Centrometal

HEATING TECHNIQUE

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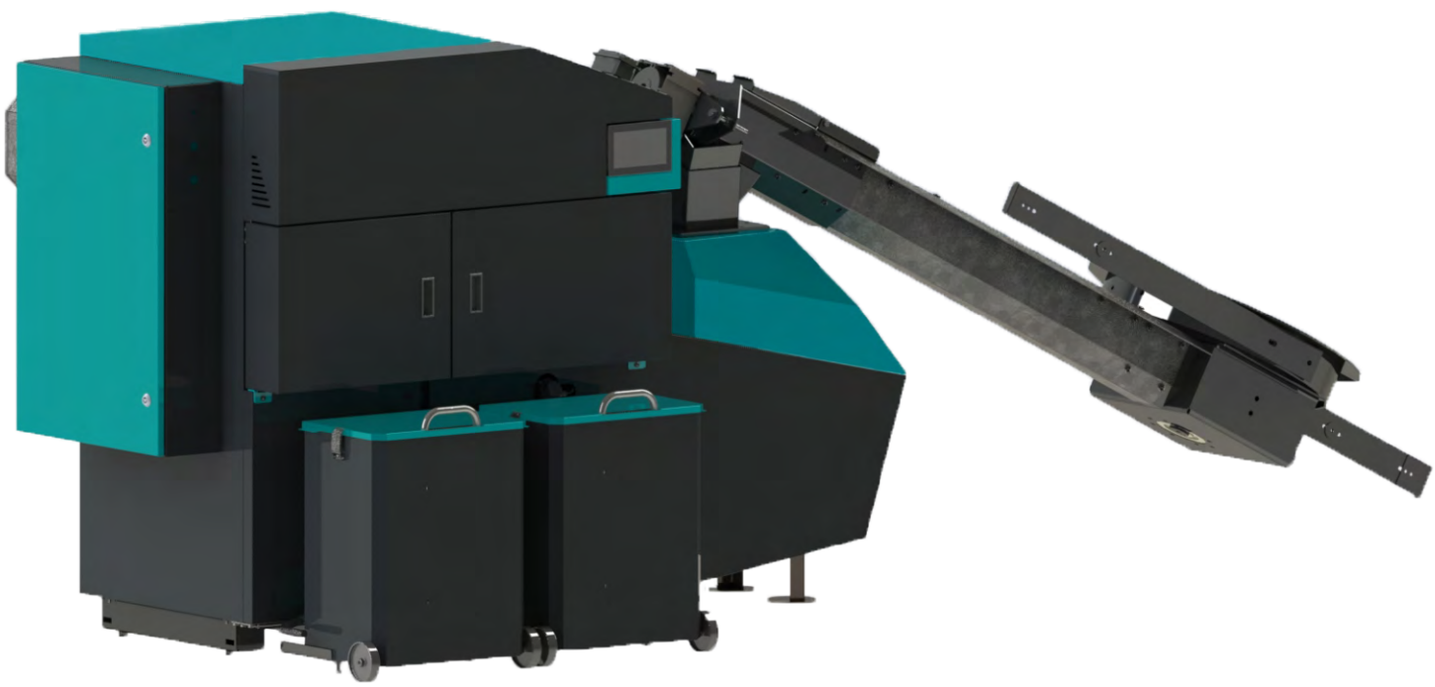
ENG

TECHNICAL INSTRUCTIONS

for installation, use and maintenance of hot water boiler and installation of additional equipment

CE



THE FIRST START-UP MUST BE DONE BY AUTHORIZED PERSON, OTHERWISE PRODUCT WARRANTY IS NOT VALID.

You can find the latest technical instructions for BIO-SC by scanning the QR code or at the web address:

https://www.centrometal.hr/cm-download-bio-sc/

BIO-SC

READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLING THE BOILER TO HEATING SYSTEM!

Boiler must not be used by children or disabled persons (either physicallyor mentally), as well as by person without knowledge or experience, unless they are under control or trained by s person responsible for their safety. Children must be supervised in the vicinity of the product.

Boiler must not operate in flammable and explosive environment.

Before any work on the boiler, electric energy must be switched off.

Insufficient combustion air for chimney vent boilers with room air for combustion can lead to dangerous conditions.

Make sure that the combustion air supply and discharge openings are not reduced or closed off.

Keep doors to the boiler room closed.

Protect the boiler room and avoid rodents and birds from entering and blocking the air openings.

When the above issues have not been resolved, the boiler can not be placed in operation.

TECHNICAL DATA

Model identifier (TYPE):			BIO-SC 48	BIO-SC 96
Useful heat output at rated heat output - Pn		(kW)	48	96
Useful heat output at 30 % of rated heat output - Pp		(kW)	14,4	28,8
Useful efficiency at rated heat output (Net calorific value "NCVar")		(%)	93,6	93,9
Useful efficiency at 30 % of rated heat output (Net calorific value "NCVar")		(%)	93,9	93,6
Useful efficiency at rated heat output (Gross calorific value "GCVar") - ηn		(%)	85,2	85,5
Useful efficiency at 30 % of rated heat output (Gross calorific value "GCVar") - ηp		(%)	85,5	85,2
Heat output range		(kW)	14,4-48	28,8-96
Boiler class			5	
Required chimney underpressure		(mbar)	0,02	
Water amount in boiler		(l)	145	200
Exhaust gas temperature at nominal heat output		(°C)	130	
Exhaust gas temperature at minimal heat output		(°C)	100	
Exhaust mass flow at nominal heat output		(g/s)	52,5	18,8
Exhaust mass flow at minimal heat output		(g/s)	99,7	35,1
Minimum operating time at nominal power		(h)	6	
Cold water tem. and pressure for safety heat exchanger		(°C/bar)	10-15°C / 2 bar	
Setting range for temperature controller		(°C)	65-90	
Minimum return flow temperature		(°C)	>0	
Heat loss when the boiler is OFF		(W)	345 - 416	630 - 800
Boiler resistance on water side at nominal output *1		(mbar)	0,17	0,32
Max. heat input		(kW)	-	-
Fuel moisture content		(%)	max. 35 (dry basis)	
Combustion chamber volume		(l)	5,8	10
Combustion chamber type			underpressure	
Power consumption		(W)	-	-
Ash box volume (left/right)		(l)	49/49	65/65
Auxiliray power requirements at Q_N		(W)	155	321
Auxiliray power requirements at Q_{min}		(W)	72	127
Supply voltage		(V~)	400	
Frequency		(Hz)	50	
Boiler body dimensions	Length (A)	(mm)	1335	1580
	Width (B)	(mm)	1920	2120
	Height (C)	(mm)	1440	1440
Total mass		(kg)	780	1020
Max. operating overpressure		(bar)	2,5	
Test pressure		(bar)	5,0	
Max. operating temperature		(°C)	90	
Flue gas tube - external diameter		(mm)	150	200
Dimension D*2/D*3		(mm)	1355 / 1040	1370 / 1300
Dimension E		(mm)	179	179
Dimension F		(mm)	-	700
Boiler connections	Main/return flow (thread)	(G)	5/4"	6/4"
	Filling/drainage (thread)	(G)	1/2"	
Heating appliance working			with fan	
Heating appliance working			under non-condensing conditions	
Stoking mode			automatic	
I is recommended that the boiler be operated with a hot water storage tank of a volume of at least		(l)	960	1920
Condensing boiler			no	
Solid fuel cogeneration boiler			no	
Combination boiler			no	
Preferred fuel			Wood chip: EN ISO 177225 - 4; Class (A1-A2) / (P16S-P31S / (G30-G50); Moisture content W20-W35 / M20	
Seasonal space heating energy efficiency - η_S		(%)	81	81
Seasonal space heating emissions for preferred fuel *4	PM	mg/m³ (10% O2)	34	21
	OGC	mg/m³ (10% O2)	<1	<1
	CO	mg/m³ (10% O2)	158	122
	NOx	mg/m³ (10% O2)	137	148
Auxiliary electricity consumption	At rated heat output - elmax	(kW)	0,155	0,321
	At 30 % of rated heat output - elmin	(kW)	0,072	0,127
	Of incorporated secondary emission abatement equipment	(kW)	Not applicable	
	In standby mode - P_{SB}	(kW)	0,012	

*2 possible way of installing the fan (output is directed up)

*1 dT=20°C

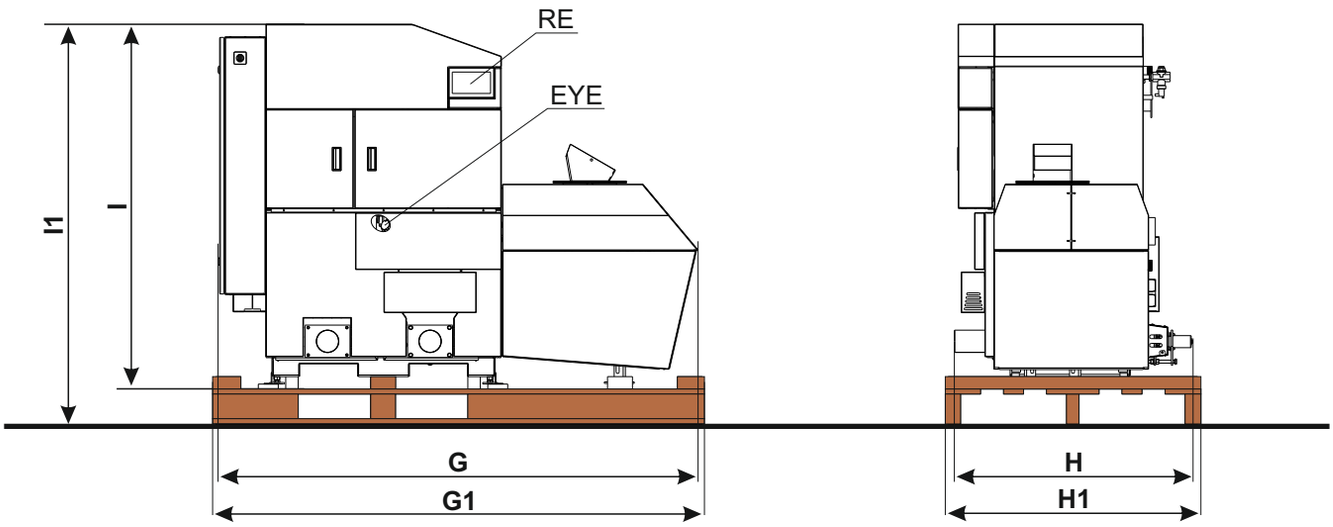
*3 possible way of installing the fan (output is directed sideways)

*4 PM = particulate matter, OGC = organic gaseous compounds, CO = carbon monoxide, NOx = nitrogen oxides

Contact details: Centrometal d.o.o. - Glavna 12, 40306 Macinec, Croatia

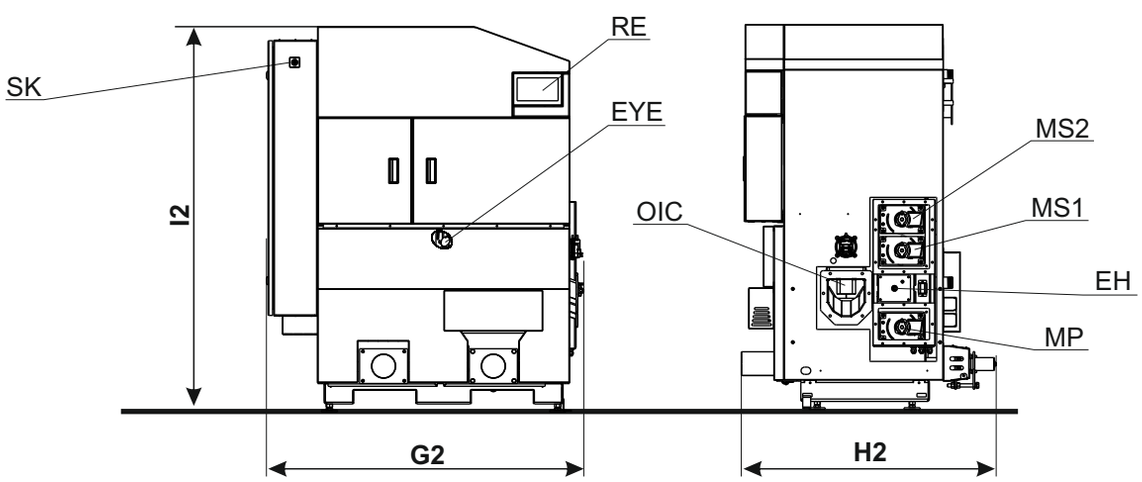
Dimensions of the boiler to enter the room (boiler with screw feeder-1, rotary valve), standard form of delivery.

Dimensions (mm):		48 kW	96 kW
Width (boiler only)	(G)	1920	2120
Depth (boiler only)	(H)	955	1020
Height (boiler only)	(I)	1440	1440
Width (boiler with wooden pallet)	(G1)	1950	2150
Depth (boiler with wooden pallet)	(H1)	1000	1065
Height (boiler with wooden pallet)	(I1)	1605	1770



Dimensions of the boiler to enter the room (boiler without screw feeder-1 and rotary valve)

Dimensions (mm):		48 kW	96 kW
Width (boiler only)	(G2)	1190	1355
Depth (boiler only)	(H2)	955	1020
Height (boiler only)	(I2)	1440	1440



BOILER PARTS (basic delivery):

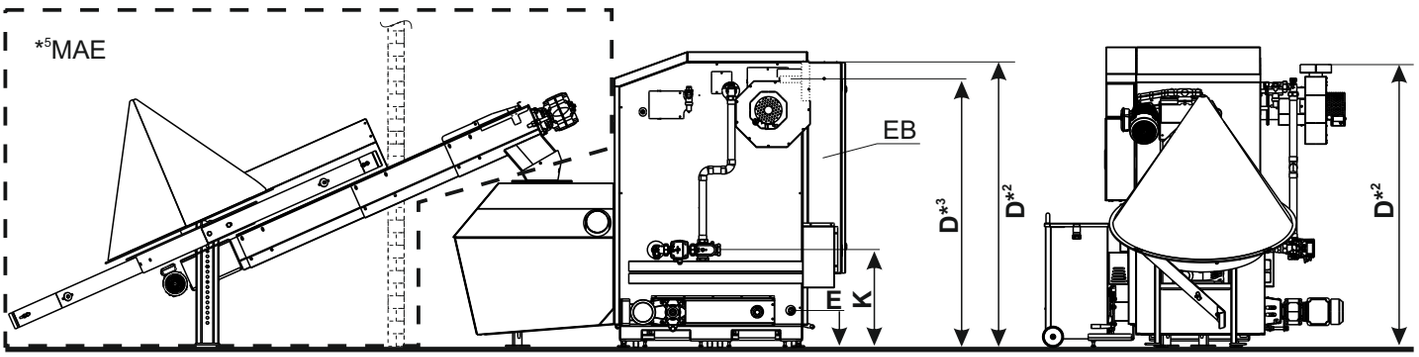
ABL - Ash box - Left
ABR - Ash box - Right
CG - Cable glands
CTP - Chain transmission protection
CVO - Cover of the opening for fuel cleaning/weighing
DP - Flue gas tube
EB - Junction (electric) box (jbox)
EH - Electric heater
EYE - "Eye" for flame control
FA - Fresh air inlet to the boiler
MAR - Automatic ash extraction geared motor
MC1 - Screw feeder (transporter) 1 - geared motor
MGC - Grate cleaning mechanism
MP - Primary air actuator
MRV - Rotary valve (RSE) - motor actuator
MS1 - Secondary air actuator 1
MS2 - Secondary air actuator 2
OIC - Opening for installation of screw feeder-1
OP - Cover lid - boiler sensor
PE - Connection for expansion vessel
PG - Pump group
PLV - Main flow connection
PP - Filling / drainage
PT1 - Screw feeder-1
PVV - Return flow connection
RE - Boiler control screen (7") (controller)
RV - Rotary valve (RSE)
SK - Main switch (0/1)
STB - Safety thermostat (STB)
TP - Thermal protection exchanger
TPC - Cover lid - thermic valve sensor probe
TU - Temperature sensor tube (probe)
VE - Fan (fan output can be mounted in any directions)

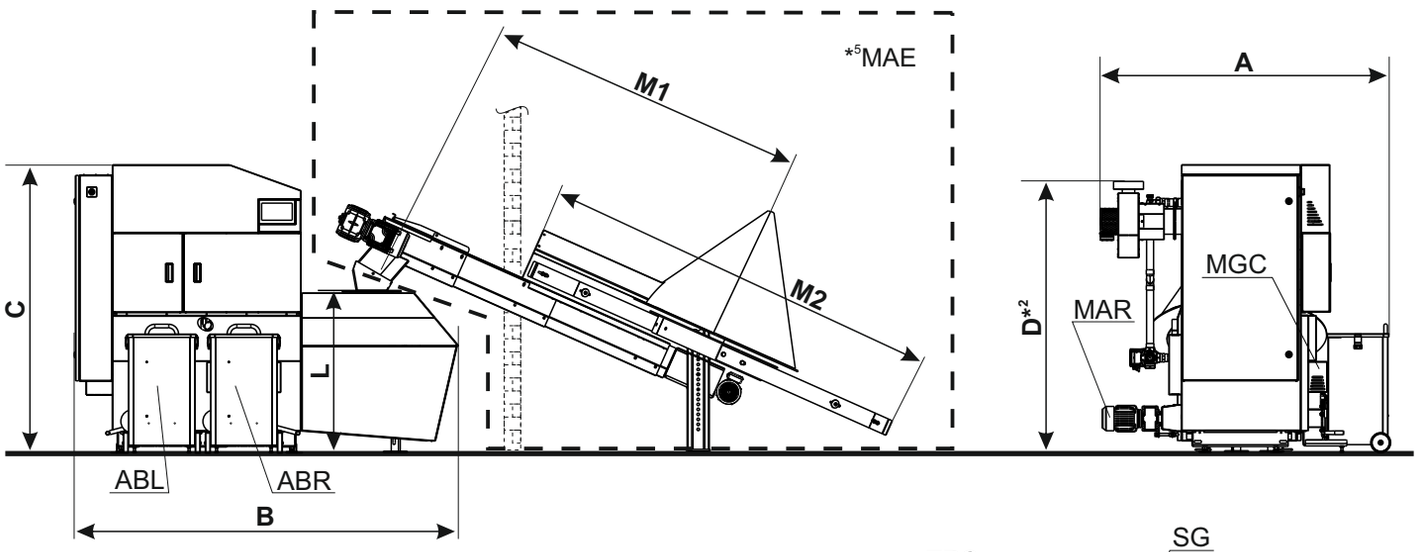
MANDATORY ADDITIONAL EQUIPMENT:

***[5]MAE -** System for supplying wood chips from the tank (the sketch shows an example of supplying wood chips from the tank-room)
- ***[5]PT2 -** Screw feeder-2
- ***[5]MC2 -** Screw feeder-2 - motor actuator
- ***[5]WCM -** Wood chip mixer
- ***[5]WCMR -** Wood chip mixer - angle reducer
- ***[6]MWCM -** Wood chip mixer - motor actuator

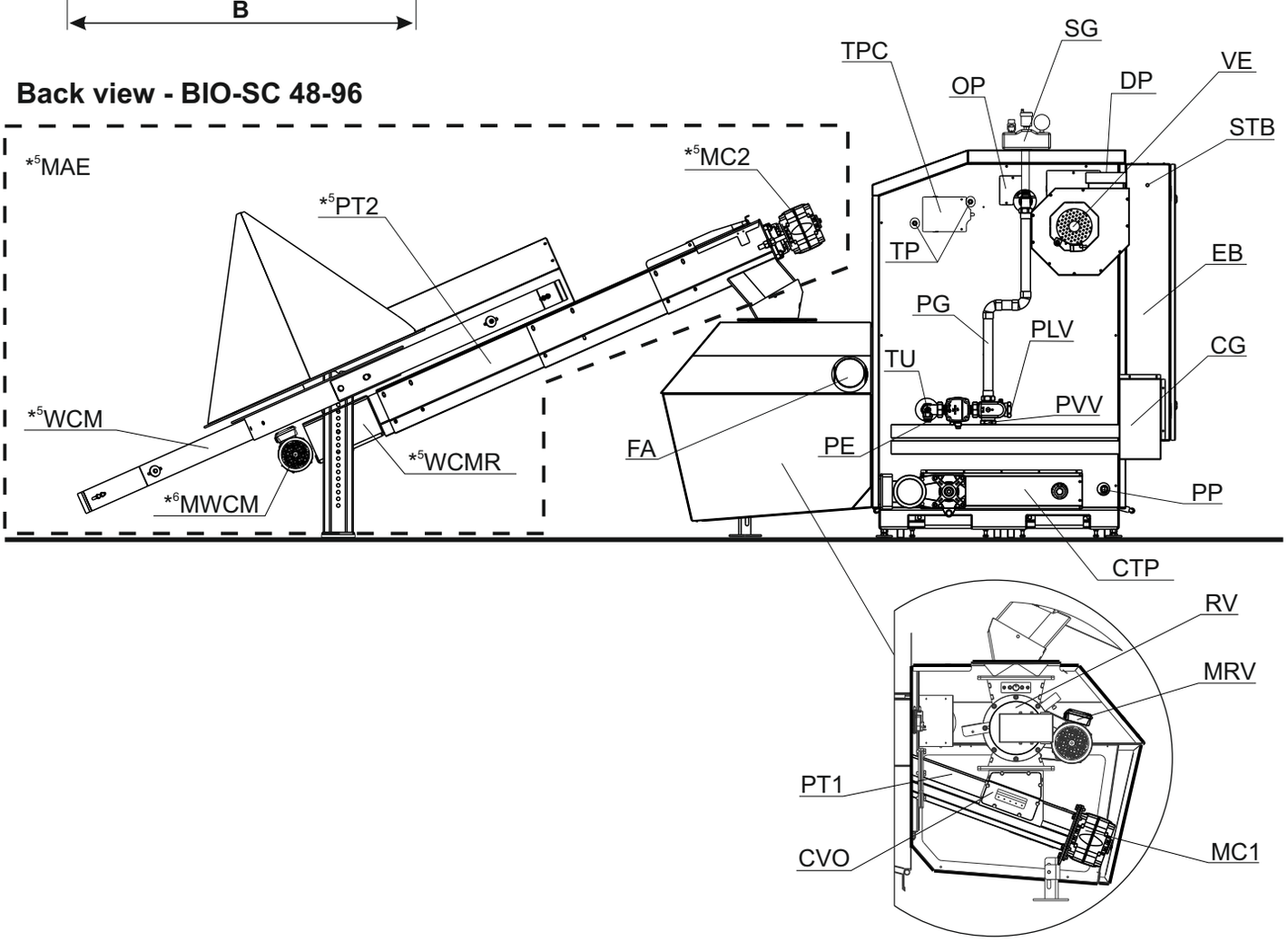
***[5]SG -** Safety airvent group

***[5]** - mandatory additional equipment
***[6]** - mandatory additional equipment (in certain situations, a solution without this component is also possible)

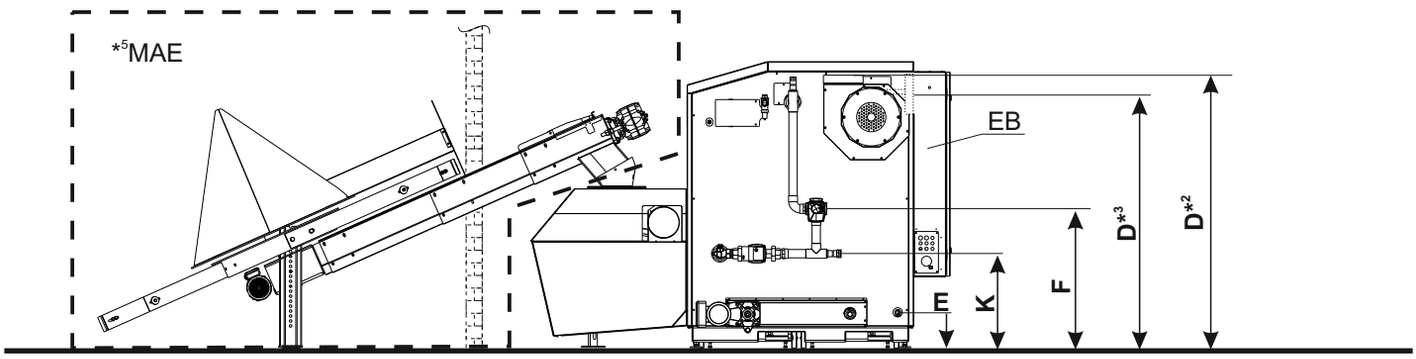




Back view - BIO-SC 48-96

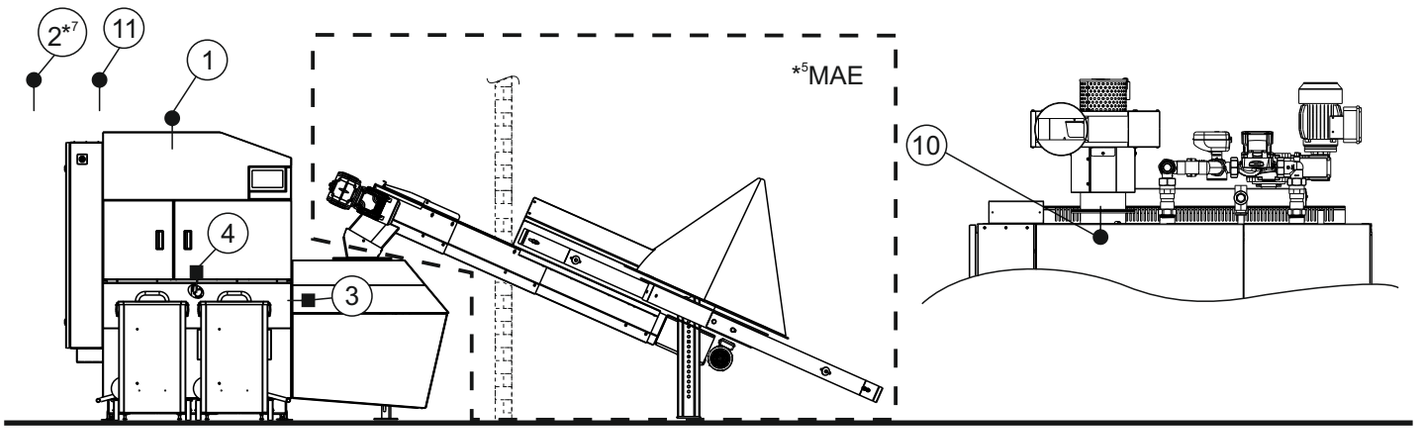


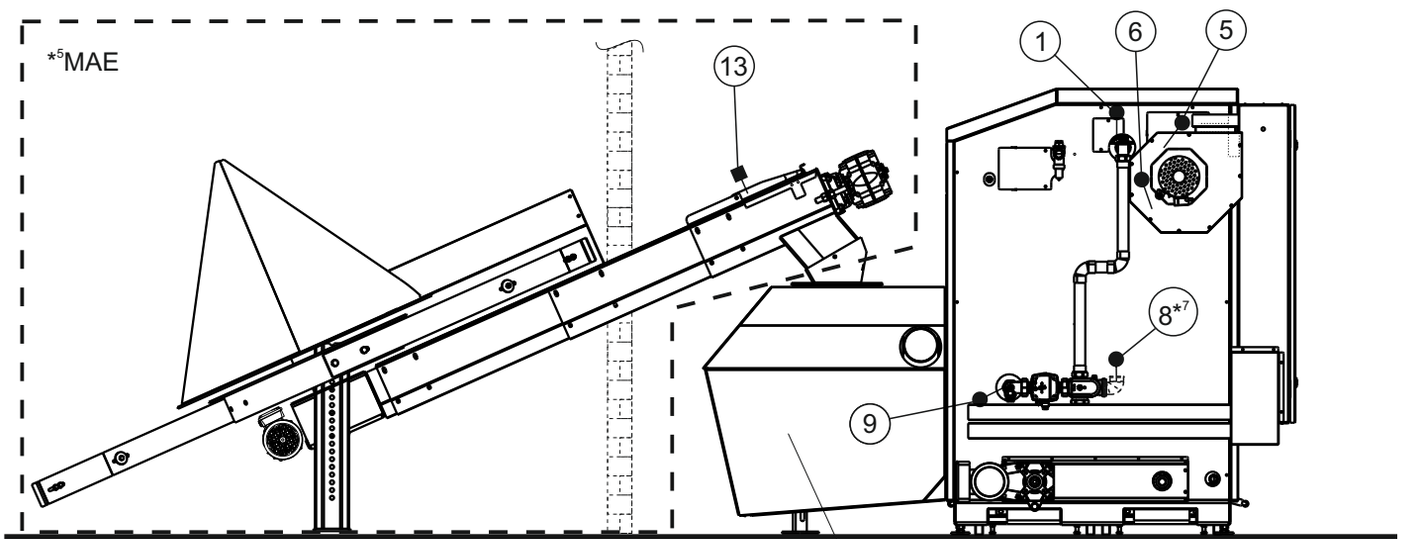
BIO-SC 96



Other boiler dimensions:

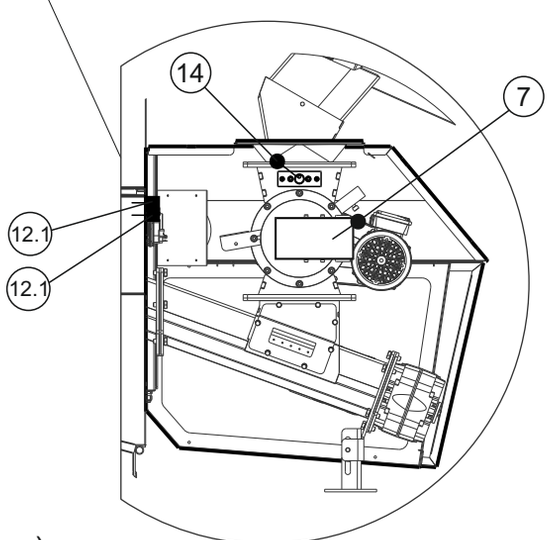
Dimensions	48-96 kW
(K)	475 mm
(L)	810 mm
(M1)	2-5 m
(M2)	2-5 m





Sensors and microswitches in the basic delivery:

1 - Boiler sensor (NTC 5k)
2*7 - DHW sensor (NTC 5k)
3 - Pressure switch
4 - Photocell
5 - Flue gas sensor (Pt 1000)
6 - Fan speed sensor
7 - Inductive sensor (2 pieces)
8*7 - Main flow sensor (NTC 5k)
9 - Return flow sensor (NTC 5k)
10 - Lambda probe
11 - Outdoor temperature sensor (NTC 5k)
12.1 - Firebox flap - microswitch 1
12.2 - Firebox flap - microswitch 2
13 - Screw feeder-2 - microswitch
14 - Fuel level ultrasonic sensor (transmitter and receiver)



*5 - mandatory additional equipment
*6 - mandatory additional equipment (in certain situations, a solution without this component is also possible)
*7 - depending on the configuration can be used as: DHW sensor, flow temperature sensor, accumulation tank sensor (CAS), hydraulic crossover (CRO)

ADDITIONAL EQUIPMENT

CAL - alarm box (speaker/ LED)

Room corrector (CSK-Touch)

Room corrector (CSK)

CMNET module for boiler cascade

CM2K module for regulation 2+ heating circuits

1.0. INTRODUCTION

The **BIO-SC** has a modern construction and design and is made out of the controlled materials of high quality, welded with most modern technology and is approved and tested under EN 303 - 5 norm and fulfil all special request for the connection on the installation of a central heating system**.**

1.1. BOILER DESCRIPTION

Steel hot water boiler are engineered for chipped wood firing. In the boiler is installed the burner for chipped wood firing with the automatic firing and automatic self-cleaning function which enables the reliable operation also with the low quality chipped wood. The function of the automatic cleaning flue gas tubes provides the unifying exchange of the heat and high and unifying level of boiler efficiency. Digital boiler control screen (7”) in a basic construction also has combustion control using a lambda probe. The Screw feeder-2 and mixer or chipped wood tank with mixer is a mandatory additional boiler equipment. The boiler is delivered in pieces due to the easier transport into the boiler room.

1.2. SAFETY PRECAUTIONS

The boiler and related accessories are state of the art and meet all applicable safety regulations. The boiler control screen (7”), Junction (electric) box (jbox), el. heater, safety cut-out STB thermostat, fan, grid cleaning mechanism, flue gas tubes cleaning mechanism and chipped wood supply mechanism (screw feeder-1 and rotary valve) are integrated into the **BIO-SC**. Some operate at 230 V AC, and some at 400 V AC. Improper installation or repair can pose the danger of life-threatening electric shock. The installation of the boiler and its basic delivery and additional equipment may be performed only by appropriately qualified technicians.

Caution symbols:
Please take careful note of the following symbols in this Operating Manual.

	**This symbol indicates measures for protection against accidents and warning for the user and / or exposed persons.**

1.3. IMPORTANT INFORMATIONS

All local regulations, including those referring to national and European standards need to be complied with when installing the appliance.
The boiler must not be modified unless using the tested original accessories we provide or if the work is undertaken by our Customer Service.
Only fit original spare parts. These can be obtained from your customer service partner or directly from ourselves. European standards need to be complied with when installing the appliance. Regular care and cleaning of the appliance, flue gas outlets, connecting piece and flue.

 **CAUTION:**

The flue may block if the boiler is heated again after a long period of it not being used. Before starting the boiler, have the flue checked by a specialist (chimney sweep). Ensure sufficient supply of fresh air in the installation room when heating. The air must be replaced at least 0.8 times an hour through constant and reliable room venting. Fresh air may have to be provided from outside if the windows and doors in the room where the boiler is installed are well sealed or if this room contains other equipment, such as extractor hoods, clothes dryer, fan etc.

1.4. STATUS OF DELIVERY

Equipment is delivered seperately:

1. Boiler with covers and thermal insulation (on a wooden pallet 1/2):

With inbuilt and pre-wired:

- junction box (jbox)
- boiler temperature sensor - NTC 5K - PVC l=1000 (12041)
- 1x flue gas temperature sensor - PT 1000 - Teflon l=1700 (62330)
- 1x return flow temperature sensor - NTC 5K - PVC l=2000 (26226)
- 2x Inductive sensor (57499)
- 1x Ultrasound sensor-set (76923)
- lambda probe
- Pressure switch
- Photocell
- Electric heater
- 2 x Combustion chamber microswitch
- Screw feeder-1 with rotary valve
- Thermic protection valve (Caleffi 543, 98°C)

2. Other parts and sensors in the basic delivery (found in the set together with the sensors in the junction box (jbox) of the boiler):

- colour touch boiler control screen (7")
- 1x angle screen holder
- UTP cable, L= 10m (29104)
- 1 x return flow temperature sensor - NTC 5K - PVC l=2000 (26226)
- 3 x (main flow temperature sensor / DHW temperature sensor / Acc. (buffer) tank temperature sensor / Hydraulic crossover temperature sensor) - NTC 5K - PVC l=2000 (26226)
- 1 x outdoor temperature sensor - NTC 5K (31428)
- 1x set (main flow) - NTC 5K - PVC l=2000 (32685)

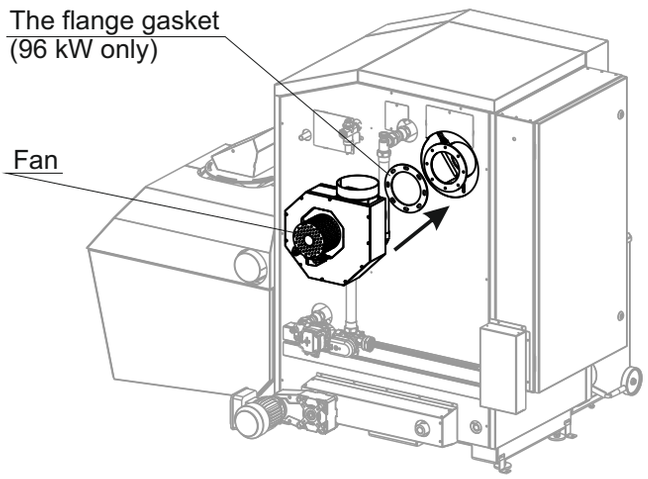
3. Other parts and equipment in standard delivery (on a wooden pallet 2/2):

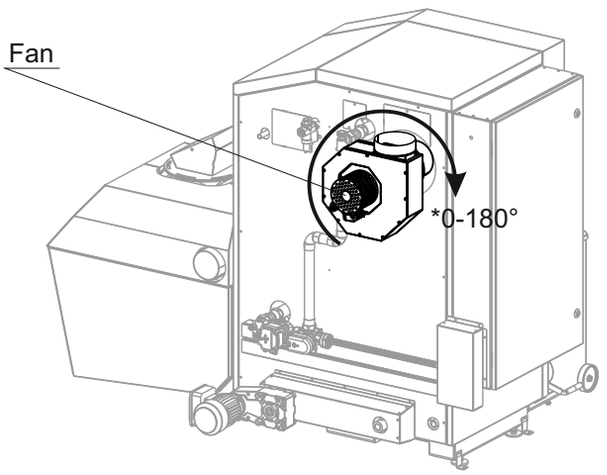
- Fan (requires installation on the boiler)
- Pump group (Tubes with 4-way mixing valve with actuator and circulation pump (requires installation on the boiler)
- 2x external ash box supports (automatic ash removal system) - (requires installation on the boiler)
- 2x external ash box (automatic ash removal system) - (requires installation on the boiler)
- Motor / reducer of automatic ash removal system (requires installation on the boiler)
- Thermal insulation of the connection flue gas tube between fan and chimney (flue pipe required)
- Cleaning tools: scraper, wooden cleaning brush, wire cleaning brushes
- Fuel weighing plate (used by an authorized service technician)

1.5. ASSEMBLING BOILER PARTS

For ease of handling, transport and import of boiler, BIO-SC is delivered in parts that need be mounted on the boiler when the boiler is in the boiler room. These parts need to be installed on the boiler:

a. Boiler fan installation (example: output is directed up)

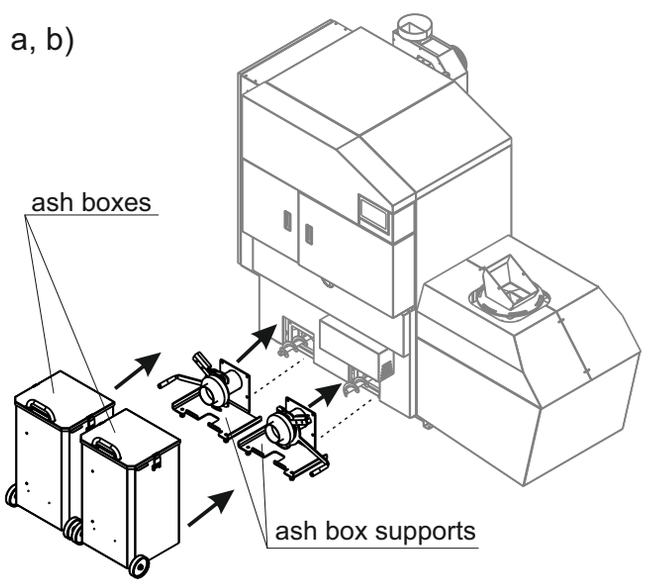


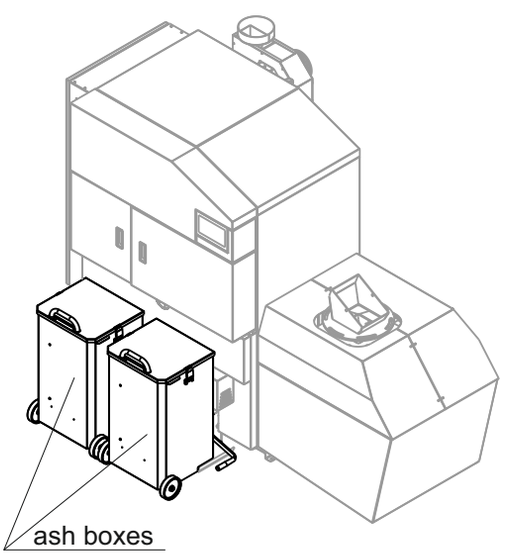


* possibility of installation at an angle of 0-180°

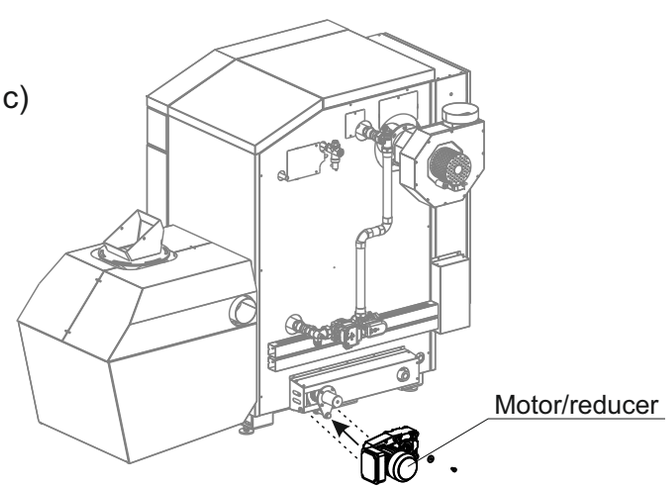
b. Installation of parts of automatic ash extraction on the boiler:

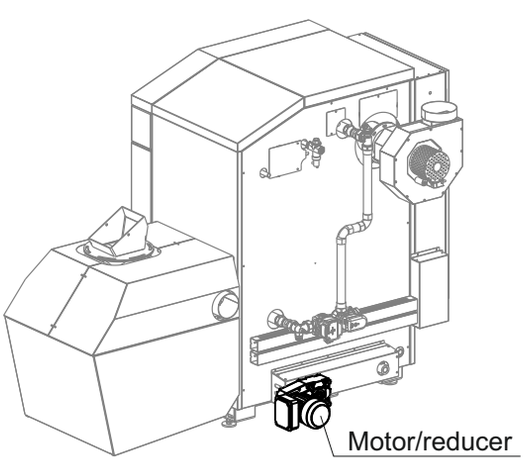
a, b)



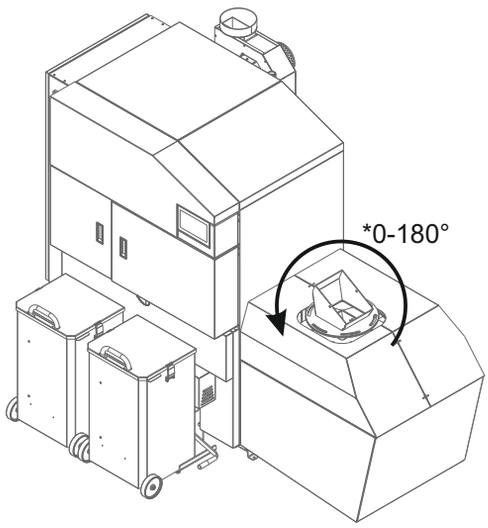


c)





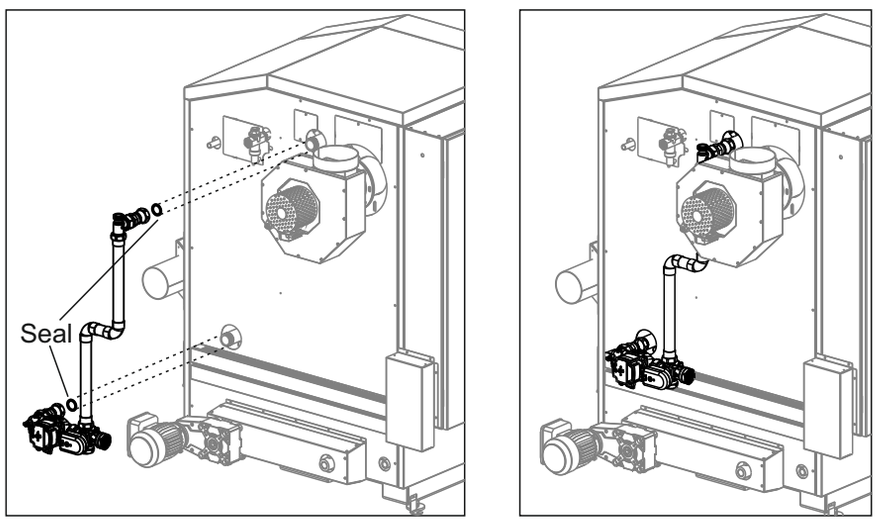
c. Adjustment of screw feeder-2 connection (180°)



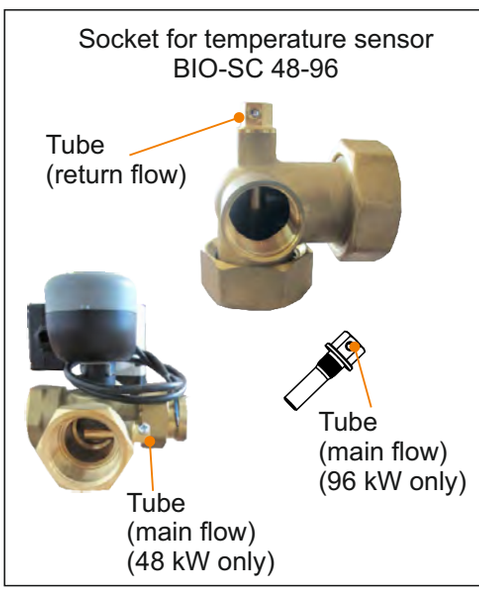
* possibility of installation at an angle of 0-180°

d. Installation of the pump group on the boiler

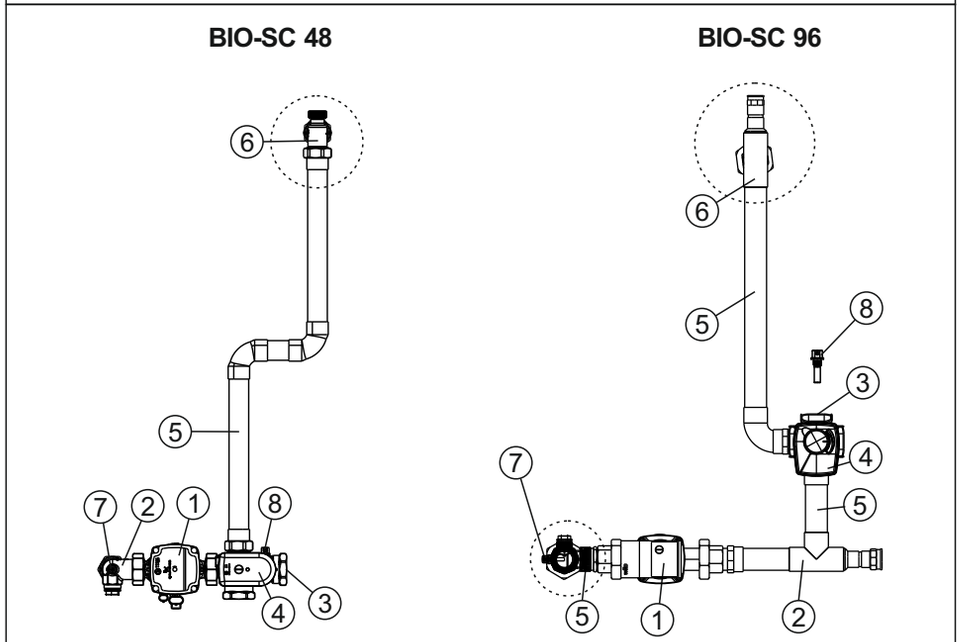
- mount pump group with 4-way mixing valve to the boiler so that the T-piece is in the upper side. On the upper connector of the T-piece incorporate safety ventilation group (obligatory additional equipment). On the back of boiler were prepared two holenders for mounting connection tubes (connection tubes with 4- way mixing valve). Be sure to use the seal for holenders. Set return temperature sensor in the socket for the sensor between the 4-way mixing valve and the boiler. It is obligatory using the included thermal paste. Connect the pump cable with connector in the pump connector.



