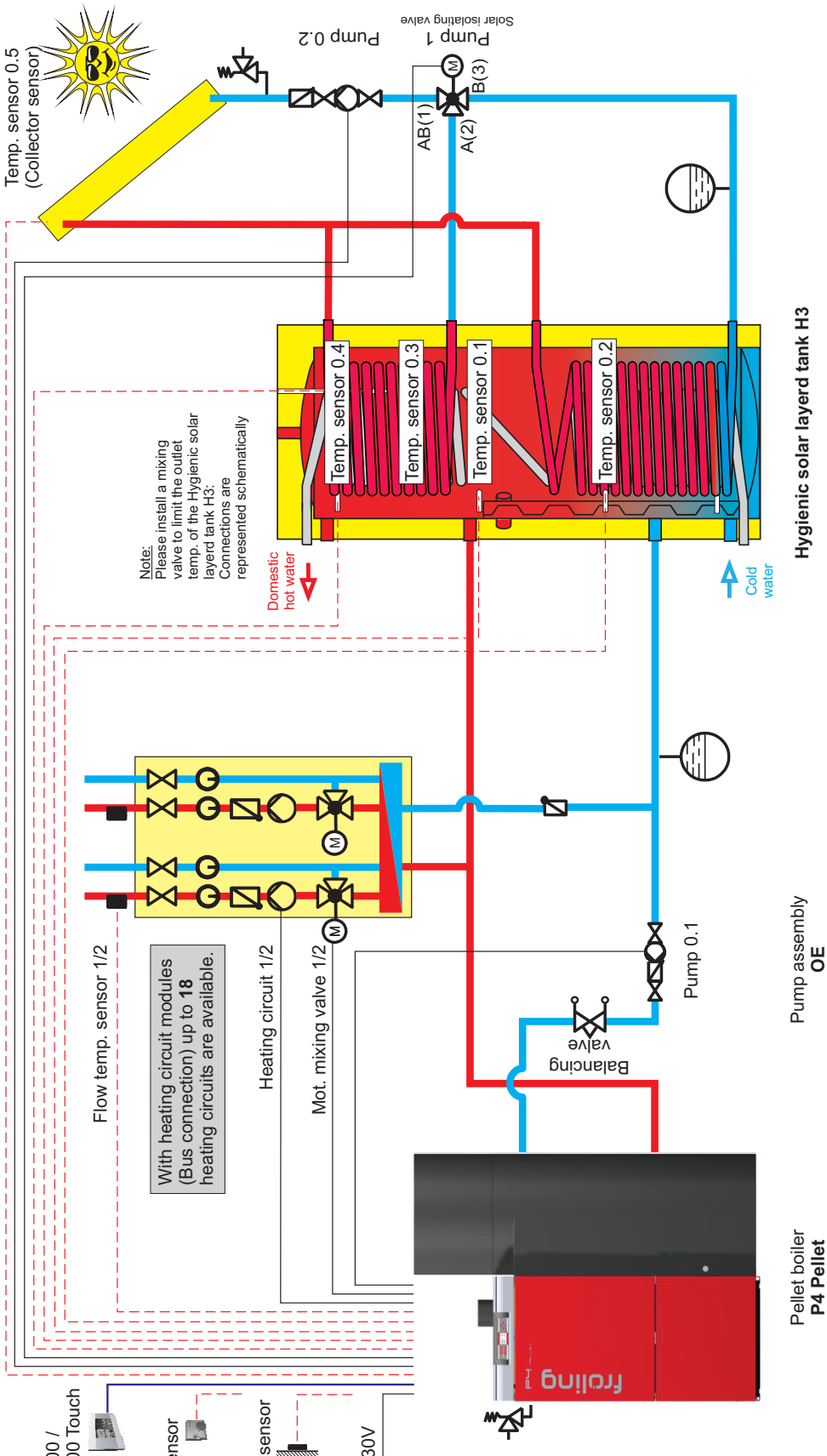
System 1.P005



Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to “NO”! Controller P3200

System 1.P007

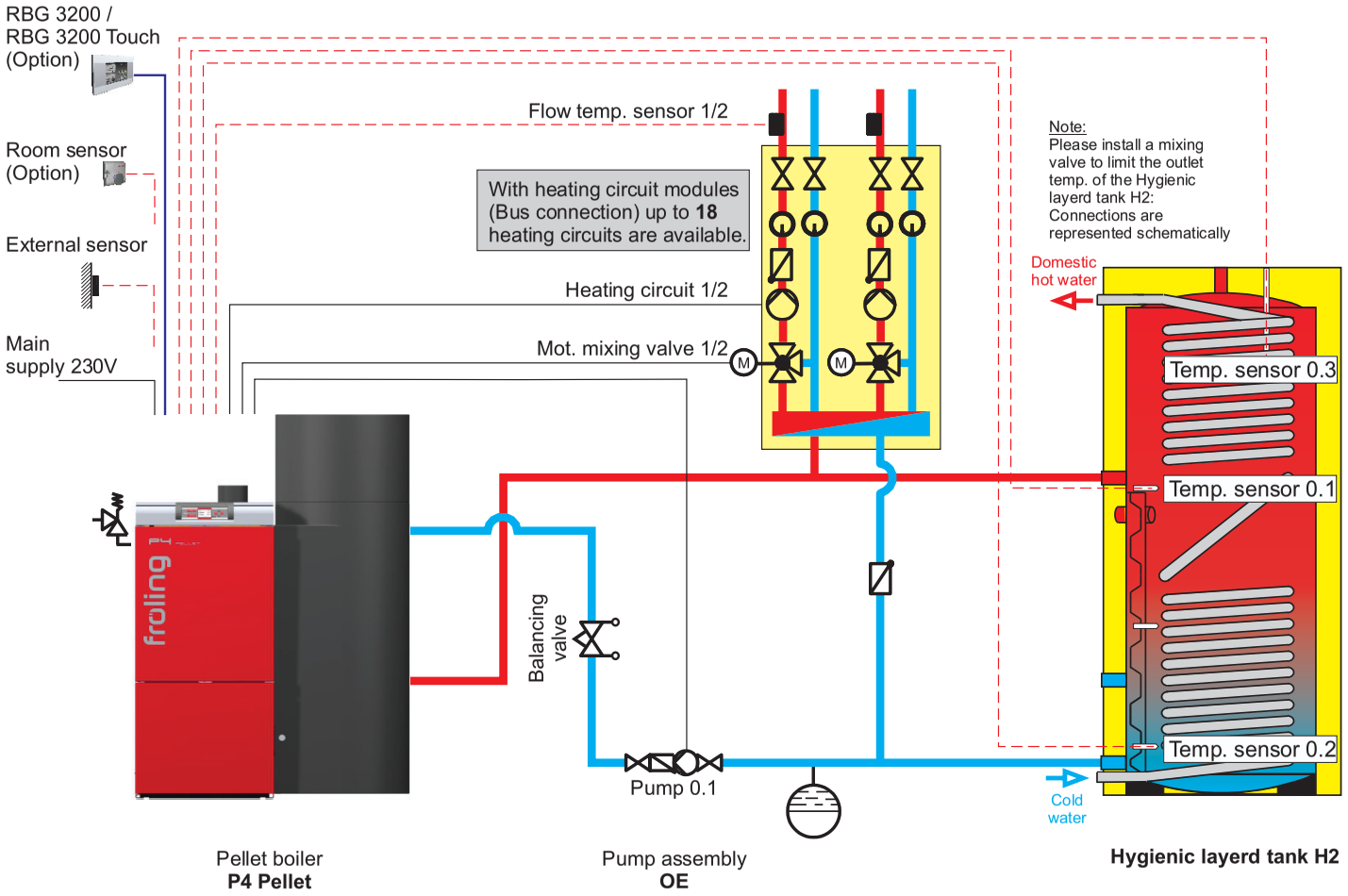
Suggested layout proposal!



Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to "NO"!
Set parameter in menu SOLAR, item SERVICE, SOLAR SYSTEM to "3",
WHICH SENSOR IS USED FOR THE SOLAR COLLECTOR to "0.5",
WHICH PUMP IS USED FOR THE SOLAR ISOLATING VALVE to "Pump 1",
WHICH PUMP IS USED FOR THE SOLAR COLLECTOR to "0.2".
Controller P 3200

Suggested layout proposal!

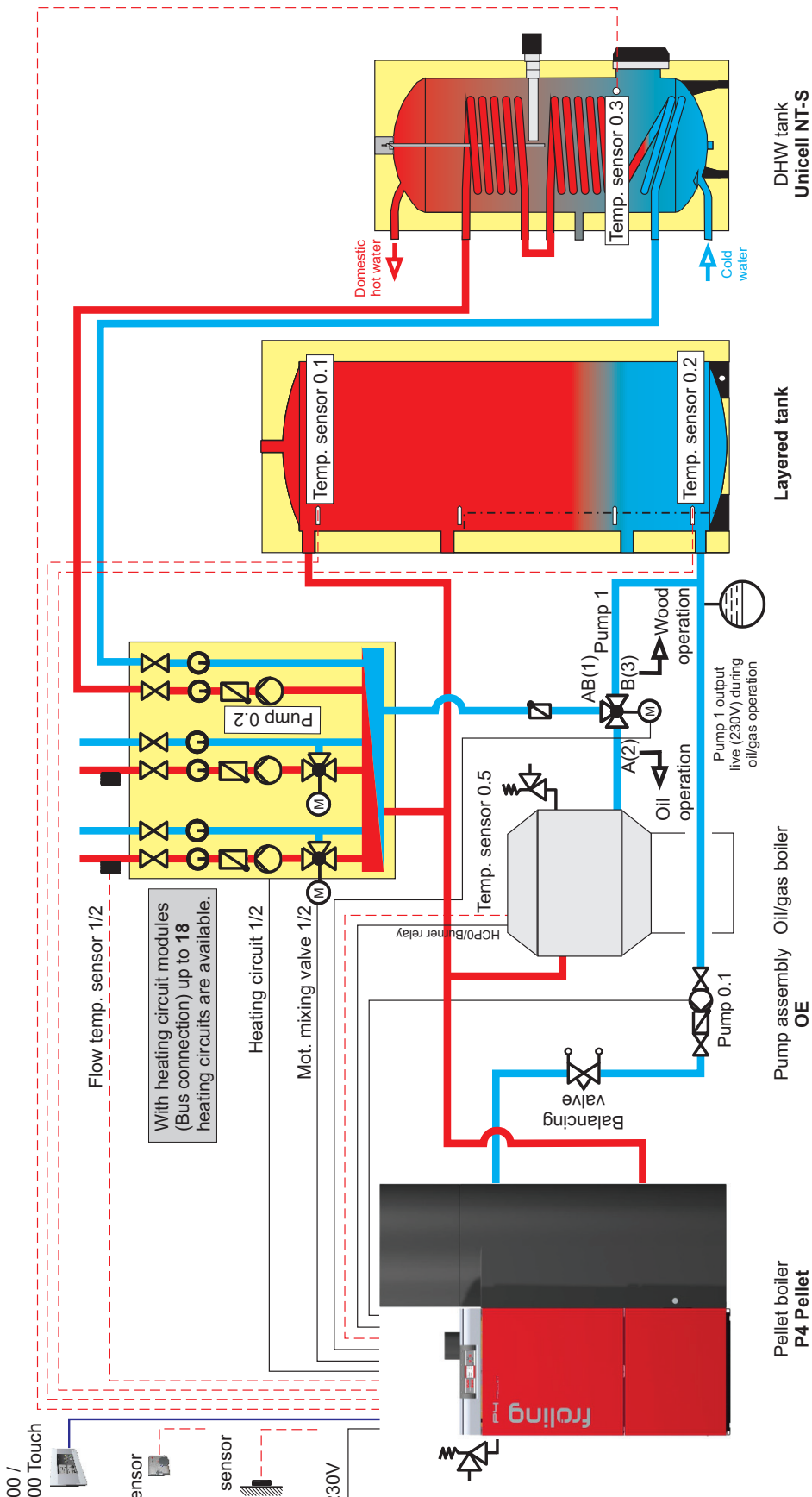
System 1.P008



Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to “NO”!
Controller P3200

System 2.P001

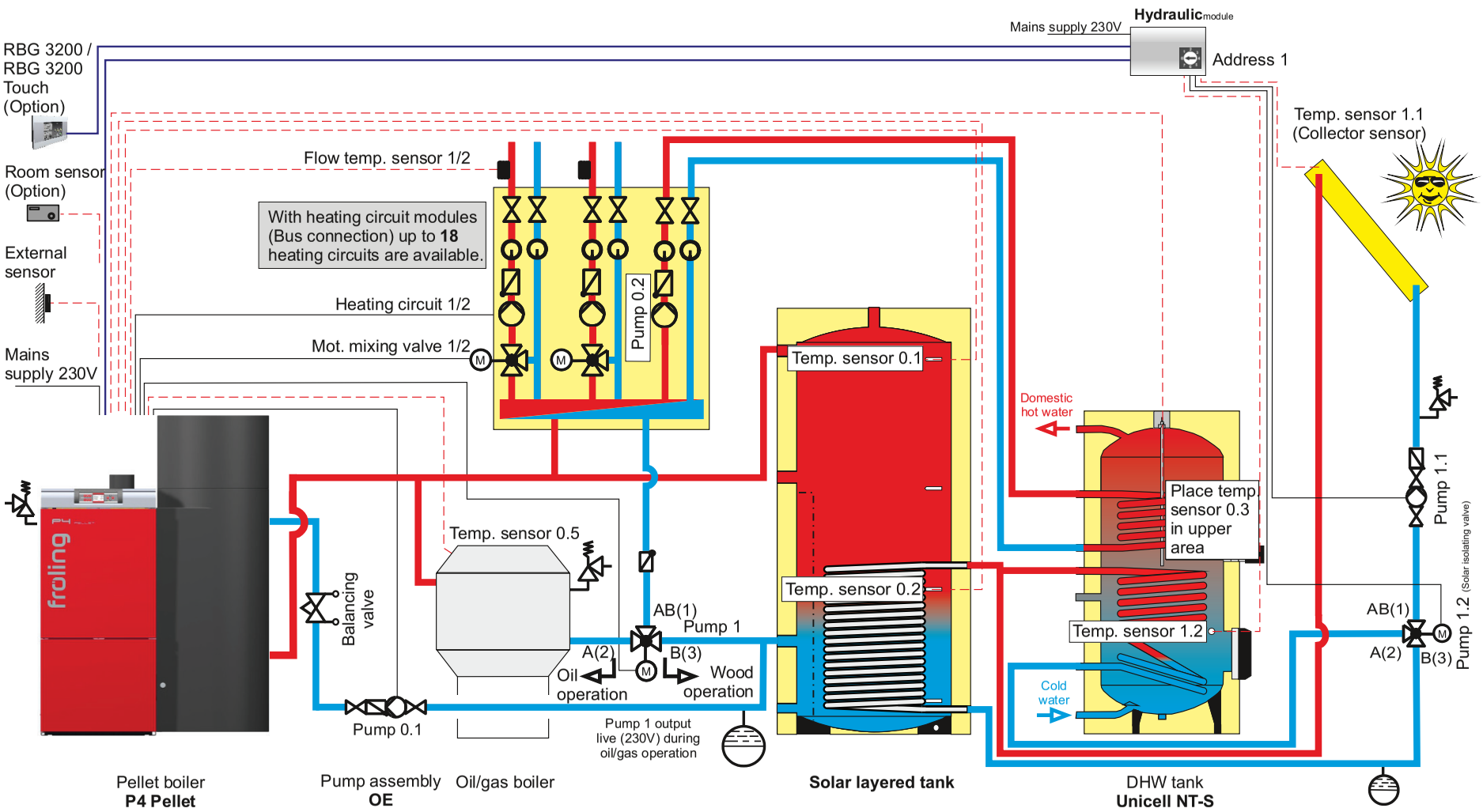
Suggested layout proposal!



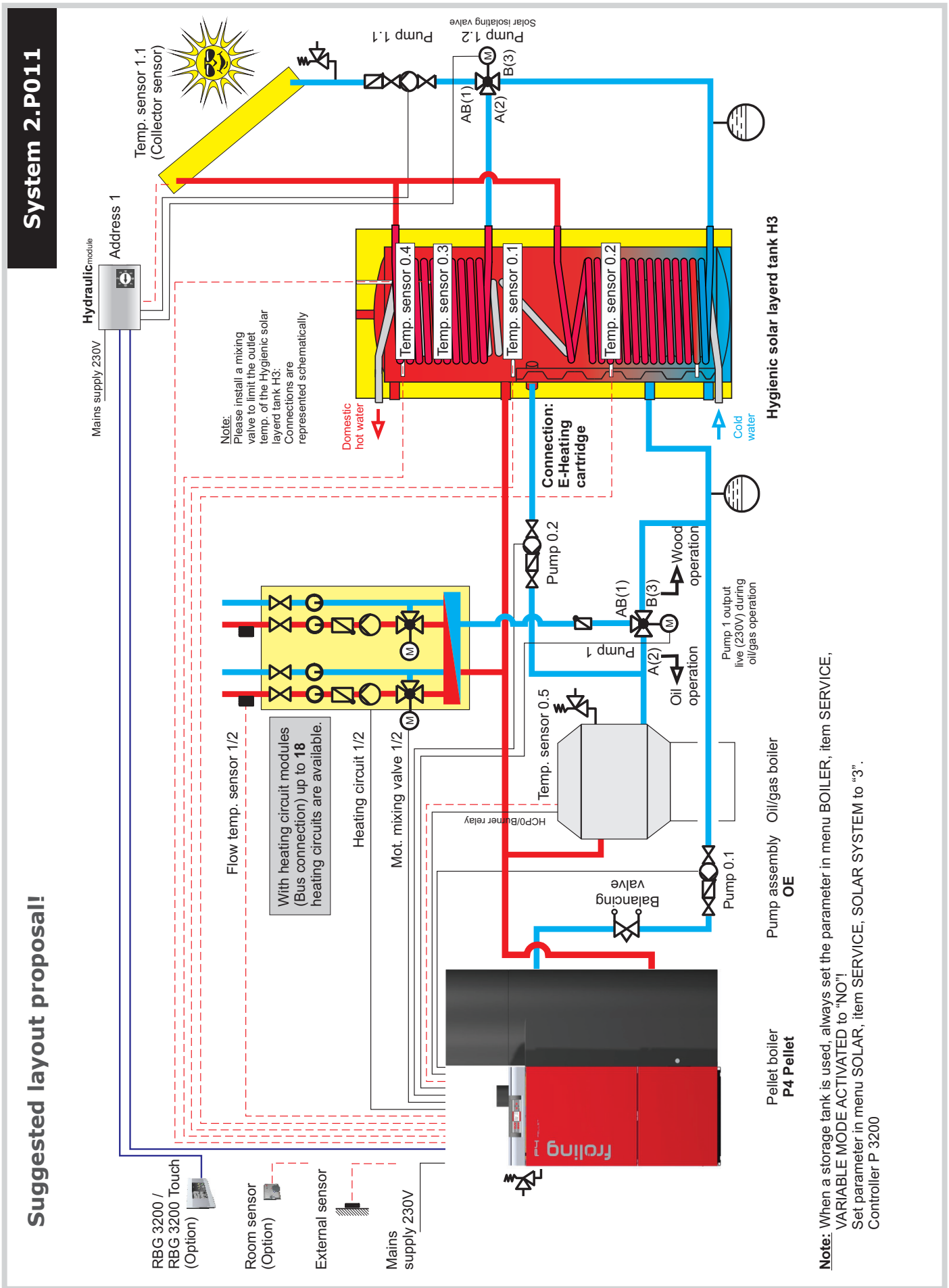
Note: When a storage tank is used always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to "NO"!
Controller P 3200

Suggested layout proposal!

System 2.P003

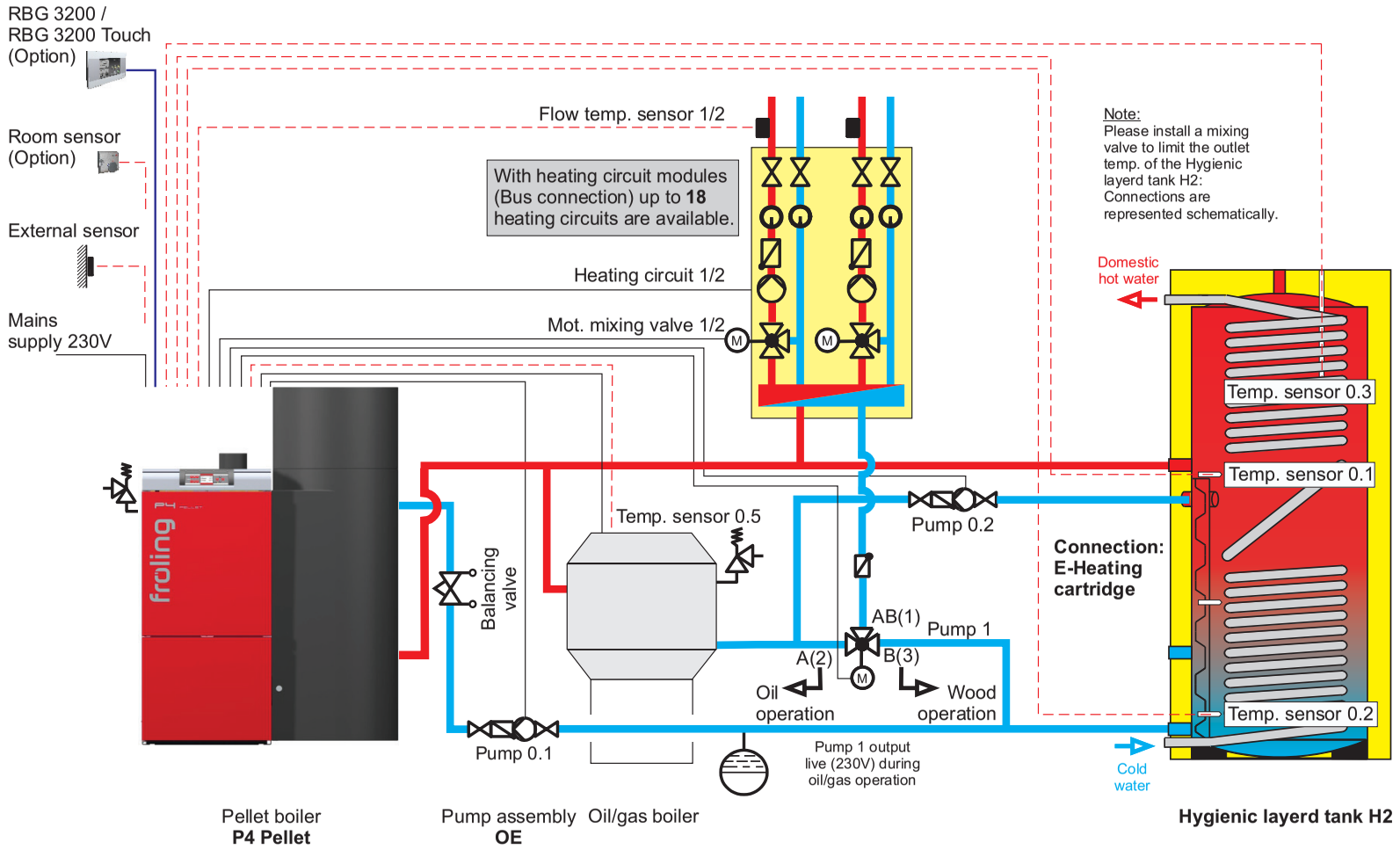


Note: When a storage tank is used always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to “NO”!
Set parameter in menu SOLAR, item SERVICE, SOLAR SYSTEM to “3” and WHICH SENSOR IS USED FOR BOTTOM DHW TANK to “1.2”!
Controller P 3200