Example of installation pump group to the boiler BIO-SC 48-96



Pump group



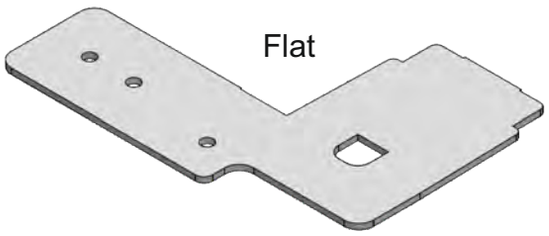
LEGEND:

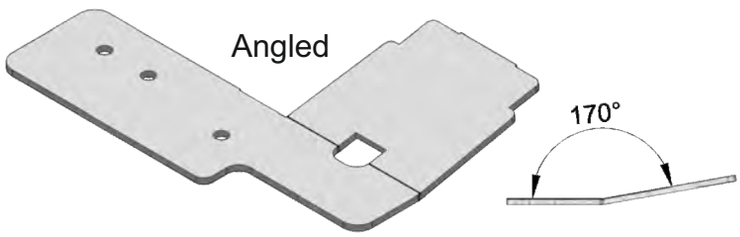
1. - Boiler pump P0
2. - Angled T-piece (connects to the boiler return flow)
3. - 4-way mixing valve
4. - Motor actuator
5. - Connecting pipe
6. - T-piece (connects to the boiler main flow)
7. - Return flow sensor tube
8. - Main flow sensor tube

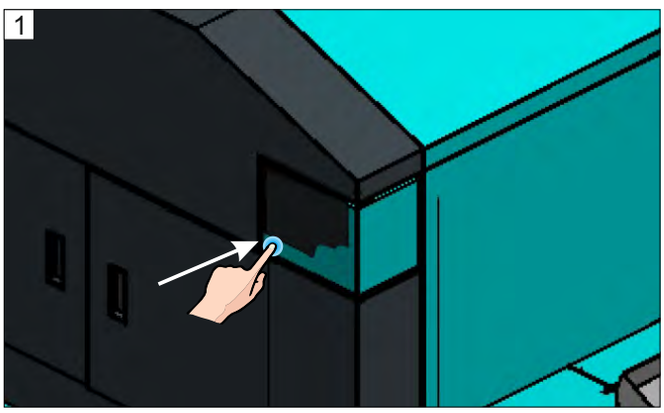
NOTE: check the tightness of connection tubes and tighten them as necessary.

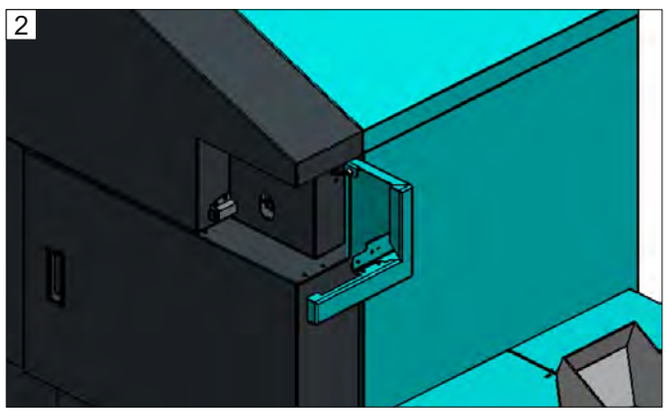
e. Installation of the supports and boiler screen (controller)

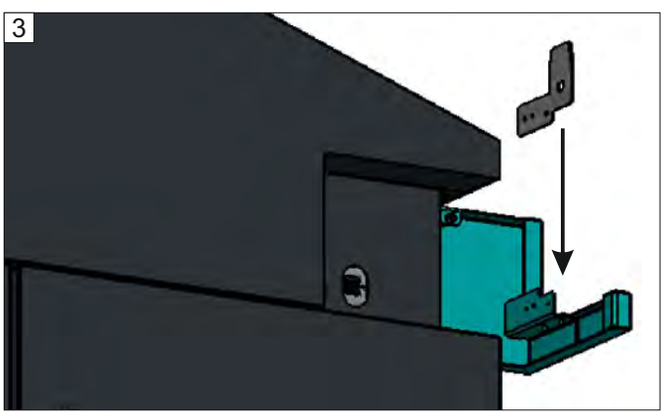
A flat holder is factory-installed on the boiler. The BIO-SC boiler is also supplied with a angled (slanted) holder (in the jbox). Either a flat or slanted screen holder can be installed if desired. The procedure is the same for both holders.

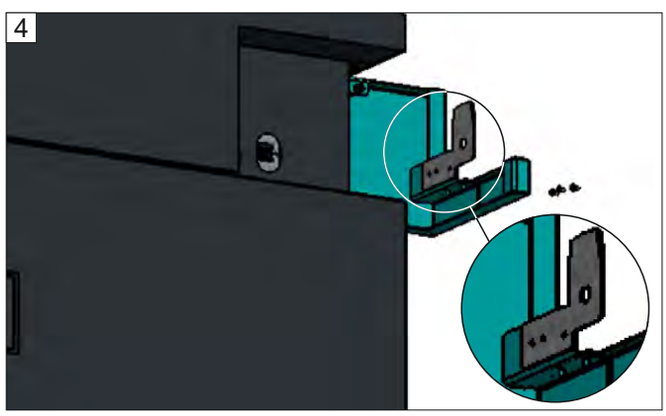


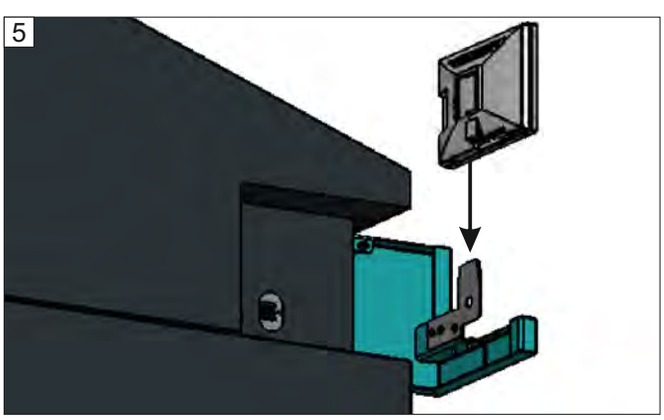


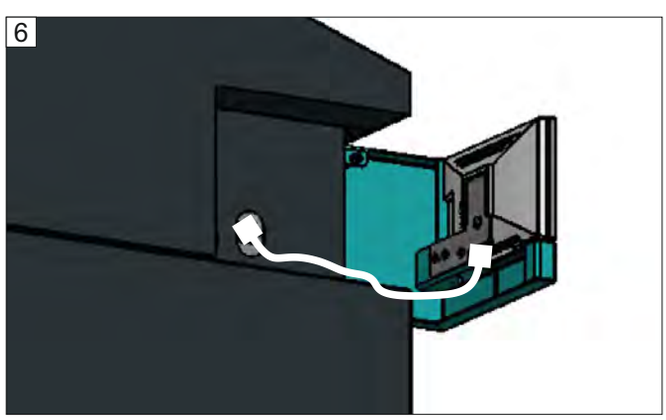








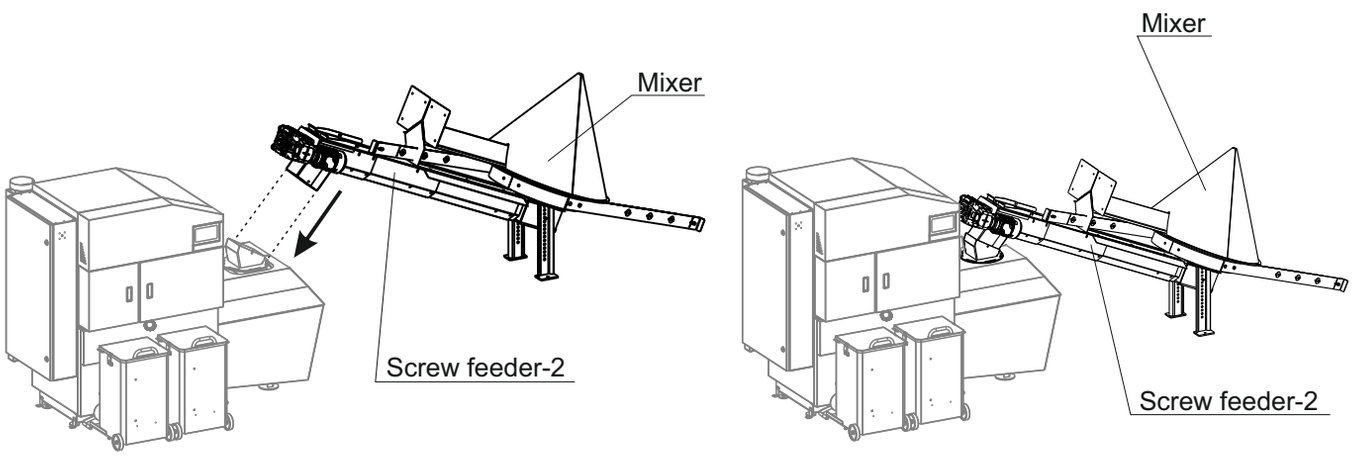




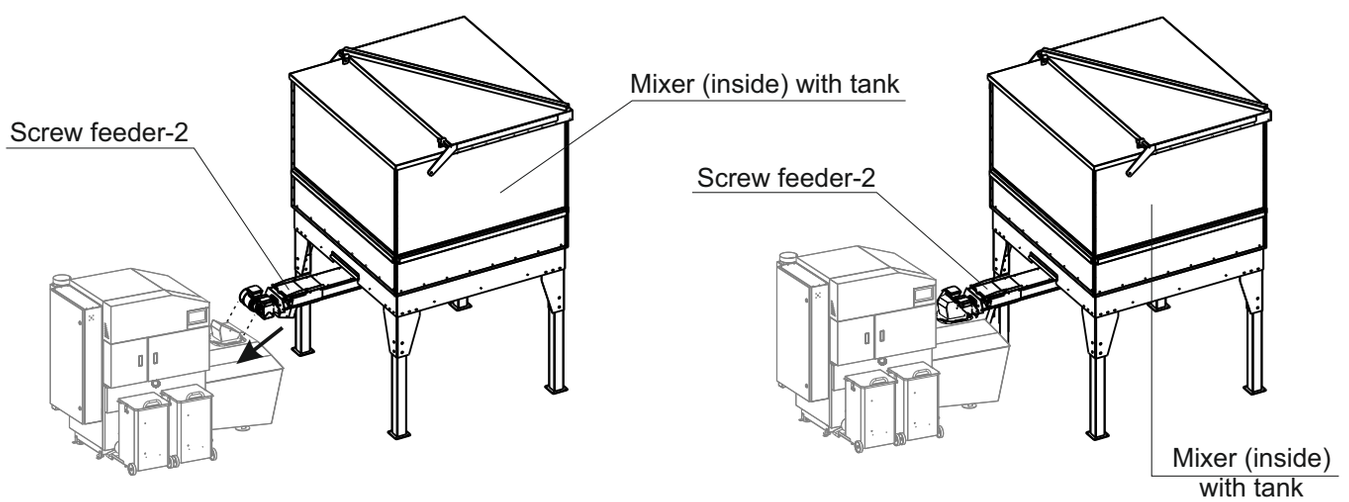
1. Press the marked part of the casing to open the screen door.
2. Open the door fully.
3. Choose a flat or angled screen holder as desired.
4. Use the 3 included screws to secure the chosen screen holder.
5. Place the boiler screen (controller) on the installed holder (so that it "clicks" into the slot).
6. Plug the UTP cable into the connector on the boiler casing and the screen and close the door (in the same way as it was opened).

1.5.1. CONNECTING THE SCREW FEEDER-2

Connecting the screw feeder-2 with the wood chip mixer to the boiler



Connecting the screw feeder-2 with the wood chip mixer and the tank to the boiler



1.6. SAFETY ELEMENTS

Boiler has a few safety elements:

- **Rotary valve -** prevents the return of flame from the combustion chamber through the supply fuel screw feeder to the fuel storage.
- **Pressure switch -** if there is no underpressure in the boiler (eg. chimney is not passable, any boiler door or cleaning opening is opens), the boiler control screen displayed E12 and "Safety pressure switch", and the boiler stops working.
- **Photocell -** in case there is no flame (photocell does not see flame) in the ignition phase at the set time, the boiler control screen displays E18 and "No flame in ignition stage" and stops the boiler, if the flame disappears in the ignition phase, the control displays E23 and "Flame disappeared in ignition stage" and stops the operation of the boiler, if the flame disappears in the stabilization phases, the boiler control screen displays E24 and "Flame disappeared stabilization stage" and stops the boiler, and if the flame disappears in the phases of boiler operation, the boiler control screen displays E19 and "Flame disappeared working phase" and stops the boiler operation.
- **Boiler control screen (Controller**) has built in a protective function which protects the boiler against overheating. If temperature in the boiler exceeds 93 °C, regardless heating or sanitary water is needed the boiler pump and/or the sanitary water turns on and works until temperature in the boiler falls below 93 °C.
- **The fan** has a built-in RPM counter and, if regulation is informed that the fan does not operate in accordance with the requirement interrupts the process display error E13 and "Fan error".
- **The grate cleaning mechanism** has two built-in microswitches that monitor the position of the grates. If the some grate is not in the required position at a certain moment, the boiler control screen receives this information and interrupts the operation process, and E21 and "Error grate cleaner" will appear on the display.
- **Flue gas connection** has in-built sensor for flue gas temperature measuring. If flue gas tube temperature is over 300 °C, controller interrupt process and display information E4 and "Flue gas sensor error".
- **STB thermostat -** When temperature in the boiler exceeds 110 °C (+0 °C / - 6 °C), power supply is turned off by the safety thermostat (STB).
- **Thermal protection exchanger -** it is built into the boiler and the thermal water supply has to be connected to the thermal valve so that the boiler can be cooled in case of overheating **(thermal protection valve is in standard delivery, Caleffi 543, 98°C).**

- **FIREBOX FLAP MICROSWITCHES -**
- **Microswitch-1 is pressed:** the firebox flap is raised, it presses the first microswitch, boiler screw feeders operate in a special mode and the information I10 - TOO MUCH FUEL IN THE FIREBOX is shown.
- **Microswitch-1 and microswitch-2 are pressed:** the firebox flap is raised, it presses the first and second microswitches, an error is displayed "E87 - CONVEYOR FLAP" and ejects "F3" automatic electrical fuse in the boiler electrical junction box (jbox).
- **SCREW FEEDER 2 MICROSWITCH - Microswitch isn't pressed: the fuel storage screw feeder lid is opened, the screw feeder can't work.**

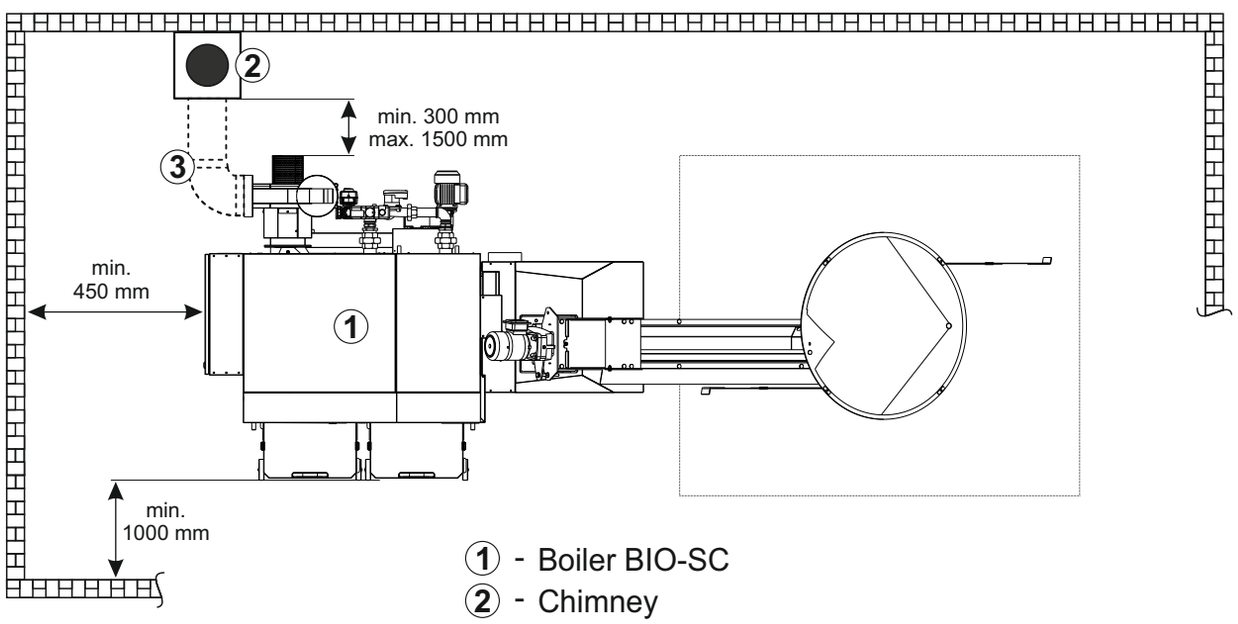
2.0. BOILER POSITIONING AND ASSEMBLY

Boiler positioning, assembly and building in must be performed by a qualified person. We recommend that boiler is placed on a concrete base with height of 50 to 100 mm above the floor. Boiler room must be frostproof and well ventilated. Boiler has to be positioned so that it can be properly connected to the chimney (see Figure 1a.) and simultaneously, enabling tending of boiler and additional equipment, control during operation, cleaning and maintenance.

WARNING!
Flammable items must not be placed on the boiler and within the minimum distances shown in Figure 1a and 1b.

2.1. MINIMUM DISTANCES FROM THE WALL AND CEILING

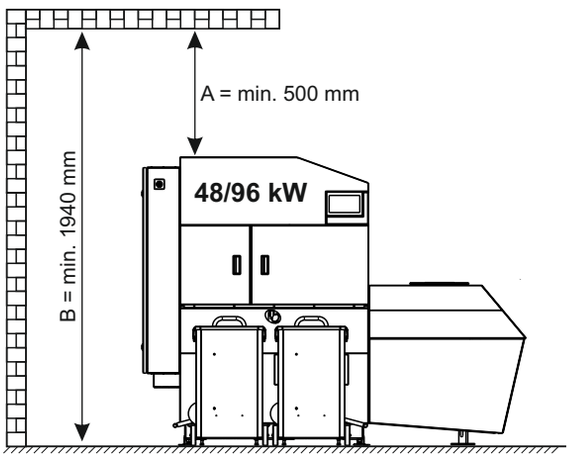
Figure 1a. Minimum distances from the room wall and ceiling for BIO-SC 48-96



① - Boiler BIO-SC
② - Chimney
③ - Flue gas tube (Chimney connection; must be insulated)

Provide minimum distance from the boiler room ceiling and walls for undisturbed cleaning.

Figure 1b. Minimum distance from the boiler room ceiling (A) and minimum required height of the room (B).



2.2. OPENING FOR FRESH AIR (FRESH AIR SUPPLY)

Each boiler room **must be equipped with an opening** for supply of fresh air which is dimensioned in accordance with boiler output (minimum opening area according to the below shown equation). Such opening must be protected with a net or grate. All installation works have to be performed in accordance with valid national and European standards. Boiler must not operate in flammable and explosive environment.

$$A = 6{,}02 \times Q$$

A - opening area in cm^2

Q - boiler output in kW

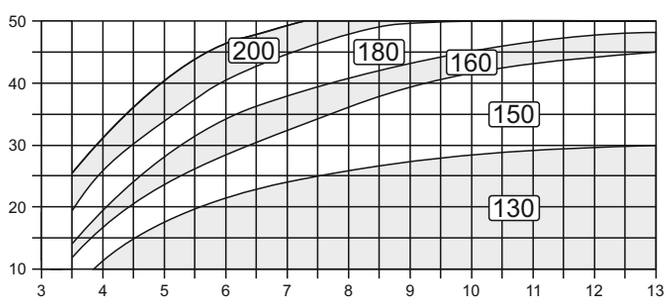
3.0. CONNECTION TO THE CHIMNEY

Properly dimensioned and built chimney is the main condition for safe and economical functioning of the boiler. The thermal insulation of the chimney has to be done properly, it has to be absolutely gas-proof and smooth. On its lower part there has to be built in the opening for cleaning with the door. An brick-layed chimney has to have three layers with an insulation of 30 mm in the middle, if the chimney is built inside the house (i.e. inside the heated area), or an insulation of 50 mm if it is built outside the house (i.e. outside the heated area). The flue gas temperature has to be at least 30°C higher then the temperature of their condensation point. The choice and the construction of the chimney has to be performed by the authorized person. Inner diameter of the chimney must be selected according the possible effective chimney height and boiler power and according diagram below. Chimney must be dimensioned by "diagram for chimney selection" and maximum permitted length of connection flue gas tube between connection on fan and chimney is 2000 mm with maximum two 90° bends. Connection flue gas tube can be mounted horizontally or at any angle which allows to gas, on his way to chimney, a constant increase of height with considering of exit point from fan. Connection flue gas tube must have openings for cleaning through which is possible to clean entire length of flue gas tube or must ensure easy removal part of flue gas tube which allow complete cleaning of connection flue gas tube. To prevent entry of condensate form chimney into the boiler, flue gas tube must be mounted 10 mm deeper into the chimney. **Connection flue gas tube between fan and chimney must be insulated with 30-50 mm mineral wool.**

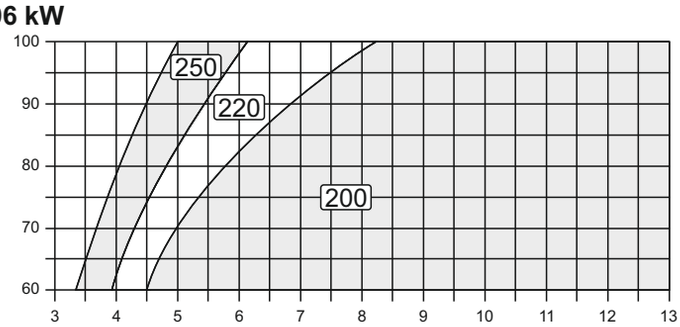
The chimney must be resistant against flue condensate!

Figure 2. Dimensioning of the chimney for BIO-SC

48 kW



96 kW



Chimney dimensioning examples:
for boiler BIO-SC 96.

Boiler heat output: ***96*** *kW*
Required usable chimney height: ***8*** *m*
Required inner chimney diameter: ***200*** *mm*
Fuel: ***chipped wood***

Chimney dimensioning examples:

inner chimney diameter (mm)	*boiler power (kW)* 48	96
130	-	-
150	-	-
160	-	-
180	**8,5**	-
200	**7**	**8**
220	-	**6**
250	-	**5**

min. chimney effective height (m)

NOTES:
For flue gas tubes up to 2 m and 2 flue gas elbows look at the diagram.
Un case of longer flue gas tube or there is more than 2 flue gas elbows, effective height must be selected from the diagram and for every additional meter of the flue gas tube and/or every additional flue gas elbow, add following value to the effective height:
- BIO-SC 48: +1,0 m
- BIO-SC 96: +0,5 m

In case of flue gas tubes longer than 5 meters, recommended is (or it's neccessary) select flue gas tube for 10 mm biger than boiler output because of ash deposits during the boiler working.
In any case, neccessary is to predict correct amount cleaning openigs for flue gas tube and elbows cleaning.

4.0. INSTALLATION

All local regulations, including those referring to national and European standards need to be complied with when installing the appliance.

4.1. CONNECTION TO CENTRAL HEATING SYSTEM

All installation work must be made in accordance with valid national and European standards. Boiler **BIO-SC** can be built in closed and open central heating systems. In both cases boiler can be fired with chipped wood. Installation has to be made, in according to technical standards, by a professional who will be responsible for proper boiler operation. Before connecting boiler to central heating system, the system has to be flushed to remove impurities remaining after system installation. It prevents boiler overheating, noise within the system, disturbances at a pump and mixing valve. Boiler should always be connected to central heating system by connectors, never by welding. Figure 1. shows safe distances required for boiler cleaning and maintenance.

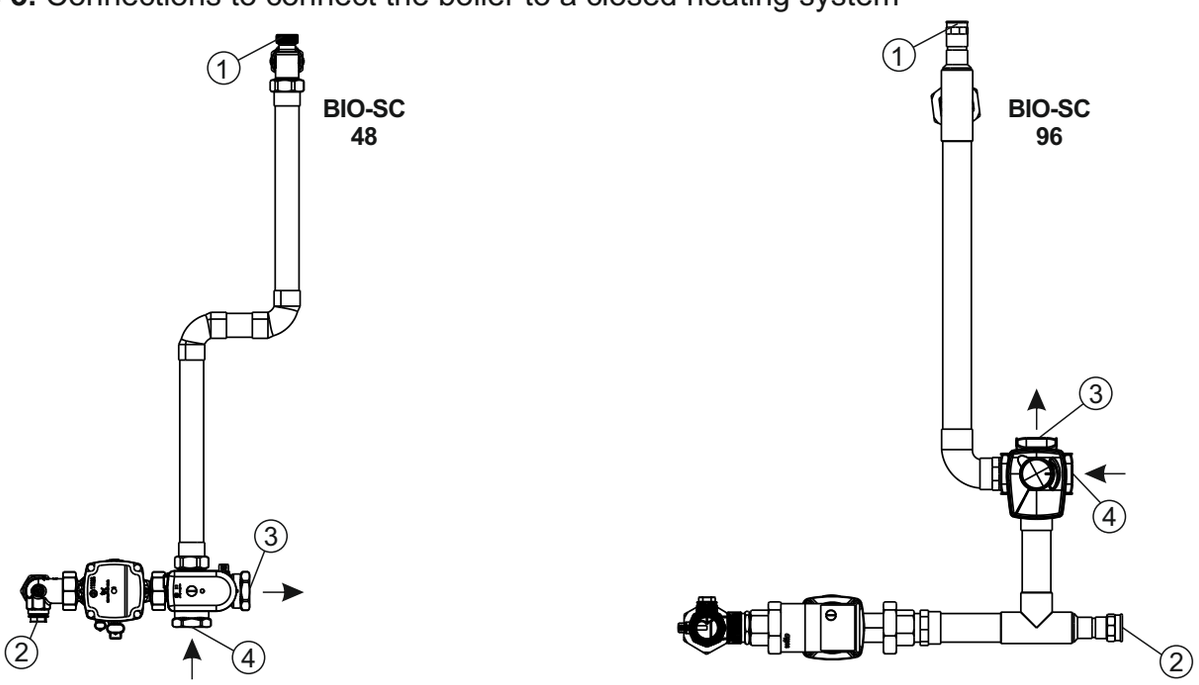
4.1.1. CONNECTION TO OPEN HEATING SYSTEM

In open system it is necessary to put an open expansion vessel min. 0,5 m above the height of the highest heating body. If expansion vessel is located in a room without heating, it should be insulated. The system pump could be connected on the inline or back line of the boiler.

4.1.2. CONNECTION TO CLOSED HEATING SYSTEM

In closed heating system it is **obligatory** to build in certified safety valve with opening pressure of 2,5 bar and a membrane expansion vessel. Safety valve and expansion vessel must be built in accordance with professional rules and between safety valve and expansion vessel and boiler must not be any valve. Schemes for possible configurations are on following pages.

Figure 3. Connections to connect the boiler to a closed heating system



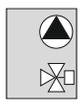
① - Safety ventilation group connection
② - Expansion vessel connection
③ - Main flow to installation
④ - Return flow from installation

4.2. CONFIGURATION - DESCRIPTION

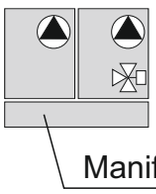
Temperatures choice depends on the configuration of heating. Below are shown all types of installation and configuration.

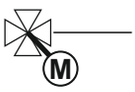
Pump group
(direct heating system pump / DHW)

Pump group
(heating system pump with 3-way valve with actuator)



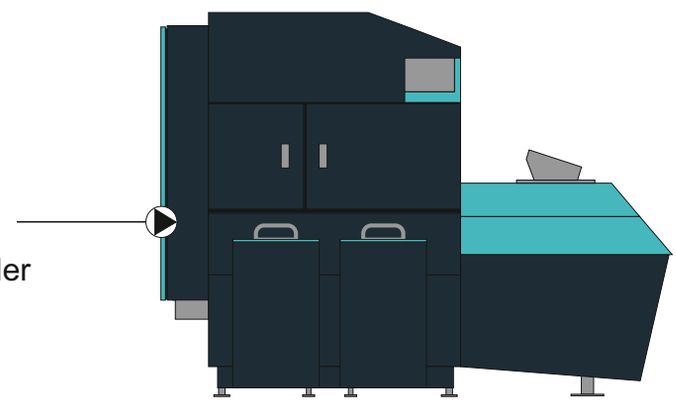
Pump groups
(direct heating system pump / DHW and heating system pump with 3-way valve with actuator)



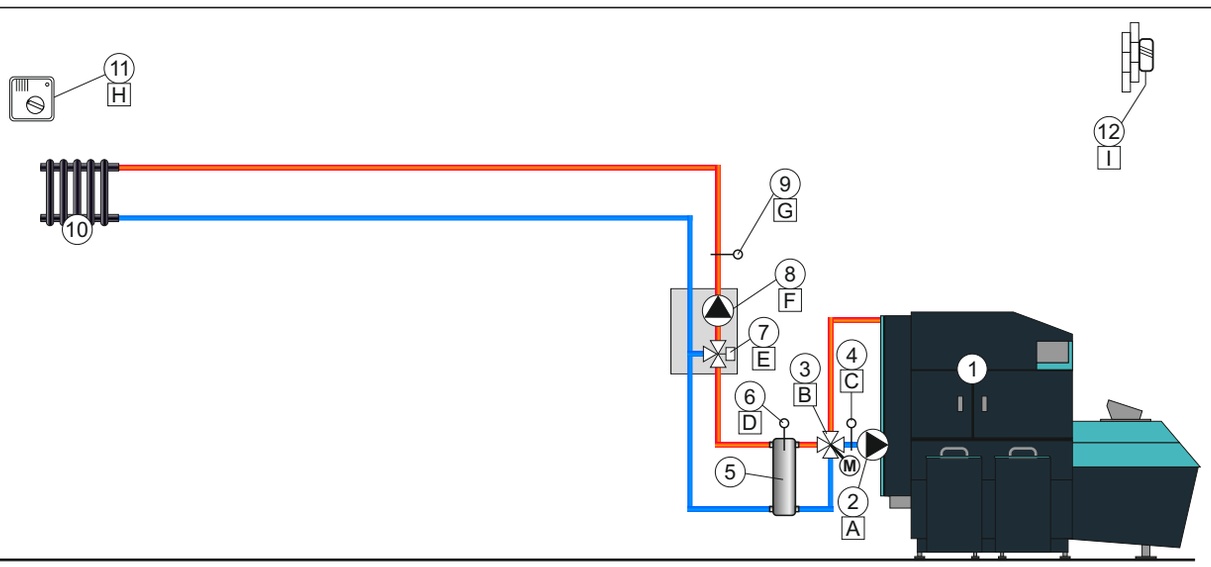


MIXING VALVE
(4-way mixing valve with actuator - boiler circuit)

P0 -
(Boiler circuit)
(boiler pump)
is located in the boiler



4.2.1. EXAMPLE OF SENSORS AND PUMPS CONNECTIONS (CONFIGURATION 1)



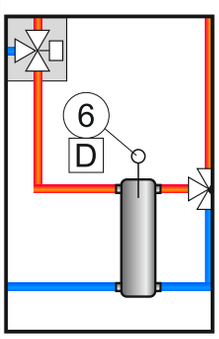
A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	MIX VALVE CL1 OP1
F	UDR-4 RP1
G	S4 Circuit 1
H	CSK CSK1 1.P 2.G 3.T
H	CSK-Touch CSKT + -
I	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
8 - **P1** - (Heating circuit 1 (K1))
9 - Temperature sensor ((K1) Heating circuit 1 - main flow)
10 - **(K1)** Heating circuit 1 (with mixing valve 1)
11 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
12 - Outdoor temperature sensor

Devices (pumps, CSK, etc.)

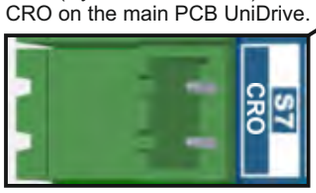
Marks on UniDrive and UDR-4 PCB

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly

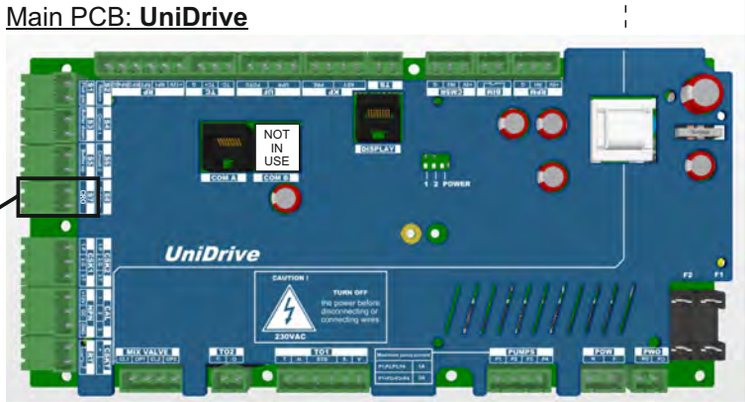


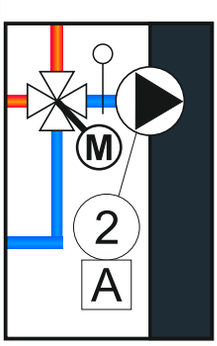
D	S7 CRO

Example of the position of (Hydraulic crossover) CRO on the main PCB UniDrive.



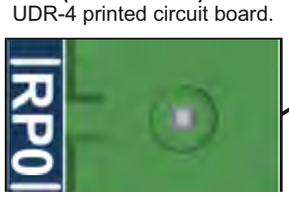
Main PCB: **UniDrive**



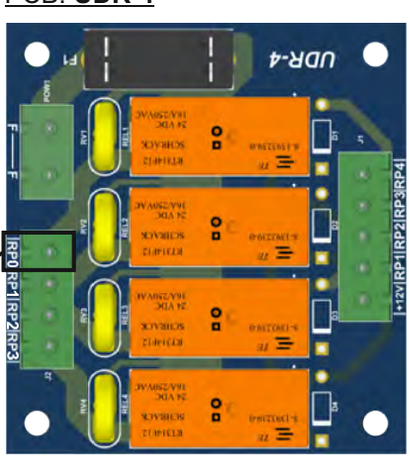


A	UDR-4 RP0

Example for connection position **P0 - (Boiler circuit)** on the UDR-4 printed circuit board.

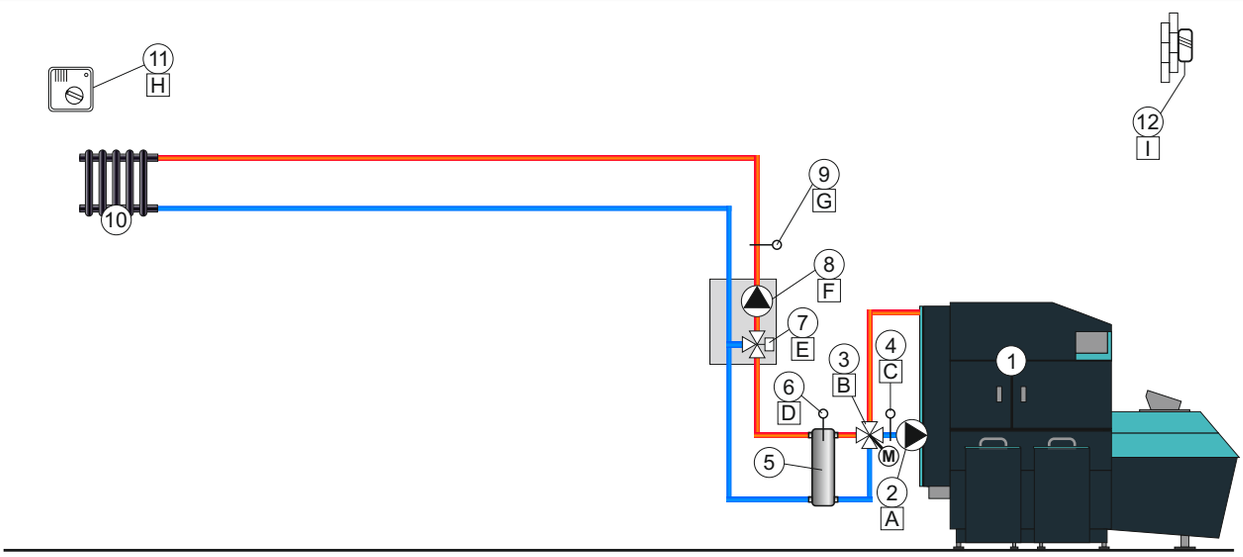


PCB: **UDR-4**



4.2.2. CONFIGURATION / SCHEME

CONFIGURATION 1

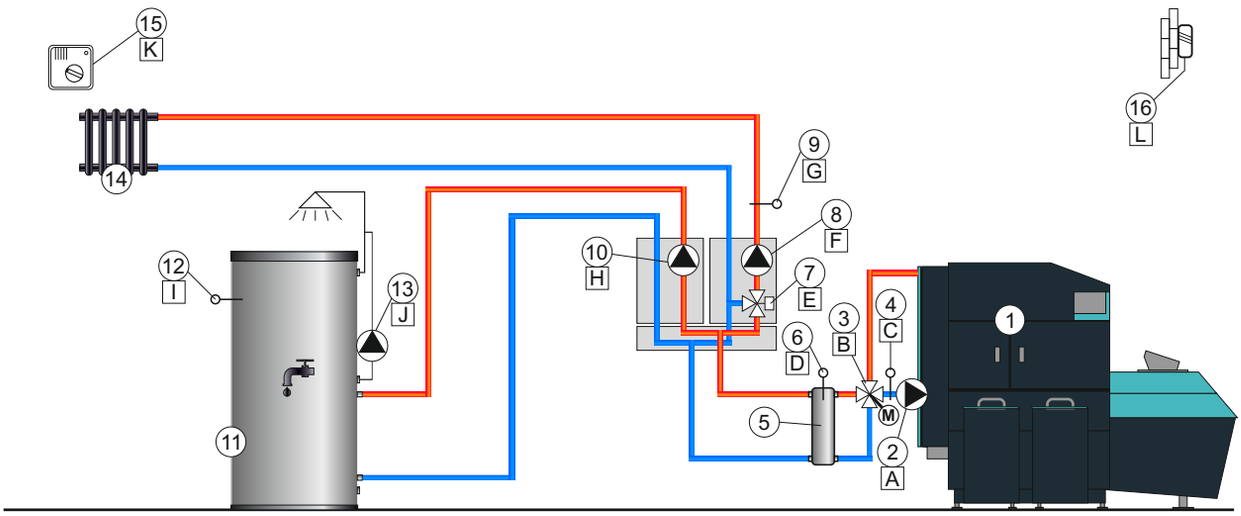


A	UDR-4 RP1
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	MIX VALVE CL1 OP1
F	UDR-4 RP2
G	S4 Circuit 1
H	CSK: CSK1 1.P 2.G 3.T / CSK-Touch: CSKT + -
I	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
8 - **P1** - (Heating circuit 1 (K1))
9 - Temperature sensor ((K1) Heating circuit 1 - main flow)
10 - **(K1)** Heating circuit 1 (with mixing valve 1)
11 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
12 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 2

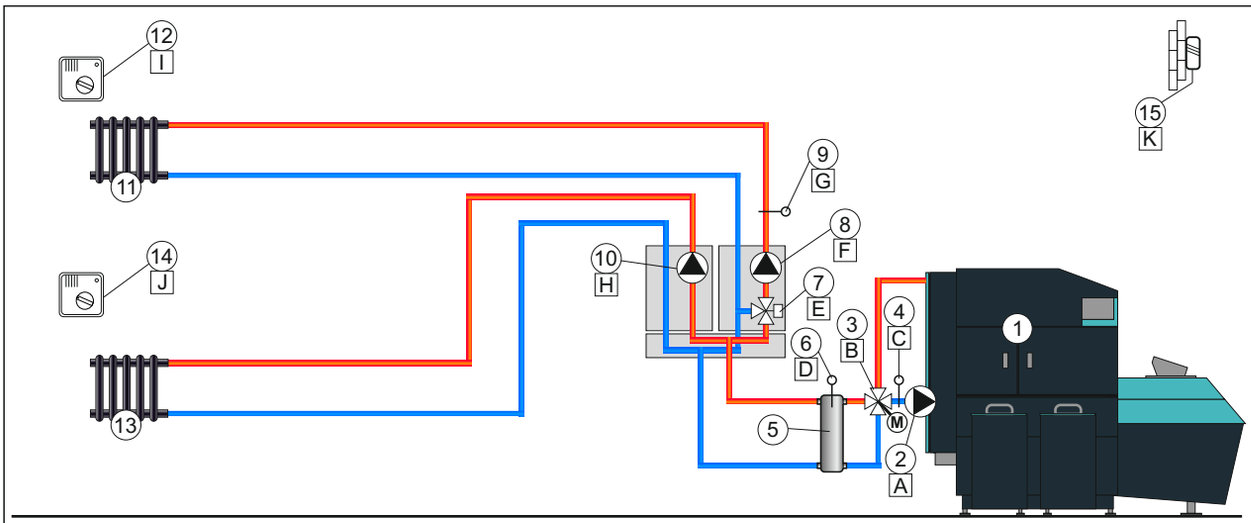


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	MIX VALVE CL1 OP1
F	UDR-4 RP1
G	S4 Circuit 1
H	UDR-4 RP2
I	S6 Circuit 2
J	UDR-4 RP3
K	CSK: CSK1 1.P 2.G 3.T
K	CSK-Touch: CSKT + -
L	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
8 - **P1** - (Heating circuit 1 (K1))
9 - Temperature sensor ((K1) Heating circuit 1 - main flow)
10 - **P2** - DHW (Heating circuit 2 (K2))
11 - **(K2)** Heating circuit 2 (DHW)
12 - Temperature sensor DHW ((K2) Heating circuit 2)
13 - **P3** - Recirculation DHW (Heating circuit 2 (K2))
14 - **(K1)** Heating circuit 1 (with mixing valve 1)
15 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
16 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 3