System 2.P011
Suggested layout proposal!
Temp. sensor 1.1 (Collector sensor)
Pump 1.1
Pump 1.2
Solar isolating valve
B(3)
AB(1)
A(2)
Address 1
Hydraulic module
Mains supply 230V
Temp. sensor 0.4
Temp. sensor 0.3
Temp. sensor 0.1
Temp. sensor 0.2
Hygienic solar layerd tank H3
Note:
Please install a mixing valve to limit the outlet temp. of the Hygienic solar layerd tank H3:
Connections are represented schematically
Domestic hot water
Cold water
Connection: E-Heating cartridge
Pump 0.2
Wood operation
Pump 1
Oil operation
Pump 1 output live (230V) during oil/gas operation
Temp. sensor 0.5
HCP0/Burner relay
Flow temp. sensor 1/2
With heating circuit modules (Bus connection) up to 18 heating circuits are available.
Heating circuit 1/2
Mot. mixing valve 1/2
Balancing valve
Pump 0.1
Pump assembly Oil/gas boiler OE
Pellet boiler P4 Pellet
RBG 3200 / RBG 3200 Touch (Option)
Room sensor (Option)
External sensor
Mains supply 230V
Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to "NO"!
Set parameter in menu SOLAR, item SERVICE, SOLAR SYSTEM to "3".
Controller P 3200

Suggested layout proposal!

System 2.P017

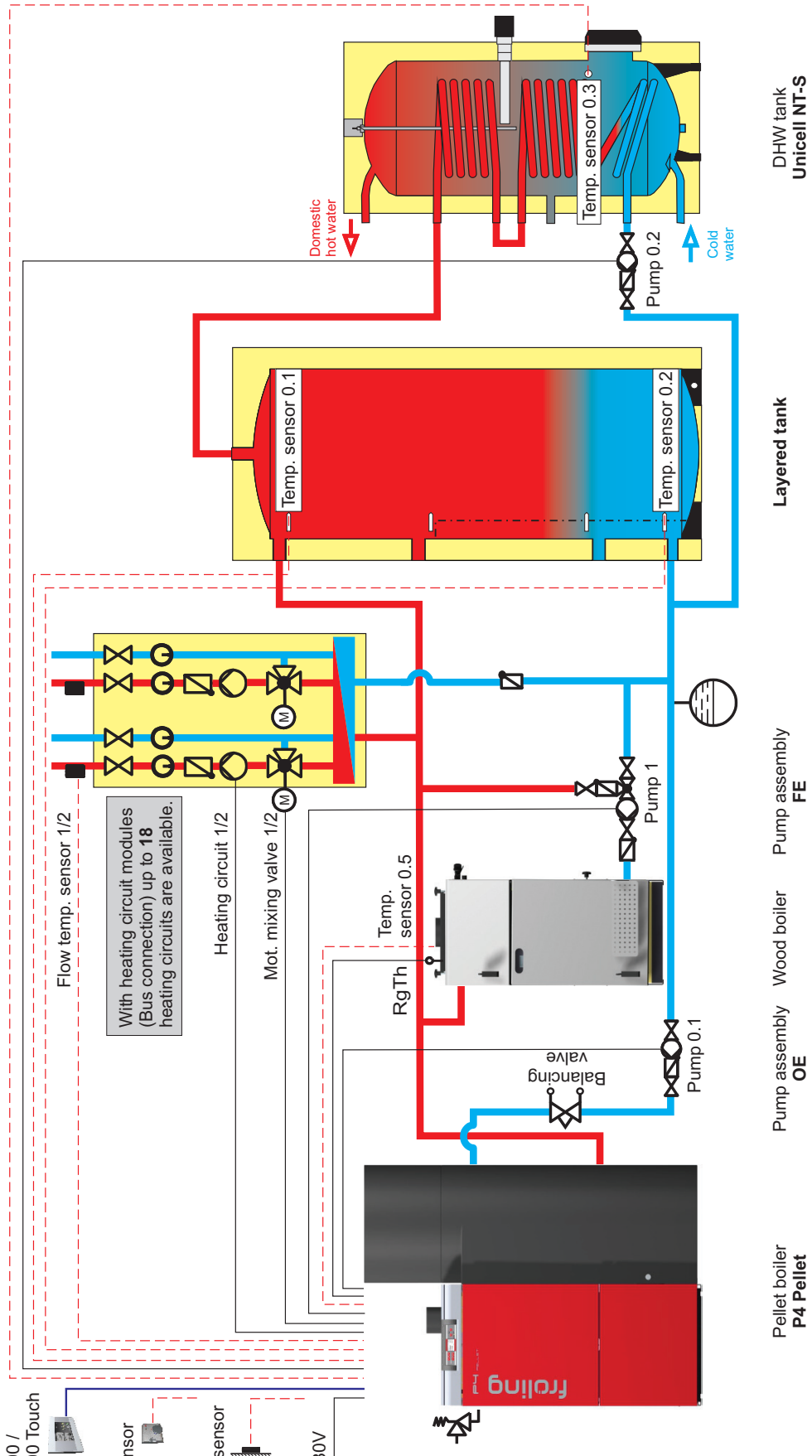


Note: When a storage tank is used always set the parameter in menu BOILER, item SERVICE, CONTROL STANDBY to “NO”!
Controller P3200