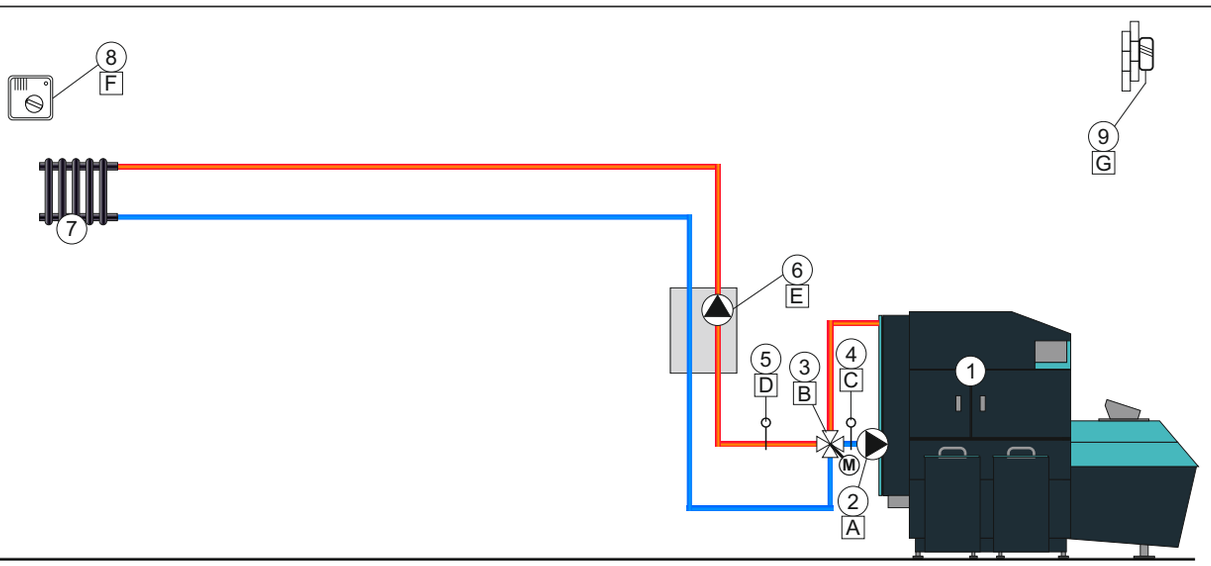


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	MIX VALVE CL1 OP1
F	UDR-4 RP1
G	S4 Circuit 1
H	UDR-4 RP2
I	CSK 1: CSK1 1.P 2.G 3.T
I	CSK-Touch 1: CSKT + -
J	CSK 2: CSK2 1.P 2.G 3.T
K	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
8 - **P1** - (Heating circuit 1 (K1))
9 - Temperature sensor ((K1) Heating circuit 1 - main flow)
10 - **P2** - (heating circuit 2 (K2))
11 - **(K1)** Heating circuit 1 (with mixing valve 1)
12 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
13 - **(K2)** Heating circuit 2 - (direct circuit)
14 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
15 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 4

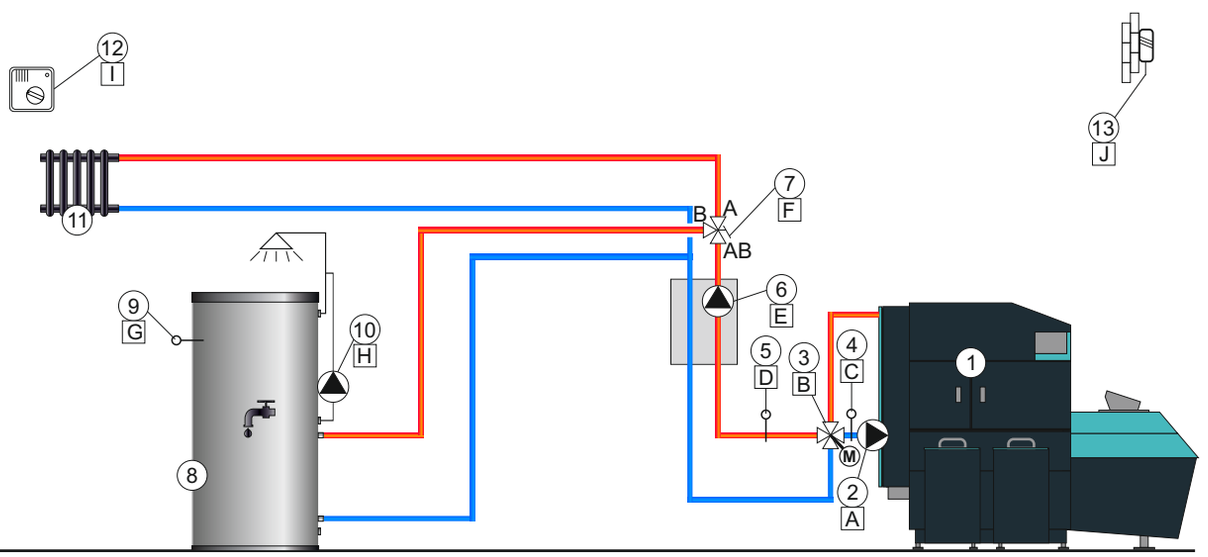


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S4 Circuit 1
E	UDR-4 RP1
F	CSK CSK1 1.P 2.G 3.T
F	CSK-Touch CSKT + -
G	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Temperature sensor ((K1) Heating circuit 1 - main flow)
6 - **P1** - (Heating circuit 1 (K1))
7 - **(K1)** Heating circuit 1 - (direct circuit)
8 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
9 - Outdoor temperature sensor

Notes:
- in this configuration, it is not possible to connect the "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 5

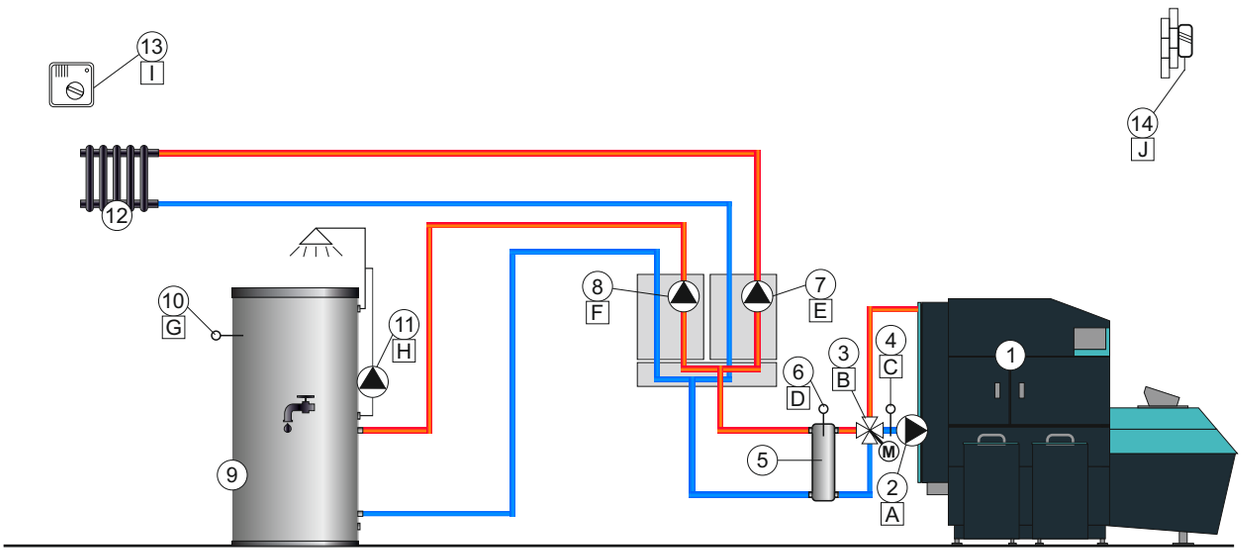


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S4 Circuit 1
E	UDR-4 RP1
F	UDR-4 RP2
G	S6 Circuit 2
H	UDR-4 RP3
I	CSK CSK1 1.P 2.G 3.T
I	CSK-Touch CSKT + -
J	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Temperature sensor ((K1) Heating circuit 1 - main flow)
6 - **P1** - P1
7 - **P2** - Diverting valve
8 - **(K2)** Heating circuit 2 (DHW)
9 - Temperature sensor DHW ((K2) Heating circuit 2)
10 - **P3** - Recirculation DHW (Heating circuit 2 (K2))
11 - **(K1)** Heating circuit 1 - (direct circuit)
12 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
13 - Outdoor temperature sensor

Notes:
- in this configuration, it is not possible to connect the "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 6

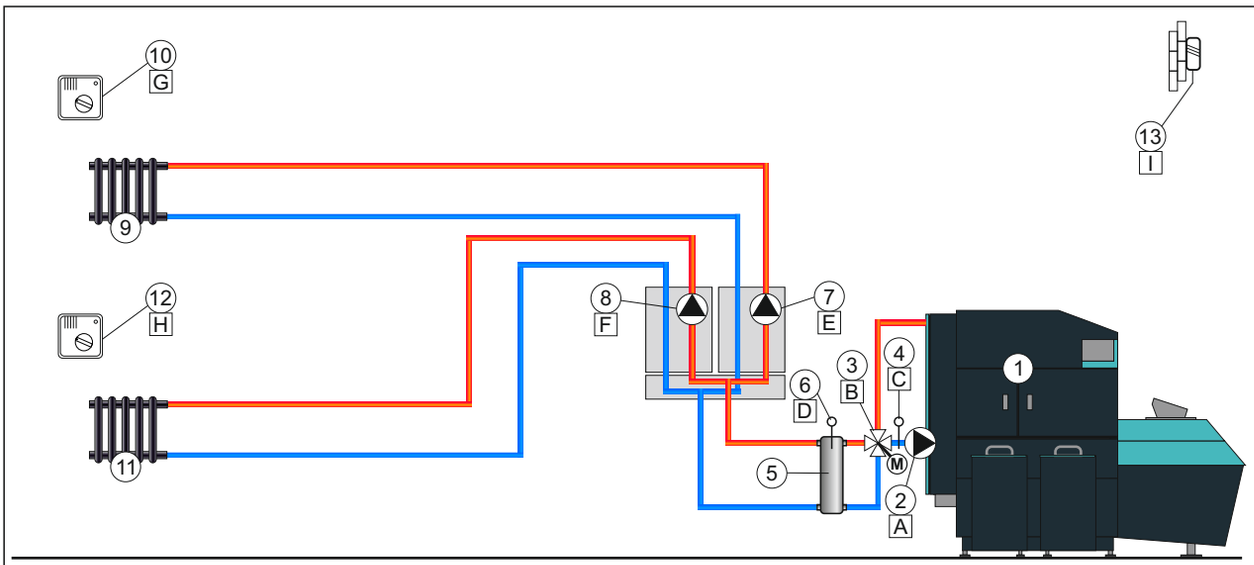


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S6 Circuit 2
H	UDR-4 RP3
	CSK
I	CSK1 1.P 2.G 3.T
	CSK-Touch
I	CSKT + -
J	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - (Heating circuit 1 (K1))
8 - **P2** - DHW (Heating circuit 2 (K2))
9 - **(K2)** Heating circuit 2 (DHW)
10 - Temperature sensor DHW ((K2) Heating circuit 2)
11 - **P3** - Recirculation DHW (Heating circuit 2 (K2))
12 - **(K1)** Heating circuit 1 - (direct circuit)
13 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
14 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 7

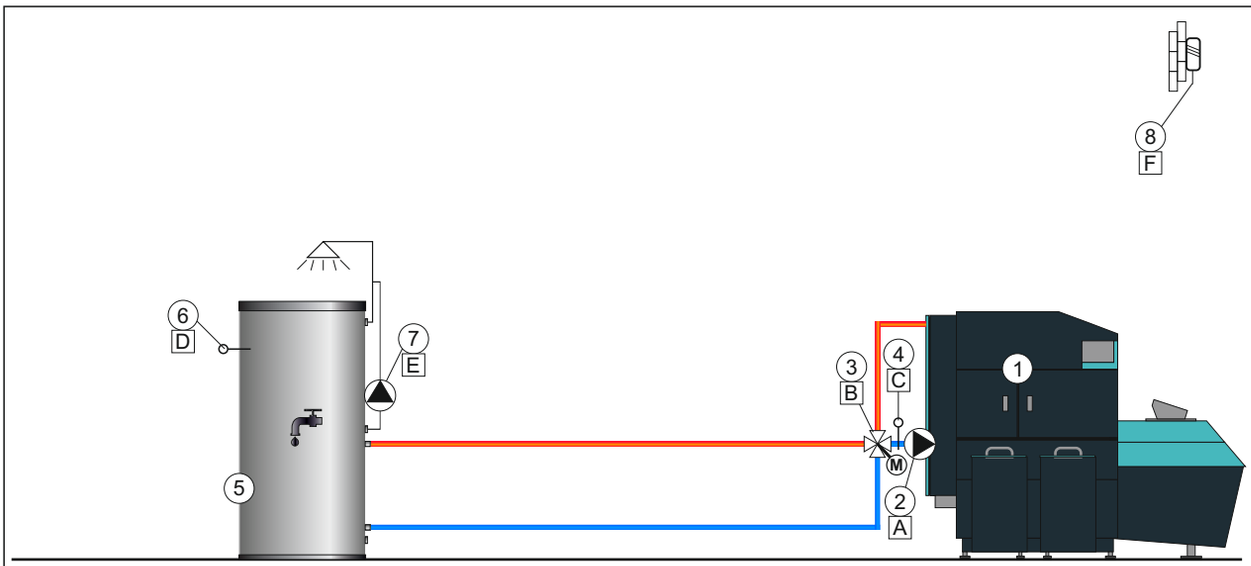


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
	CSK 1
G	CSK1 1.P 2.G 3.T
	CSK-Touch 1
G	CSKT + -
	CSK 2
H	CSK2 1.P 2.G 3.T
I	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - (Heating circuit 1 (K1))
8 - **P2** - (Heating circuit 2 (K2))
9 - **(K1)** Heating circuit 1 - (direct circuit)
10 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
11 - **(K2)** Heating circuit 2 - (direct circuit)
12 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
13 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

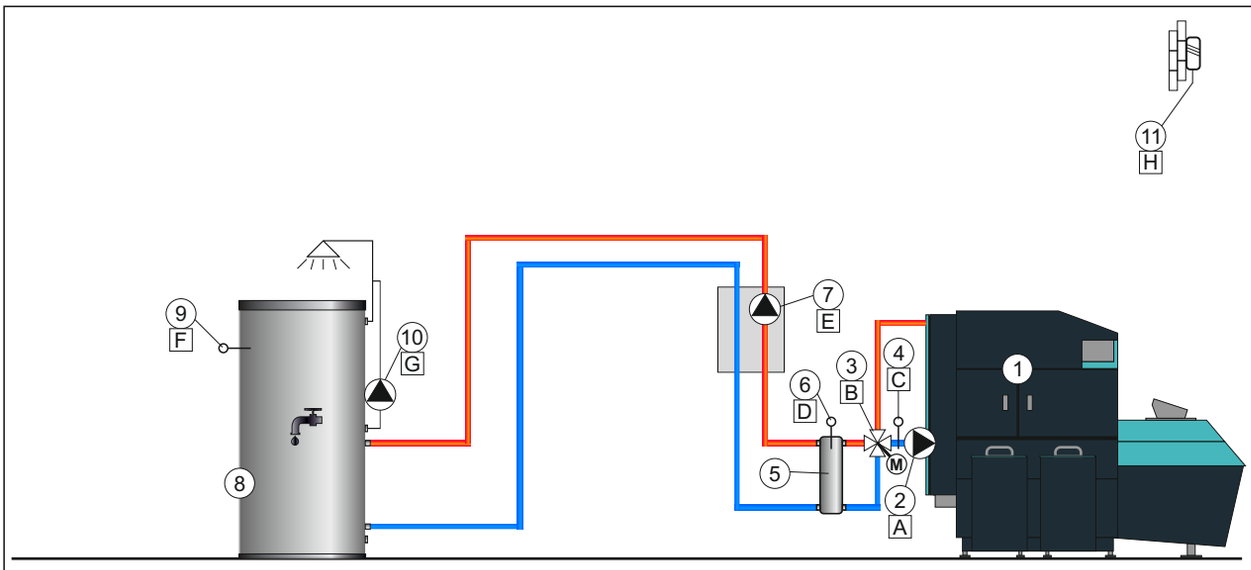
CONFIGURATION 8



1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - **(K1)** Heating circuit 1 (DHW)
6 - Temperature sensor DHW ((K1) Heating circuit 1)
7 - **P1** - Recirculation DHW (Heating circuit 1 (K1))
8 - Outdoor temperature sensor

Notes:
- in this configuration, it is not possible to connect the "CM2K module for regulation 2 heating circuits".
- in this configuration, it is not possible to connect the CSK-Touch (additional equipment).

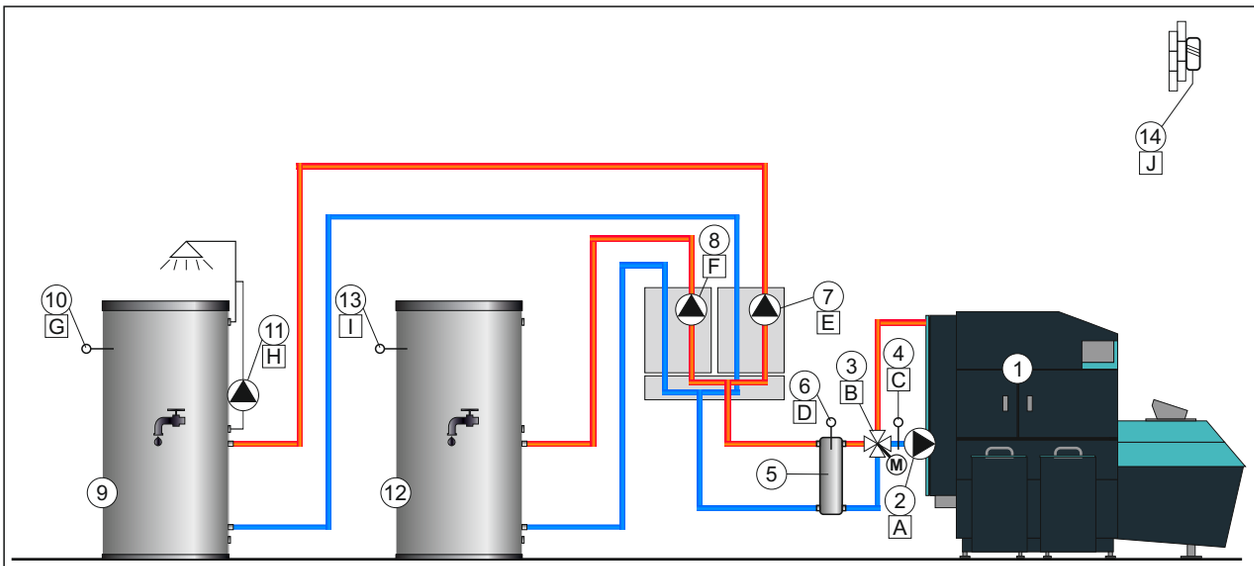
CONFIGURATION 9



1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - DHW (Heating circuit 1 (K1))
8 - **(K1)** Heating circuit 1 (DHW)
9 - Temperature sensor DHW ((K1) Heating circuit 1)
10 - **P2** - Recirculation DHW (Heating circuit 1 (K1))
11 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 10

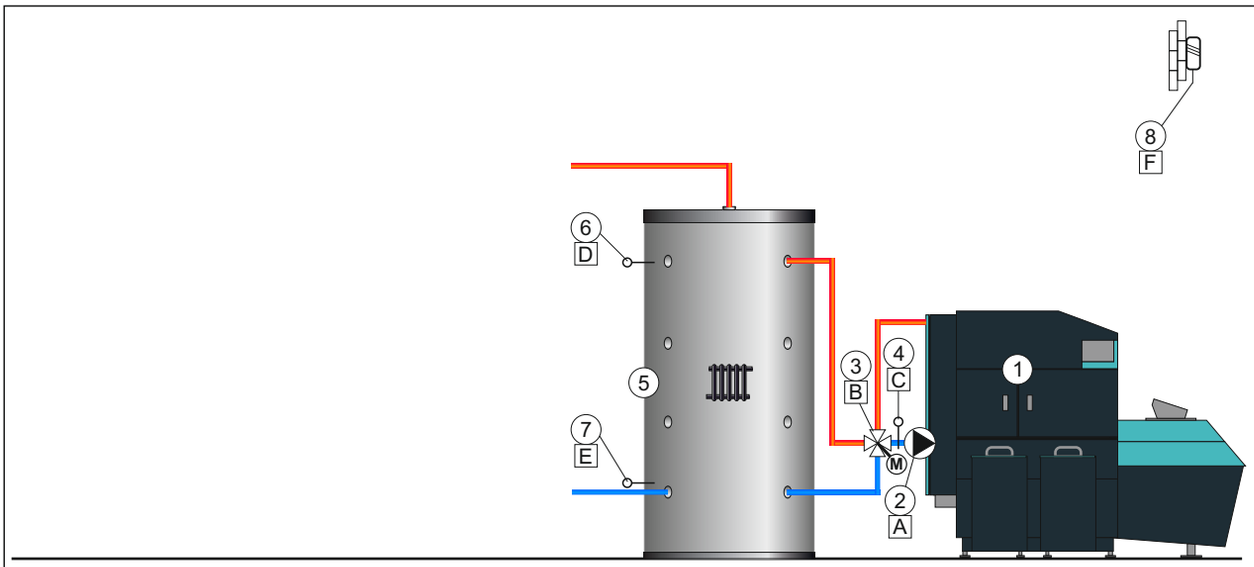


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S4 Circuit 1
H	UDR-4 RP3
I	S6 Circuit 2
J	S8 Outdoor
*	CSK-Touch CSKT + -

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - DHW (Heating circuit 1 (K1))
8 - **P2** - DHW (Heating circuit 2 (K2))
9 - **(K1)** Heating circuit 1 (DHW)
10 - Temperature sensor DHW ((K1) Heating circuit 1)
11 - **P3** - Recirculation DHW (Heating circuit 1 (K1))
12 - **(K2)** Heating circuit 2 (DHW)
13 - Temperature sensor DHW ((K2) Heating circuit 2)
14 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 11

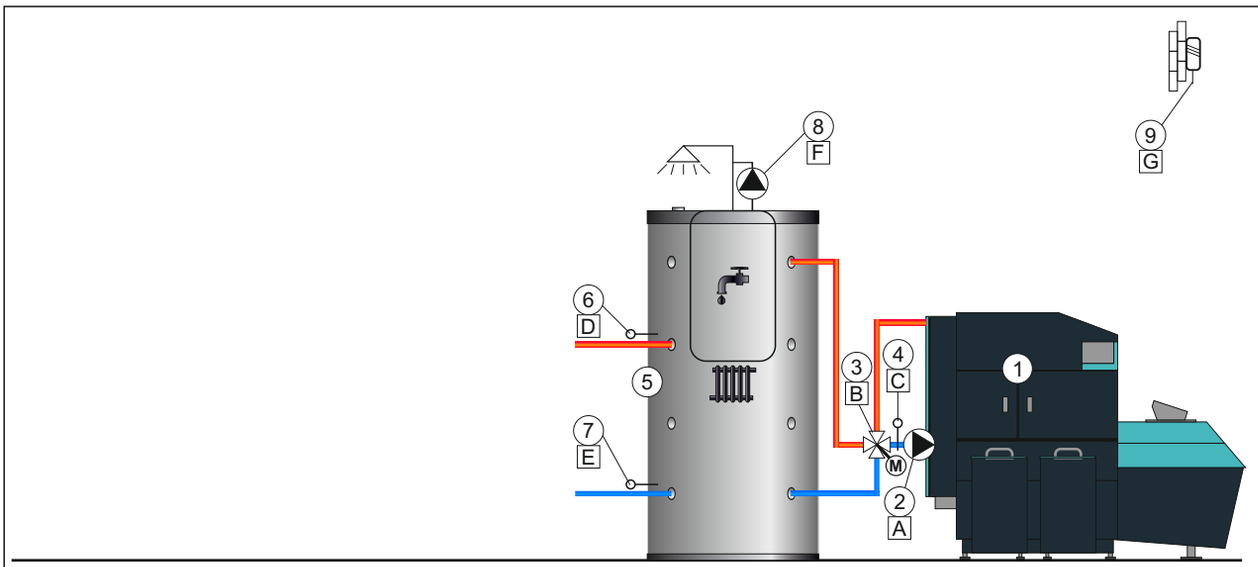


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	S8 Outdoor
*	CSK-Touch CSKT + -

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- in this configuration, it is possible to connect 8 boilers in a cascade using the CMNET module (all boilers are connected to the same accumulation (buffer) tank/s).
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 12

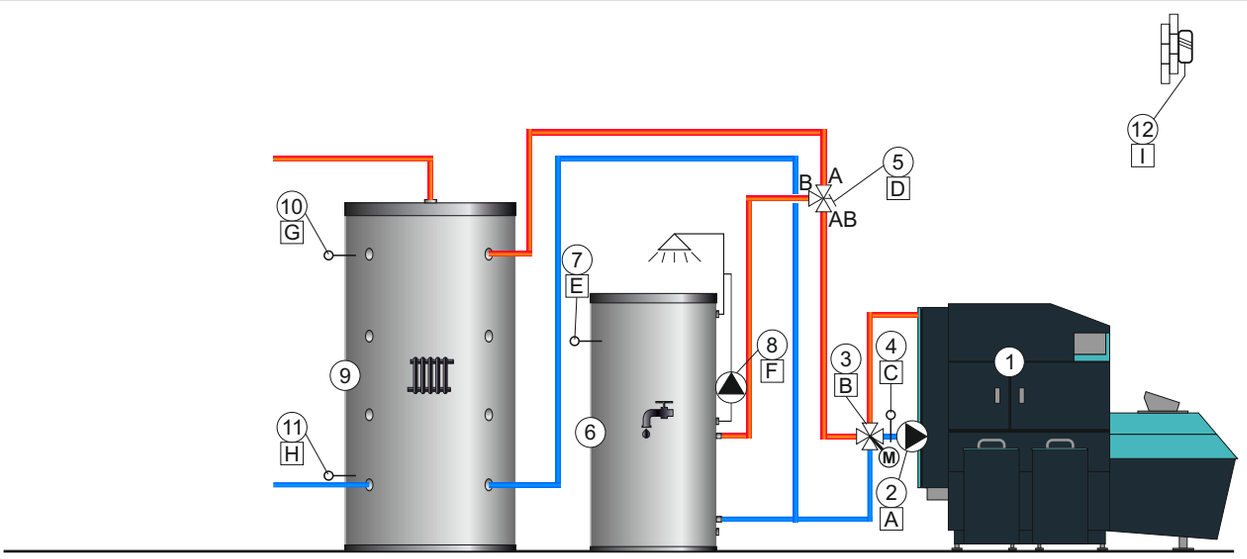


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	UDR-4 RP1
G	S8 Outdoor
*	CSK-Touch CSKT + -

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS-B" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - **P1** - Recirculation DHW
9 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 13

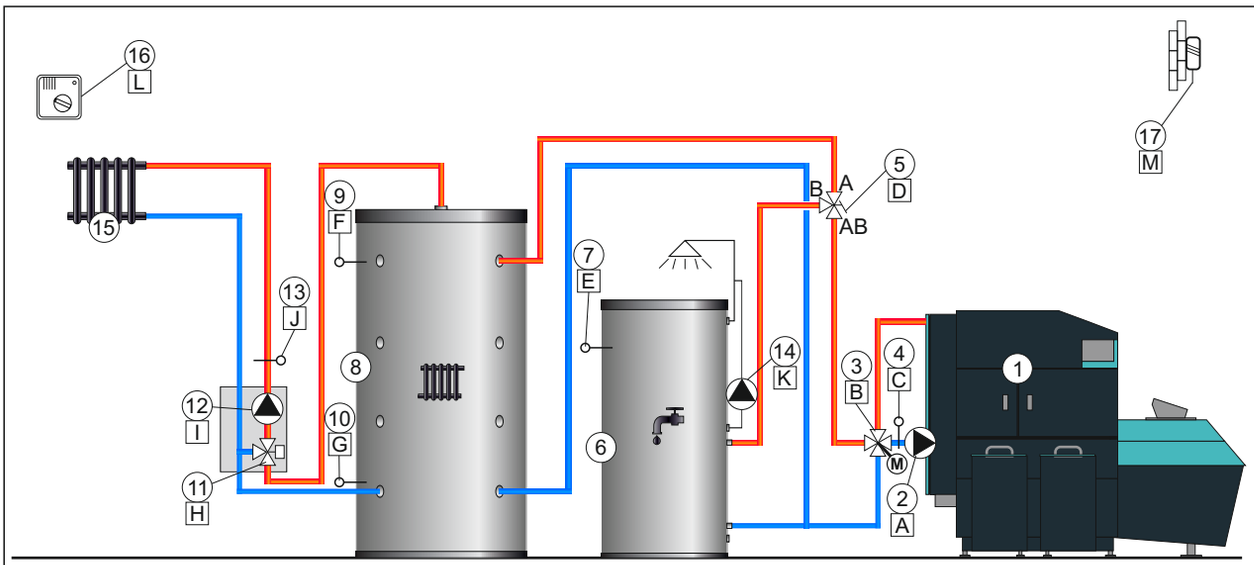


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	UDR-4 RP1
E	S4 Circuit 1
F	UDR-4 RP2
G	S5 Buffer up
H	S3 Buffer down
I	S8 Outdoor
*	CSK-Touch CSKT + -

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - **P1** - Diverting valve
6 - **(K1)** Heating circuit 1 (DHW)
7 - Temperature sensor DHW ((K1) Heating circuit 1)
8 - **P2** - Recirculation DHW (Heating circuit 1 (K1))
9 - "CAS" accumulation (buffer) tank
10 - Temperature sensor (UP) - accumulation (buffer) tank
11 - Temperature sensor (DOWN) - accumulation (buffer) tank
12 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 14

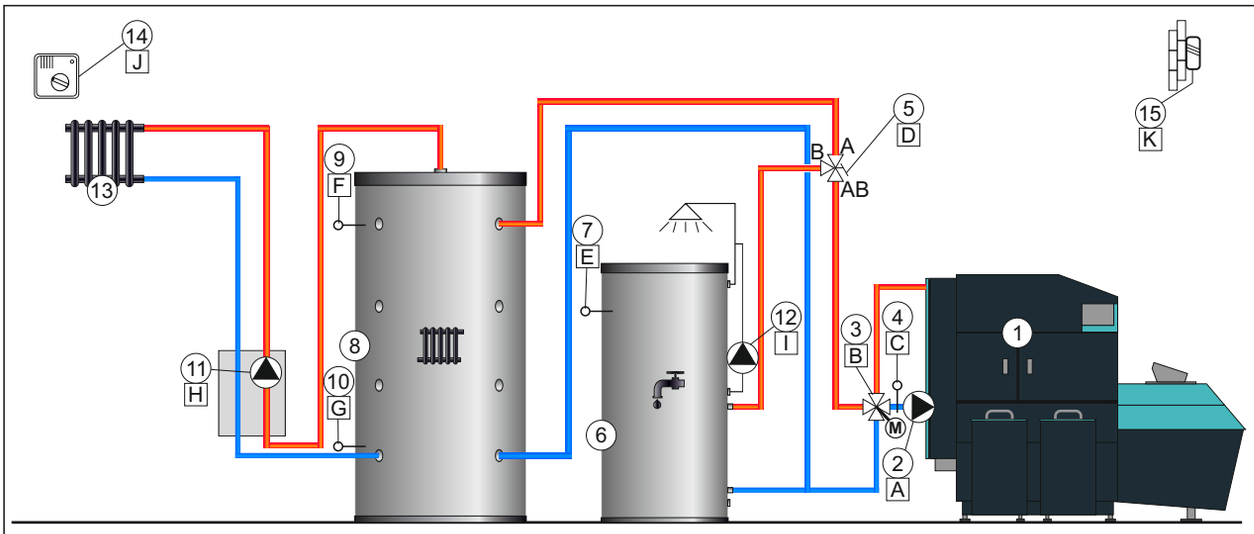


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - **P1** - Diverting valve
6 - **(K2)** Heating circuit 2 (DHW)
7 - Temperature sensor DHW ((K2) Heating circuit 2)
8 - "CAS" accumulation (buffer) tank
9 - Temperature sensor (UP) - accumulation (buffer) tank
10 - Temperature sensor (DOWN) - accumulation (buffer) tank
11 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
12 - **P2** - (Heating circuit 1 (K1))
13 - Temperature sensor ((K1) Heating circuit 1 - main flow)
14 - **P3** - Recirculation DHW (Heating circuit 2 (K2))
15 - **(K1)** Heating circuit 1 (with mixing valve 1)
16 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
17 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4	RP0
B	MIX VALVE	to connector
C	S2	Return
D	UDR-4	RP1
E	S6	Circuit 2
F	S5	Buffer up
G	S3	Buffer down
H	MIX VALVE	CL1 OP1
I	UDR-4	RP2
J	S4	Circuit 1
K	UDR-4	RP3
L	CSK	CSK1 (1.P 2.G 3.T)
L	CSK-Touch	CSKT (+ -)
M	S8	Outdoor

CONFIGURATION 15

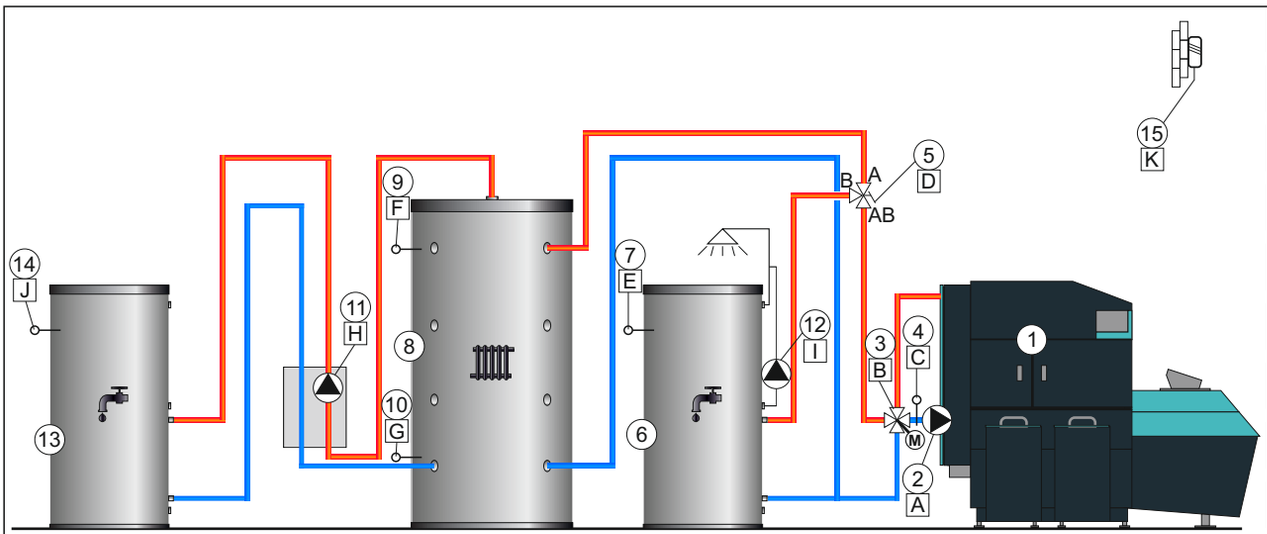


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - **P1** - Diverting valve
6 - **(K2)** Heating circuit 2 (DHW)
7 - Temperature sensor DHW ((K2) Heating circuit 2)
8 - "CAS" accumulation (buffer) tank
9 - Temperature sensor (UP) - accumulation (buffer) tank
10 - Temperature sensor (DOWN) - accumulation (buffer) tank
11 - **P2** - (Heating circuit 1 (K1))
12 - **P3** - Recirculation DHW (Heating circuit 2 (K2))
13 - **(K1)** Heating circuit 1 - (direct circuit)
14 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
15 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4	RP0
B	MIX VALVE	to connector
C	S2	Return
D	UDR-4	RP1
E	S6	Circuit 2
F	S5	Buffer up
G	S3	Buffer down
H	UDR-4	RP2
I	UDR-4	RP3
J	CSK	CSK1 (1.P 2.G 3.T)
J	CSK-Touch	CSKT (+ -)
K	S8	Outdoor

CONFIGURATION 16

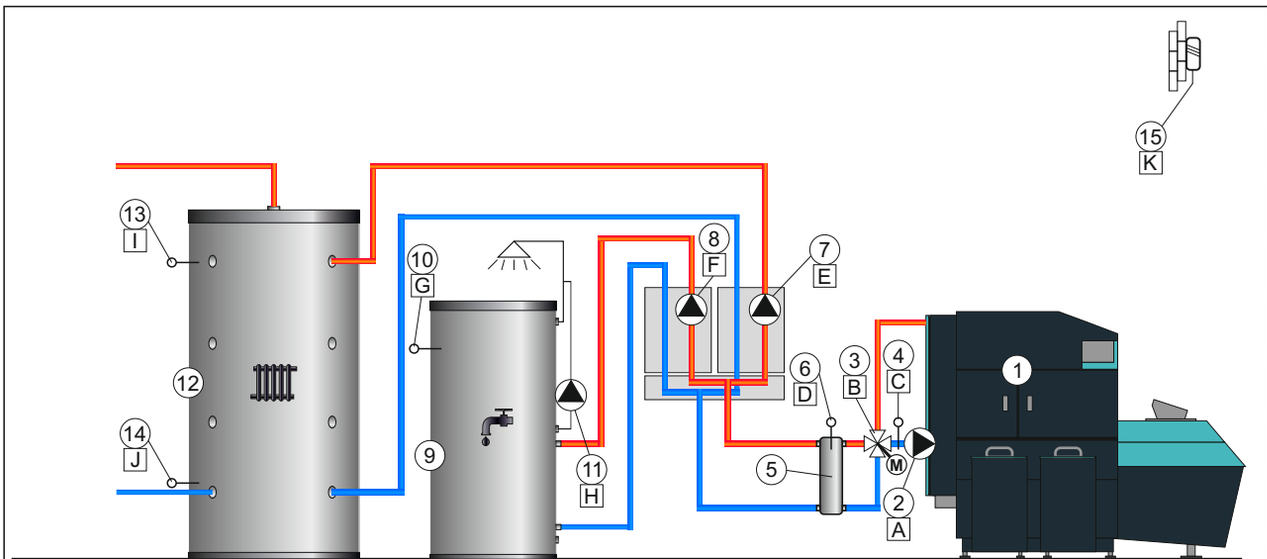


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	UDR-4 RP1
E	S4 Circuit 1
F	S5 Buffer up
G	S3 Buffer down
H	UDR-4 RP2
I	UDR-4 RP3
J	S6 Circuit 2
K	S8 Outdoor
CSK-Touch *	CSKT + -

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - **P1** - Diverting valve
6 - **(K1)** Heating circuit 1 (DHW)
7 - Temperature sensor DHW ((K1) Heating circuit 1)
8 - "CAS" accumulation (buffer) tank
9 - Temperature sensor (UP) - accumulation (buffer) tank
10 - Temperature sensor (DOWN) - accumulation (buffer) tank
11 - **P2** - DHW (Heating circuit 2 (K2))
12 - **P3** - Recirculation DHW (Heating circuit 1 (K1))
13 - **(K2)** Heating circuit 2 (DHW)
14 - Temperature sensor DHW ((K2) Heating circuit 2)
15 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 17

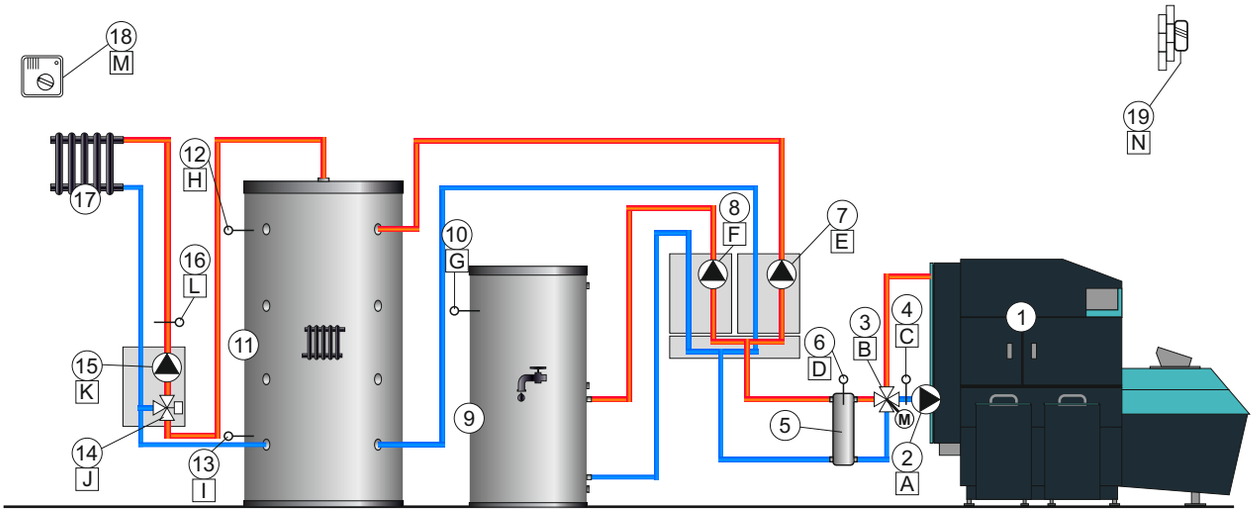


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S4 Circuit 1
H	UDR-4 RP3
I	S5 Buffer up
J	S3 Buffer down
K	S8 Outdoor
CSK-Touch *	CSKT + -

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - BUF (accumulation (buffer) tank)
8 - **P2** - DHW (Heating circuit 1 (K1))
9 - **(K1)** Heating circuit 1 (DHW)
10 - Temperature sensor DHW ((K1) Heating circuit 1)
11 - **P3** - Recirculation DHW (Heating circuit 1 (K1))
12 - "CAS" accumulation (buffer) tank
13 - Temperature sensor (UP) - accumulation (buffer) tank
14 - Temperature sensor (DOWN) - accumulation (buffer) tank
15 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 18

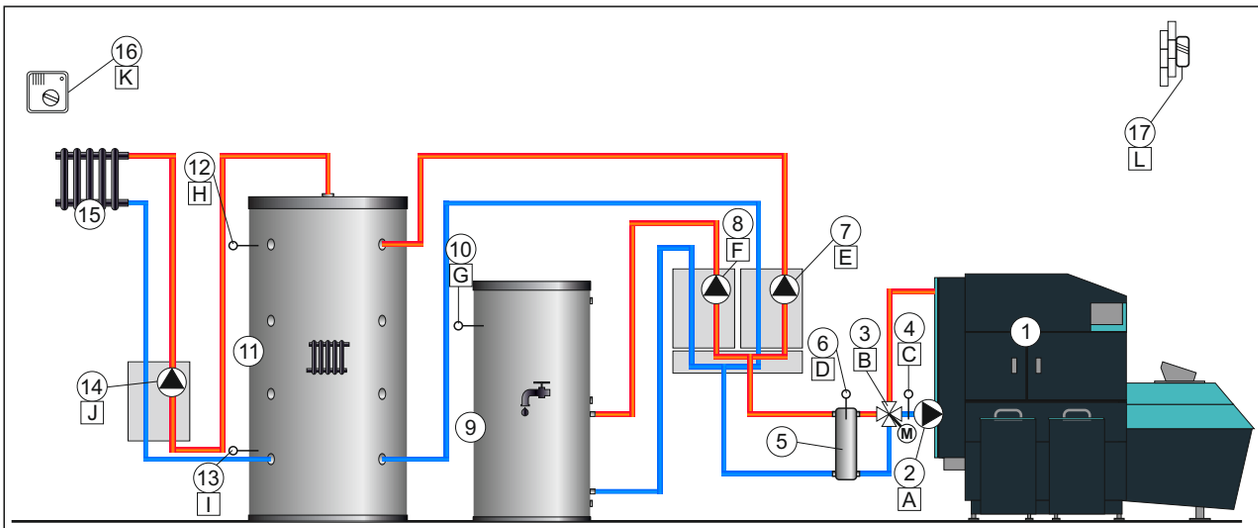


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - BUF (accumulation (buffer) tank)
8 - **P2** - DHW (Heating circuit 2 (K2))
9 - **(K2)** Heating circuit 2 (DHW)
10 - Temperature sensor DHW ((K2) Heating circuit 2)
11 - "CAS" accumulation (buffer) tank
12 - Temperature sensor (UP) - accumulation (buffer) tank
13 - Temperature sensor (DOWN) - accumulation (buffer) tank
14 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
15 - **P3** - (Heating circuit 1 (K1))
16 - Temperature sensor ((K1) Heating circuit 1 - main flow)
17 - **(K1)** Heating circuit 1 (with mixing valve 1)
18 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
19 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4			
	RP0			
B	MIX VALVE			
	to connector			
C	S2			
	Return			
D	S7			
	CRO			
E	UDR-4			
		RP1		
F	UDR-4			
			RP2	
G	S6			
	Circuit 2			
H	S5			
	Buffer up			
I	S3			
	Buffer down			
J	MIX VALVE			
	CL1	OP1		
K	UDR-4			
				RP3
L	S4			
	Circuit 1			
	CSK			
M	CSK1			
	1.P	2.G	3.T	
	CSK-Touch			
M	CSKT			
	+	-		
N	S8			
	Outdoor			

CONFIGURATION 19



A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S6 Circuit 2
H	S5 Buffer up
I	S3 Buffer down
J	UDR-4 RP3