Energy systems

System 2.P005

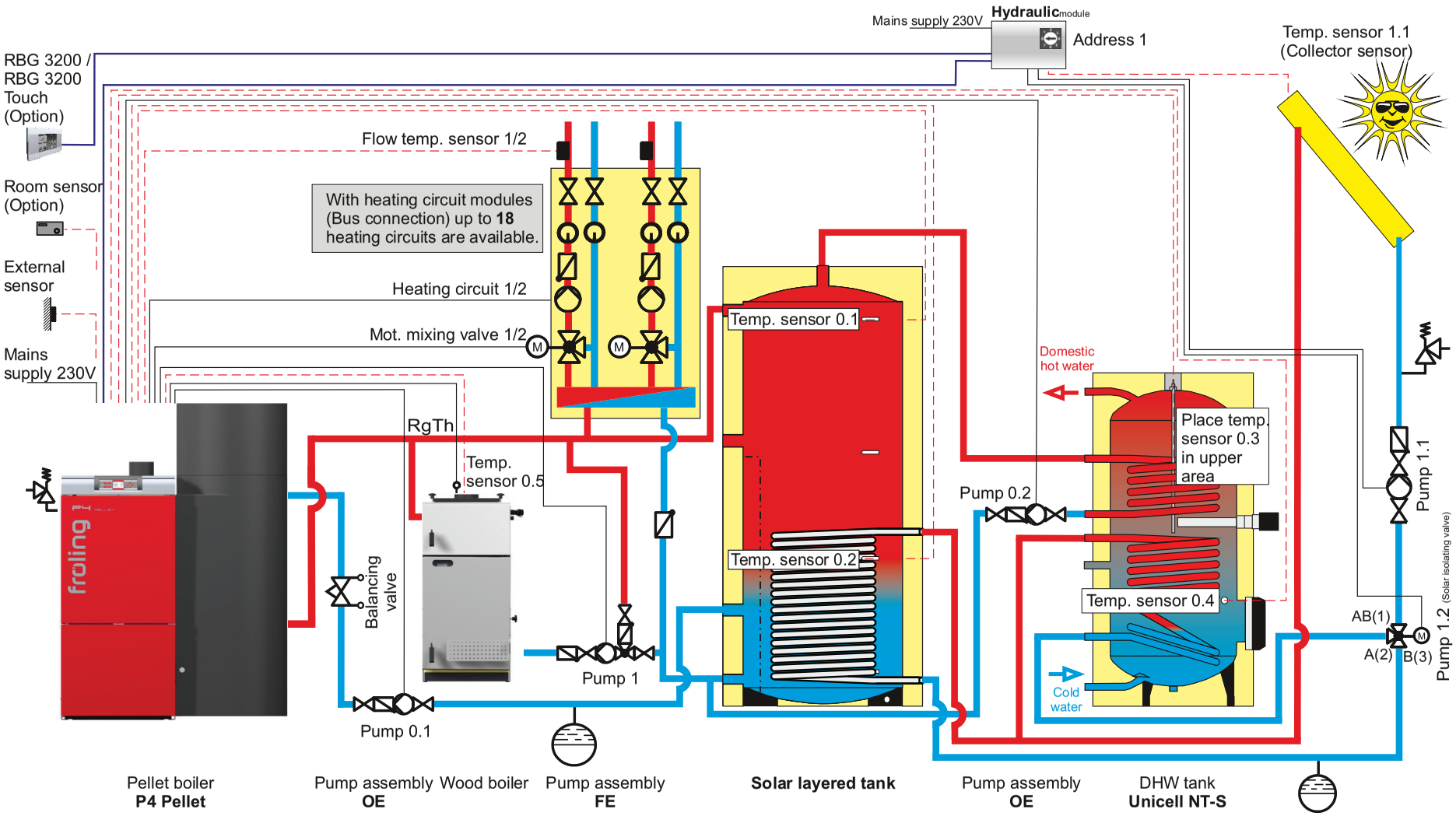
Suggested layout proposal!



Note: When a storage tank is used always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to "NO"!
DUE TO LEGAL REQUIREMENTS SEVERAL CHIMNEYS ARE NECESSARY!
Controller P 3200

Suggested layout proposal!

System 2.P007

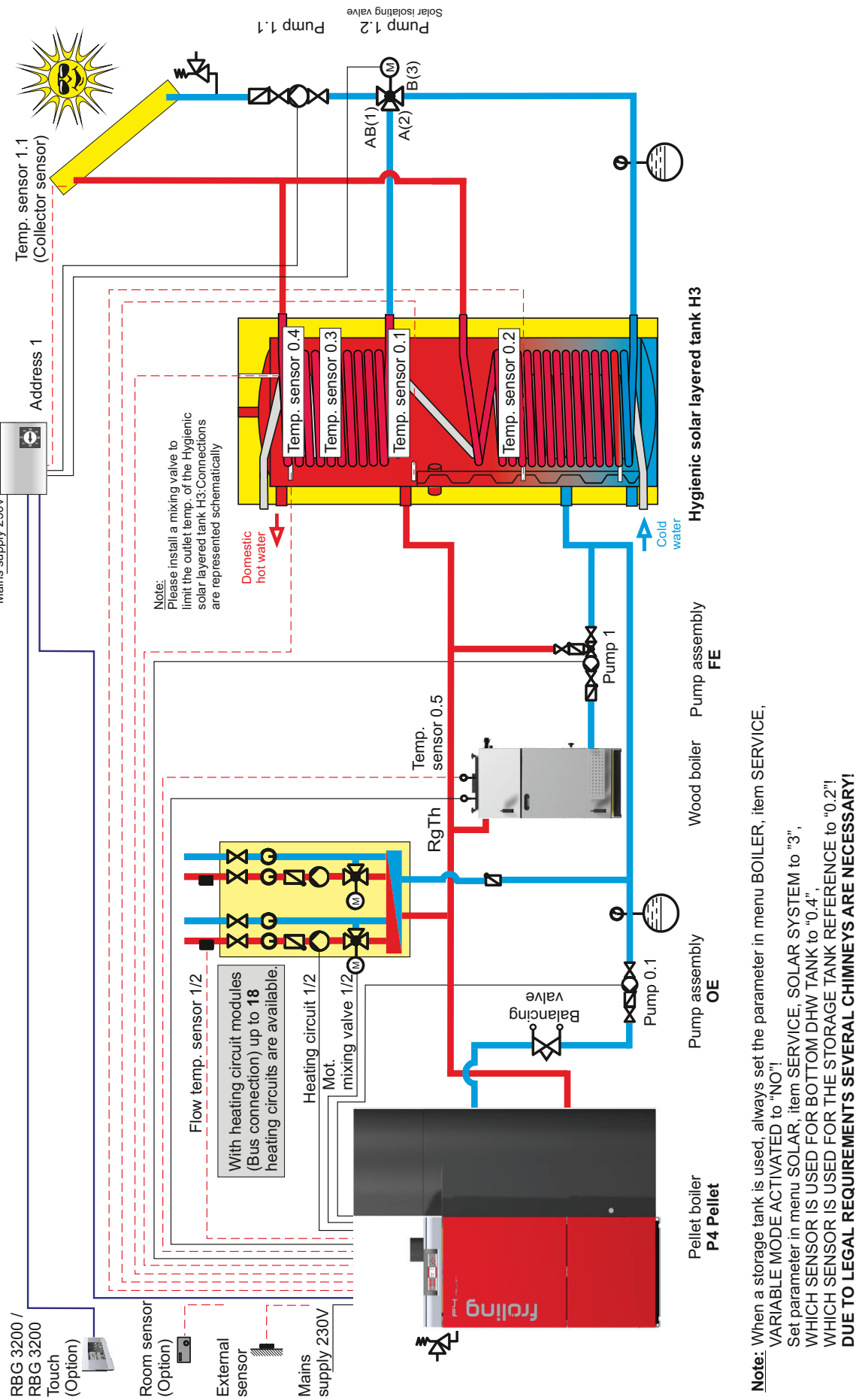


Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to “NO”!
Please set parameter in menu SOLAR, item SERVICE, SOLAR SYSTEM to ”1”.
DUE TO LEGAL REQUIREMENTS SEVERAL CHIMNEYS ARE NECESSARY!
Controller P 3200