CSK

L	CSK1		
	1.P	2.G	3.T

CSK-Touch

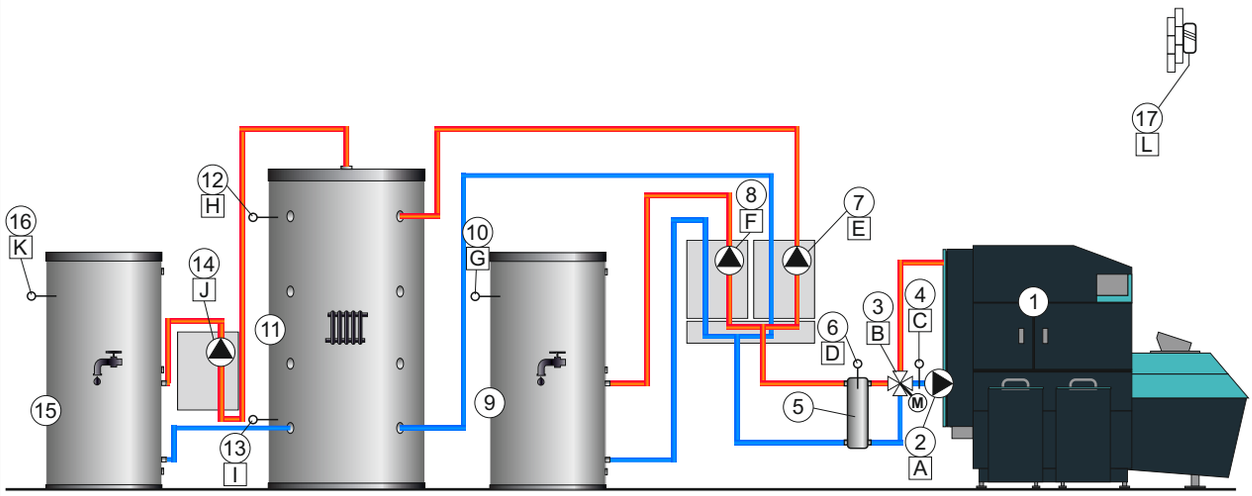
L	CSKT	
	+	-

M	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - BUF (accumulation (buffer) tank)
8 - **P2** - DHW (Heating circuit 2 (K2))
9 - **(K2)** Heating circuit 2 (DHW)
10 - Temperature sensor DHW ((K2) Heating circuit 2)
11 - "CAS" accumulation (buffer) tank
12 - Temperature sensor (UP) - accumulation (buffer) tank
13 - Temperature sensor (DOWN) - accumulation (buffer) tank
14 - **P3** - (Heating circuit 1 (K1))
15 - **(K1)** Heating circuit 1 - (direct circuit)
16 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
17 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 20

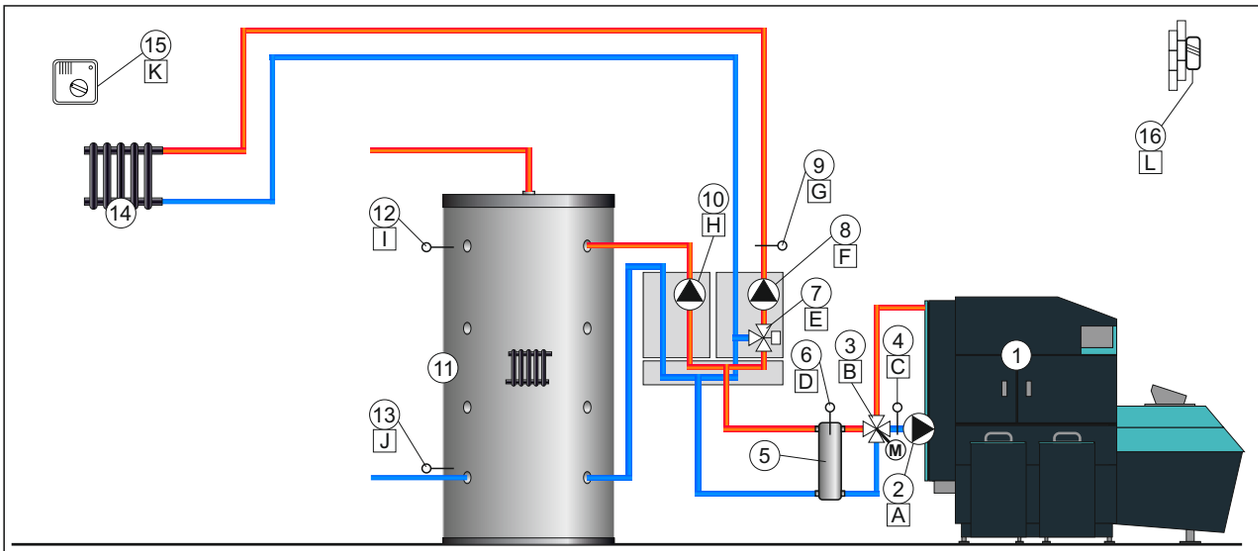


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S4 Circuit 1
H	S5 Buffer up
I	S3 Buffer down
J	UDR-4 RP3
K	S6 Circuit 2
L	S8 Outdoor
CSK-Touch	
*	CSKT + -

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - BUF (accumulation (buffer) tank)
8 - **P2** - DHW (Heating circuit 1 (K1))
9 - **(K1)** Heating circuit 1 (DHW)
10 - Temperature sensor DHW ((K1) Heating circuit 1)
11 - "CAS" accumulation (buffer) tank
12 - Temperature sensor (UP) - accumulation (buffer) tank
13 - Temperature sensor (DOWN) - accumulation (buffer) tank
14 - **P3** - DHW (Heating circuit 2 (K2))
15 - **(K2)** Heating circuit 2 (DHW)
16 - Temperature sensor DHW ((K2) Heating circuit 2)
17 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 21

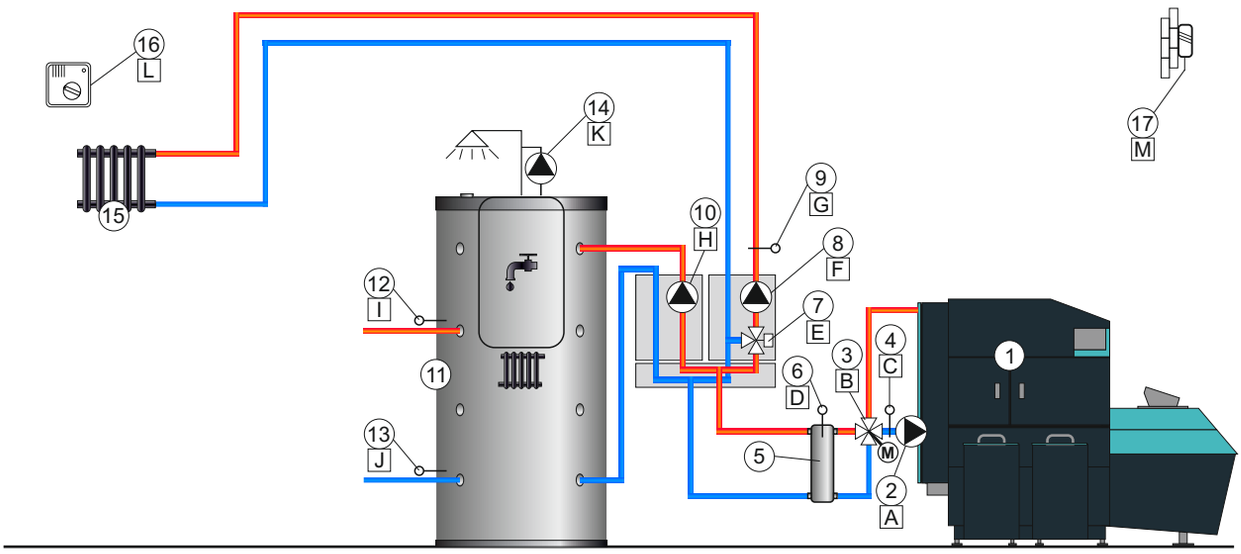


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	MIX VALVE CL1 OP1
F	UDR-4 RP1
G	S4 Circuit 1
H	UDR-4 RP2
I	S5 Buffer up
J	S3 Buffer down
CSK	
K	CSK1 1.P 2.G 3.T
CSK-Touch	
K	CSKT + -
L	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - ((Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
8 - **P1** - (Heating circuit 1 (K1))
9 - Temperature sensor ((K1) Heating circuit 1 - main flow)
10 - **P2** - BUF (accumulation (buffer) tank)
11 - "CAS" accumulation (buffer) tank
12 - Temperature sensor (UP) - accumulation (buffer) tank
13 - Temperature sensor (DOWN) - accumulation (buffer) tank
14 - **(K1)** Heating circuit 1 (with mixing valve 1)
15 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
16 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 22

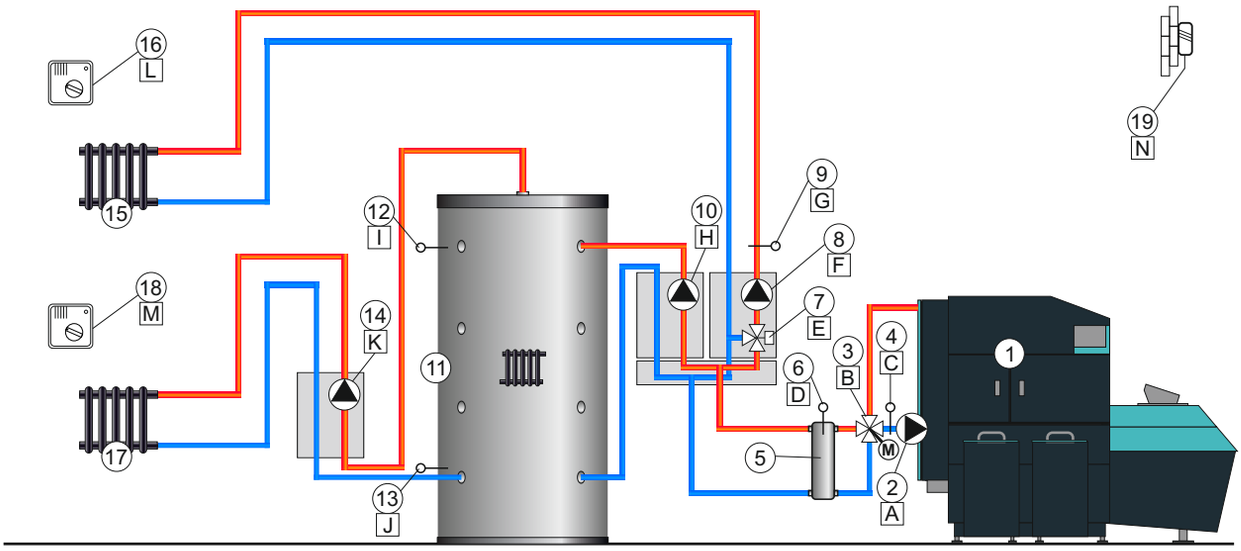


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
8 - **P1** - (Heating circuit 1 (K1))
9 - Temperature sensor ((K1) Heating circuit 1 - main flow)
10 - **P2** - BUF (accumulation (buffer) tank)
11 - "CAS-B" accumulation (buffer) tank
12 - Temperature sensor (UP) - accumulation (buffer) tank
13 - Temperature sensor (DOWN) - accumulation (buffer) tank
14 - **P3** - Recirculation DHW
15 - **(K1)** Heating circuit 1 (with mixing valve 1)
16 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
17 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	MIX VALVE CL1 OP1
F	UDR-4 RP1
G	S4 Circuit 1
H	UDR-4 RP2
I	S5 Buffer up
J	S3 Buffer down
K	UDR-4 RP3
L	CSK: CSK1 (1.P, 2.G, 3.T)
L	CSK-Touch: CSKT (+, -)
M	S8 Outdoor

CONFIGURATION 23

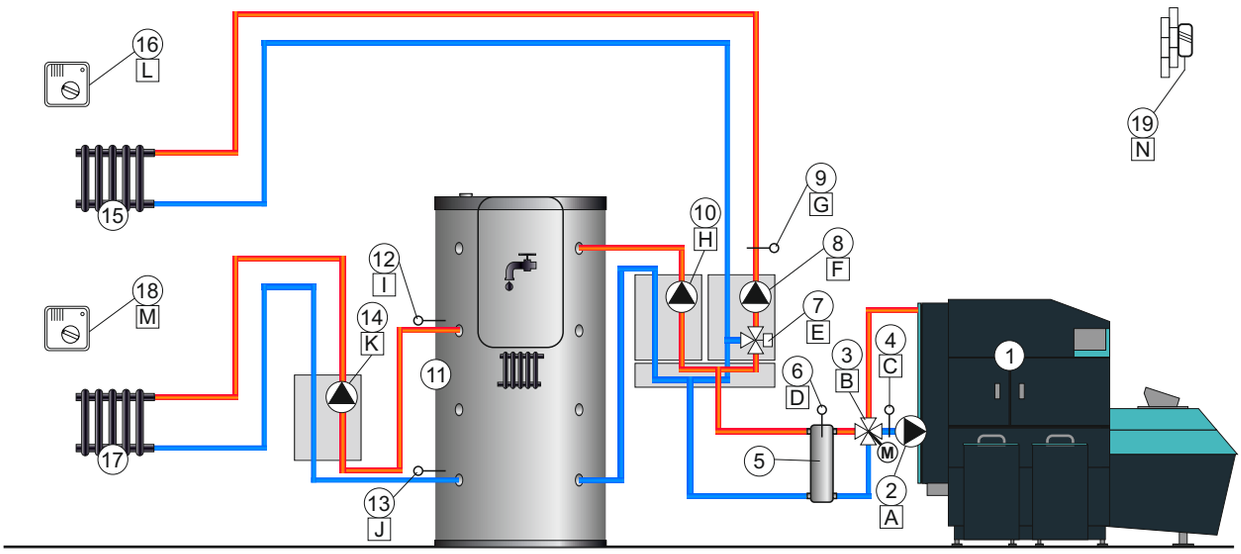


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
8 - **P1** - (Heating circuit 1 (K1))
9 - Temperature sensor ((K1) Heating circuit 1 - main flow)
10 - **P2** - BUF (accumulation (buffer) tank)
11 - "CAS" accumulation (buffer) tank
12 - Temperature sensor (UP) - accumulation (buffer) tank
13 - Temperature sensor (DOWN) - accumulation (buffer) tank
14 - **P3** - (Heating circuit 2 (K2))
15 - **(K1)** Heating circuit 1 (with mixing valve 1)
16 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
17 - **(K2)** Heating circuit 2 - (direct circuit)
18 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
19 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	MIX VALVE CL1 OP1
F	UDR-4 RP1
G	S4 Circuit 1
H	UDR-4 RP2
I	S5 Buffer up
J	S3 Buffer down
K	UDR-4 RP3
L	CSK 1: CSK1 1.P 2.G 3.T
L	CSK-Touch 1: CSKT + -
M	CSK 2: CSK2 1.P 2.G 3.T
N	S8 Outdoor

CONFIGURATION 24

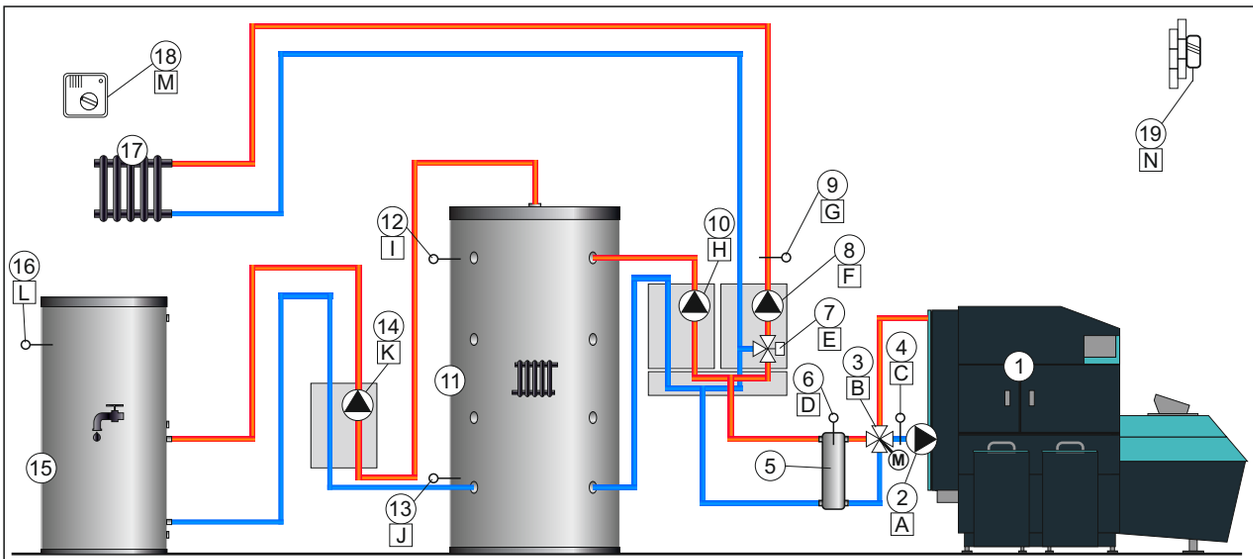


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
8 - **P1** - (Heating circuit 1 (K1))
9 - Temperature sensor ((K1) Heating circuit 1 - main flow)
10 - **P2** - BUF (accumulation (buffer) tank)
11 - "CAS-B" accumulation (buffer) tank
12 - Temperature sensor (UP) - accumulation (buffer) tank
13 - Temperature sensor (DOWN) - accumulation (buffer) tank
14 - **P3** - (Heating circuit 2 (K2))
15 - **(K1)** Heating circuit 1 (with mixing valve 1)
16 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
17 - **(K2)** Heating circuit 2 - (direct circuit)
18 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
19 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4				
	RP0				
B	MIX VALVE				
	to connector				
C	S2				
	Return				
D	S7				
	CRO				
E	MIX VALVE				
	CL1	OP1			
F	UDR-4				
		RP1			
G	S4				
	Circuit 1				
H	UDR-4				
			RP2		
I	S5				
	Buffer up				
J	S3				
	Buffer down				
K	UDR-4				
					RP3
	CSK 1				
L	CSK1				
	1.P	2.G	3.T		
	CSK-Touch 1				
L	CSKT				
	+	-			
	CSK 2				
M	CSK2				
	1.P	2.G	3.T		
N	S8				
	Outdoor				

CONFIGURATION 25

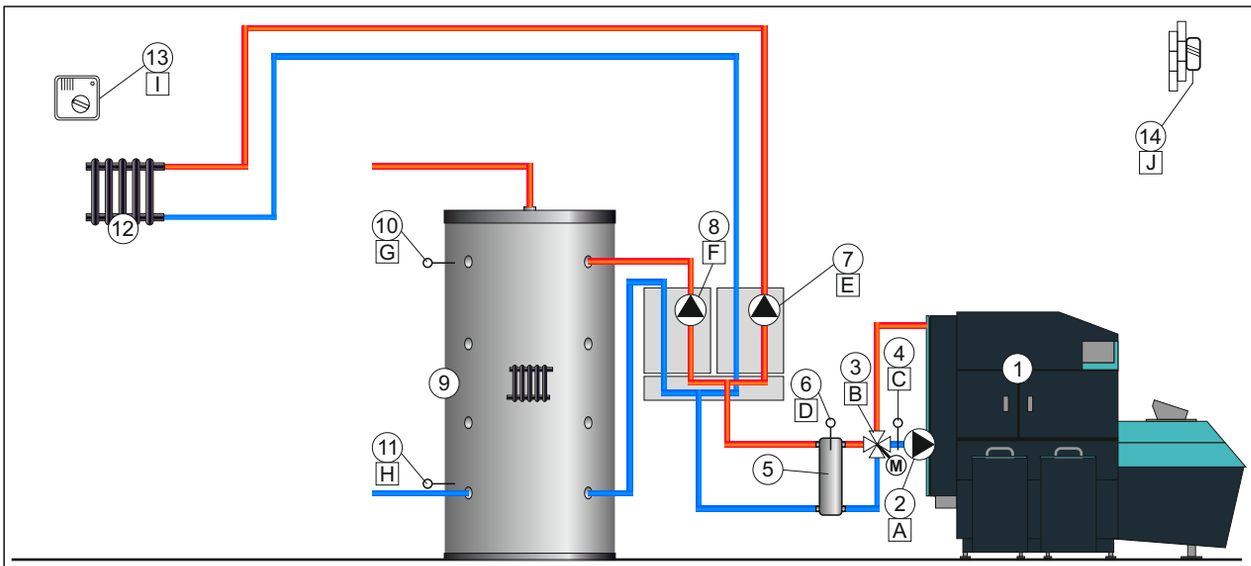


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
8 - **P1** - (Heating circuit 1 (K1))
9 - Temperature sensor ((K1) Heating circuit 1 - main flow)
10 - **P2** - BUF (accumulation (buffer) tank)
11 - "CAS" accumulation (buffer) tank
12 - Temperature sensor (UP) - accumulation (buffer) tank
13 - Temperature sensor (DOWN) - accumulation (buffer) tank
14 - **P3** - DHW (Heating circuit 2 (K2))
15 - **(K2)** Heating circuit 2 (DHW)
16 - Temperature sensor DHW ((K2) Heating circuit 2)
17 - **(K1)** Heating circuit 1 (with mixing valve 1)
18 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
19 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4			
	RP0			
B	MIX VALVE			
	to connector			
C	S2			
	Return			
D	S7			
	CRO			
E	MIX VALVE			
	CL1	OP1		
F	UDR-4			
		RP1		
G	S4			
	Circuit 1			
H	UDR-4			
			RP2	
I	S5			
	Buffer up			
J	S3			
	Buffer down			
K	UDR-4			
				RP3
L	S6			
	Circuit 2			
	CSK			
M	CSK1			
	1.P	2.G	3.T	
	CSK-Touch			
M	CSKT			
	+	-		
N	S8			
	Outdoor			

CONFIGURATION 26

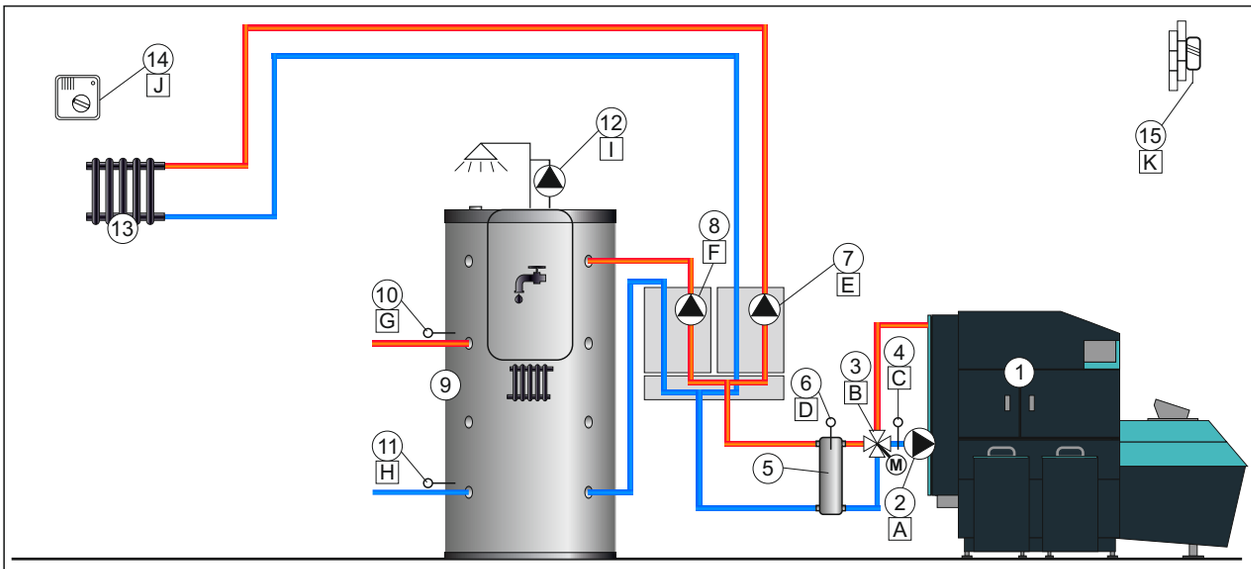


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S5 Buffer up
H	S3 Buffer down
	CSK
I	CSK1 1.P 2.G 3.T
	CSK-Touch
I	CSKT + -
J	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - (Heating circuit 1 (K1))
8 - **P2** - BUF (accumulation (buffer) tank)
9 - "CAS" accumulation (buffer) tank
10 - Temperature sensor (UP) - accumulation (buffer) tank
11 - Temperature sensor (DOWN) - accumulation (buffer) tank
12 - **(K1)** Heating circuit 1 - (direct circuit)
13 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
14 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 27

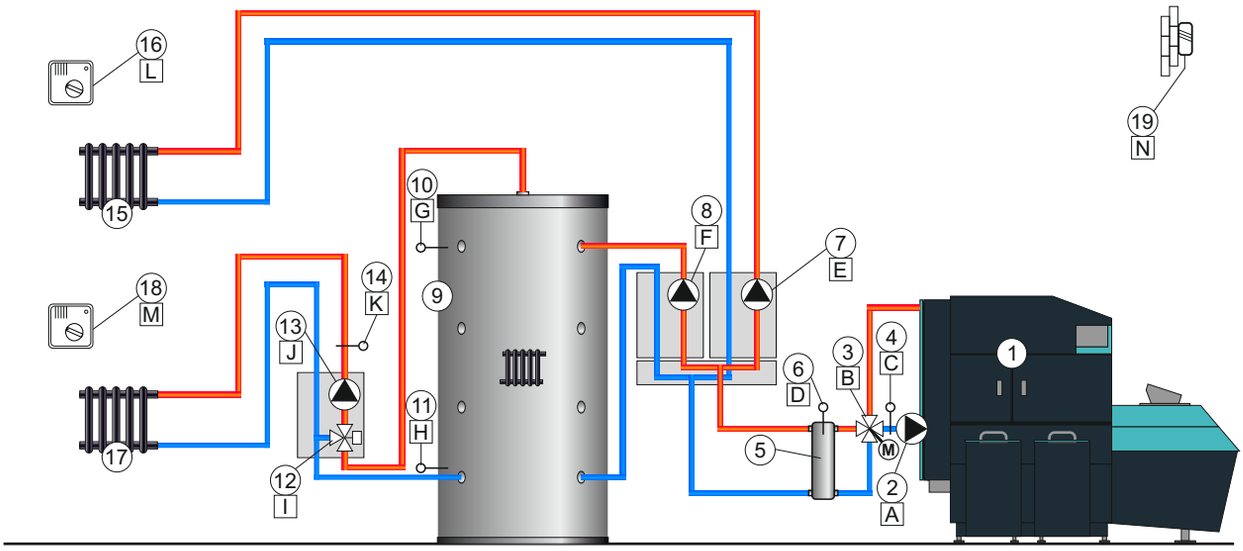


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S5 Buffer up
H	S3 Buffer down
I	UDR-4 RP3
	CSK
J	CSK1 1.P 2.G 3.T
	CSK-Touch
J	CSKT + -
K	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - (Heating circuit 1 (K1))
8 - **P2** - BUF (accumulation (buffer) tank)
9 - "CAS-B" accumulation (buffer) tank
10 - Temperature sensor (UP) - accumulation (buffer) tank
11 - Temperature sensor (DOWN) - accumulation (buffer) tank
12 - **P3** - Recirculation DHW
13 - **(K1)** Heating circuit 1 - (direct circuit)
14 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
15 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 28

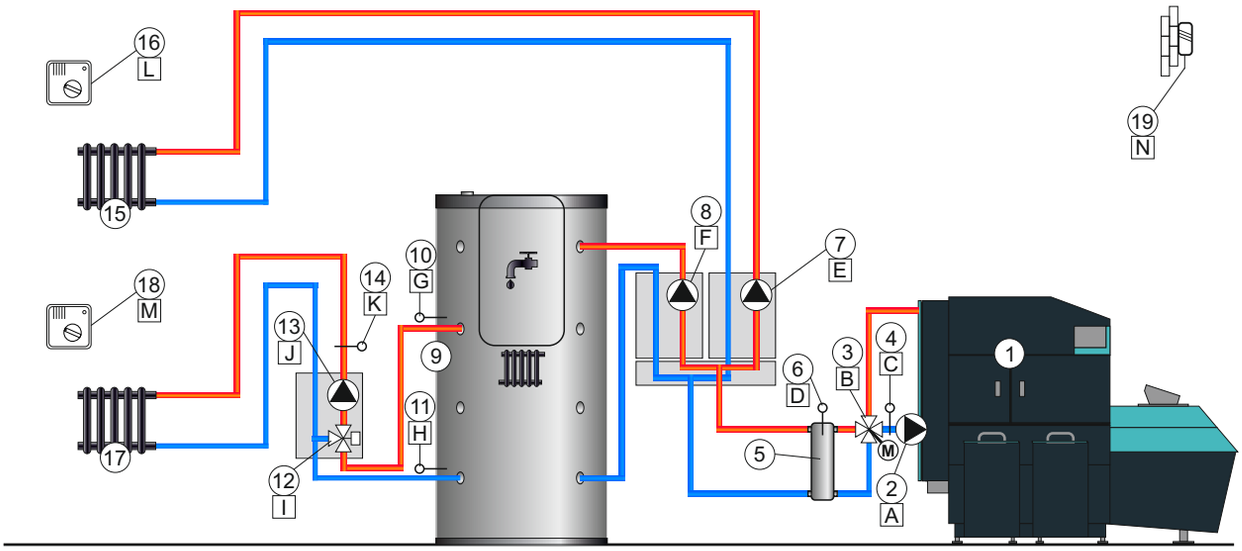


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - (Heating circuit 2 (K2))
8 - **P2** -BUF (accumulation (buffer) tank)
9 - "CAS" accumulation (buffer) tank
10 - Temperature sensor (UP) - accumulation (buffer) tank
11 - Temperature sensor (DOWN) - accumulation (buffer) tank
12 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
13 - **P3** - (Heating circuit 1 (K1))
14 - Temperature sensor ((K1) Heating circuit 1 - main flow)
15 - **(K2)** Heating circuit 2 - (direct circuit)
16 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
17 - **(K1)** Heating circuit 1 (with mixing valve 1)
18 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
19 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S5 Buffer up
H	S3 Buffer down
I	MIX VALVE CL1 OP1
J	UDR-4 RP3
K	S4 Circuit 1
L	CSK 2 — CSK2 — 1.P 2.G 3.T
M	CSK 1 — CSK1 — 1.P 2.G 3.T
M	CSK-Touch 1 — CSKT — + -
N	S8 Outdoor

CONFIGURATION 29

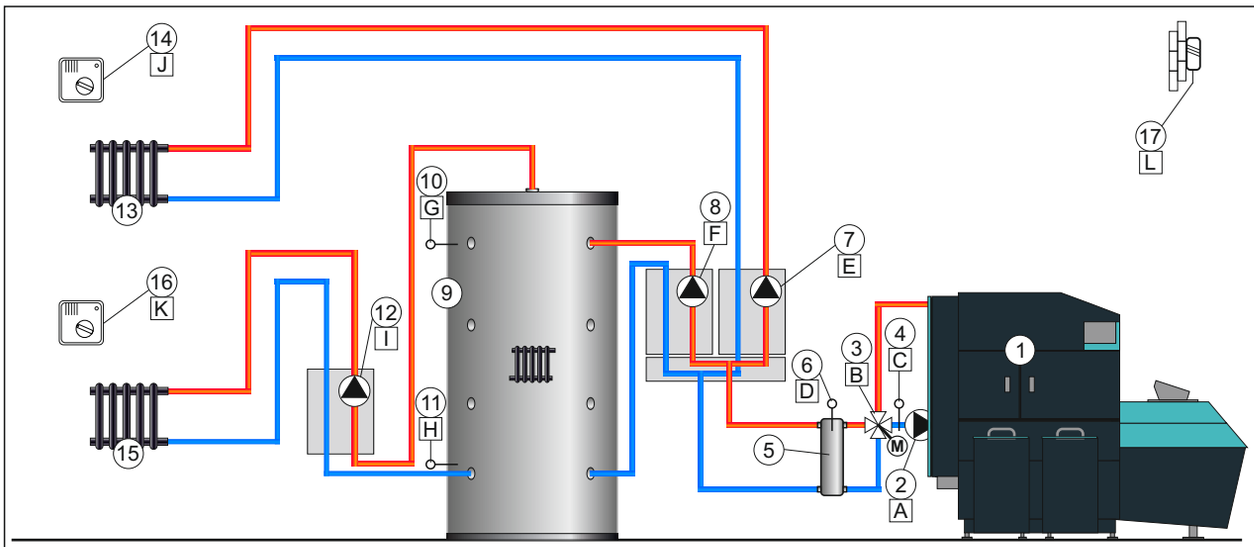


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - (Heating circuit 2 (K2))
8 - **P2** - BUF (accumulation (buffer) tank)
9 - "CAS-B" accumulation (buffer) tank
10 - Temperature sensor (UP) - accumulation (buffer) tank
11 - Temperature sensor (DOWN) - accumulation (buffer) tank
12 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
13 - **P3** - (Heating circuit 1 (K1))
14 - Temperature sensor ((K1) Heating circuit 1 - main flow)
15 - **(K2)** Heating circuit 2 - (direct circuit)
16 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
17 - **(K1)** Heating circuit 1 (with mixing valve 1)
18 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
19 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4				
	RP0				
B	MIX VALVE				
	to connector				
C	S2				
	Return				
D	S7				
	CRO				
E	UDR-4				
		RP1			
F	UDR-4				
			RP2		
G	S5				
	Buffer up				
H	S3				
	Buffer down				
I	MIX VALVE				
	CL1	OP1			
J	UDR-4				
				RP3	
K	S4				
	Circuit 1				
	CSK 2				
L	CSK2				
	1.P	2.G	3.T		
	CSK 1				
M	CSK1				
	1.P	2.G	3.T		
	CSK-Touch 1				
M	CSKT				
	+	-			
N	S8				
	Outdoor				

CONFIGURATION 30

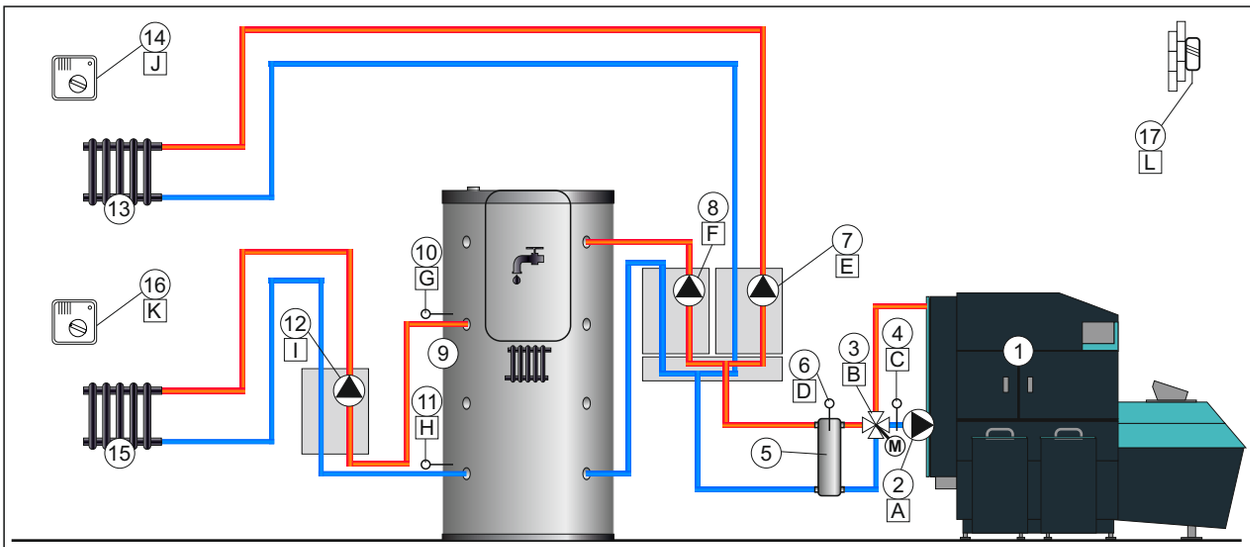


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S5 Buffer up
H	S3 Buffer down
I	UDR-4 RP3
J	CSK 1: CSK1 (1.P, 2.G, 3.T)
J	CSK-Touch 1: CSKT (+, -)
K	CSK 2: CSK2 (1.P, 2.G, 3.T)
L	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - (Heating circuit 1 (K1))
8 - **P2** - BUF (accumulation (buffer) tank)
9 - "CAS" accumulation (buffer) tank
10 - Temperature sensor (UP) - accumulation (buffer) tank
11 - Temperature sensor (DOWN) - accumulation (buffer) tank
12 - **P3** - (Heating circuit 2 (K2))
13 - **(K1)** Heating circuit 1 - (direct circuit)
14 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
15 - **(K2)** Heating circuit 2 - (direct circuit)
16 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
17 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 31

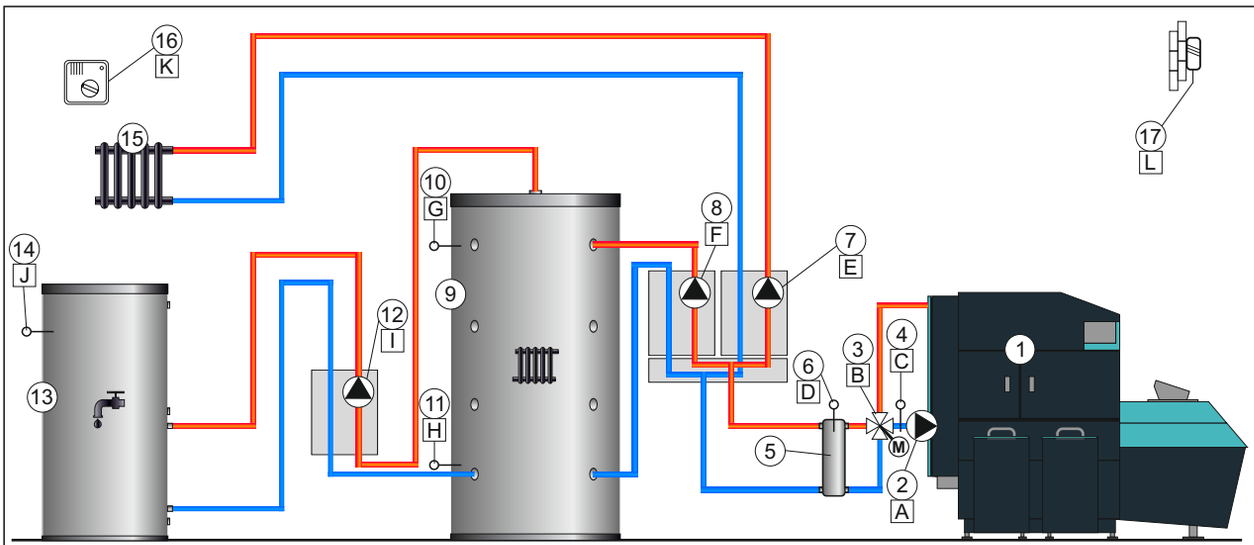


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S5 Buffer up
H	S3 Buffer down
I	UDR-4 RP3
J	CSK 1: CSK1 (1.P, 2.G, 3.T)
J	CSK-Touch 1: CSKT (+, -)
K	CSK 2: CSK2 (1.P, 2.G, 3.T)
L	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - (Heating circuit 1 (K1))
8 - **P2** - BUF (accumulation (buffer) tank)
9 - "CAS-B" accumulation (buffer) tank
10 - Temperature sensor (UP) - accumulation (buffer) tank
11 - Temperature sensor (DOWN) - accumulation (buffer) tank
12 - **P3** - (Heating circuit 2 (K2))
13 - **(K1)** Heating circuit 1 - (direct circuit)
14 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
15 - **(K2)** Heating circuit 2 - (direct circuit)
16 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
17 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 32

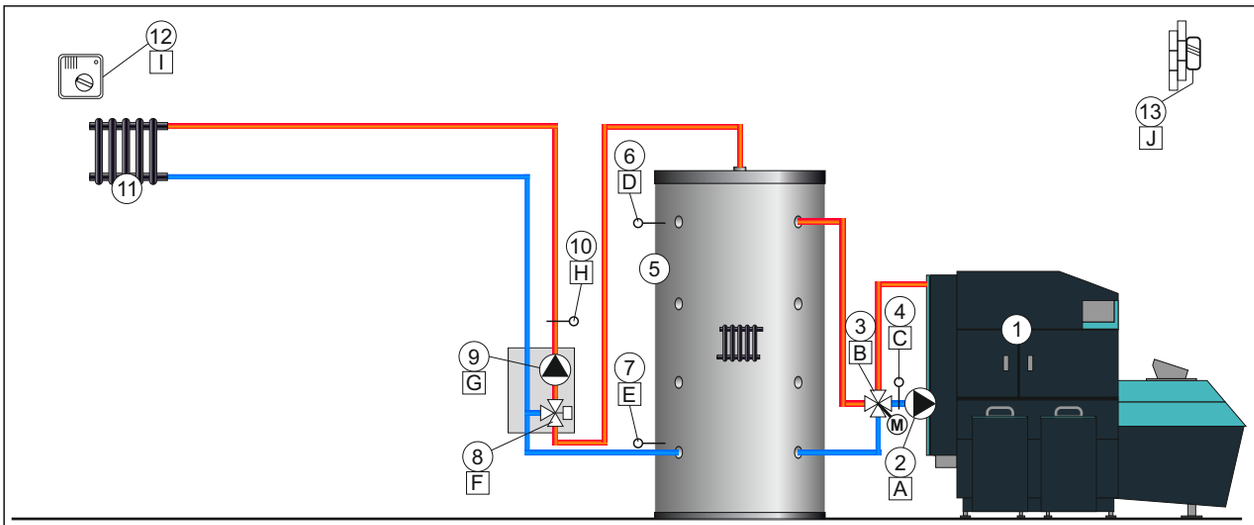


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - **P1** - (Heating circuit 1 (K1))
8 - **P2** - BUF (accumulation (buffer) tank)
9 - "CAS" accumulation (buffer) tank
10 - Temperature sensor (UP) - accumulation (buffer) tank
11 - Temperature sensor (DOWN) - accumulation (buffer) tank
12 - **P3** - DHW (Heating circuit 2 (K2))
13 - **(K2)** Heating circuit 2 (DHW)
14 - Temperature sensor DHW ((K2) Heating circuit 2)
15 - **(K1)** Heating circuit 1 - (direct circuit)
16 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
17 - Outdoor temperature sensor

A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	UDR-4 RP1
F	UDR-4 RP2
G	S5 Buffer up
H	S3 Buffer down
I	UDR-4 RP3
J	S6 Circuit 2
K	CSK: CSK1 1.P 2.G 3.T
K	CSK-Touch: CSKT + -
L	S8 Outdoor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 33

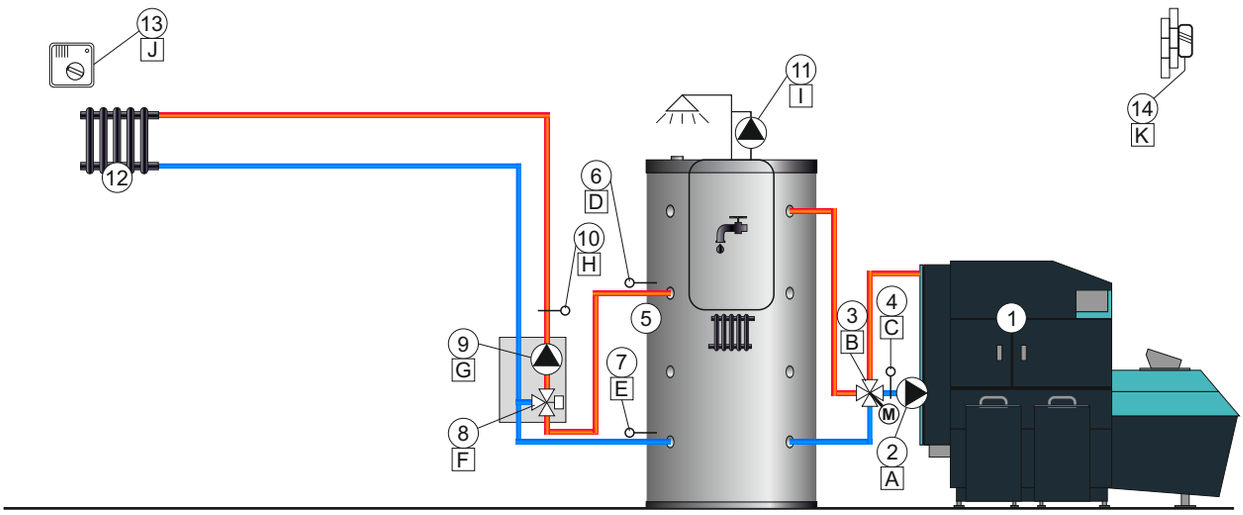


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
9 - **P1** - (Heating circuit 1 (K1))
10 - Temperature sensor ((K1) Heating circuit 1 - main flow)
11 - **(K1)** Heating circuit 1 (with mixing valve 1)
12 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
13 - Outdoor temperature sensor

A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	MIX VALVE CL1 OP1
G	UDR-4 RP1
H	S4 Circuit 1
I	CSK: CSK1 1.P 2.G 3.T
I	CSK-Touch: CSKT + -
J	S8 Outdoor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 34

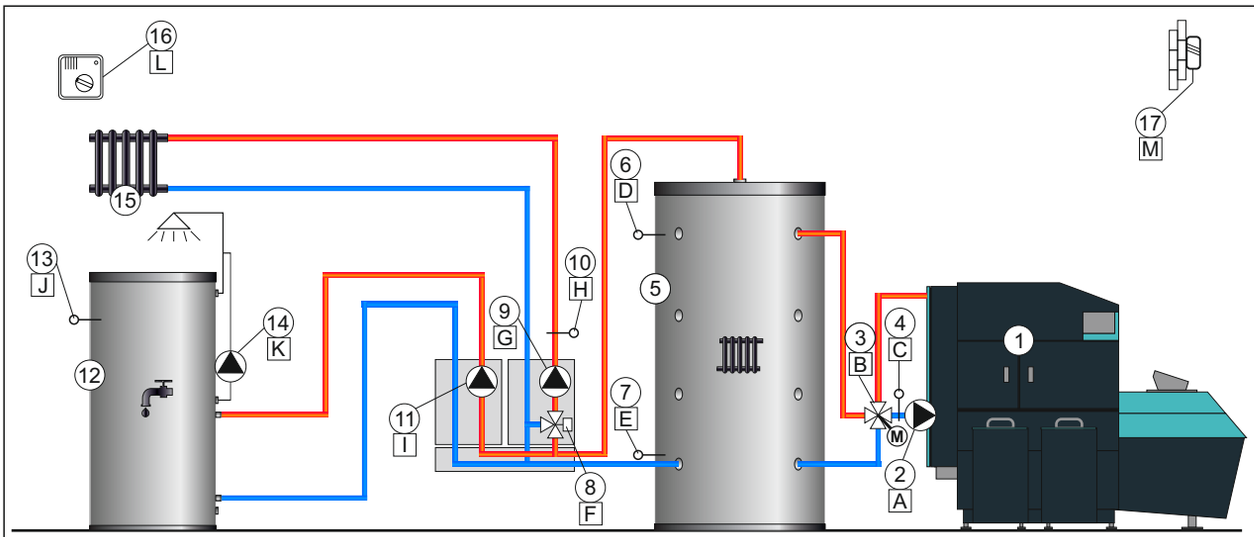


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS-B" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
9 - **P1** - (Heating circuit 1 (K1))
10 - Temperature sensor ((K1) Heating circuit 1 - main flow)
11 - **P2** - Recirculation DHW
12 - **(K1)** Heating circuit 1 (with mixing valve 1)
13 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
14 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4			
	RP0			
B	MIX VALVE			
	to connector			
C	S2			
	Return			
D	S5			
	Buffer up			
E	S3			
	Buffer down			
F	MIX VALVE			
	CL1	OP1		
G	UDR-4			
		RP1		
H	S4			
	Circuit 1			
I	UDR-4			
			RP2	
	CSK			
J	CSK1			
	1.P	2.G	3.T	
	CSK-Touch			
J	CSKT			
	+	-		
K	S8			
	Outdoor			

CONFIGURATION 35

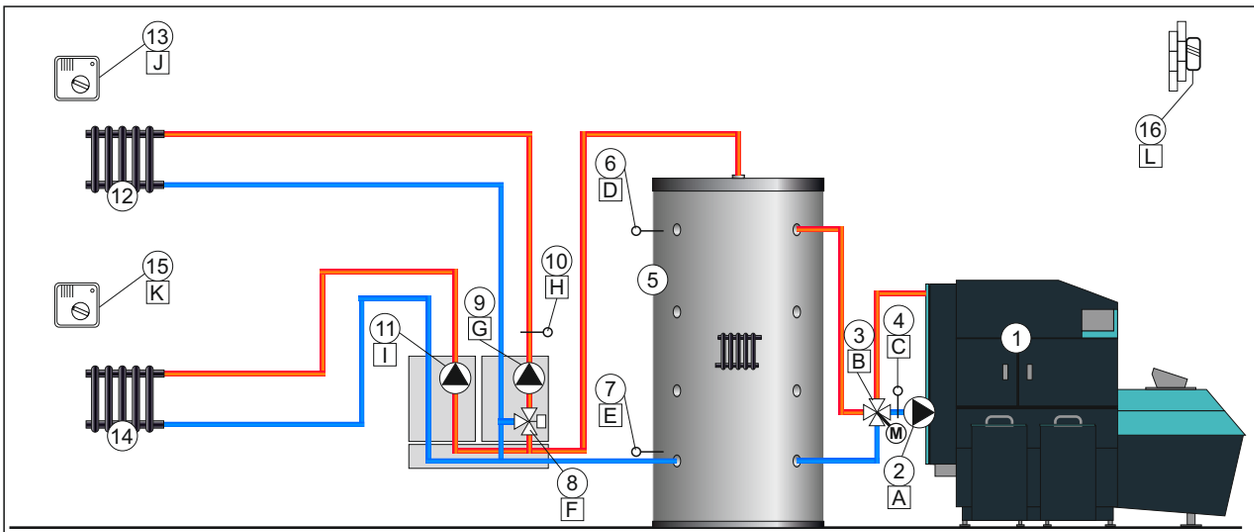


1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
9 - **P1** - (Heating circuit 1 (K1))
10 - Temperature sensor ((K1) Heating circuit 1 - main flow)
11 - **P2** - DHW (Heating circuit 2 (K2))
12 - **(K2)** Heating circuit 2 (DHW)
13 - Temperature sensor DHW ((K2) Heating circuit 2)
14 - **P3** - Recirculation DHW (Heating circuit 2 (K2))
15 - **(K1)** Heating circuit 1 (with mixing valve 1)
16 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
17 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

A	UDR-4			
	RP0			
B	MIX VALVE			
	to connector			
C	S2			
	Return			
D	S5			
	Buffer up			
E	S3			
	Buffer down			
F	MIX VALVE			
	CL1	OP1		
G	UDR-4			
		RP1		
H	S4			
	Circuit 1			
I	UDR-4			
			RP2	
J	S6			
	Circuit 2			
K	UDR-4			
				RP3
	CSK			
L	CSK1			
	1.P	2.G	3.T	
	CSK-Touch			
L	CSKT			
	+	-		
M	S8			
	Outdoor			

CONFIGURATION 36

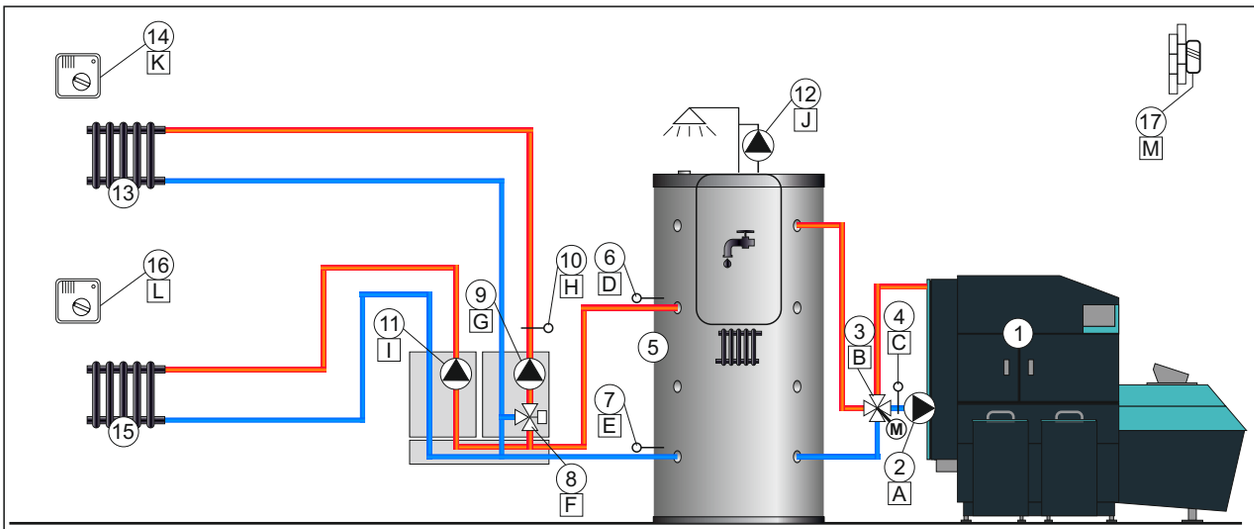


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	MIX VALVE CL1 OP1
G	UDR-4 RP1
H	S4 Circuit 1
I	UDR-4 RP2
J	CSK 1: CSK1 1.P 2.G 3.T / CSK-Touch 1: CSKT + -
K	CSK 2: CSK2 1.P 2.G 3.T
L	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
9 - **P1** - (Heating circuit 1 (K1))
10 - Temperature sensor ((K1) Heating circuit 1 - main flow)
11 - **P2** - (Heating circuit 2 (K2))
12 - **(K1)** Heating circuit 1 (with mixing valve 1)
13 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
14 - **(K2)** Heating circuit 2 - (direct circuit)
15 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
16 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 37

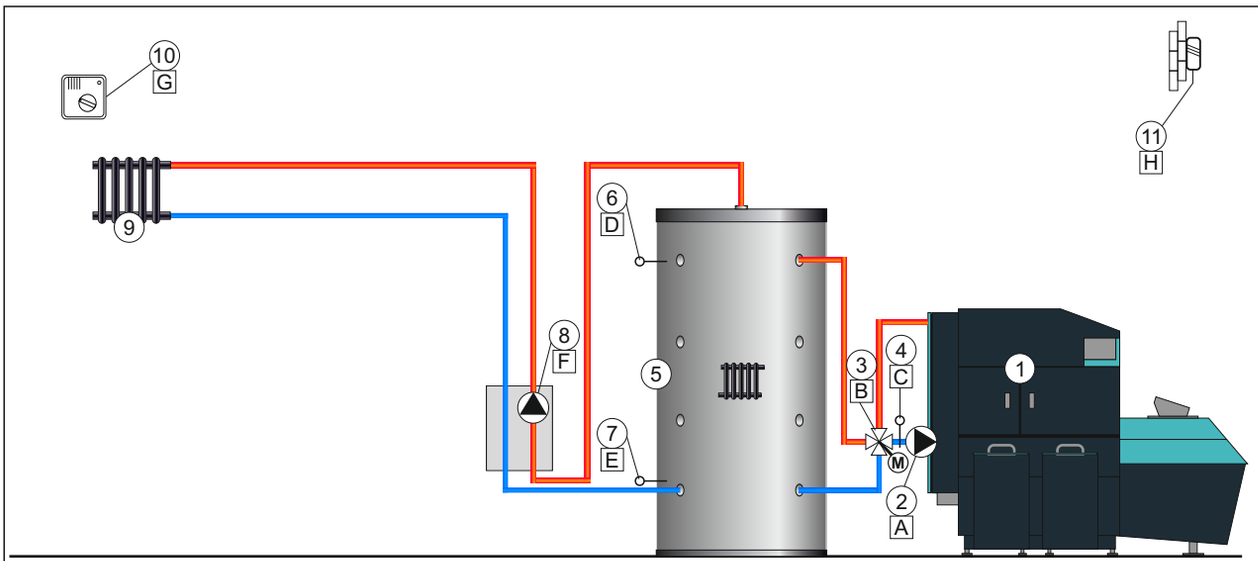


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	MIX VALVE CL1 OP1
G	UDR-4 RP1
H	S4 Circuit 1
I	UDR-4 RP2
J	UDR-4 RP3
K	**CSK 1** CSK1 1.P 2.G 3.T
K	**CSK-Touch 1** CSKT + -
L	**CSK 2** CSK2 1.P 2.G 3.T
M	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS-B" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - MIXING VALVE 1 (3-way mixing valve with actuator - heating circuit 1 (K1))
9 - **P1** - (Heating circuit 1 (K1))
10 - Temperature sensor ((K1) Heating circuit 1 - main flow)
11 - **P2** - (Heating circuit 2 (K2))
12 - **P3** - Recirculation DHW
13 - **(K1)** Heating circuit 1 (with mixing valve 1)
14 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
15 - **(K2)** Heating circuit 2 - (direct circuit)
16 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
17 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

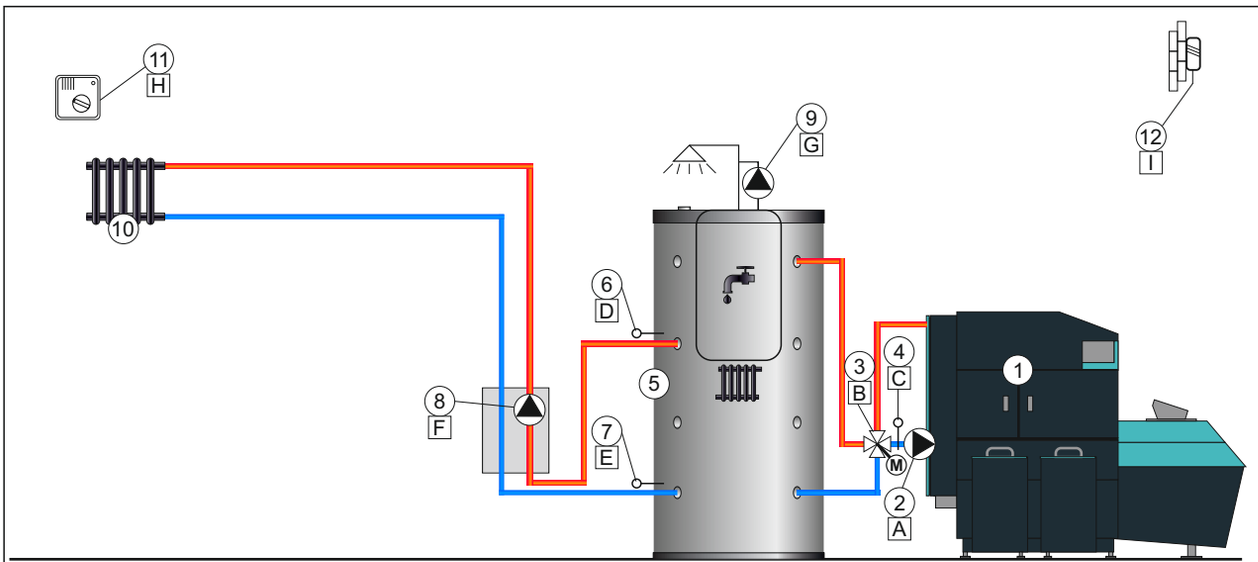
CONFIGURATION 38



1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - **P1** - (Heating circuit 1 (K1))
9 - **(K1)** Heating circuit 1 - (direct circuit)
10 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
11 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

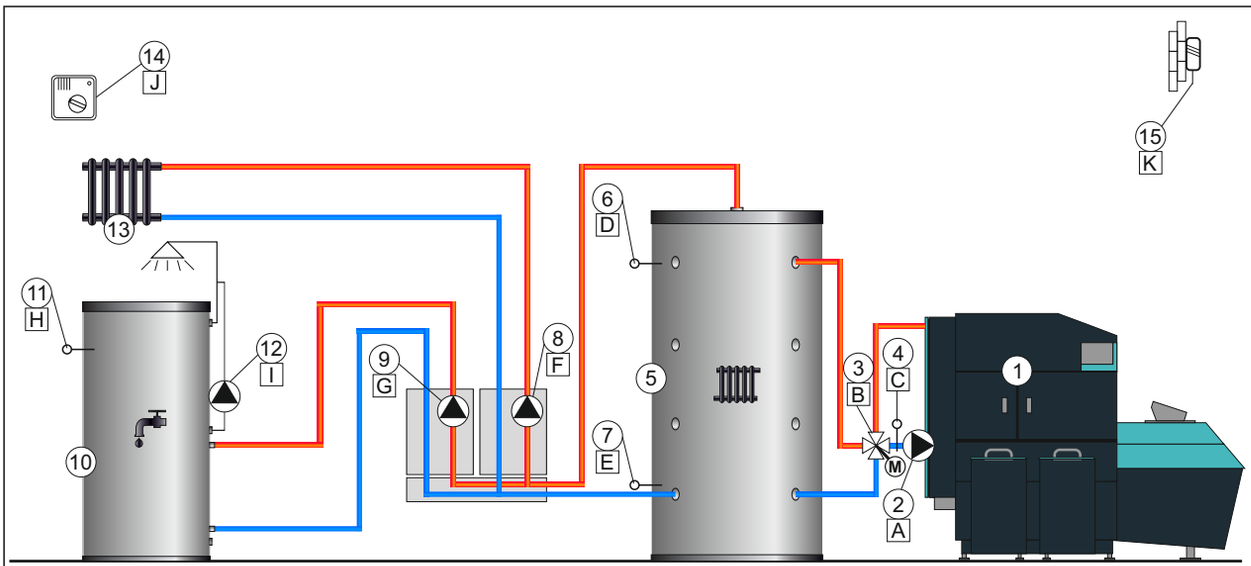
CONFIGURATION 39



1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS-B" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - **P1** - (Heating circuit 1 (K1))
9 - **P2** - Recirculation DHW
10 - **(K1)** Heating circuit 1 - (direct circuit)
11 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
12 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 40

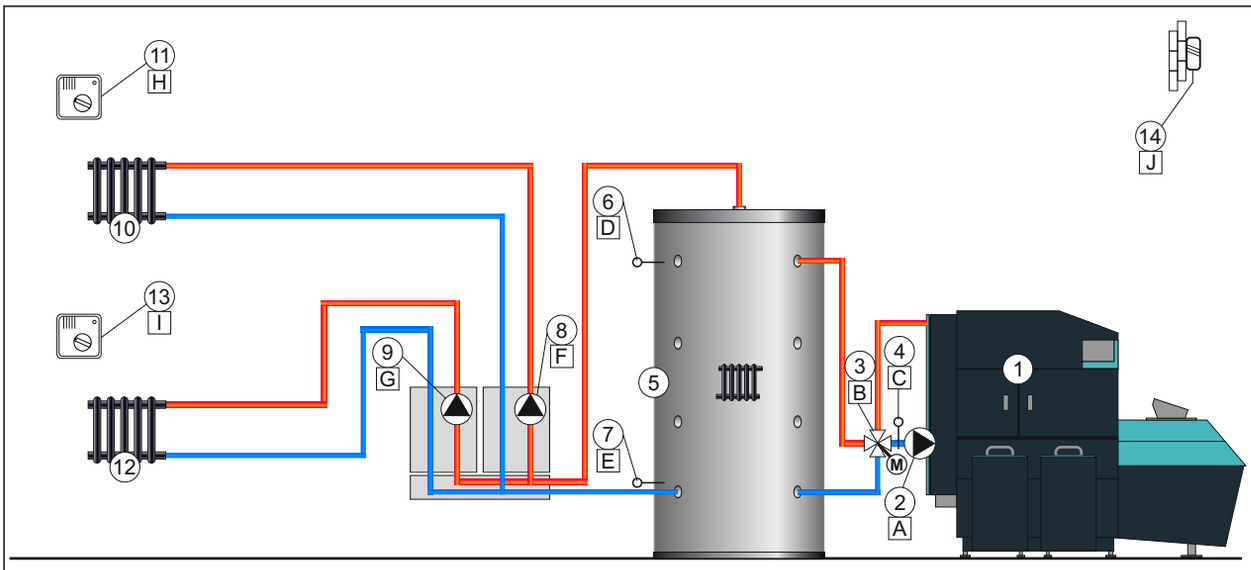


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	UDR-4 RP1
G	UDR-4 RP2
H	S6 Circuit 2
I	UDR-4 RP3
J	CSK: CSK1 1.P 2.G 3.T
J	CSK-Touch: CSKT + -
K	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - **P1** - (Heating circuit 1 (K1))
9 - **P2** - DHW (Heating circuit 2 (K2))
10 - **(K2)** Heating circuit 2 (DHW)
11 - Temperature sensor DHW ((K2) Heating circuit 2)
12 - **P3** - Recirculation DHW (Heating circuit 2 (K2))
13 - **(K1)** Heating circuit 1 - (direct circuit)
14 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
15 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 41

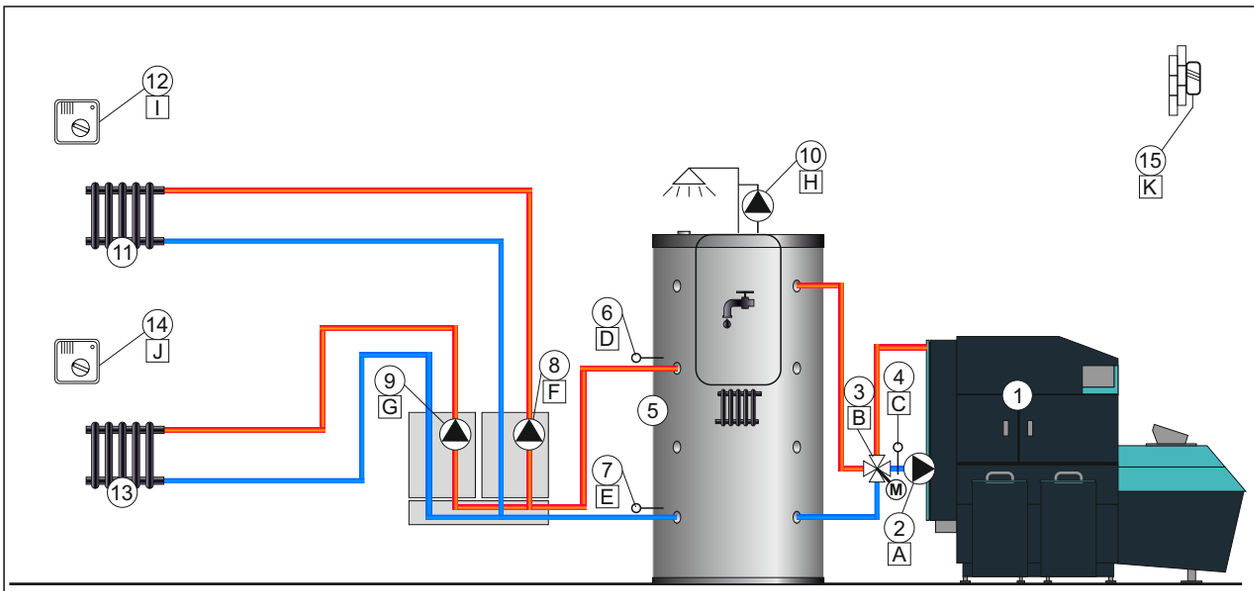


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	UDR-4 RP1
G	UDR-4 RP2
H	CSK 1: CSK1 1.P 2.G 3.T
H	CSK-Touch 1: CSKT + -
I	CSK 2: CSK2 1.P 2.G 3.T
J	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - **P1** - (Heating circuit 1 (K1))
9 - **P2** - (Heating circuit 2 (K2))
10 - **(K1)** Heating circuit 1 - (direct circuit)
11 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
12 - **(K2)** Heating circuit 2 - (direct circuit)
13 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
14 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 42

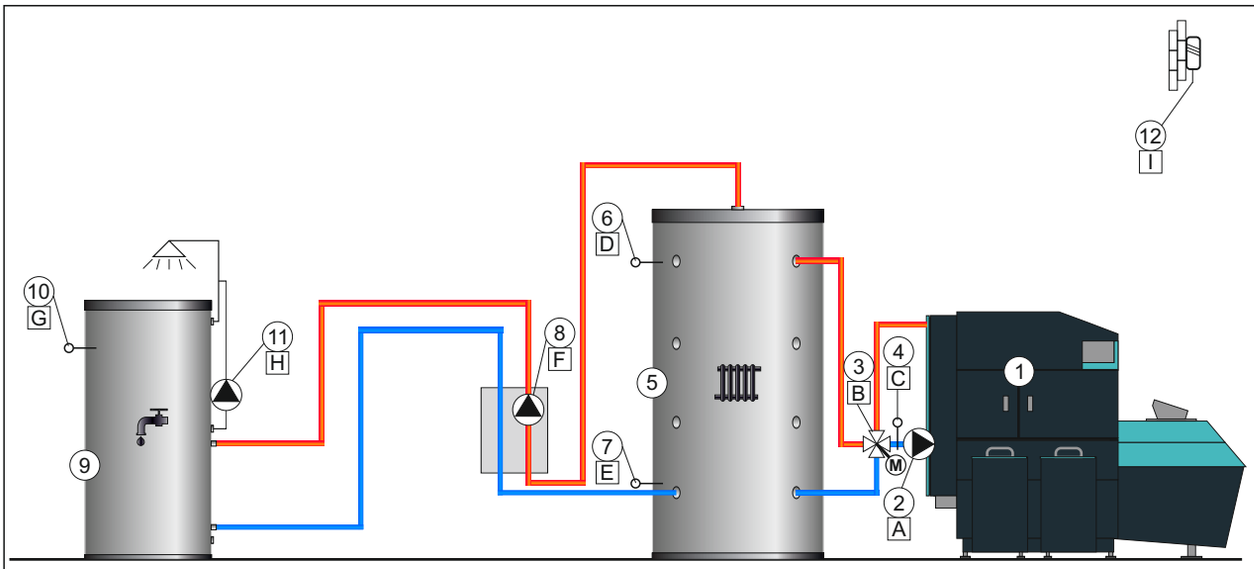


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	UDR-4 RP1
G	UDR-4 RP2
H	UDR-4 RP3
I	CSK 1 CSK1 1.P 2.G 3.T
I	CSK-Touch 1 CSKT + -
J	CSK 2 CSK2 1.P 2.G 3.T
K	S8 Outdoor

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS-B" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - **P1** - (Heating circuit 1 (K1))
9 - **P2** - (Heating circuit 2 (K2))
10 - **P3** - Recirculation DHW
11 - **(K1)** Heating circuit 1 - (direct circuit)
12 - Room corrector CSK 1 ((K1) heating circuit 1) / CSK-Touch / Room thermostat
13 - **(K2)** Heating circuit 2 - (direct circuit)
14 - Room corrector CSK 2 ((K2) heating circuit 2) / CSK-Touch / Room thermostat
15 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
- the first CSK-Touch can be connected to the boiler wired or wirelessly, the second CSK-Touch can only be connected wirelessly.

CONFIGURATION 43

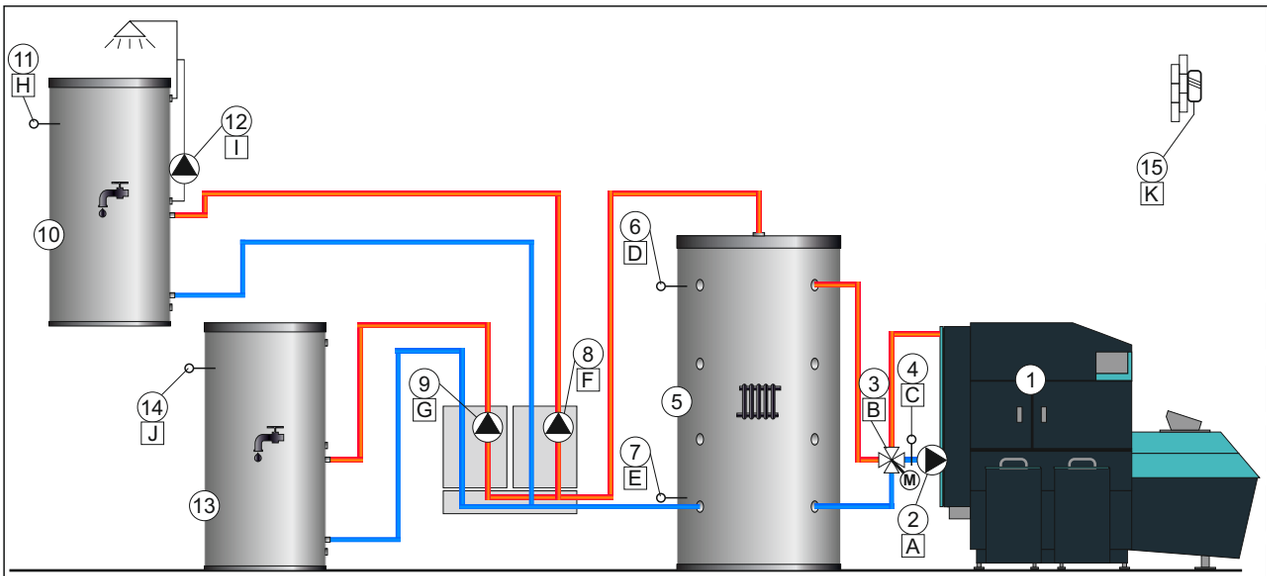


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	UDR-4 RP1
G	S4 Circuit 1
H	UDR-4 RP2
I	S8 Outdoor
*	CSK-Touch CSKT + -

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - **P1** - DHW (Heating circuit 1 (K1))
9 - **(K1)** Heating circuit 1 (DHW)
10 - Temperature sensor DHW ((K1) Heating circuit 1)
11 - **P2** - Recirculation DHW (Heating circuit 1 (K1))
12 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 44

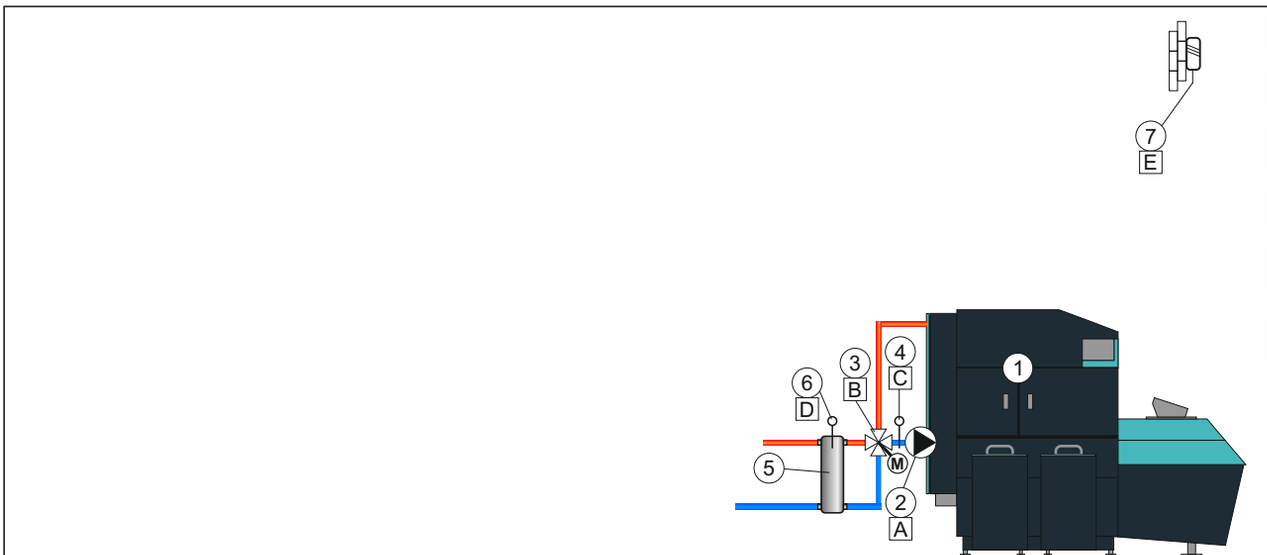


A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S5 Buffer up
E	S3 Buffer down
F	UDR-4 RP1
G	UDR-4 RP2
H	S4 Circuit 1
I	UDR-4 RP3
J	S6 Circuit 2
K	S8 Outdoor
	CSK-Touch
*	CSKT + -

1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - "CAS" accumulation (buffer) tank
6 - Temperature sensor (UP) - accumulation (buffer) tank
7 - Temperature sensor (DOWN) - accumulation (buffer) tank
8 - **P1** - DHW (Heating circuit 1 (K1))
9 - **P2** - DHW (Heating circuit 2 (K2))
10 - **(K1)** Heating circuit 1 (DHW)
11 - Temperature sensor DHW ((K1) Heating circuit 1)
12 - **P3** - Recirculation DHW (Heating circuit 1 (K1))
13 - **(K2)** Heating circuit 2 (DHW)
14 - Temperature sensor DHW ((K2) Heating circuit 2)
15 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

CONFIGURATION 45



A	UDR-4 RP0
B	MIX VALVE to connector
C	S2 Return
D	S7 CRO
E	S8 Outdoor
	CSK-Touch
*	CSKT + -

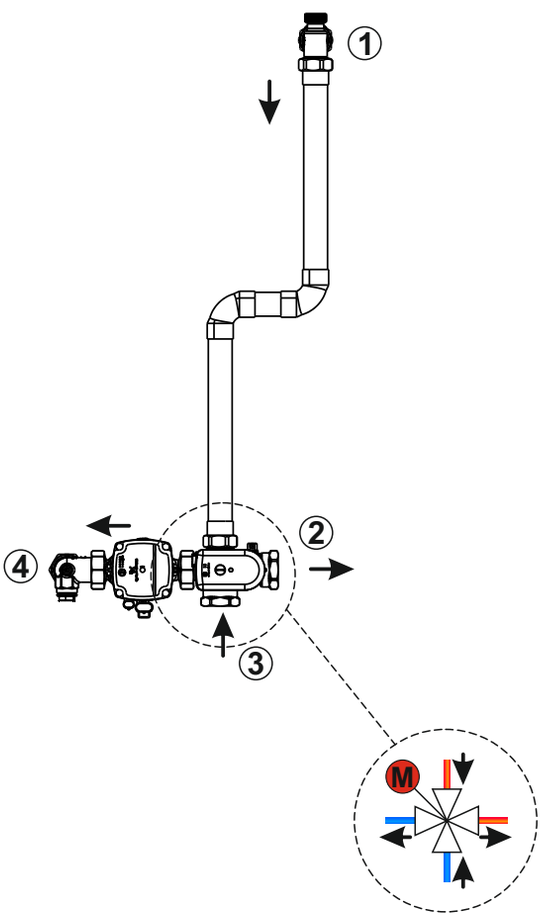
1 - Boiler BIO-SC
2 - **P0** - (Boiler circuit)
3 - MIXING VALVE (4-way mixing valve with actuator - boiler circuit)
4 - Temperature sensor (boiler circuit - return flow)
5 - Hydraulic crossover
6 - Temperature sensor (Hydraulic crossover)
7 - Outdoor temperature sensor

Notes:
- in this configuration is possible to connect up to 3 unit "CM2K module for regulation 2 heating circuits".
* in this configuration is possible to connect CSK-Touch (additional equipment) only if CM2K is installed.

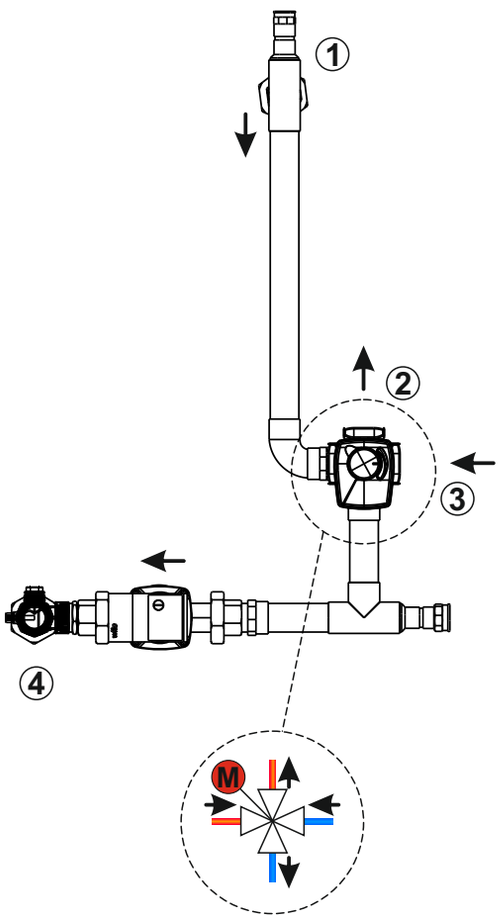
4-WAY MIXING VALVE CONNECTIONS:

LEGEND:
1 - boiler main flow
2 - main flow to the installation
3 - return flow from the installation
4 - boiler return flow

BIO-SC 48



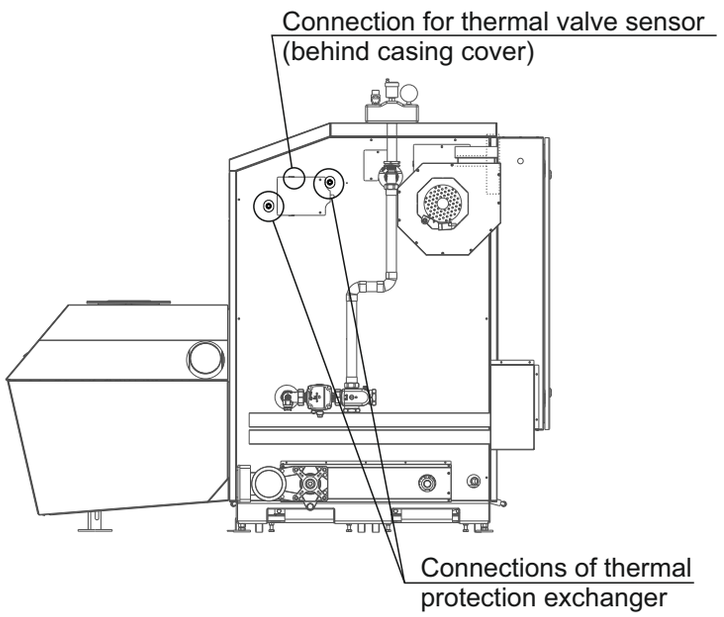
BIO-SC 96

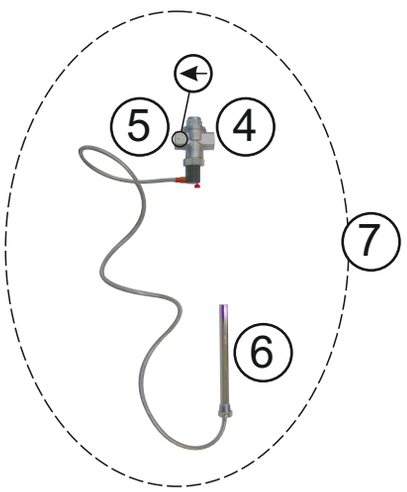


4.3. THERMAL SAFETY PROTECTION INSTALLATION

Boilers BIO-SC obligatory must have thermal protection installed. They have factory installed thermal protection exchanger which must be connected to the water supply throught the thermal protection valve (delivered with the boiler, must be installed by installer). Connections of the thermal protection exchanger are on the boiler back side. Example of connection is shown in picture below.

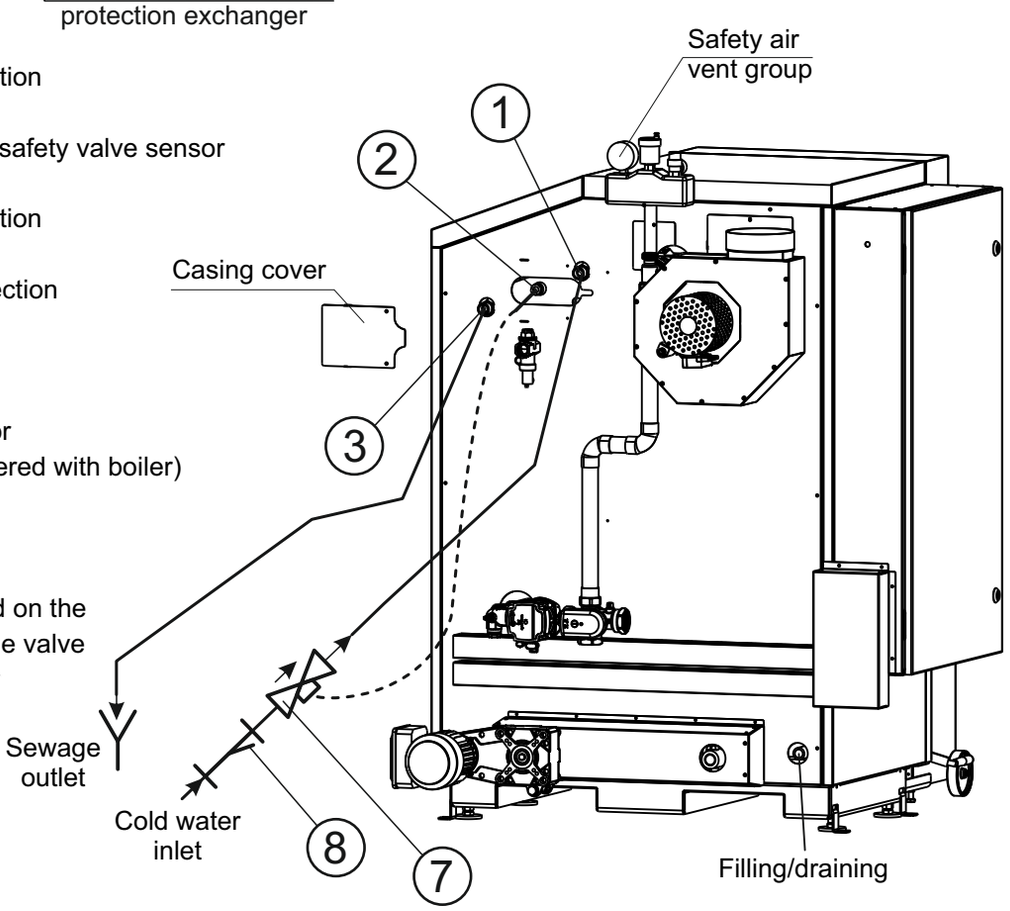
Thermal protection installation





① - Thermal exchanger connection
(to thermal safety valve)
② - Connection for the thermal safety valve sensor
(behind casing cover)
③ - Thermal exchanger connection
(to the sewerage)
④ - Thermal safety valve connection
(cold water inlet)
⑤ - Thermal valve connection
(to the termal exchanger)
⑥ - Thermal safety valve-sensor
⑦ - Thermal safety valve (delivered with boiler)
(Caleffi 543, 98°C)
⑧ - Dirt filter (recommended)

Thermal valve must be installed on the cold water inlet and arrow on the valve must be pointing towards boiler



NOTE: thermal protection exchanger is build inside boiler body

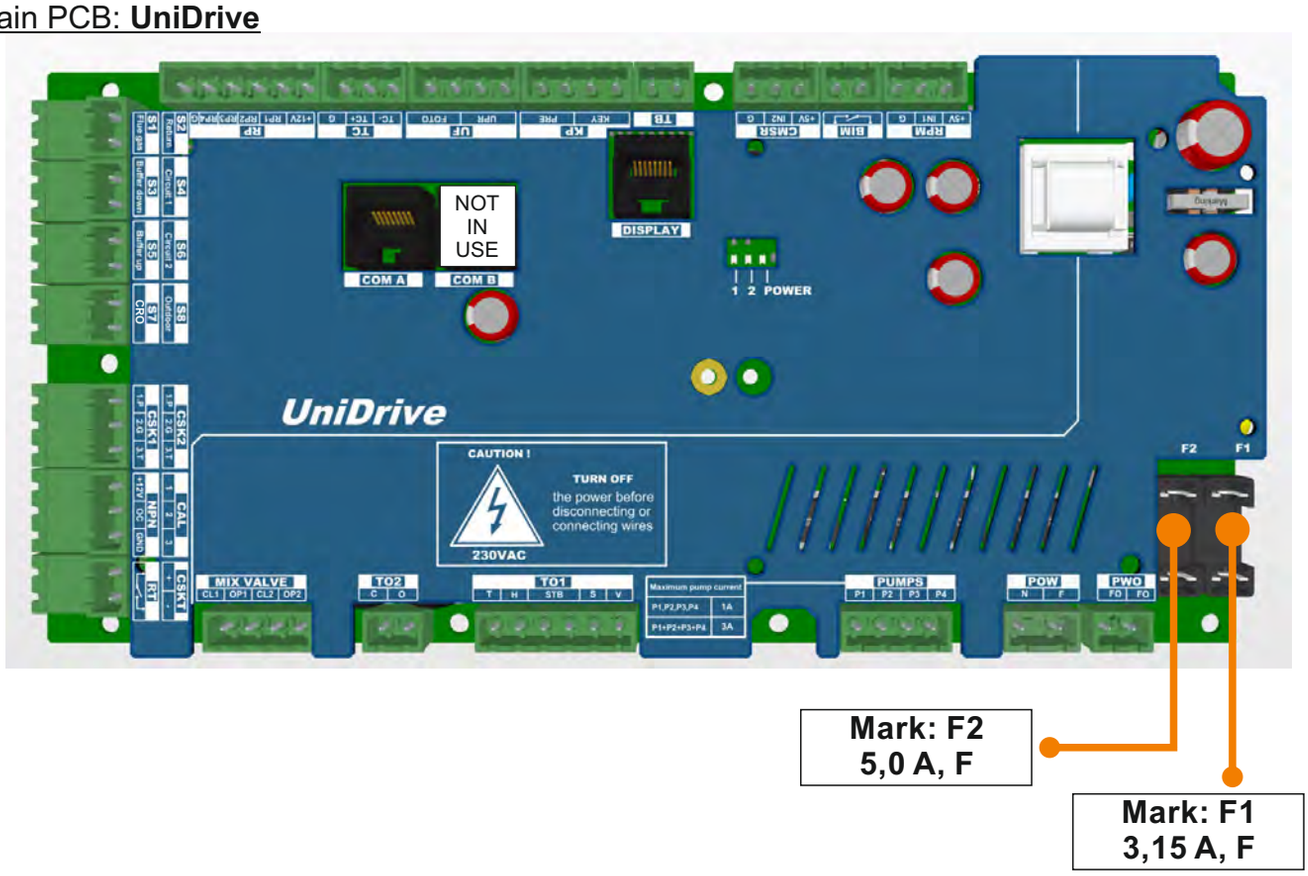
5.0. ELECTRICAL CONNECTIONS

All electrical works must be performed by a certified professional in accordance with valid national and European standards and according to the el. schemes from these technical instructions If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard. A device for switching of all power supply poles must be installed in electrical installation in accordance with the national regulations on electrical installations.

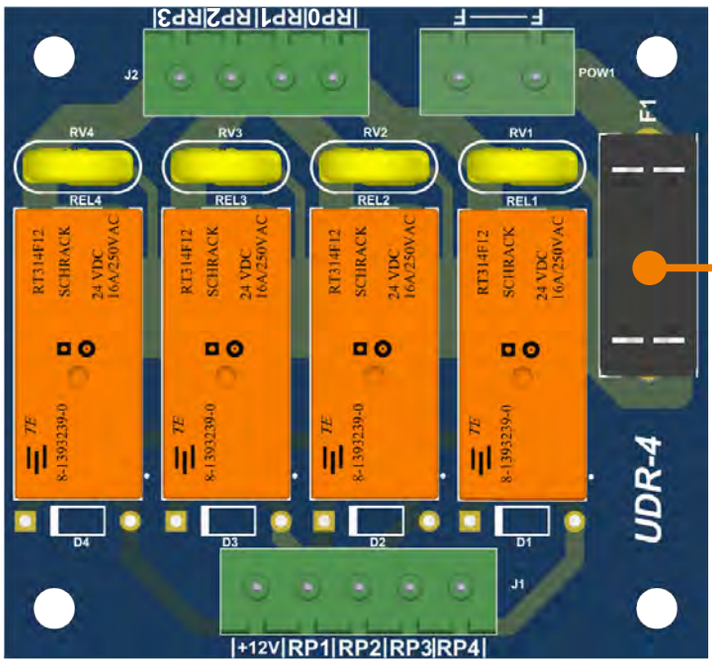
CAUTION: When connecting any electrical part be sure to unplug the boiler at the main switch (0/1) and disconnect the power supply.