Energy systems

System 2.P015

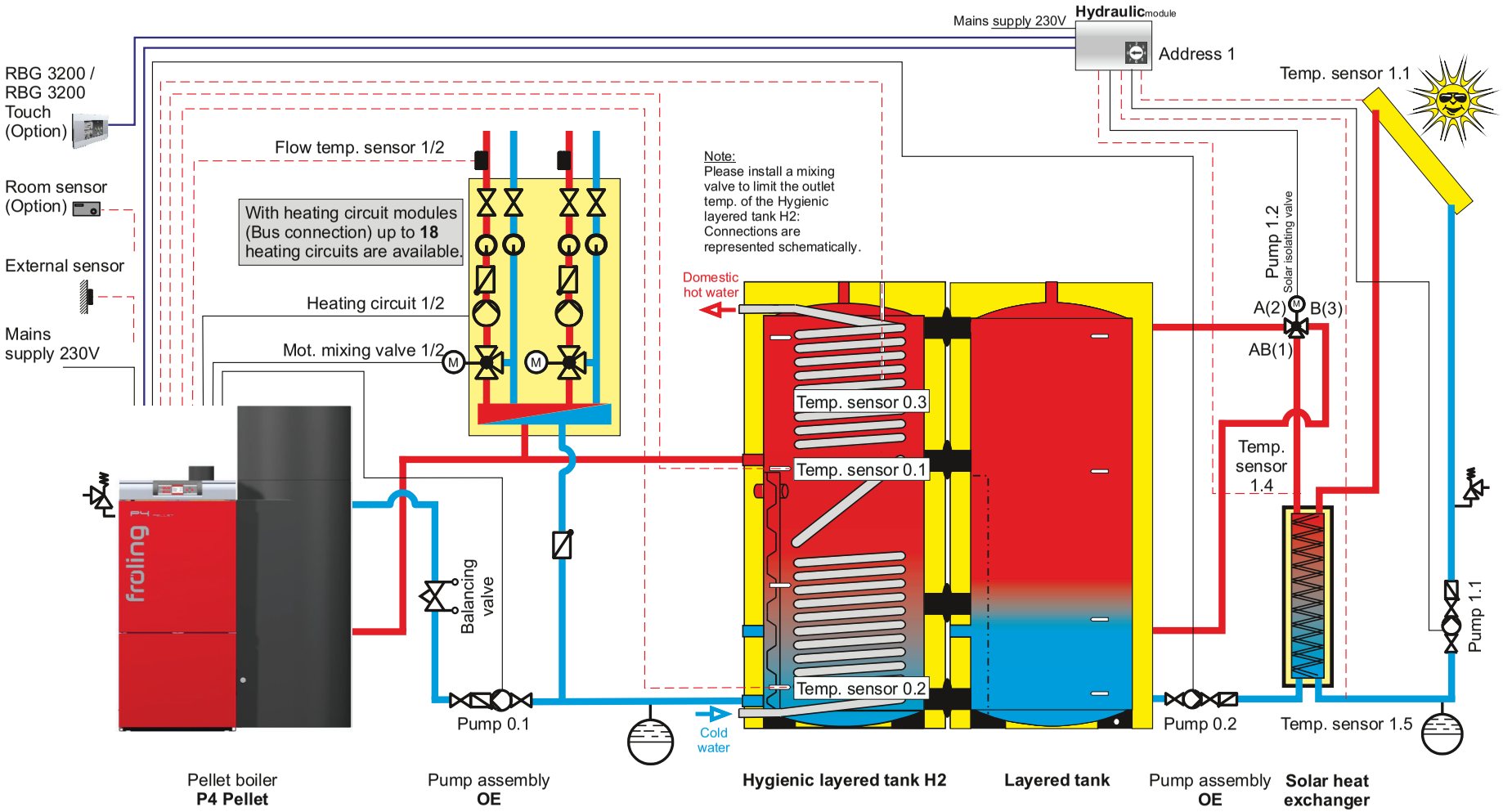
Suggested layout proposal!



Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to "NO"!
Set parameter in menu SOLAR, item SERVICE, SOLAR SYSTEM to "3",
WHICH SENSOR IS USED FOR BOTTOM DHW TANK to "0.4",
WHICH SENSOR IS USED FOR THE STORAGE TANK REFERENCE to "0.2"!
DUE TO LEGAL REQUIREMENTS SEVERAL CHIMNEYS ARE NECESSARY!
Controller P 3200

Suggested layout proposal!

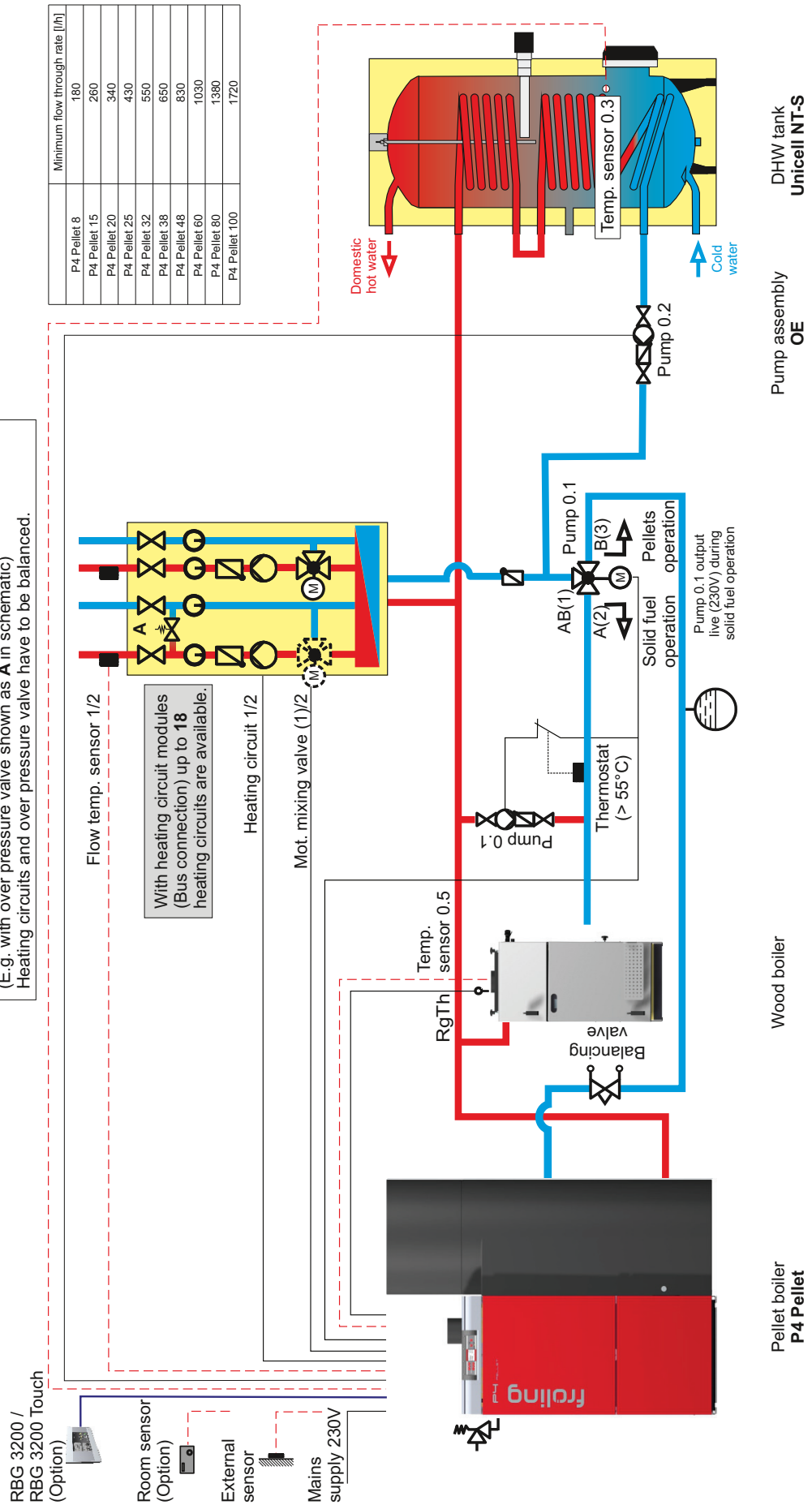
System 13.P001



Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to “NO”!
Set parameter in menu SOLAR, item SERVICE, WHICH PUMP IS USED FOR STORAGE TANK-HEAT EXCHANGER to “0.2”.
Valve is closed electroless AB-B, Controller P 3200