5.1. FUSES

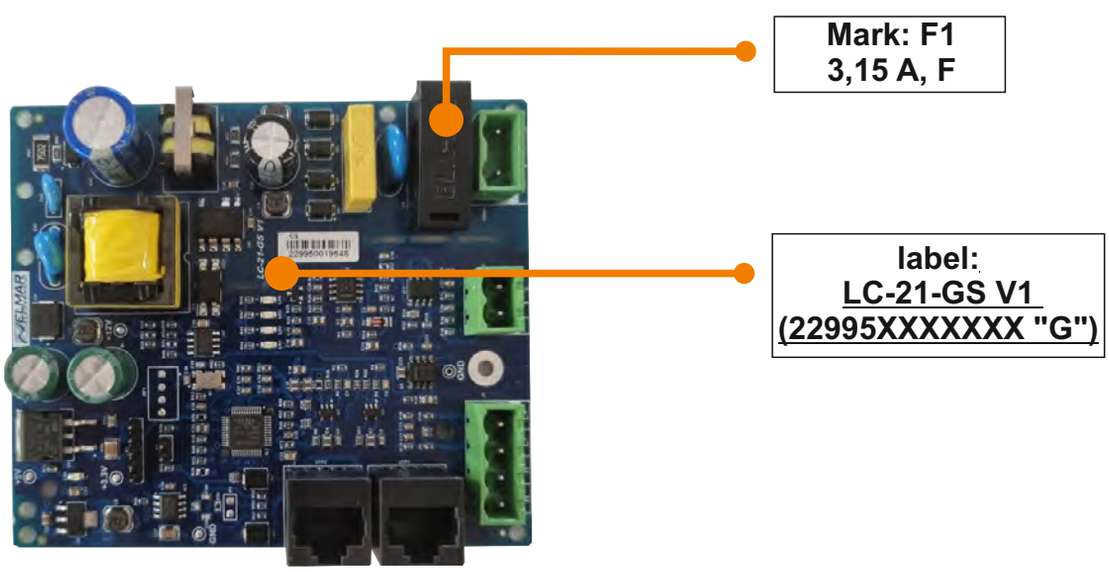
Main PCB: **UniDrive**



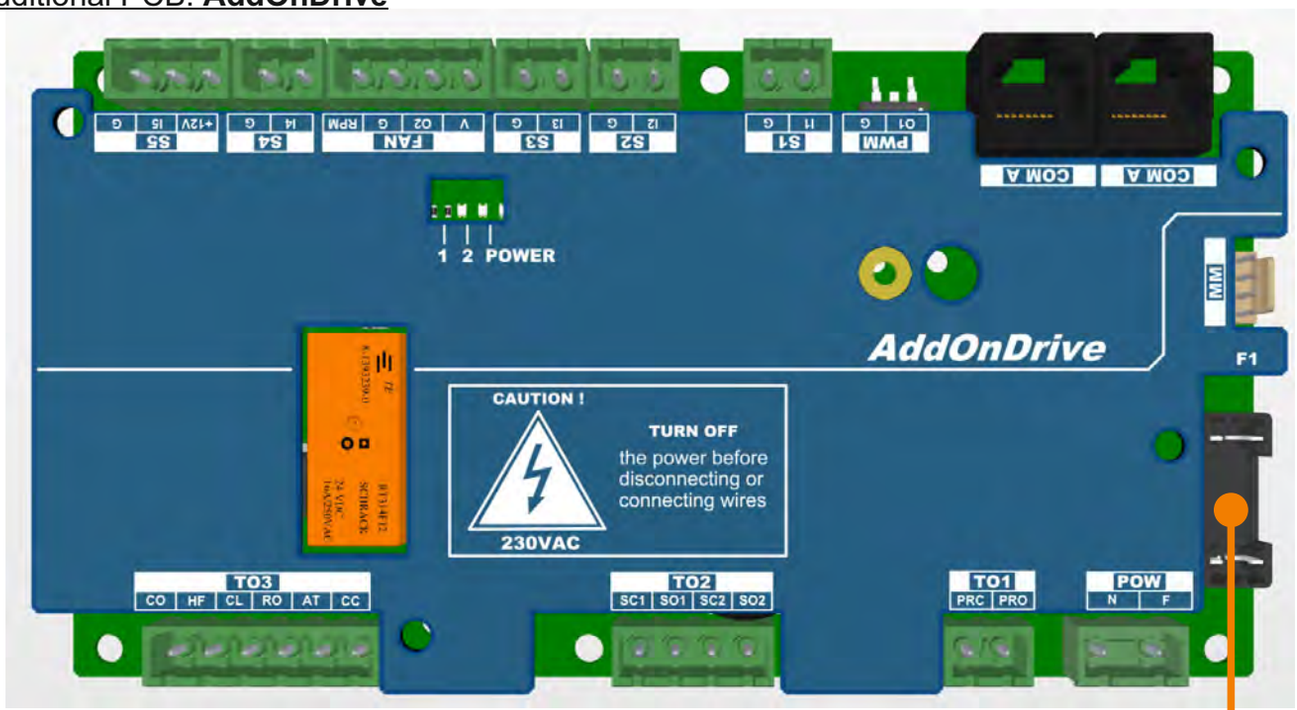
PCB: **UDR-4**



Lambda probe PCB: **LC-21-GS V1 (22995XXXXXXX "G")**



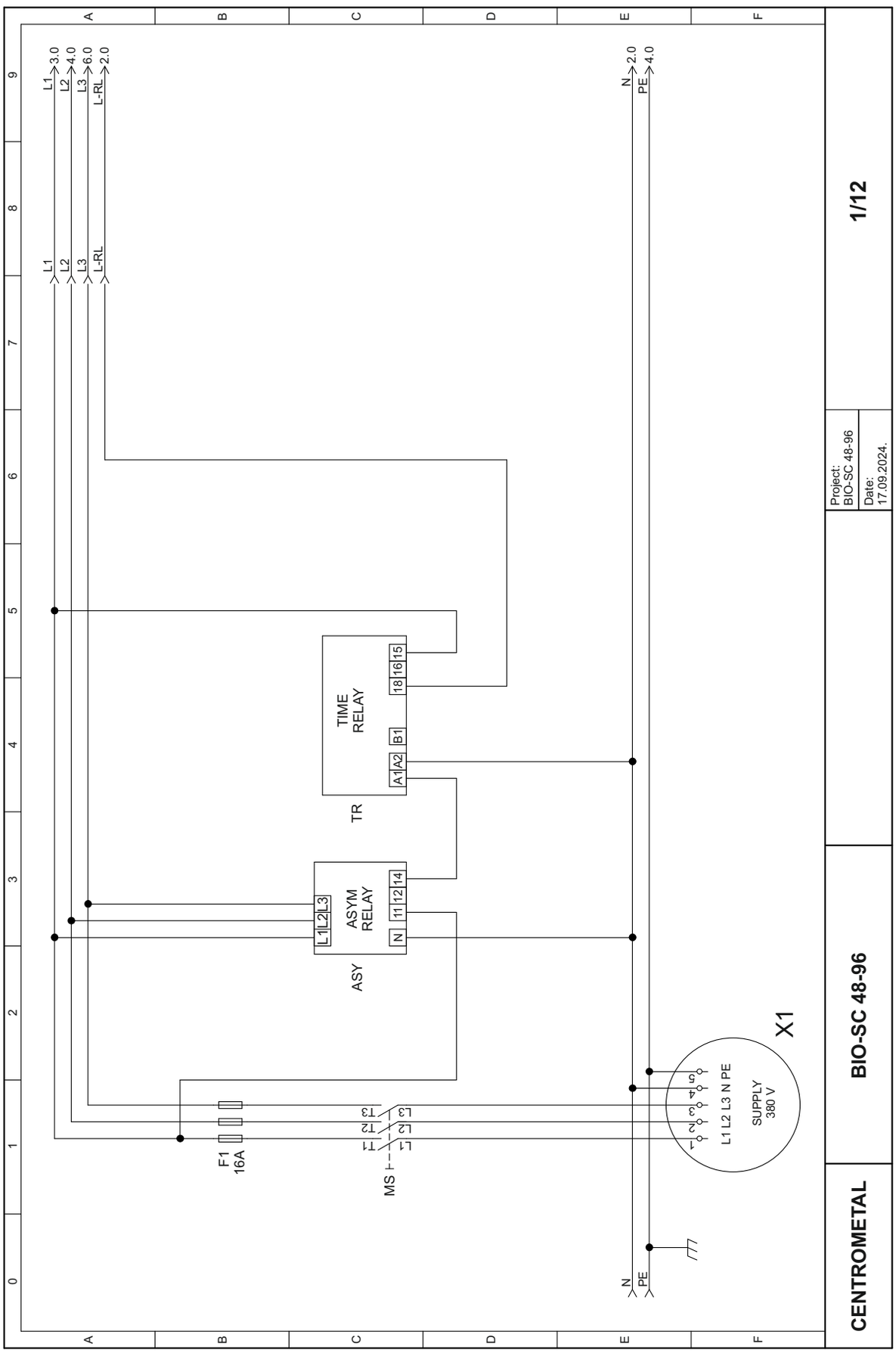
Additional PCB: **AddOnDrive**

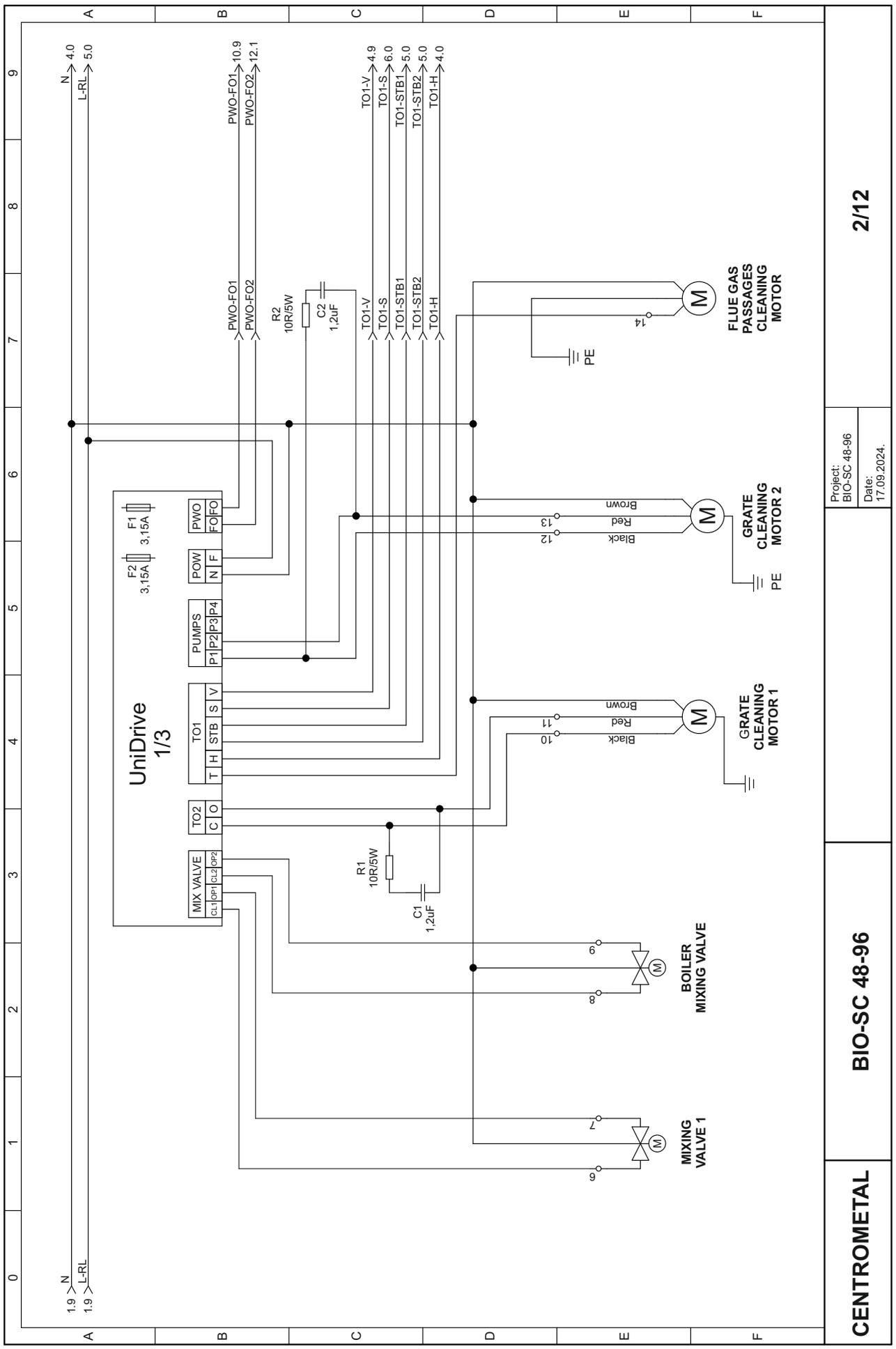


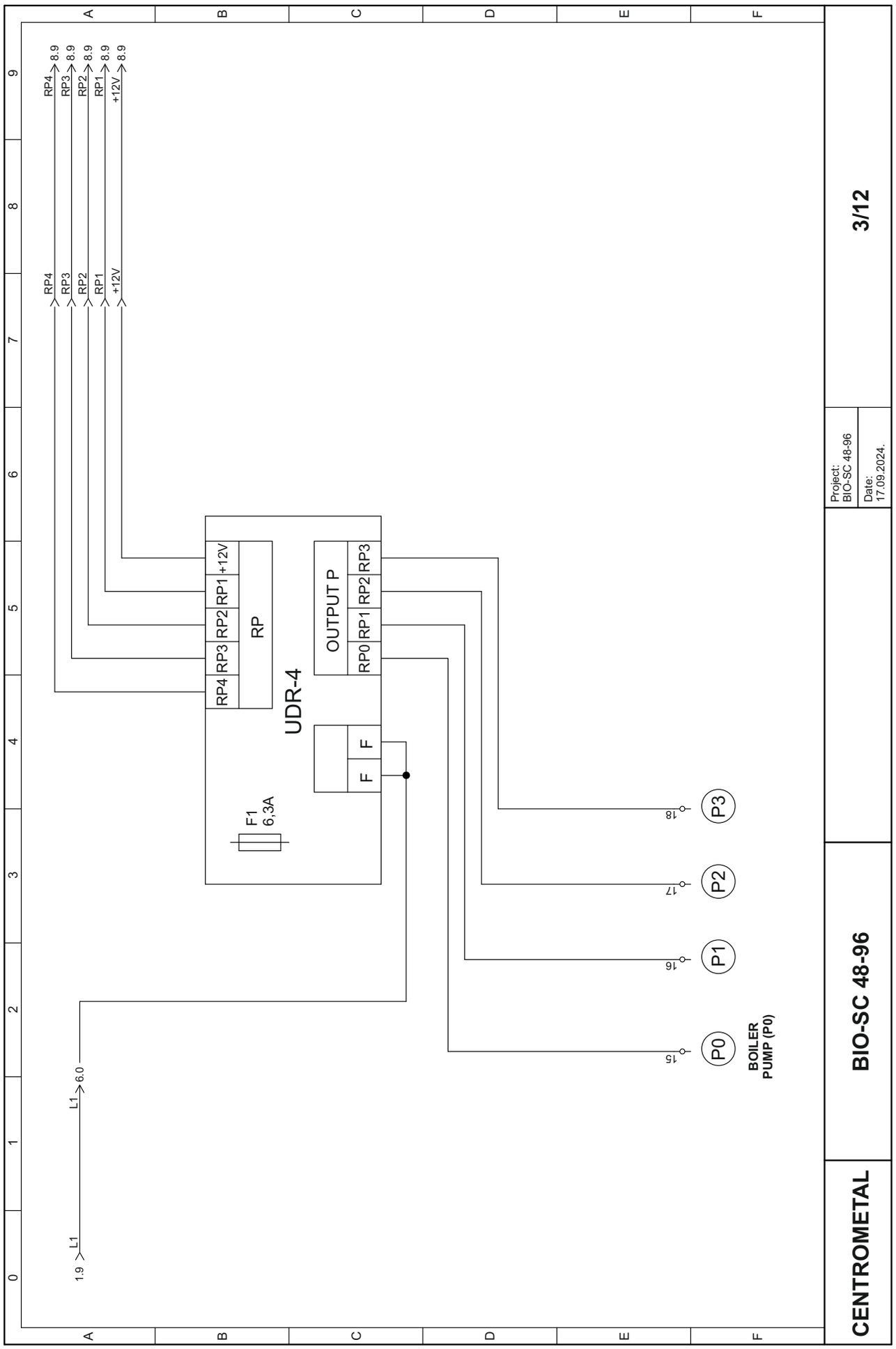
Mark: F1
3,15 A, F

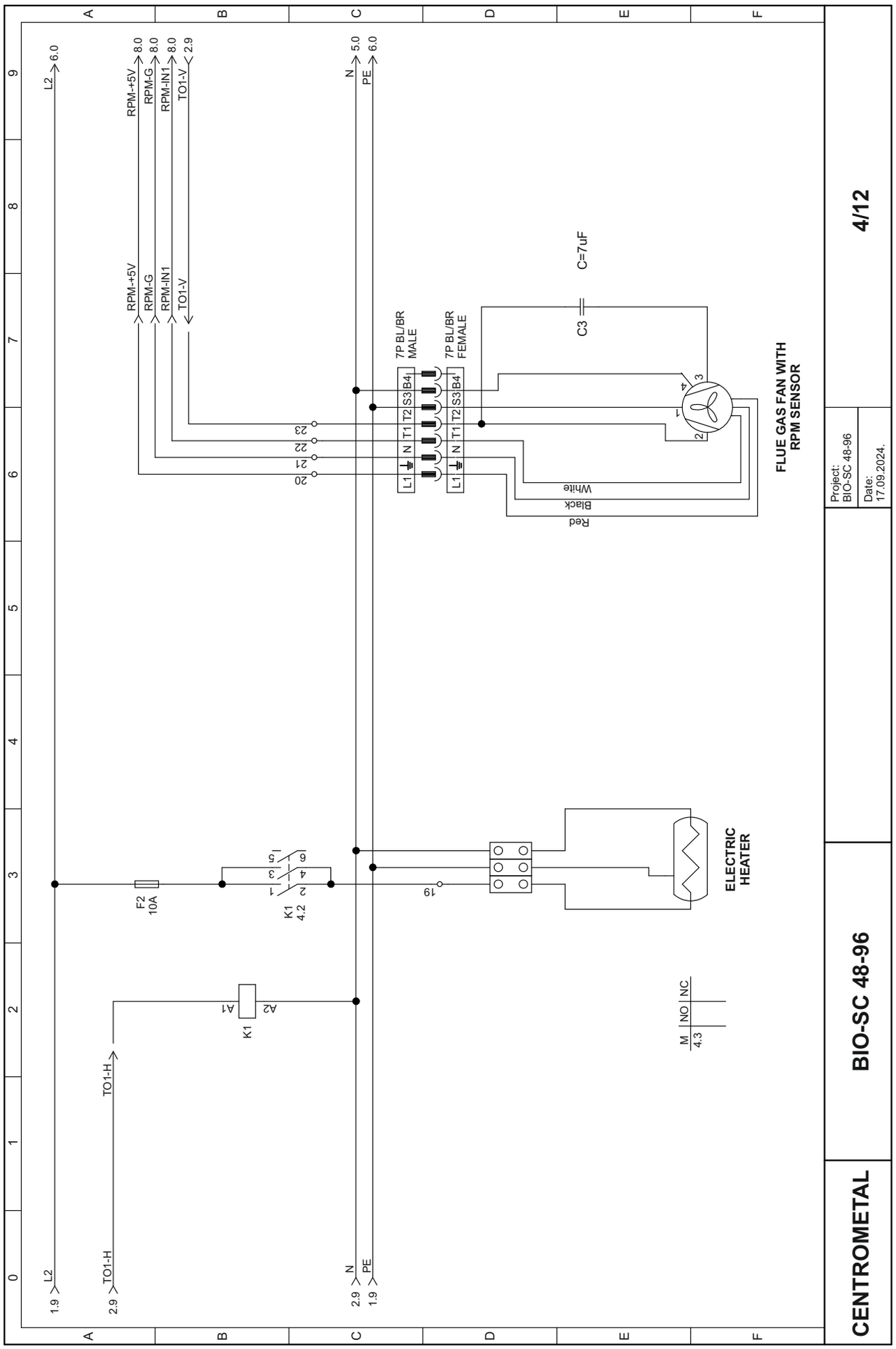
5.2. ELECTRICAL SCHEME INSTALLATION

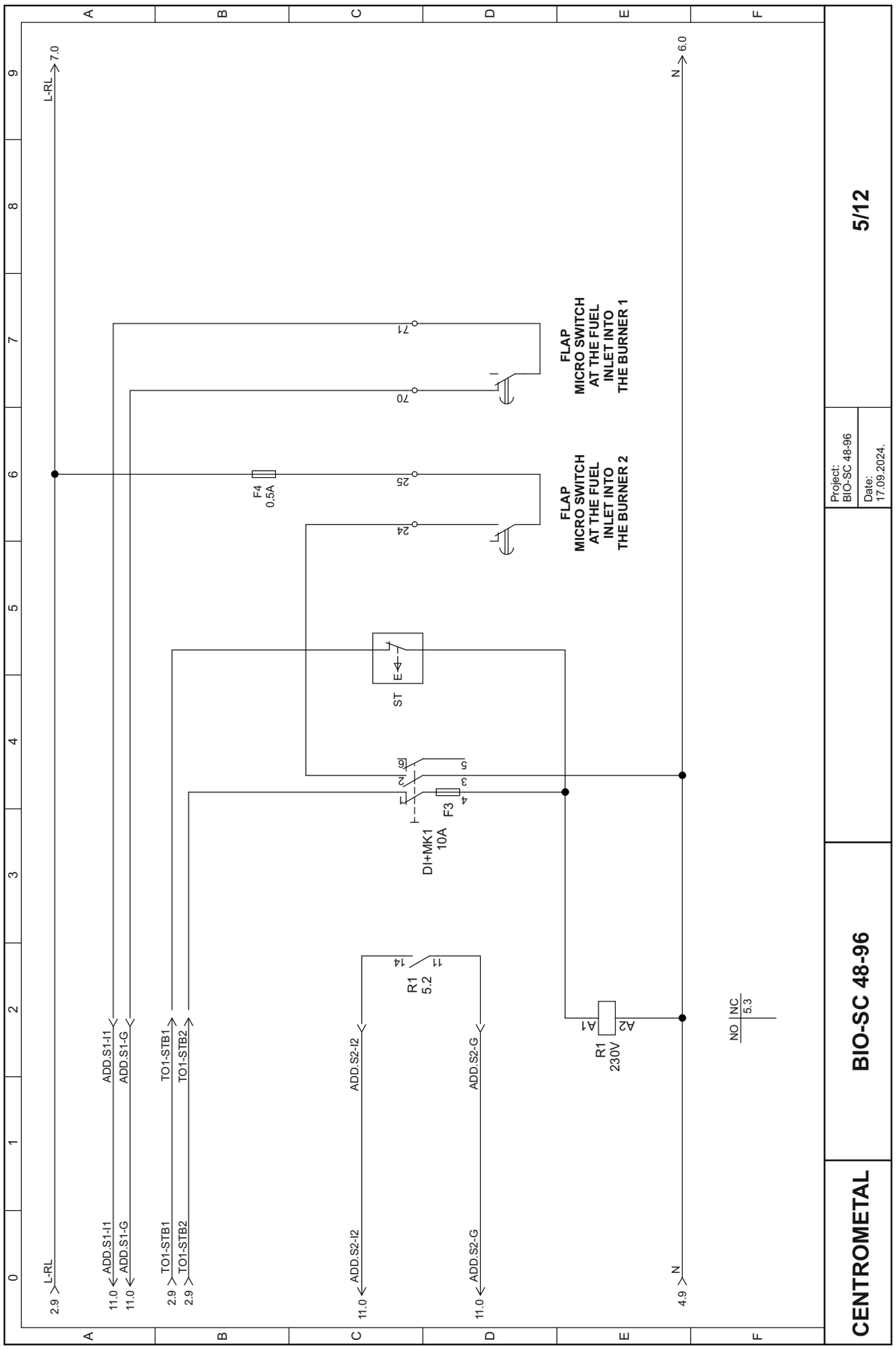
All electrical connections must be made according to this electrical scheme.

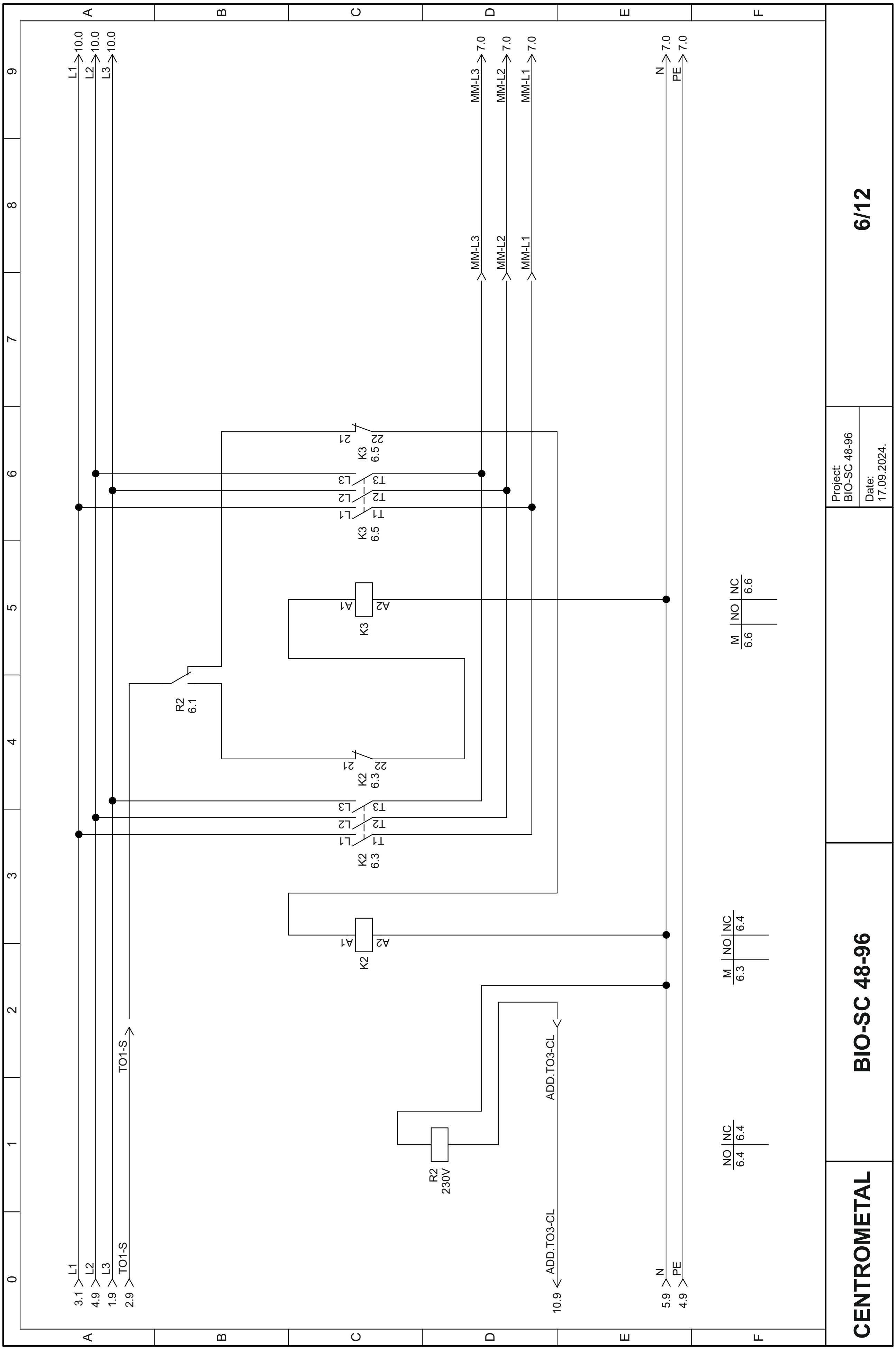


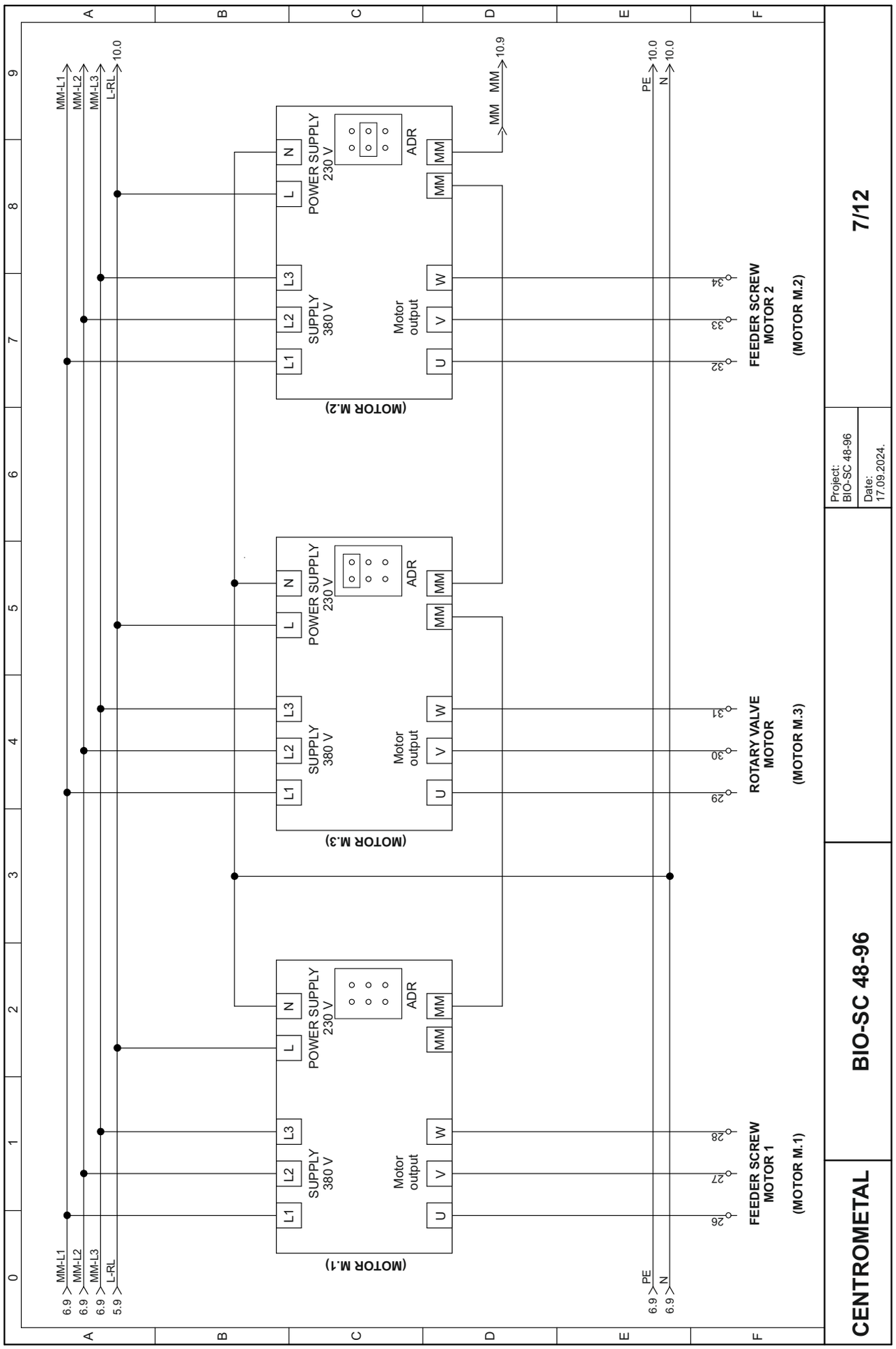

CENTROMETAL
BIO-SC 48-96
2/12
Project:
BIO-SC 48-96
Date:
17.09.2024.
UniDrive
1/3
MIX VALVE
TO2
TO1
PUMPS
POW
PWO
F1
3,15A
F2
3,15A
R1
10R/5W
C1
1,2uF
R2
10R/5W
C2
1,2uF
BOILER
MIXING VALVE
MIXING
VALVE 1
GRATE
CLEANING
MOTOR 1
GRATE
CLEANING
MOTOR 2
FLUE GAS
PASSAGES
CLEANING
MOTOR
Black
Red
Brown
PE
N
L-RL
PWO-FO1
PWO-FO2
TO1-V
TO1-S
TO1-STB1
TO1-STB2
TO1-H

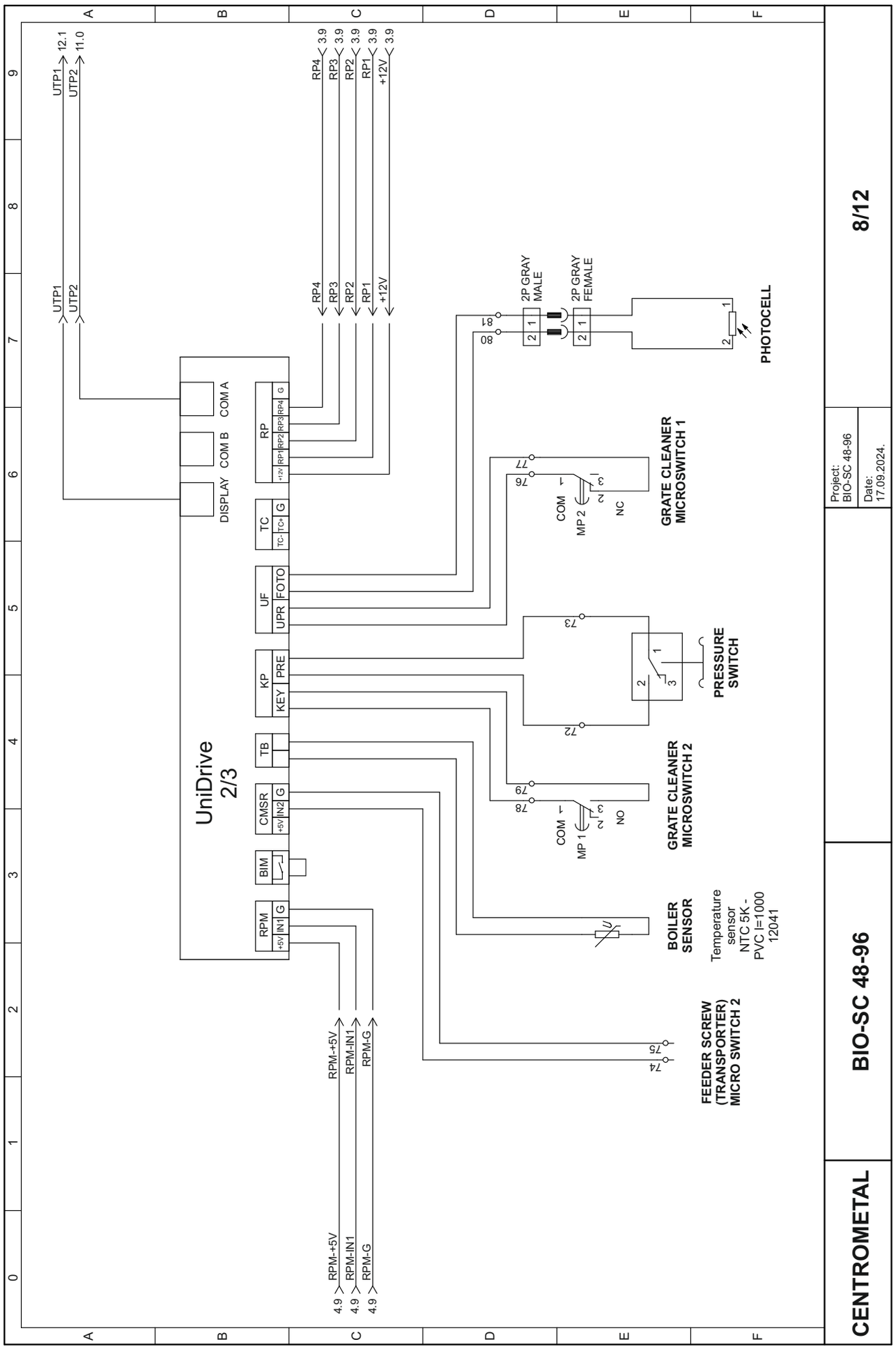

RP4 8.9
RP3 8.9
RP2 8.9
RP1 8.9
+12V 8.9
RP4
RP3
RP2
RP1
+12V
UDR-4
RP
RP4
RP3
RP2
RP1
+12V
OUTPUT P
RP0
RP1
RP2
RP3
F
F
F1
6,3A
L1 6.0
1.9 L1
P0
P1
P2
P3
15
16
17
18
BOILER
PUMP (P0)
CENTROMETAL
BIO-SC 48-96
3/12
Project:
BIO-SC 48-96
Date:
17.09.2024.

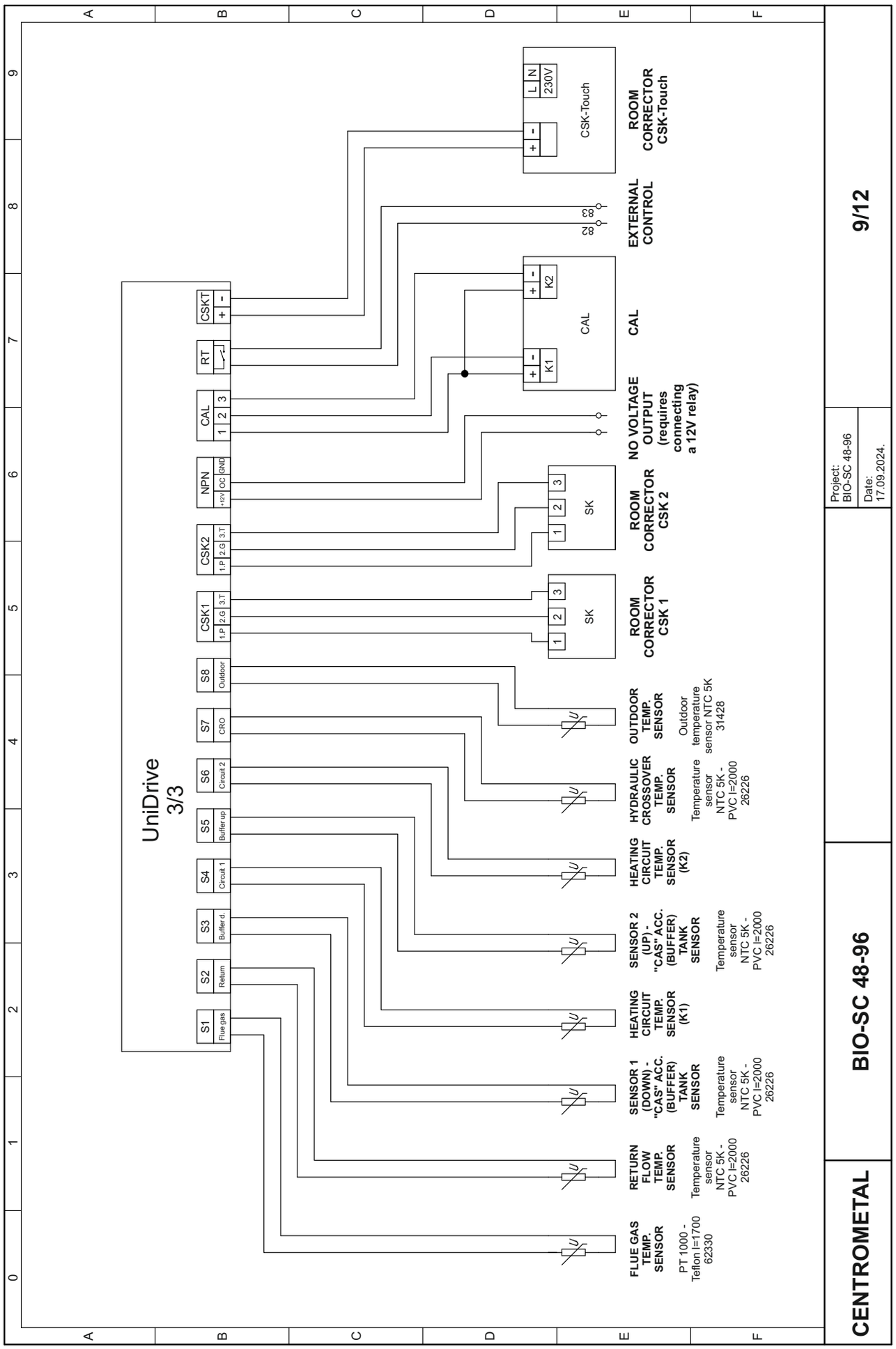

CENTROMETAL
BIO-SC 48-96
4/12
Project: BIO-SC 48-96
Date: 17.09.2024.
FLUE GAS FAN WITH RPM SENSOR
ELECTRIC HEATER
7P BL/BR MALE
7P BL/BR FEMALE
C=7uF
C3
F2 10A
K1 4.2
K1
M 4.3
NO
NC
L2
N
PE
TO1-H
RPM-+5V
RPM-G
RPM-IN1
TO1-V
L1
N
T1
T2
S3
B4
Red
Black
White

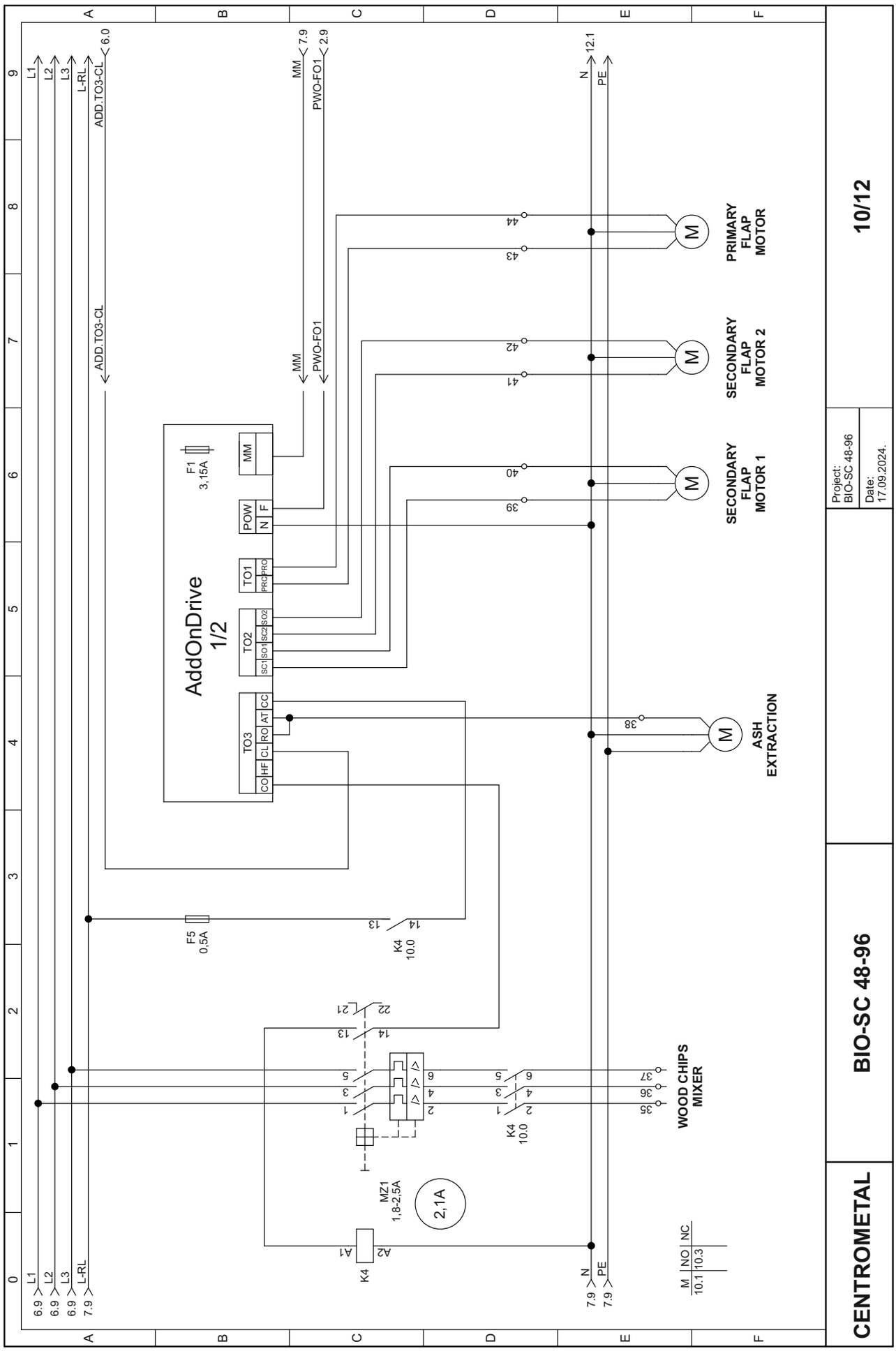

L-RL
7.0
N
6.0
FLAP
MICRO SWITCH
AT THE FUEL
INLET INTO
THE BURNER 1
FLAP
MICRO SWITCH
AT THE FUEL
INLET INTO
THE BURNER 2
F4
0,5A
ST
DI+MK1
10A
F3
R1
5.2
R1
230V
NO
NC
5.3
ADD.S1-I1
ADD.S1-G
TO1-STB1
TO1-STB2
ADD.S2-I2
ADD.S2-G
CENTROMETAL
BIO-SC 48-96
Project:
BIO-SC 48-96
Date:
17.09.2024.
5/12

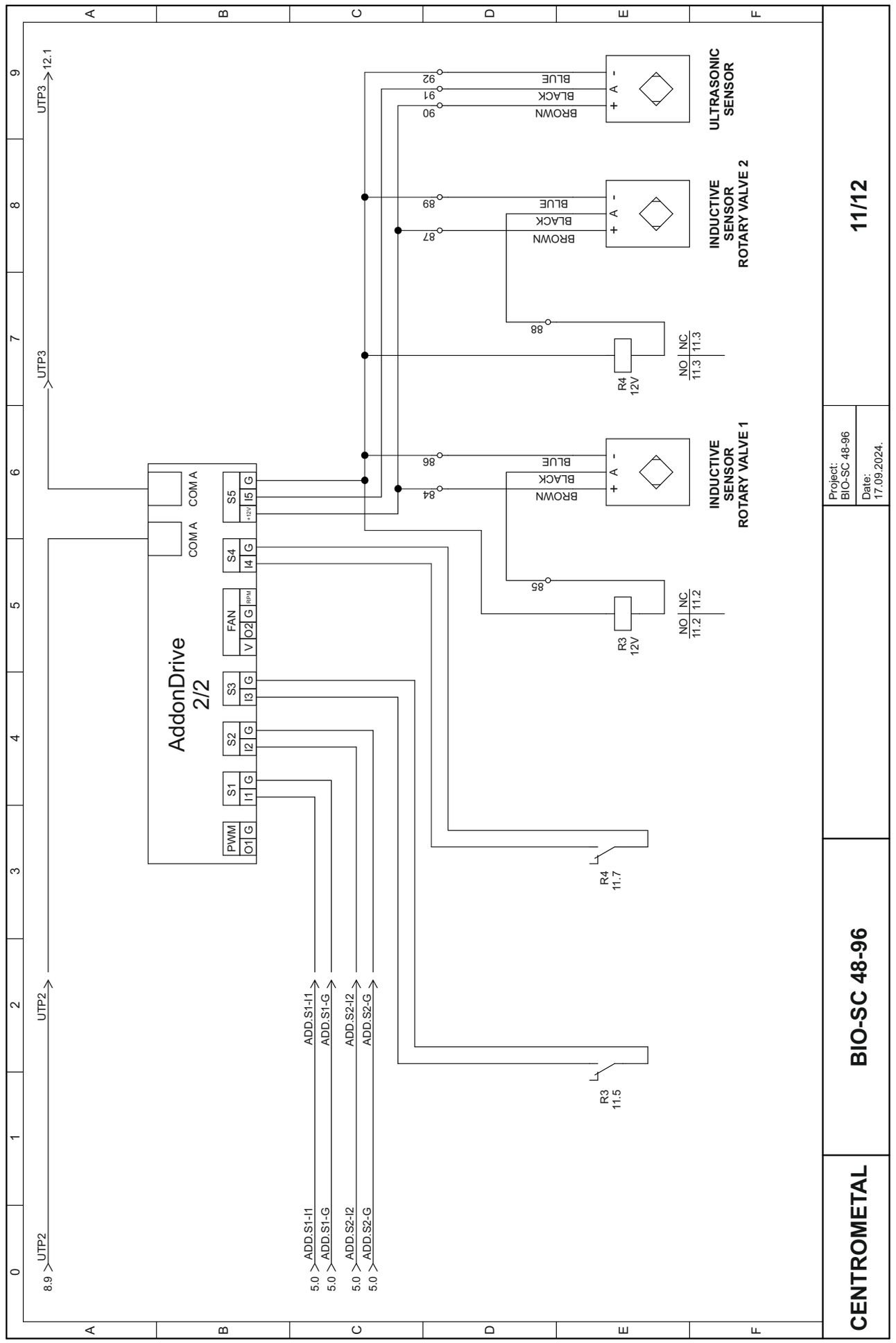

CENTROMETAL
BIO-SC 48-96
6/12
Project:
BIO-SC 48-96
Date:
17.09.2024.
L1
L2
L3
TO1-S
ADD.TO3-CL
N
PE
MM-L1
MM-L2
MM-L3
K2
K3
R2
230V

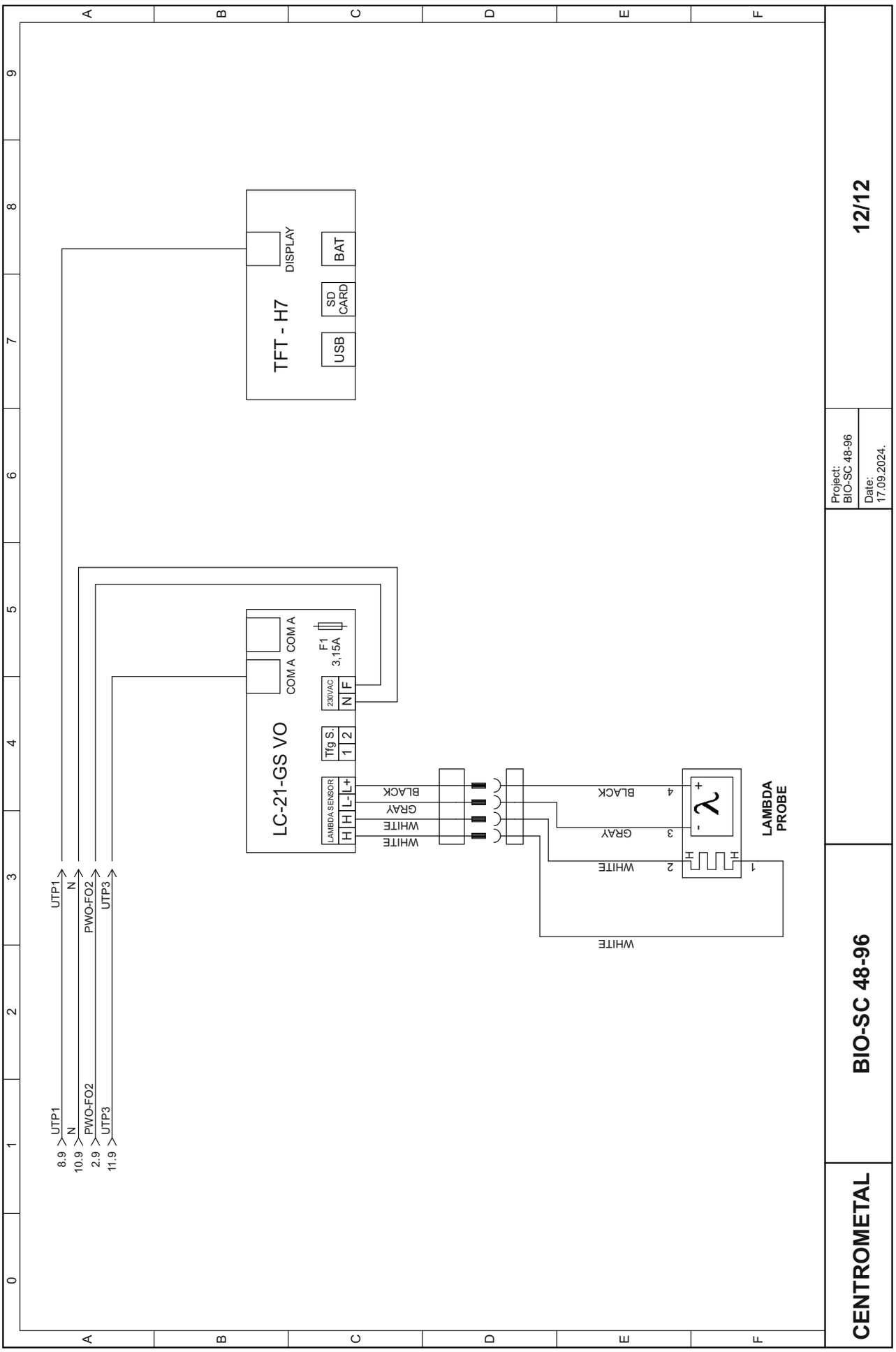

CENTROMETAL
BIO-SC 48-96
7/12
Project:
BIO-SC 48-96
Date:
17.09.2024.
MM-L1
MM-L2
MM-L3
L-RL
PE
N
MM
POWER SUPPLY
230 V
ADR
SUPPLY
380 V
Motor
output
L1
L2
L3
L
N
U
V
W
MM
(MOTOR M.1)
(MOTOR M.2)
(MOTOR M.3)
FEEDER SCREW
MOTOR 1
(MOTOR M.1)
FEEDER SCREW
MOTOR 2
(MOTOR M.2)
ROTARY VALVE
MOTOR
(MOTOR M.3)
26
27
28
29
30
31
32
33
34
6.9
5.9
10.0
10.9


UniDrive
2/3
DISPLAY
COM B
COM A
UTP1
UTP2
12.1
11.0
RP4
RP3
RP2
RP1
+12V
3.9
RP
TC
UF
KP
TB
CMSR
BIM
RPM
+5V
IN1
IN2
G
TC-
TC+
FOTO
UPR
PRE
KEY
RPM-+5V
RPM-IN1
RPM-G
4.9
2P GRAY MALE
2P GRAY FEMALE
PHOTOCELL
GRATE CLEANER MICROSWITCH 1
GRATE CLEANER MICROSWITCH 2
PRESSURE SWITCH
BOILER SENSOR
Temperature sensor NTC 5K - PVC l=1000 12041
FEEDER SCREW (TRANSPORTER) MICRO SWITCH 2
COM
NC
NO
MP 1
MP 2
CENTROMETAL
BIO-SC 48-96
Project: BIO-SC 48-96
Date: 17.09.2024.
8/12


UniDrive
3/3
S1 Flue gas
S2 Return
S3 Buffer d.
S4 Circuit 1
S5 Buffer up
S6 Circuit 2
S7 CRO
S8 Outdoor
CSK1 1.P 2.G 3.T
CSK2 1.P 2.G 3.T
NPN +12V OC GND
CAL 1 2 3
RT
CSKT + -
FLUE GAS TEMP. SENSOR
PT 1000 - Teflon l=1700 62330
RETURN FLOW TEMP. SENSOR
Temperature sensor NTC 5K - PVC l=2000 26226
SENSOR 1 (DOWN) - "CAS" ACC. (BUFFER) TANK SENSOR
Temperature sensor NTC 5K - PVC l=2000 26226
HEATING CIRCUIT TEMP. SENSOR (K1)
SENSOR 2 (UP) - "CAS" ACC. (BUFFER) TANK SENSOR
Temperature sensor NTC 5K - PVC l=2000 26226
HEATING CIRCUIT TEMP. SENSOR (K2)
HYDRAULIC CROSSOVER TEMP. SENSOR
Temperature sensor NTC 5K - PVC l=2000 26226
OUTDOOR TEMP. SENSOR
Outdoor temperature sensor NTC 5K 31428
ROOM CORRECTOR CSK 1
SK
ROOM CORRECTOR CSK 2
SK
CAL
+ - K1
+ - K2
NO VOLTAGE OUTPUT (requires connecting a 12V relay)
EXTERNAL CONTROL
ROOM CORRECTOR CSK-Touch
+ -
L N 230V
CSK-Touch
CENTROMETAL
BIO-SC 48-96
Project: BIO-SC 48-96
Date: 17.09.2024.
9/12


CENTROMETAL
BIO-SC 48-96
10/12
Project: BIO-SC 48-96
Date: 17.09.2024.
AddOnDrive 1/2
F1 3,15A
F5 0,5A
K4 10.0
MZ1 1,8-2,5A
2,1A
PRIMARY FLAP MOTOR
SECONDARY FLAP MOTOR 2
SECONDARY FLAP MOTOR 1
ASH EXTRACTION
WOOD CHIPS MIXER
L1
L2
L3
L-RL
ADD.TO3-CL
MM
PWO-FO1
N
PE


AddonDrive
2/2
COM A
COM A
PWM
O1 G
S1
I1 G
S2
I2 G
S3
I3 G
FAN
V O2 G RPM
S4
I4 G
S5
+12V I5 G
UTP2
8.9
UTP2
UTP3
UTP3
12.1
ADD.S1-I1
ADD.S1-G
ADD.S2-I2
ADD.S2-G
5.0
5.0
5.0
5.0
R3
11.5
R4
11.7
R3
12V
R4
12V
NO 11.2
NC 11.2
NO 11.3
NC 11.3
84
85
86
87
88
89
90
91
92
BROWN
BLACK
BLUE
+ A -
INDUCTIVE SENSOR ROTARY VALVE 1
INDUCTIVE SENSOR ROTARY VALVE 2
ULTRASONIC SENSOR
CENTROMETAL
BIO-SC 48-96
Project:
BIO-SC 48-96
Date:
17.09.2024.
11/12


TFT - H7
DISPLAY
BAT
SD CARD
USB
LC-21-GS VO
COM A
COM A
F1
3,15A
230VAC
N
F
Tfg S.
1
2
LAMBDA SENSOR
H
L-
L+
WHITE
GRAY
WHITE
BLACK
BLACK
4
GRAY
3
WHITE
2
H
H
1
WHITE
LAMBDA PROBE
UTP1
N
PWO-FO2
UTP3
8.9
10.9
2.9
11.9
CENTROMETAL
BIO-SC 48-96
Project: BIO-SC 48-96
Date: 17.09.2024.
12/12

6.0. OPERATING THE SYSTEM

Boiler must not be used in flammable and explosive environment. It must not be used by children or disabled persons (either physically or mentally), as well as by person without knowledge or experience, unless they are under control or trained by s person responsible for their safety. Children must be supervised in the vicinity of the product. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified.

6.1. SAFETY INSTRUCTIONS FOR THE INSTALLATION ROOM

Boiler room must be frost-proof and well ventilated. Boiler has to be positioned so that it can be properly connected to the chimney (see point 3.0) and simultaneously, enabling tending of boiler and additional equipment, control during operation, and cleaning and maintenance

6.2. INITIAL STARTUP

See technical instructions for BIO-SC digital boiler control screen (controller) where is explained initial startup.

Note:
The start up has to be done by the authorized person, otherwise the warranty for this product is not valid and the product must not be used.

Note:
If condensation escapes during the initial heatup phase, this does not indicate a fault. If this occurs, clean up using a cleaning rag.

CAUTION:

Use only permitted chipped wood!

6.3. BOILER USE

⚠	**To use the boiler, you should also use the technical instructions BIO-SC_controller (book 2/2).**

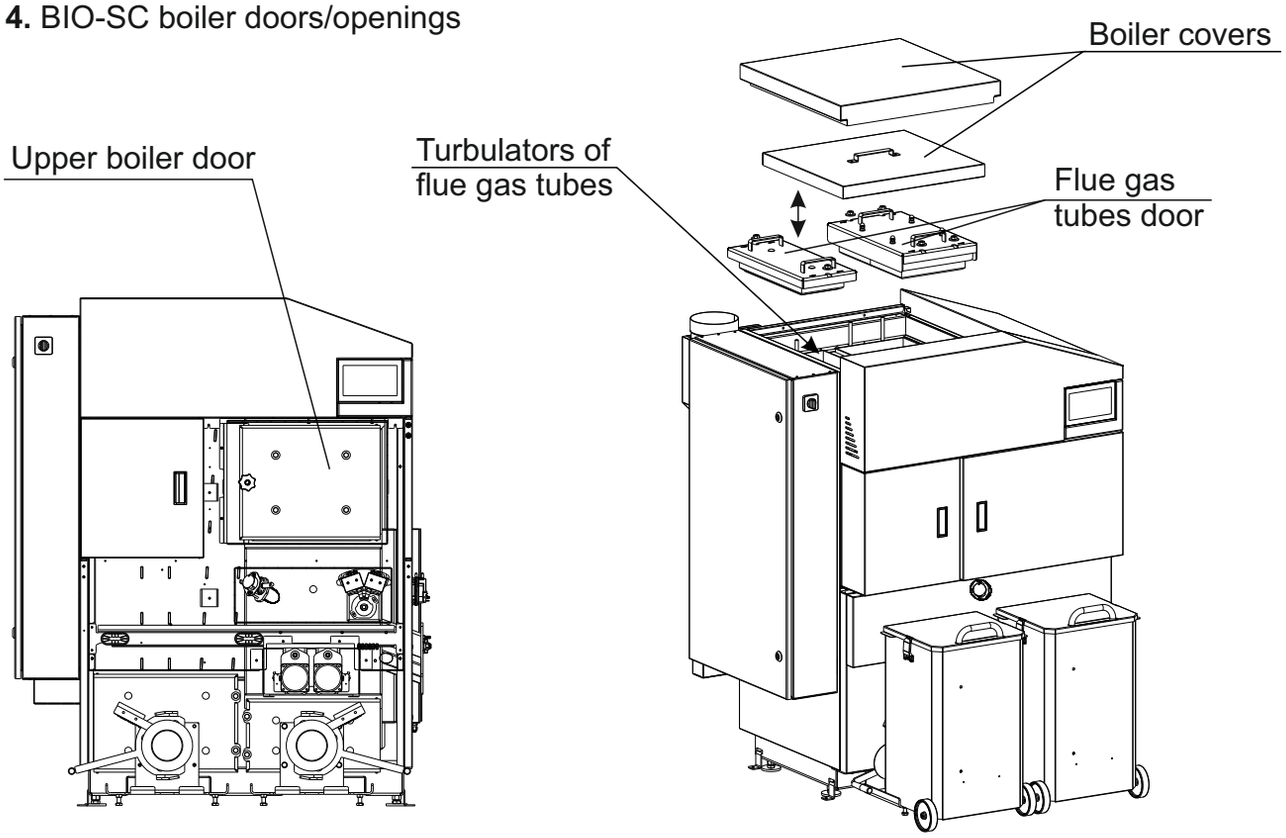
Boiler must not be used in flammable and explosive environment. It must not be used by children or disabled persons (either physically or mentally), as well as by person without knowledge or experience, unless they are under control or trained by s person responsible for their safety. Children must be supervised in the vicinity of the product. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard. Protective gloves are obligatory.
Check whether boiler and equipment are installed and connected in accordance with these Technical instructions. Check whether chimney meets requirements of point 3.0 therein. Check whether boiler room meets all requirements therein. Check if fuel fulfils all requirements therein. Check whether the boiler and the entire heating system are filled with water and vented.

Note:
Before every use chech if the boiler doors and cover door are closed (Figure 4).

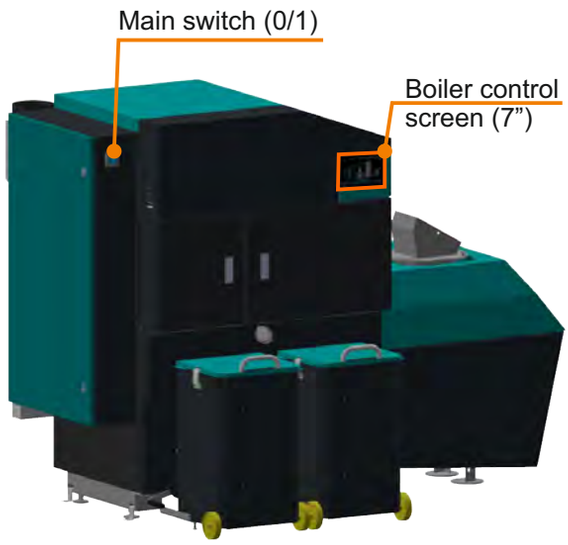
If you smell flue gas:
- shut down the heating system
- Ventilate the boiler room
- Close all doors leading to the living space

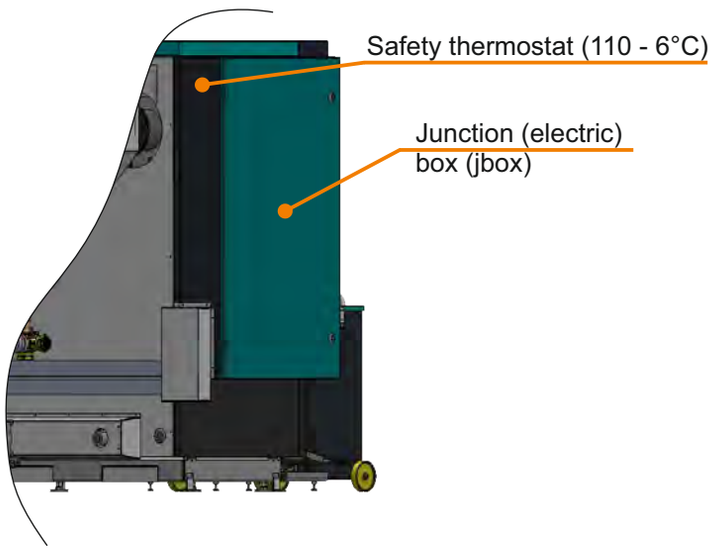
⚠	**Flue gas can lead to life-threating poisoning!**

Figure 4. BIO-SC boiler doors/openings



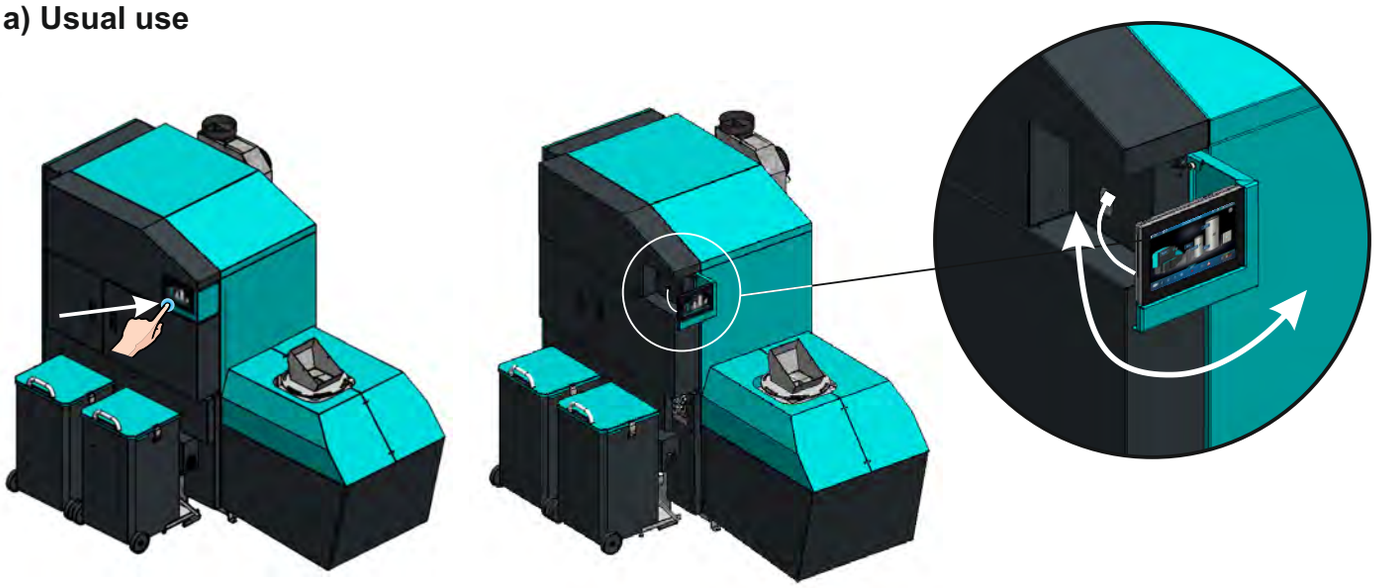
6.3.1. BOILER CONTROL UNIT COMPONENTS USED BY THE USER



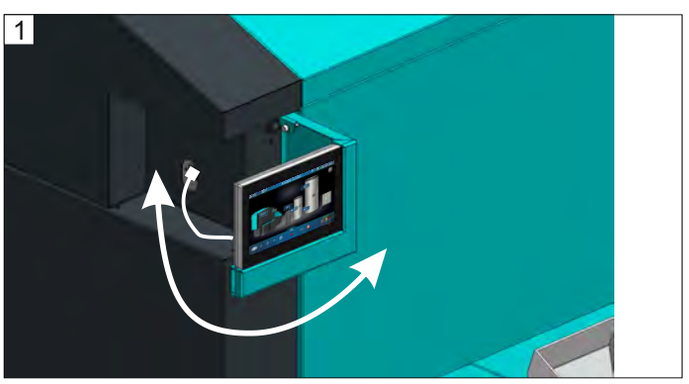


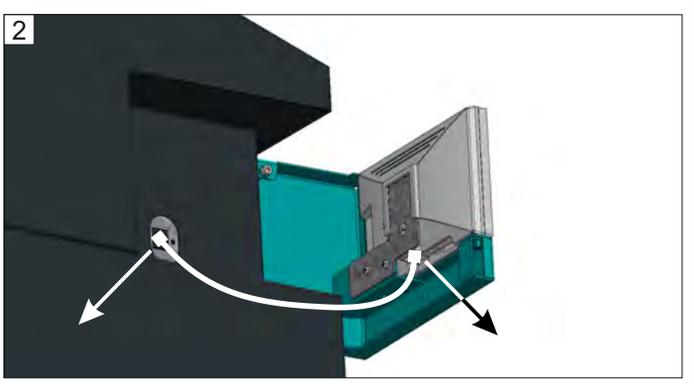
6.3.2. POSSIBLE SCREEN (CONTROLLER) POSITIONS

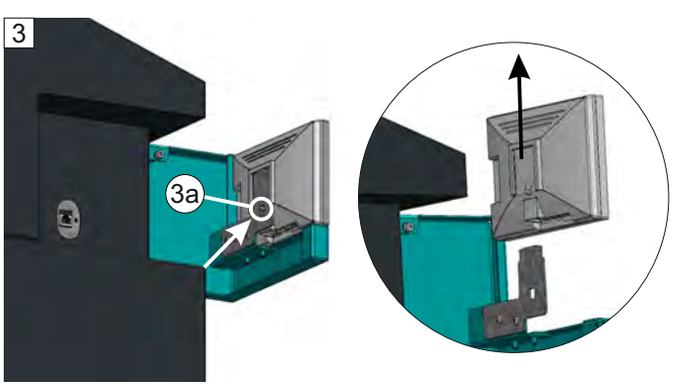
a) Usual use

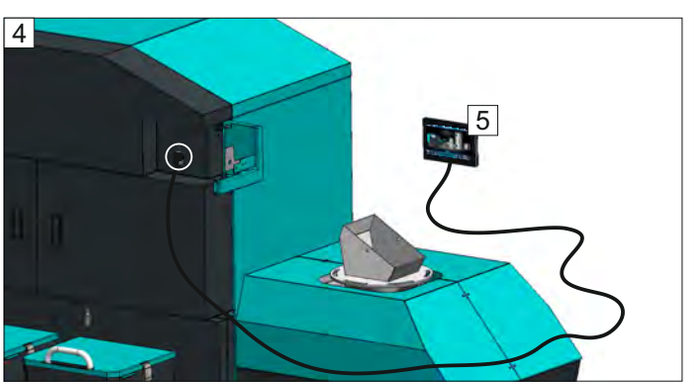


b) Use during inspection of the operation of individual boiler components that are far from the fixed position of the screen (controller)









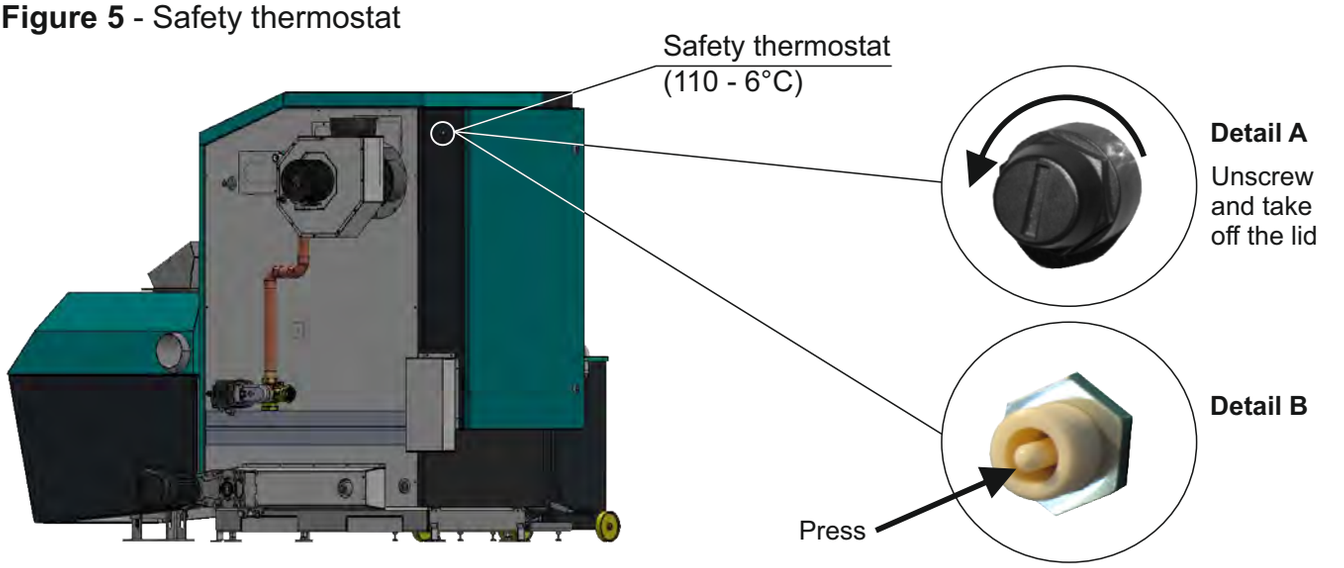
1. Open the screen door.
2. Remove the short UTP cable that was installed at the factory (from the UTP connection on the boiler and from the screen).
3. Press the marked plastic part (3a) and remove the control screen from the metal support.
4. Plug a longer UTP cable (delivered with the boiler) into the UTP connector on the boiler cover and into the controller screen.
5. Use the portable screen (5) carefully and return it to its original place in reverse order after use.

6.3.3. SAFETY THERMOSTAT (STB) - BOILER STOPPAGE

An error (E40 SAFETY THERMOSTAT) appears on the control screen, and the boiler behaves in accordance with the description of error E40 (use the technical instructions BIO-SC_controller (book 2/2). The cause of this error is the too high temperature of the water in the boiler (above 104 °C), and the safety thermostat interrupts the operation of the flue gas fan, screw feeder-1 and rotary valve (RSE).

To reactivate the safety thermostat (STB), it is necessary to do the following:
- wait until the boiler temperature drops below 70 °C.
- unscrew and take off the safety thermostat lid (detail A).
- press the thermostat restart button (detail B).
- if the same problem occurs again during the first next boiler firing or if it occurs frequently, ask an advice from the authorized technician.
- confirm the error on the Boiler control screen (7”).

Figure 5 - Safety thermostat



CAUTION!

If the thermostat frequently shuts down the fan please call an authorized serviceman to check the system.

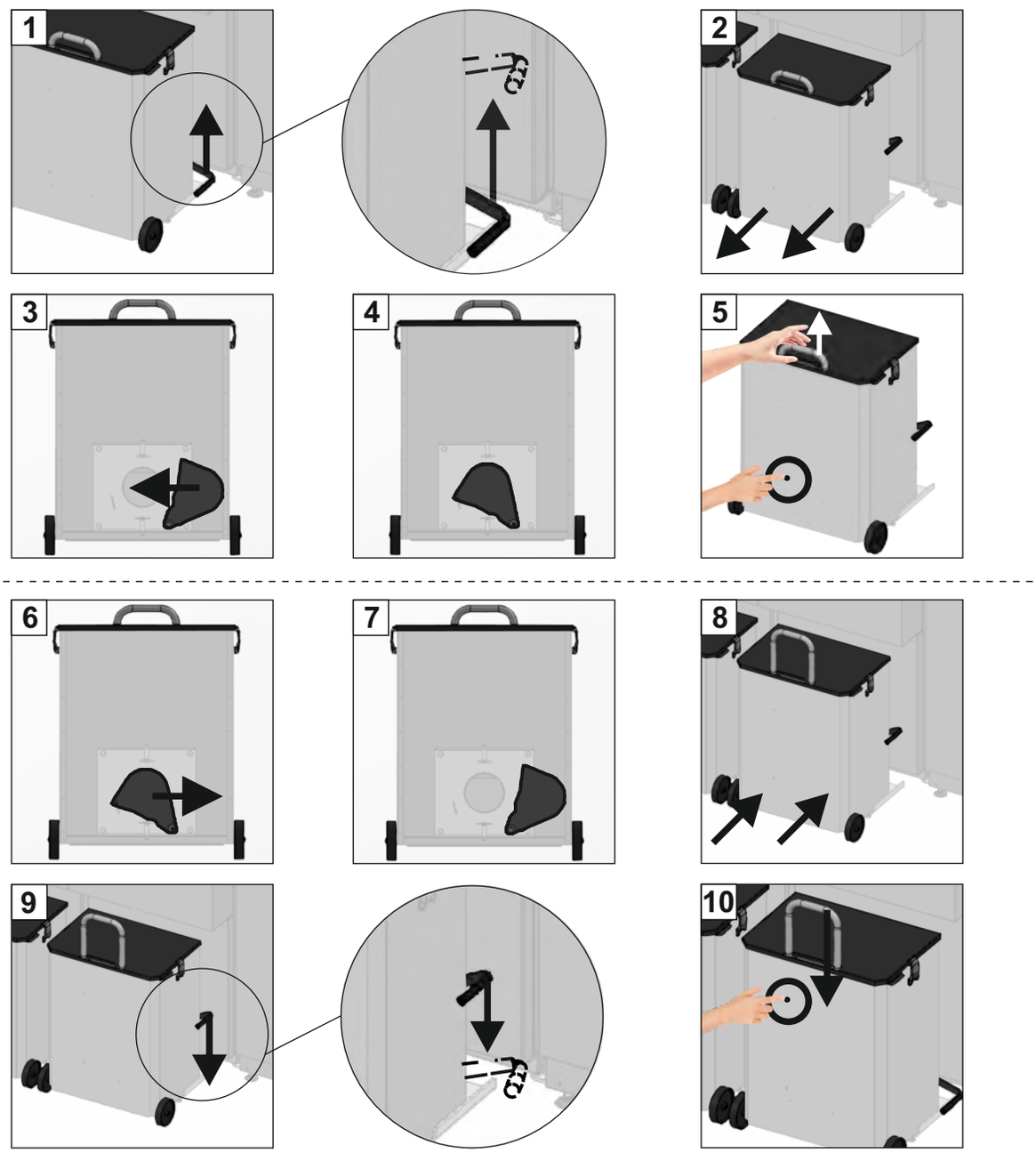
7.0. CLEANING AND MAINTENANCE

Every millimeter of soot on the exchange surfaces and in the flues means about 5 % more fuel consumption. A clean boiler saves fuel and protects the environment.
Save fuel - always clean the boiler in good time!

PROTECTIVE GLOVES ARE OBLIGATORY!

Cleaning interval	Boiler type	Description
according to the indication on the controller screen or earlier (according to estimate)	BIO-SC 48-96	Discharge ash boxes

Emptying the ash box:

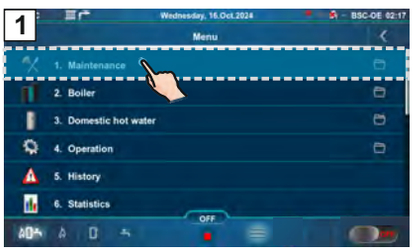


IMPORTANT! The ash can be disposed of only in a metal container!

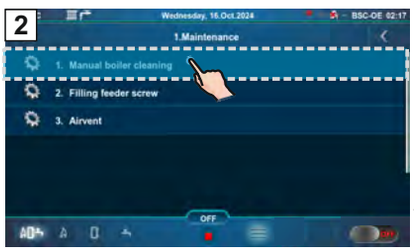
Cleaning interval	Boiler type	Description
When needed	BIO-SC 48-96	Cleaning surfaces above the burner

Claning of exchanging surfaces (above the burner)

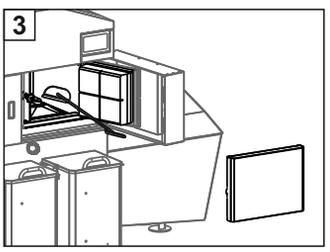
1



2



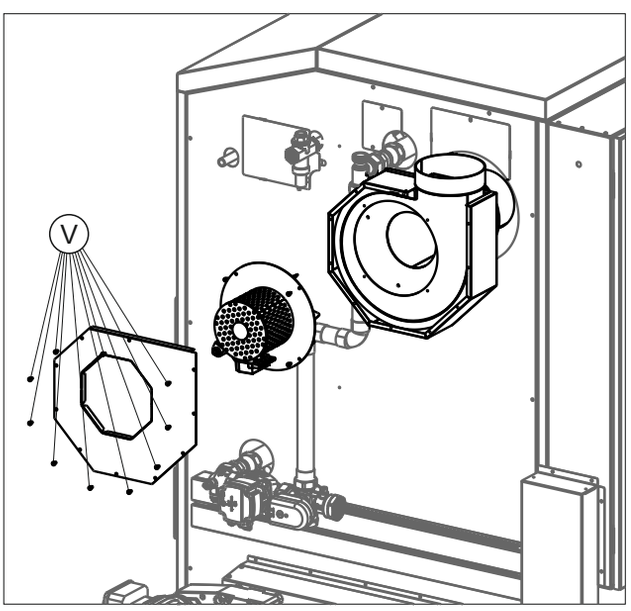
3



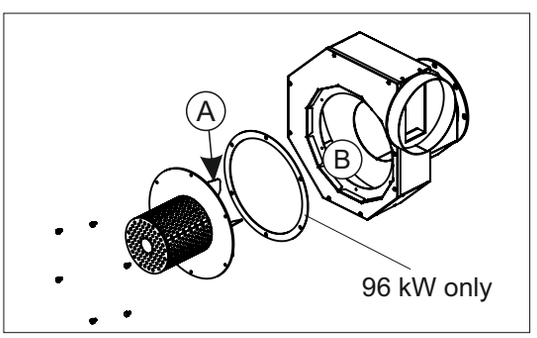
1 - Press the "Maintenance" button on the boiler control screen and then "Manual boiler cleaning".
2 - Press the "ON" button with the desired fan speed (it will start the fan and it will open a grate).
3 - By using scraper, brush or vacuum cleaner, through the door clean exchanging surfaces.
4 - After you finish cleaning, press "back" ( ) on the control screen (controller) to return the boiler control to normal mode and close the combustion chamber door.

Cleaning interval	Boiler type	Description
When needed	BIO-SC 48-96	Cleaning the blades and box of the fan

Cleaning the blades and box of the fan

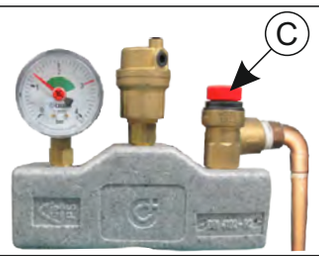


6



1. Switch off the boiler and disconnect from electric. power.
2. Pull out the 7 pin connector (Figure 6) from boiler controller. Then unscrew ten screws (V) and remove the fan, clean the fan blades (A), check the condition of the fan box (B) and clean it when is necessary by using vacuum cleaner or remove it from the boiler and clean thoroughly.
3. Set back the fan into original position and secure it with screws, then connect 7-pin connector on the M3 and connect the power supply to the boiler.

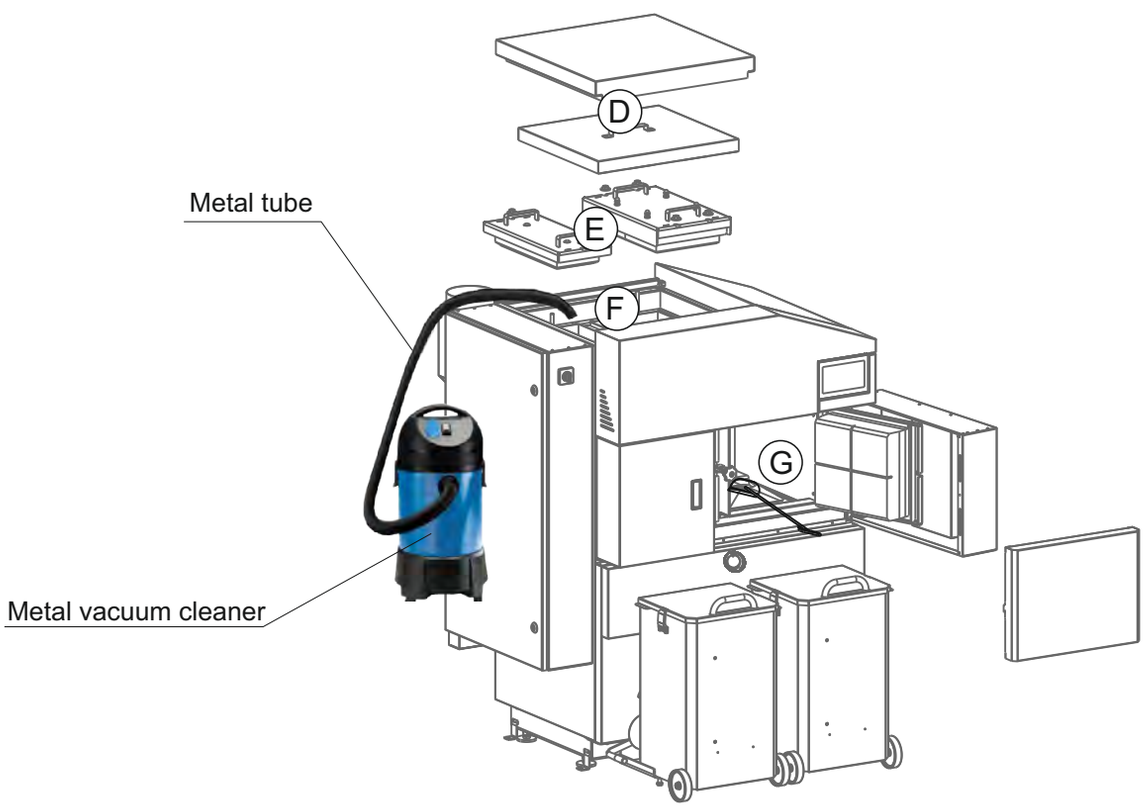
Cleaning interval	Boiler type	Description
Every 6 months	BIO-SC 48-96	Check the correctness of security valve



Checking the correctness of security valve

By briefly turning the cap of safety valve (C) check whether water coming out from the safety valve. If no water comes out after several repeated checks, then is necessary to replace the safety valve.

Cleaning interval	Boiler type	Description
At least once per year	BIO-SC 48-96	Cleaning of exchanging surfaces (around the entire boiler)

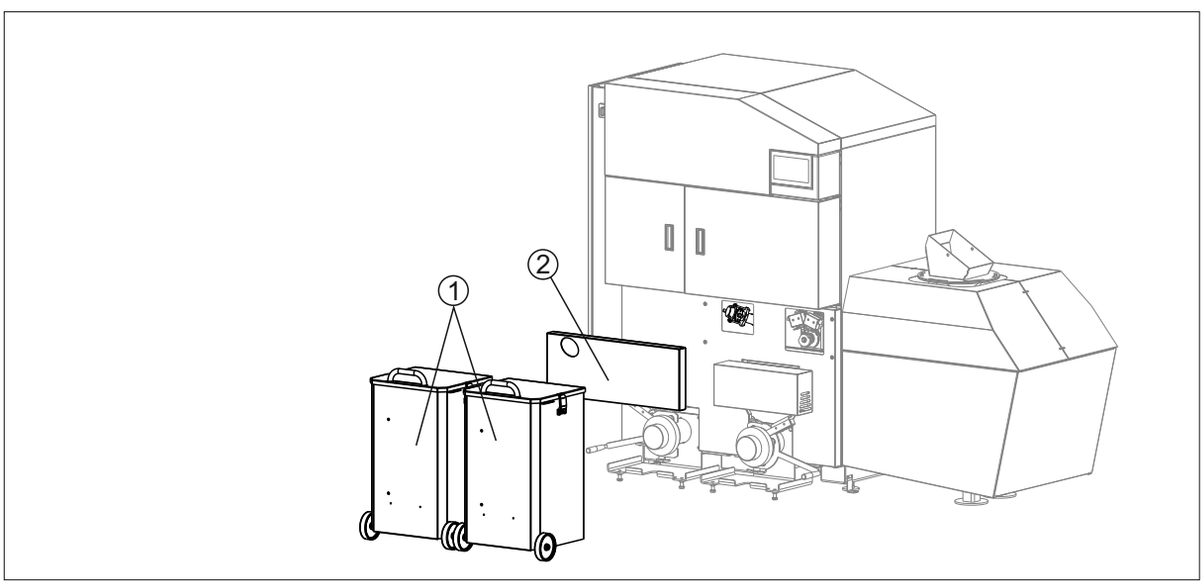


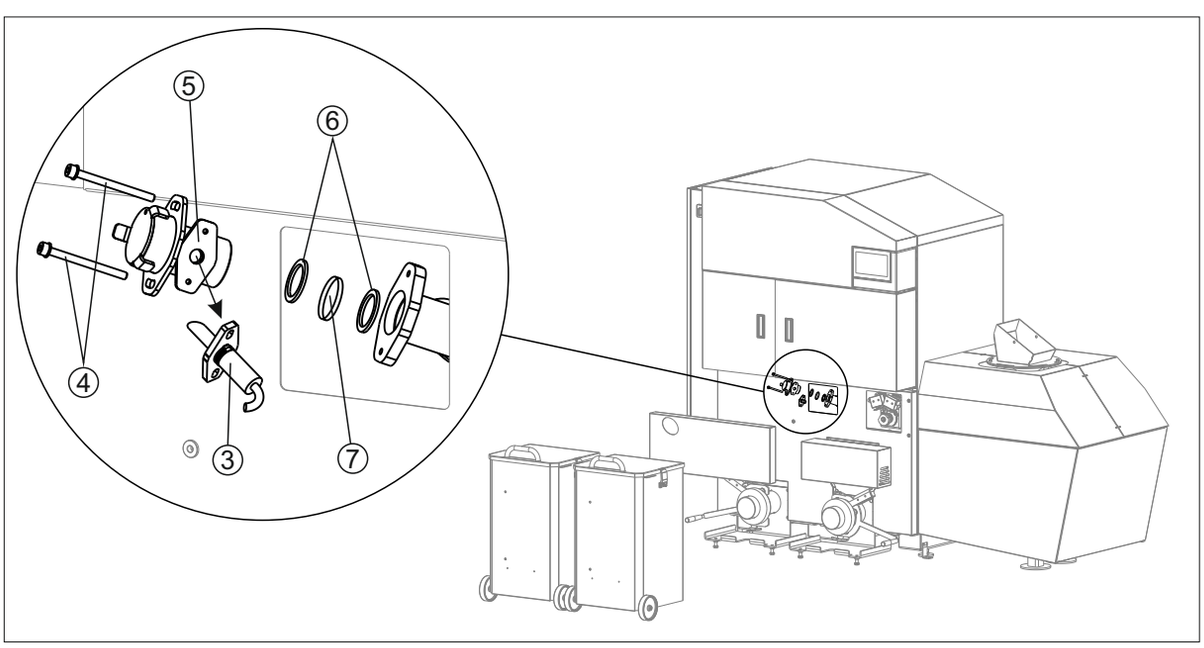
1. Press the "Maintenance" button on the boiler control screen and then "Manual boiler cleaning".
2. Press "START" (it will start the fan and it will open a grate.)
3. Lift the top covers (D), then unscrew the six screws and remove the upper doors (E).
4. By using scraper, brush and vacuum cleaner, through the upper side and trough the front door clean exchanging surfaces (F, G).
5. When you have finished cleaning, set upper doors back to original position and tighten them well, then set the top covers back to position and close the front door of the boiler.
   Then press "back" ( ) on the control screen (controller) to return boiler to normal mode.