System 3.P003

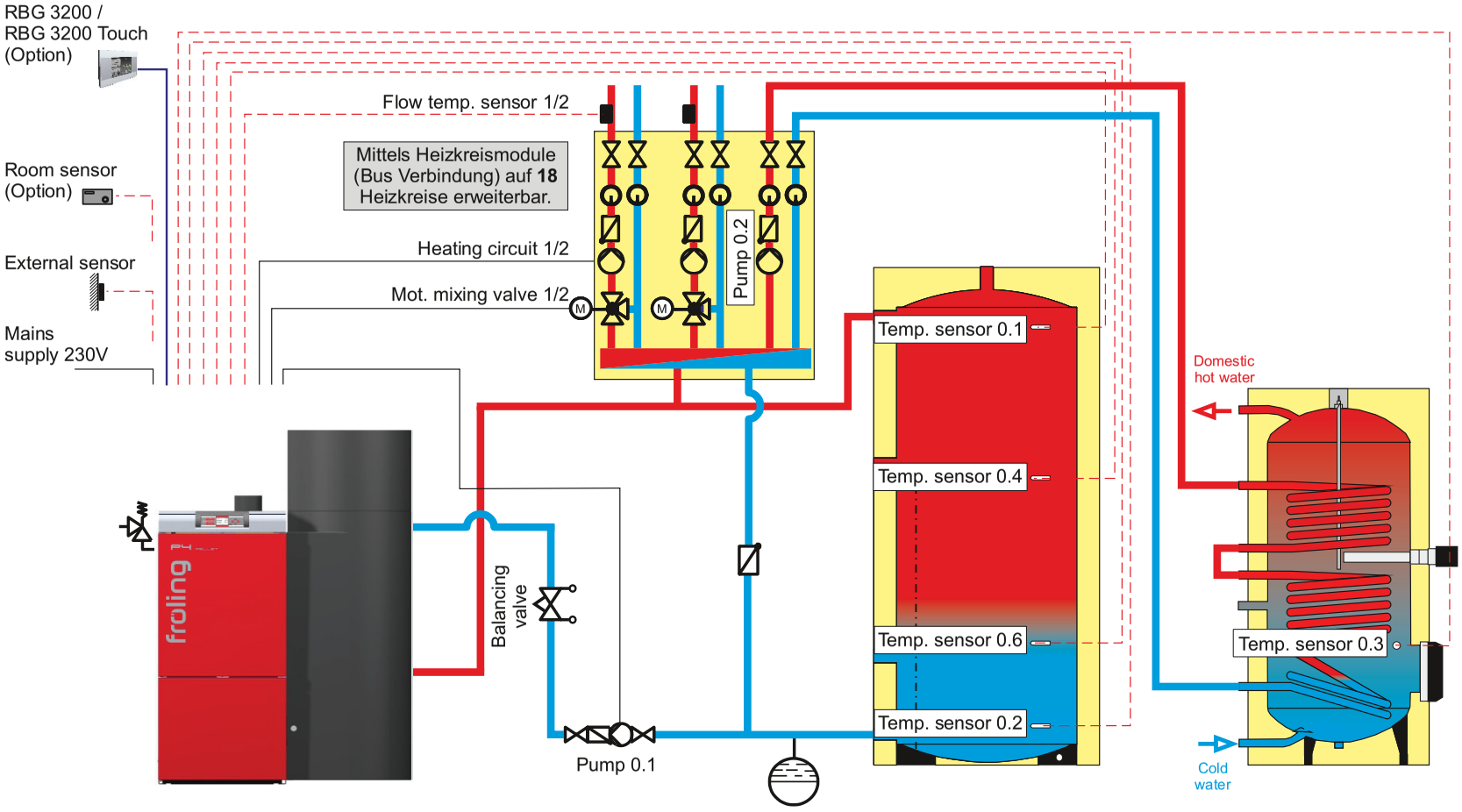
Suggested layout proposal!



Note: Controller P 3200
DUE TO LEGAL REQUIREMENTS SEVERAL CHIMNEYS ARE NECESSARY!

Suggested layout proposal!

System 4.P001



Pellet boiler
P4 Pellet

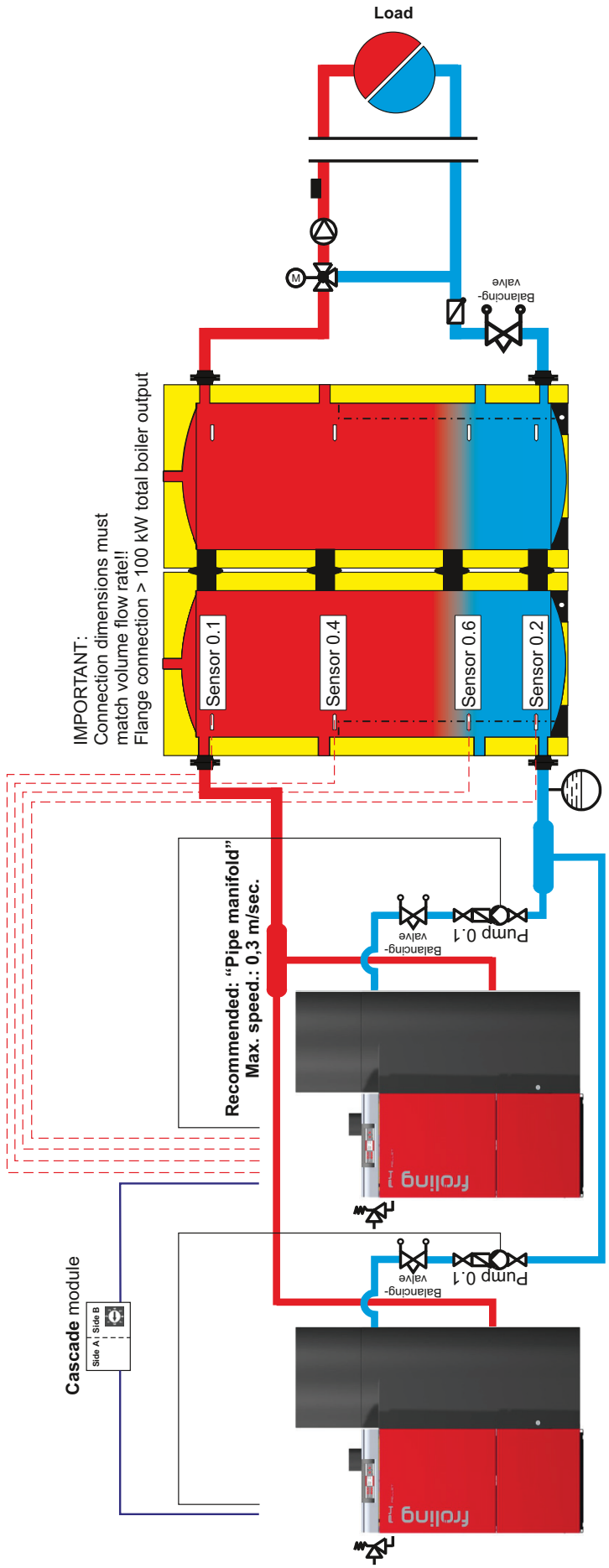
Pump assembly
OE

Layered tank

DHW tank
Unicell NT-S

Note: When a storage tank is used, always set the parameter in menu BOILER, item SERVICE, VARIABLE MODE ACTIVATED to "NO"!
Controller P3200

System 1.P708



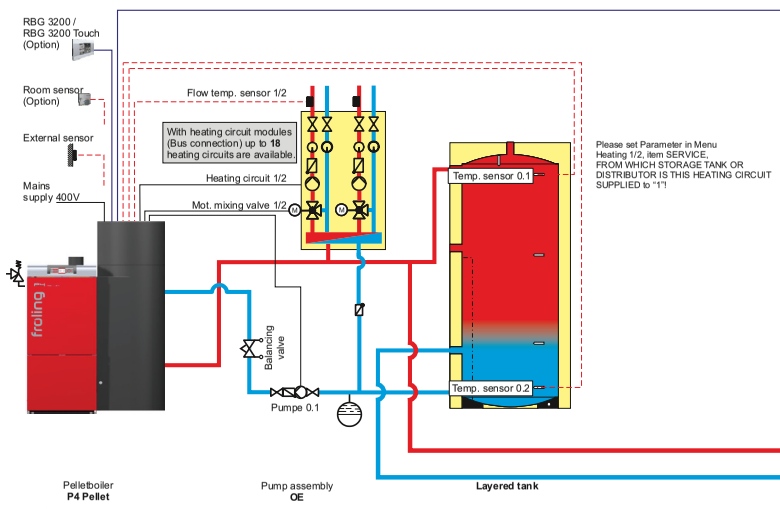
Suggested layout proposal!

Note: When a storage tank is used, set the paramter in menu Boiler, item Service VARIABLE MODE ACTIVATED to „NO" (Masterboiler). At the Slave boilers this parameter has to be set to "YES". At all boilers set the parameter BOILER STOPS AUTOMATICALLY WHEN NO HEAT REQUIRED to "YES". Controller P3200
DUE TO LEGAL REQUIREMENTS SEVERAL CHIMNEYS ARE NECESSARY!

Suggested layout proposal!

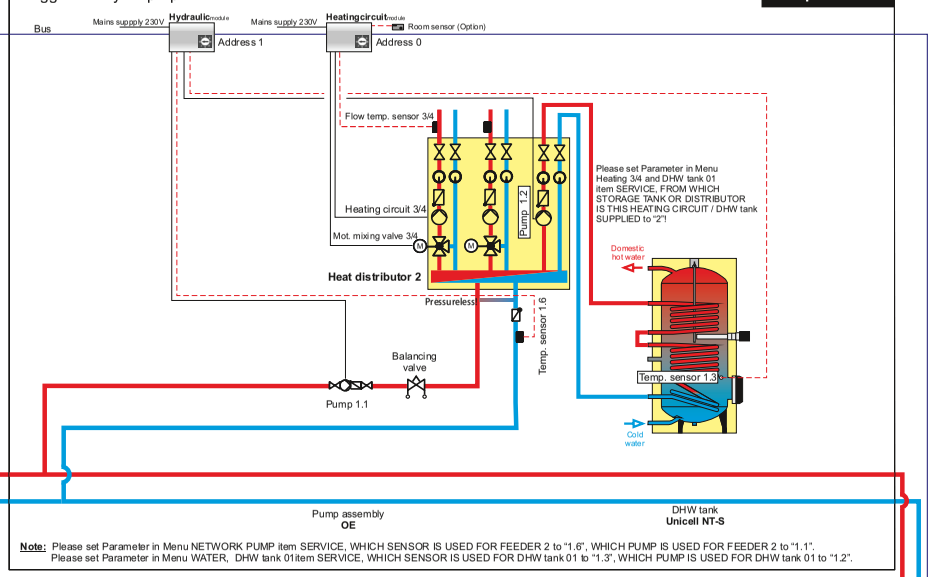
Variante 2.P002

Suggested layout proposal! — System 1.P819



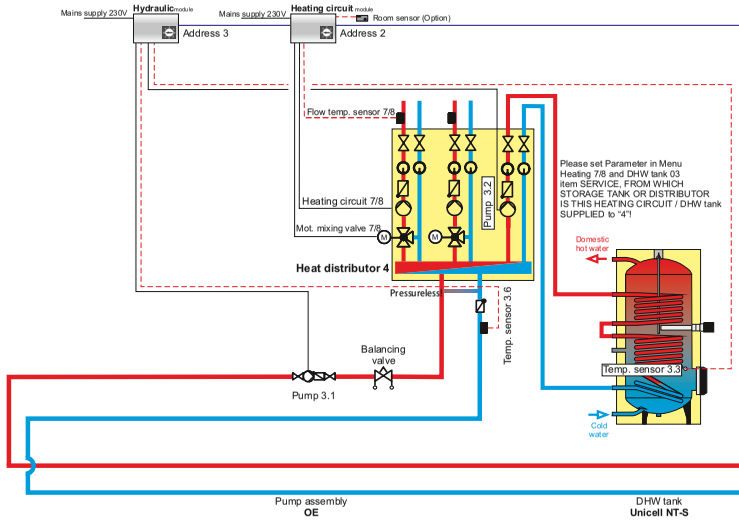
Note: Controller P3200

Suggested layout proposal! — Option 1



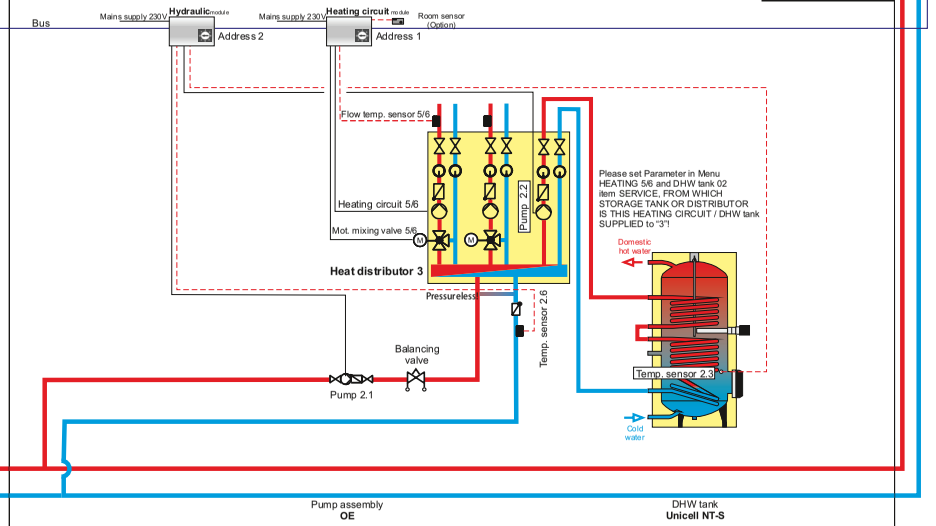
Note: Please set Parameter in Menu NETWORK PUMP item SERVICE, WHICH SENSOR IS USED FOR FEEDER 2 to "1.6", WHICH PUMP IS USED FOR FEEDER 2 to "1.1".
Please set Parameter in Menu WATER, DHW tank 01item SERVICE, WHICH SENSOR IS USED FOR DHW tank 01 to "1.3", WHICH PUMP IS USED FOR DHW tank 01 to "1.2".

Suggested layout proposal! — Option 1



Note: Please set Parameter in Menu NETWORK PUMP item SERVICE, WHICH SENSOR IS USED FOR FEEDER 4 to "3.6", WHICH PUMP IS USED FOR FEEDER 4 to "3.1".
Please set Parameter in Menu WATER, DHW tank 03 item SERVICE, WHICH SENSOR IS USED FOR DHW tank 03 to "3.3", WHICH PUMP IS USED FOR DHW tank 03 to "3.2".

Suggested layout proposal! — Option 1



Note: Please set Parameter in Menu NETWORK PUMP item SERVICE, WHICH SENSOR IS USED FOR FEEDER 3 to "2.6", WHICH PUMP IS USED FOR FEEDER 3 to "2.1".
Please set Parameter in Menu WATER, DHW tank 02 item SERVICE, WHICH SENSOR IS USED FOR DHW tank 02 to "2.3", WHICH PUMP IS USED FOR DHW tank 02 to "2.2".

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Further technical details upon request.
We will be pleased to assist and advise you.

Heizkessel- und Behälterbau GesmbH
A-4710 Grieskirchen, Industriestr. 12

AUT: Tel +43 (0) 7248 606 • Fax +43 (0) 7248 606-600
GER: Tel +49 (0) 89 927 926-0 • Fax +49 (0) 89 927 926-219
E-mail: info@froeling.com • Internet: www.froeling.com