Photocell protective glass cleaning interval	Boiler type	Description
Every 100 working hours (or more often if is needed)	BIO-SC 48-96	Cleaning the photocell protective glass

Procedure for cleaning the photocell protective glass:
- remove the ash boxes (1)
- remove grate microswitch cover (2)
- take out the photocell (3)
- unscrew the two screws (4)
- remove the entire kit: the “eye” for flame control and photocell holder (5)
- remove the gaskets (2 pcs) (6) if necessary and remove the photocell protective glass (7)
- clean the photocell protective glass (7) so that any dirt (if any) disappears
- clean the gaskets (6) (if you removed them)
- place all back in original position.

Important: Gaskets must be placed from both sides of photocell protectiong glass.





Cleaning interval	Boiler type	Description
At least once per year	BIO-SC 48-96	Cleaning and checking the flue installation sealing

Cleaning and checking the flue installation sealing

Clean flue installation between the boiler and the chimney through the revision openings for cleaning or if not incorporated revision opened by removing the flue installation. After cleaning, inspect flue installation good sealing and seal it if the seal is not satisfactory.

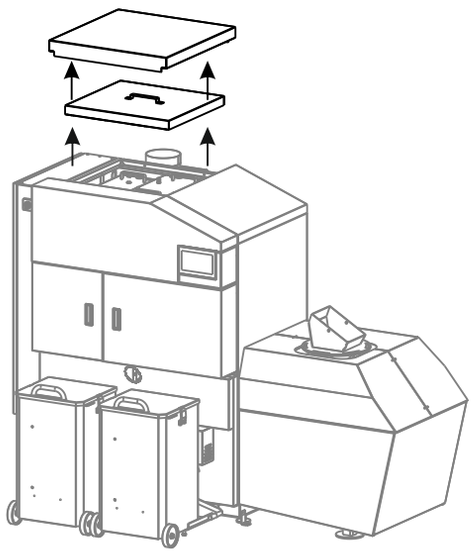
The ecological rules and standards must be applied for disposal of changed spare parts, wrapping material, all parts of the boiler after it's expire.

1. Electric heater
2. Failure on distribution power box with digital boiler controller
3. Fan failure
4. Geared motors
5. Temperature sensors failure
6. Photocell failure

Every seven years to call an authorized service provider for routine maintenance and control.

7.1. EXTRACTION OF TURBULATORS - BIO-SC 48-96

1



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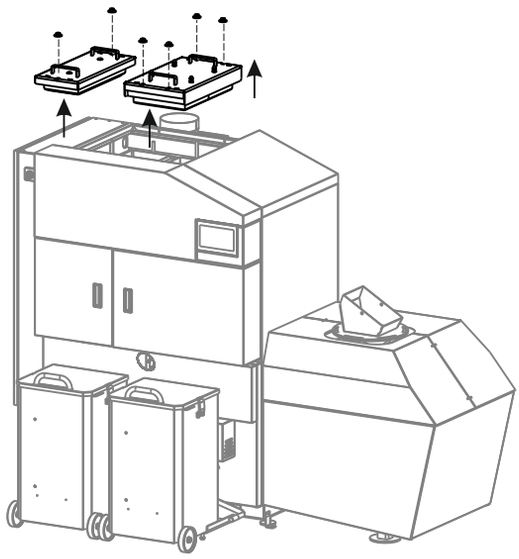

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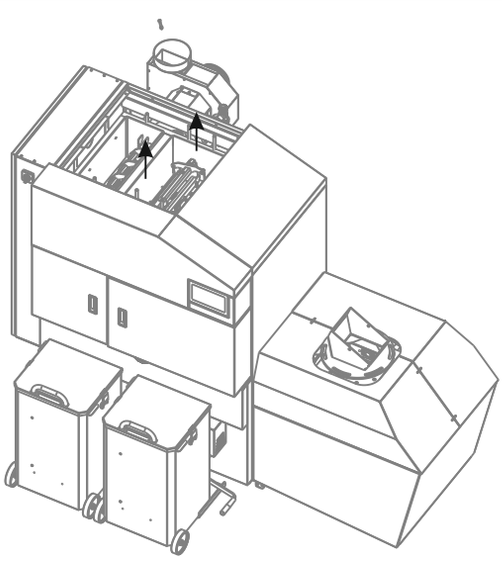

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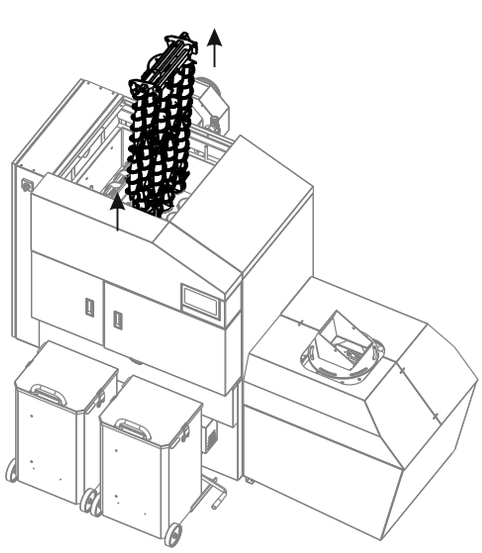

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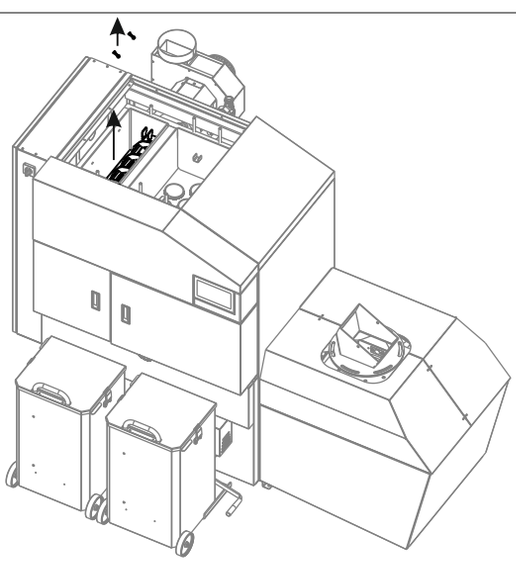
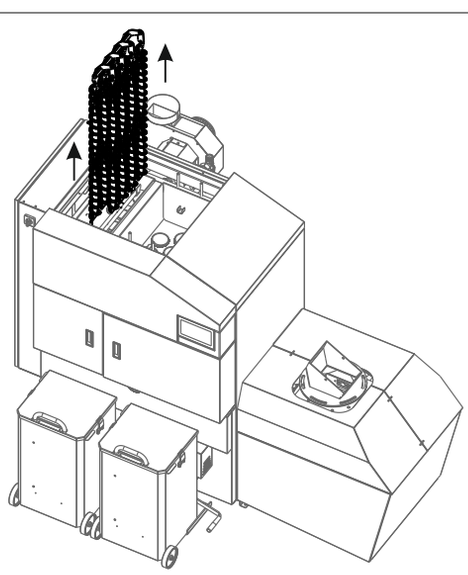
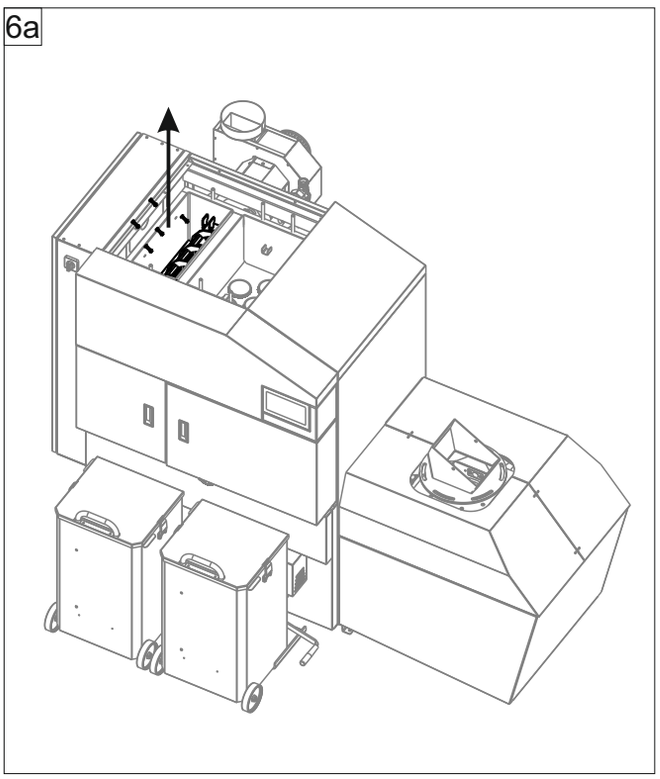


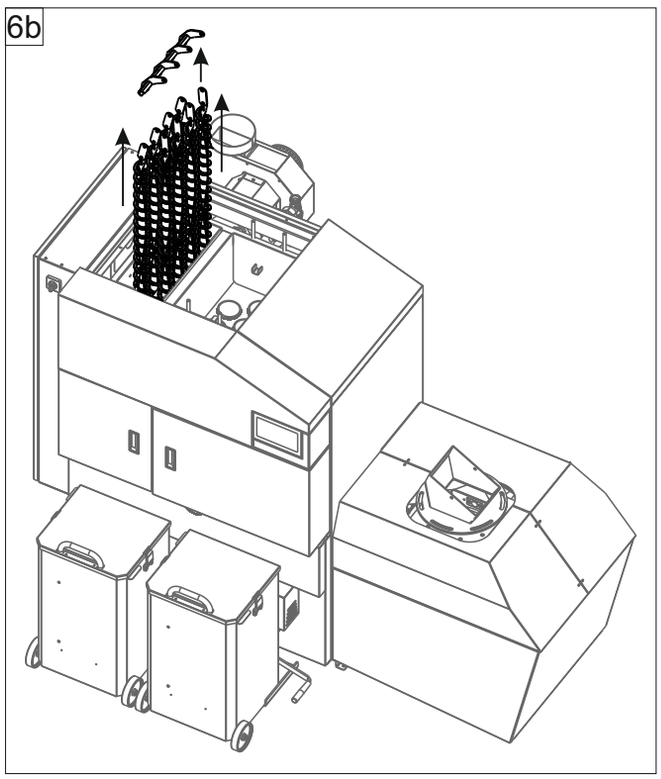
6



6a



6b



6a and 6b Only in case all turbulators can't be removed together (step 6).

PROTECTIVE GLOVES ARE OBLIGATORY!

Switch the boiler off and disconnect it from electric power.
1 - Remove the casing covers.
2 - Unscrew the 6 srews and remove 2 flue ducts door.
3, 4 - Unscrew the 2 screws and lift turbulators (first pass) with bracket as shown in picture.
5 - Unscrew the 2 screws from carrier on second pass.
6 - Remove all turbulators with carrier. (If you can't remove all turbulators together, then unscrew all screws on all turbulators (6a) and remove turbulators one by one (6b).

Note:
Place turbulators back in the same way but in the reverse order!

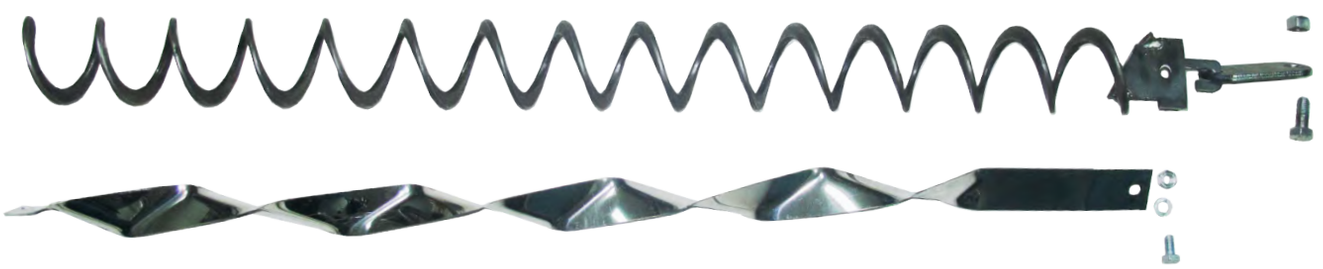
7.2. EXTRACTION OF HELICAL METAL PLATE FROM SECOND PASS TURBULATORS

For extracting of helical metal plate from turbulators is neccessary to unscrew nut and pull out helical metal plate from the bottom. With this action the flue gas temperature (in boiler work) will be increased but if there si no other solution for chimney condensation prevention (reduction to acceptable level) that procedure is neccessary.

PROTECTIVE GLOVES ARE OBLIGATORY!

Turbulator with helical metal plate

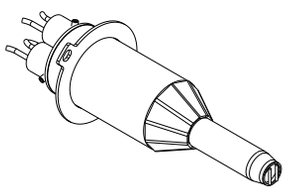
Extracted helical metal plate

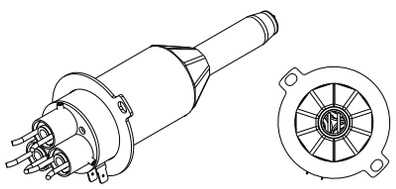


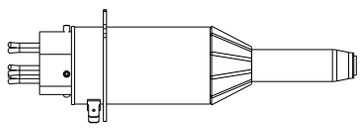
This procedure should do only authorized serviceman!

7.3. REPLACEMENT OF THE ELECTRIC HEATER (3 x 300 W)

This procedure should do only authorized serviceman!

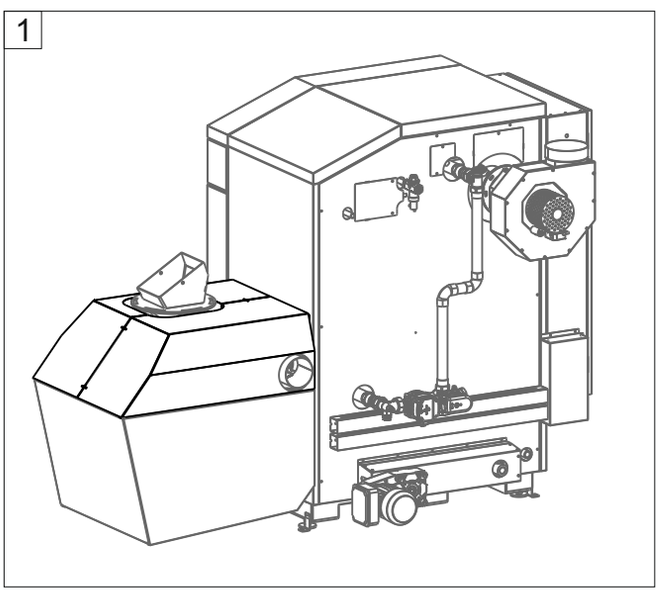




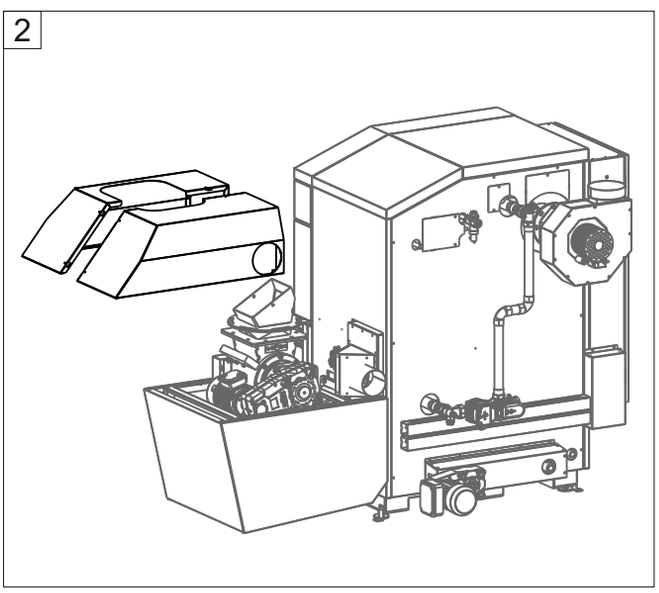


Electric heater 900 W (3 x 300 W)

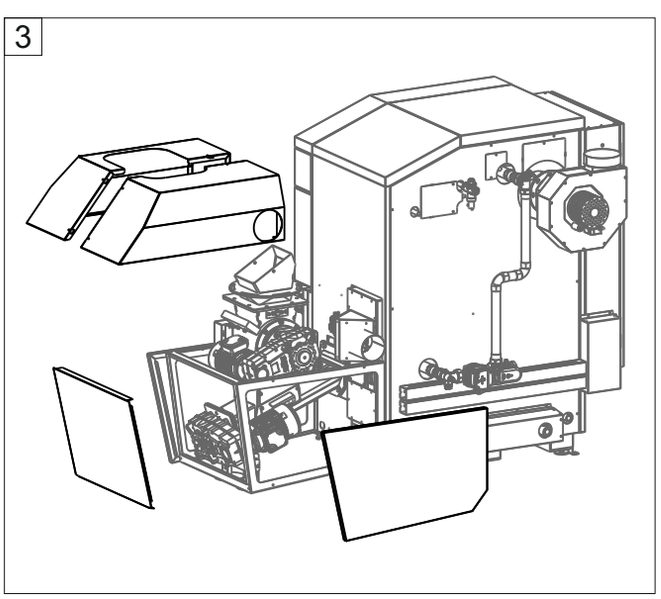
1



2



3



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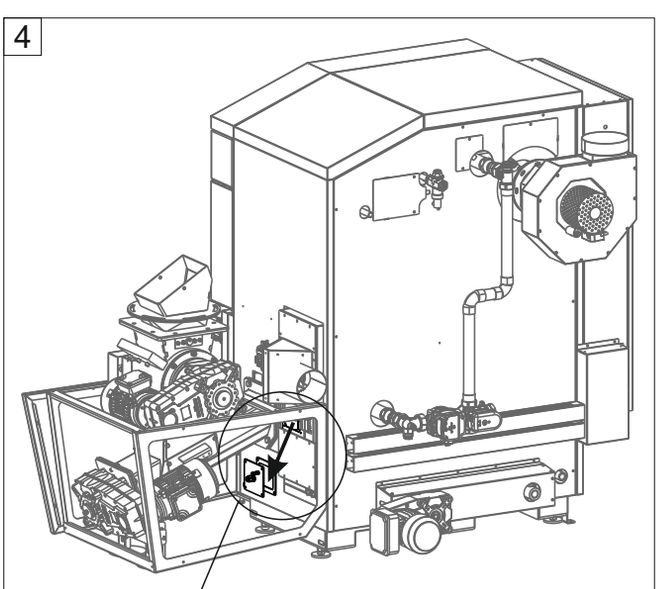
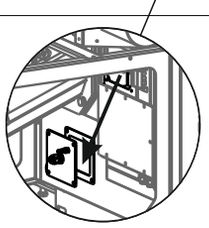
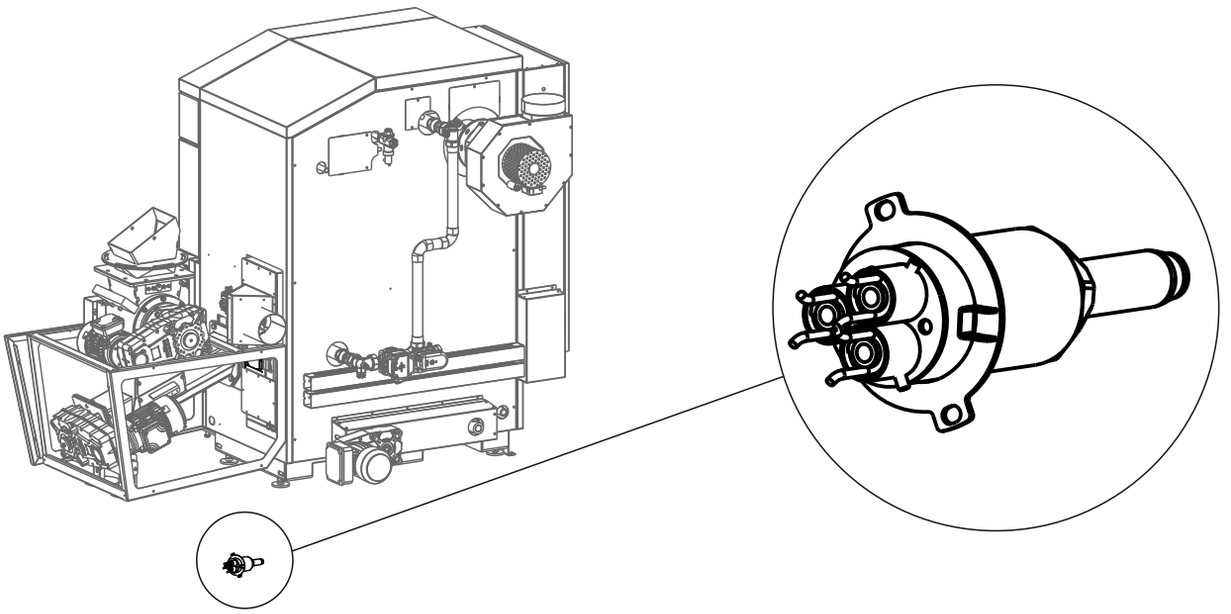
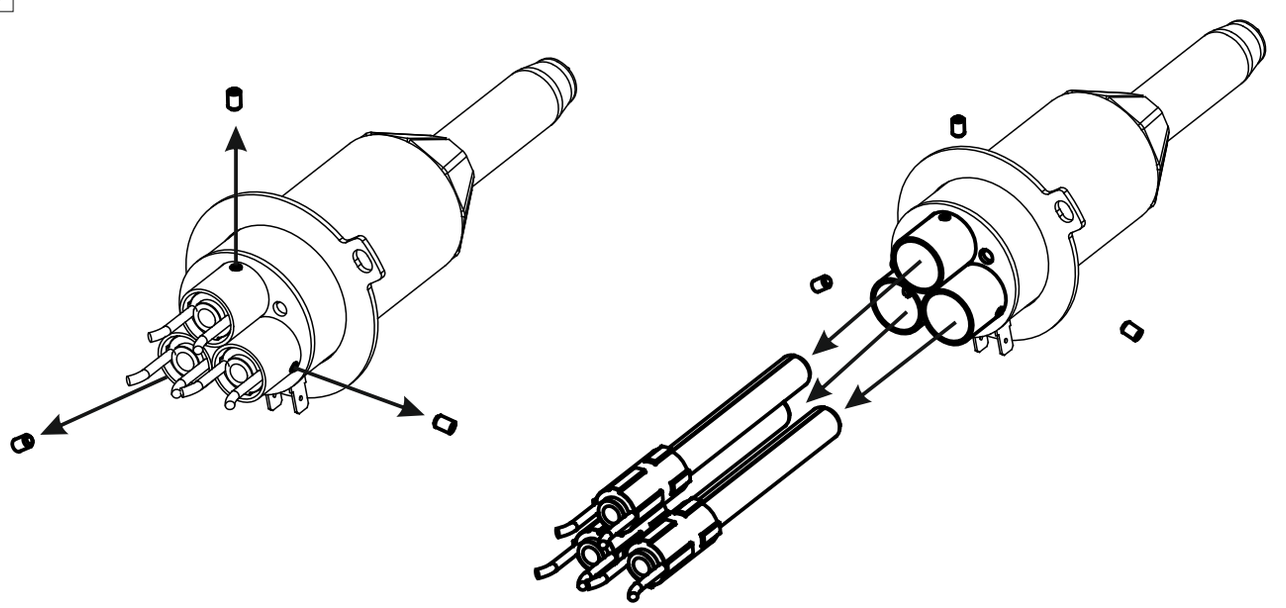




5a



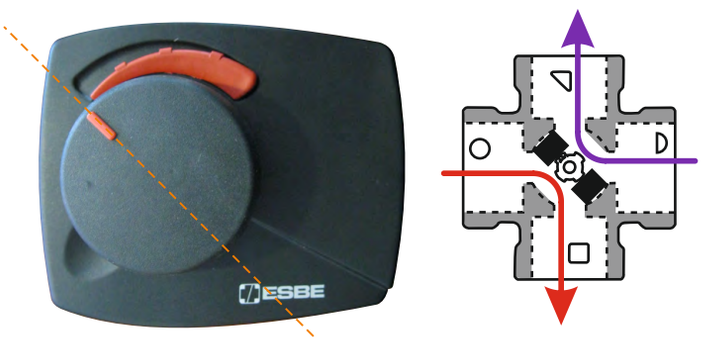
5b



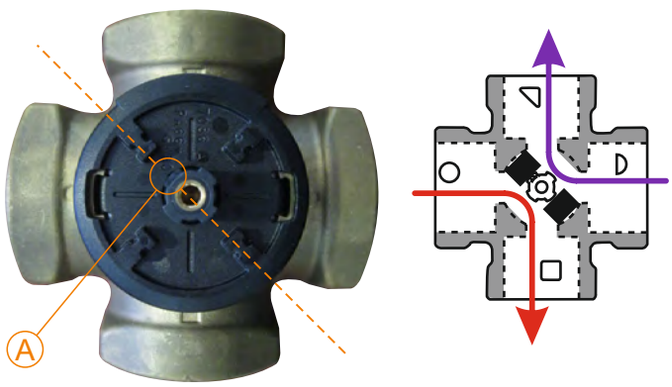
INSTALLATION OF ACTUATOR (IF THE BOILER WORKED - ONLY BIO-SC 96)

If the boiler worked, actuator of the 4-way mixing valve can be removed only when the boiler is in OFF mode (not working). When the boiler is in the OFF phase, it is necessary to press the button "Valve closing" from the menu "Manual test -> P0 + 4-way mixing valve" and wait until the valve closes completely (until valve actuator stops).

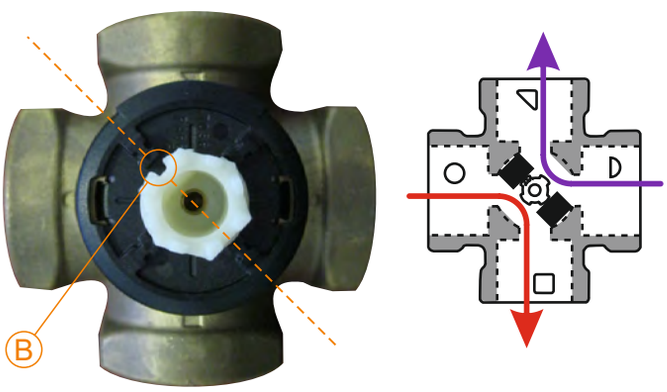
1. Actuator position when the boiler is not working (valve is closed)



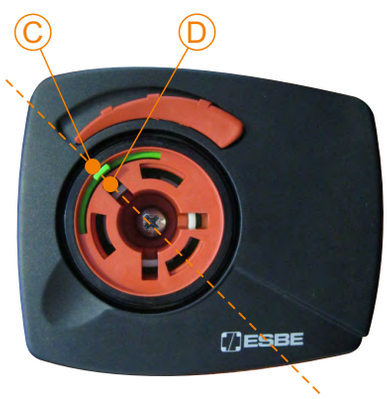
2. 4-way mixing valve position when the boiler is not working (valve is closed); designation on the axle "A" is the top left corner (45°)



3. Designation position on actuator clutch before assembly, designation on the clutch "B" is at the top left corner (45°)



4. Set the actuator as shown below the movable part of the device must be turned so that green delimiter "C" is aligned with the groove of the handle "D" and it is in the top left corner (45°)

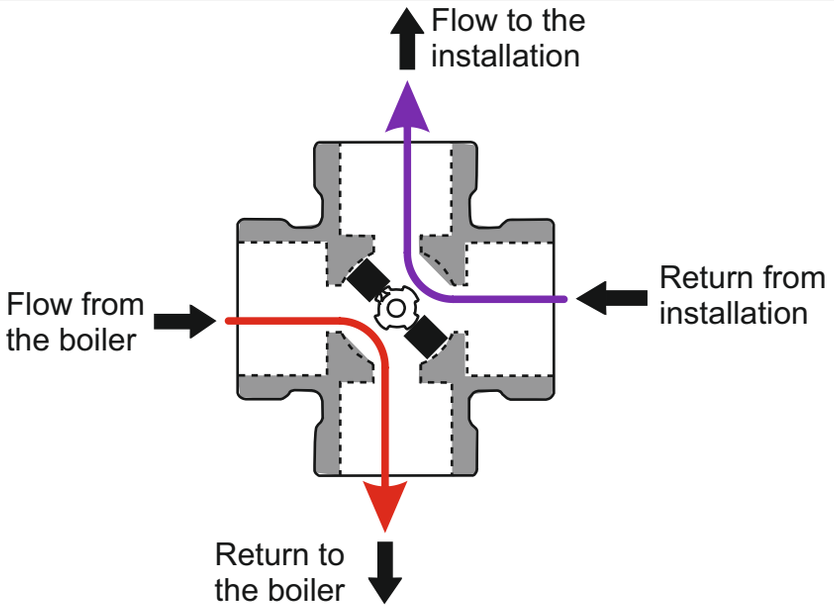


5. Tighten the screw to secure the actuator (when the screw is tightened, the movable part of the actuator is rotated to the right side, to the end position)

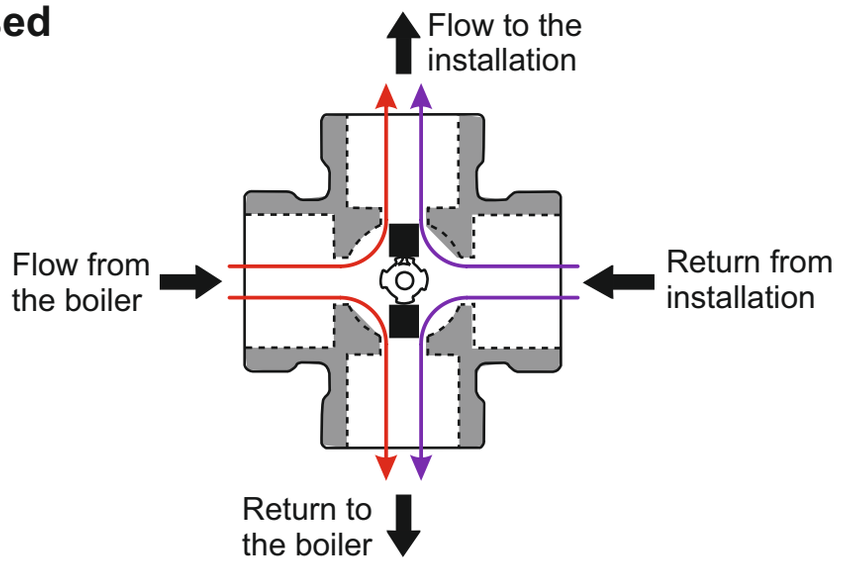
6. Install actuator handle, rotate it to the left until it can be pushed in the DOWN position
- Automatic operation

7. Actuator in DOWN position
- Automatic operation; boiler ready for operation

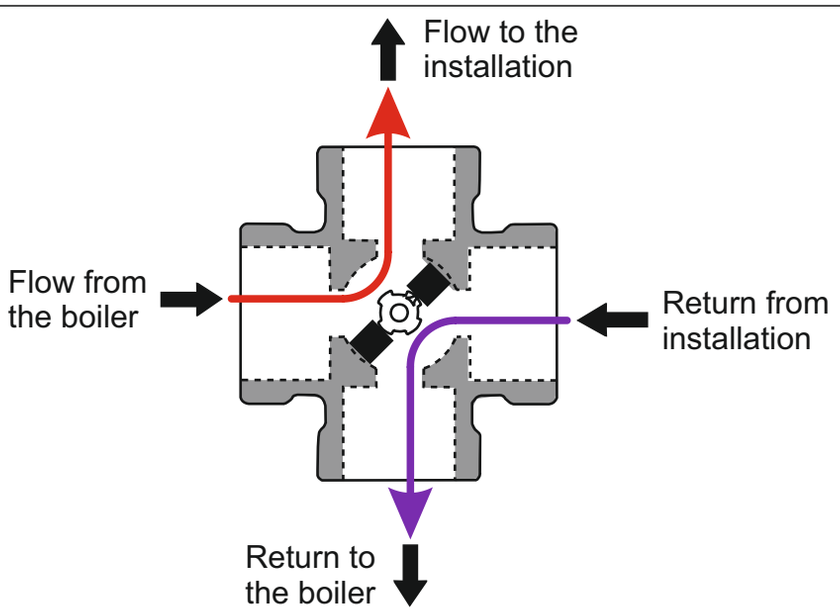
Valve is 100% closed



Valve is 50% opened/closed



Valve is 100% opened

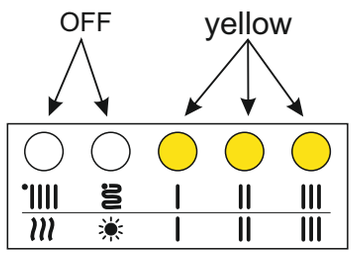


8.0. CIRCULATOR PUMP INSTALLATION

8.1. GRUNDFOS UPM3 HYBRID (25-70) (can be installed to BIO-SC 48)

8.1.1. FACTORY SETTINGS

Pump is factory preset to constant curve, curve 3 - MAX. Factory settings are displayed below (LED 1 = OFF, LED 2 = OFF, LED 3 = yellow, LED 4 = yellow, LED 5 = yellow).



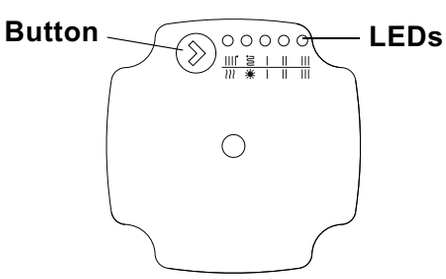
FACTORY SETTING
(constant curve, curve 3)

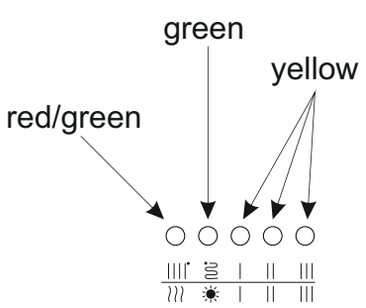
Important!
Each time you press the button the pump setting changes.

8.1.2. USER INTERFACE

The user interface is designed with a single push button, one red/green LED, one green and three yellow LEDs.

User interface with one button and five LEDs.





The user interface shows:
- operation status
- alarm status/errors

UPM3 HYBRID

Circulator pump is either for external PWM signal control with profile A or C (not in use), or for internal control of two operating modes with $AUTO_{ADAPT.}$

8.1.3. POSSIBILITY OF ADJUSTING THE PUMP (it is recommended that the pump works at the factory setting, see point 8.1.1.)

Controlling the user interface (setting the pump) is possible by pressing a button and following the display on the LED interface. The user interface displays the schedule by turning on/blinking/turning off each LED as shown in the tables below. The currently selected setting is always displayed on the interface, which can be changed with each button press.

LED BLINKING	
	1 BLINK PER SECOND
	12 BLINKS PER SECOND

	green	yellow	SETTING
0	● ○ ○	○ ○	PROPORTIONAL PRESSURE AUTO ADAPT
1	○ ● ○	○ ○	CONSTANT PRESSURE AUTO ADAPT
2	● ○ ●	○ ○	PROPORTIONAL PRESSURE 1
3	● ○ ●	● ○	PROPORTIONAL PRESSURE 2
4	● ○ ●	● ●	PROPORTIONAL PRESSURE 3 - MAX
5	○ ● ●	○ ○	CONSTANT PRESSURE 1
6	○ ● ●	● ○	CONSTANT PRESSURE 2
7	○ ● ●	● ●	CONSTANT PRESSURE 3 - MAX
8	○ ○ ●	○ ○	CONSTANT CURVE 1
9	○ ○ ●	● ○	CONSTANT CURVE 2
10	○ ○ ●	● ●	CONSTANT CURVE 3 - MAX
11	○ ✸ ●	● ●	PWM C PROFILE - SIGNAL OFF
	○ ✹ ●	● ●	PWM C PROFILE - SIGNAL ON
12	✸ ○ ●	○ ○	PWM A 1 PROFILE - SIGNAL OFF
	✹ ○ ●	○ ○	PWM A 1 PROFILE - PWM SIGNAL ON
13	✸ ○ ●	● ○	PWM A 2 PROFILE - SIGNAL OFF
	✹ ○ ●	● ○	PWM A 2 PROFILE - PWM SIGNAL ON
14	✸ ○ ●	● ●	PWM A 3 PROFILE - SIGNAL OFF
	✹ ○ ●	● ●	PWM A 3 PROFILE - PWM SIGNAL ON

FACTORY SETTING

Pump will not operate*

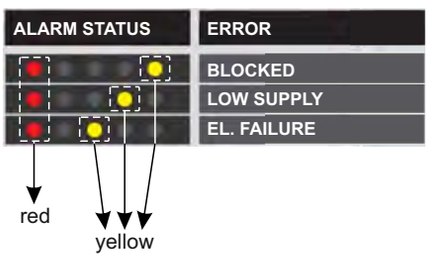
Note: Each time you press the button the pump setting changes.

*If any pump setting with PWM is selected, the pump will not operate.

8.1.4. ALARM STATUS/ERRORS

If the pump detects one of the alarms, the 2-color LED 1 changes color from green to red. When is it alarm active, LEDs show the type of alarm according to the table below. If several alarms are active at the same time, the LEDs show only the highest priority alarm. Priorities are determined according to the schedule in table. If there is no active alarm, the operating mode is displayed.

Screen	Meaning	Pump operation	Counter action
1 red LED + 1 yellow LED (LED 5)	Rotor is blocked.	Try to operate again.	Wait or unblock the shaft.
1 red LED + 1 yellow LED (LED 4)	Supply voltage is too low.	Only warning, pump runs.	Check supply voltage.
1 red LED + 1 yellow LED (LED 3)	Electrical failure.	Pump is stopped because supply voltage is too low or serious failure has occurred.	Check supply voltage / replace the pump.

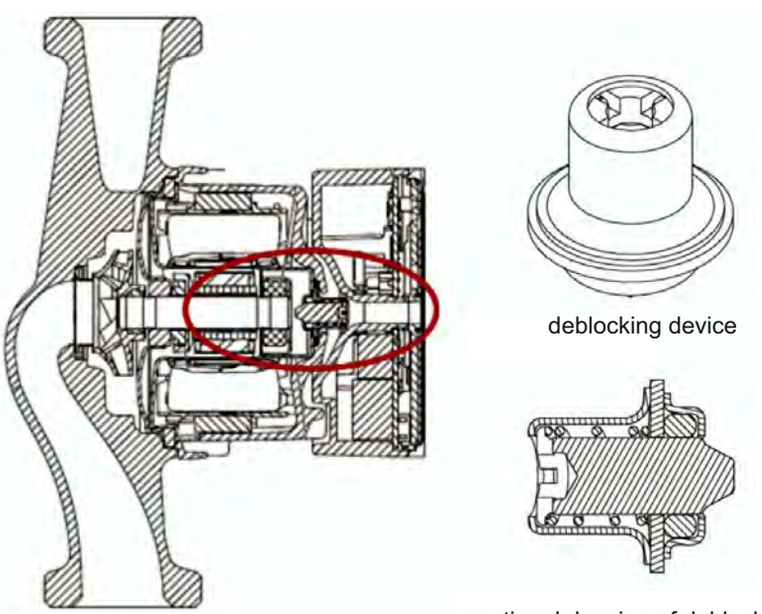


8.1.5. GRUNDFOS UPM3 ANTI BLOCKING CONCEPT

UPM3 has a double safety de-blocking system:
- deblocking software
Continuous restart after 1,33 seconds with a maximum torque of 24.8 Ncm.
- deblocking device
Manual deblocking device, accessible from front side without demounting the control box.

Deblocking device

Deblocking device consists of an axially movable plunger secured with an O-ring and a retracted spring inside a stainless steel housing that is welded to the rotor. It is made for pumps integrated into the device so that the pump can be accessed from the front without demounting the control box. By pushing and turning the screwdriver, the plunger pushes the shaft axially into the pump until it can rotate. The force is sufficient to unblock the pump where limescale has accumulated, for example if the device was tested wet and stored for a long time. Before, during and after unblocking, the device must tight and must not leak water.

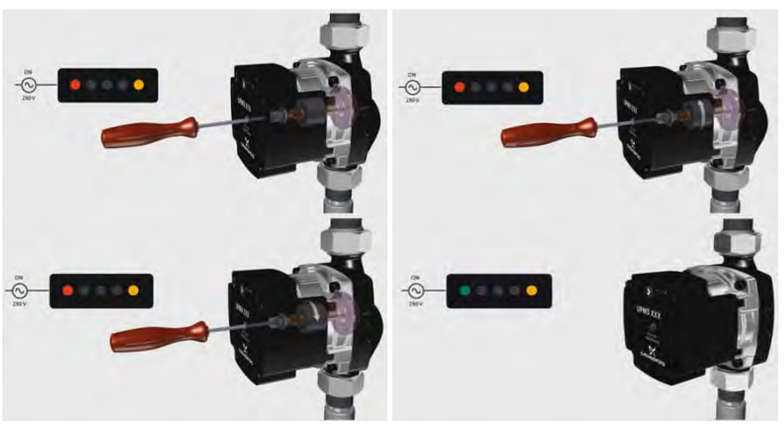


deblocking device

sectional drawing of deblocking device

Pump is blocked

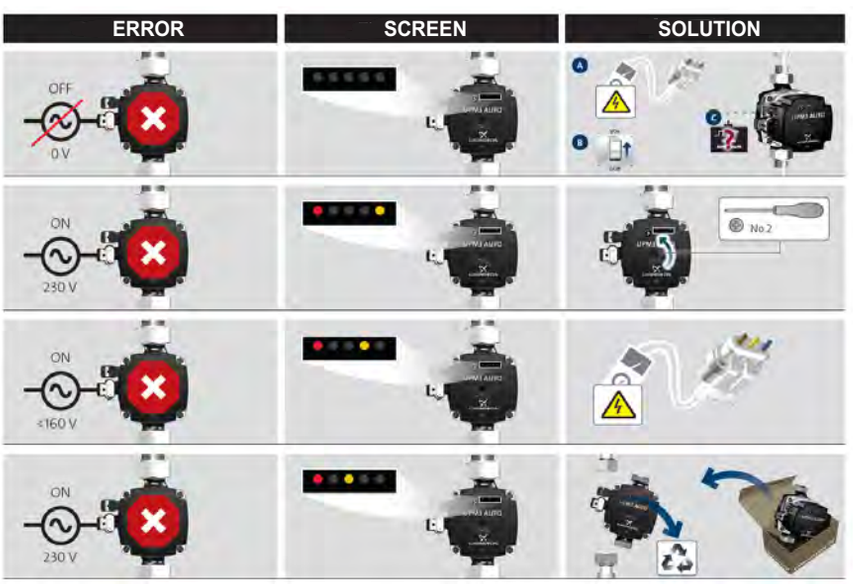
If the pump or system is filled with water for the first time and the pump is stopped for alonger period (several weeks or months), it might happen that the pump is not able to start. The pump tries to start with a cycle every 1.33 seconds and the display shows LED 1 = red and LED 5 = yellow.
In this case, please use a screwdriver and put it in the hole in the middle of the front plate. Push it towards the pump and move it counter clockwise. Probability, the pump will start.



Note:

In some cases pump cannot be unblocked with screwdriver. If this happens pump must be disassembled and rotor blades must be turned (unblocked) by hand.

Error finding

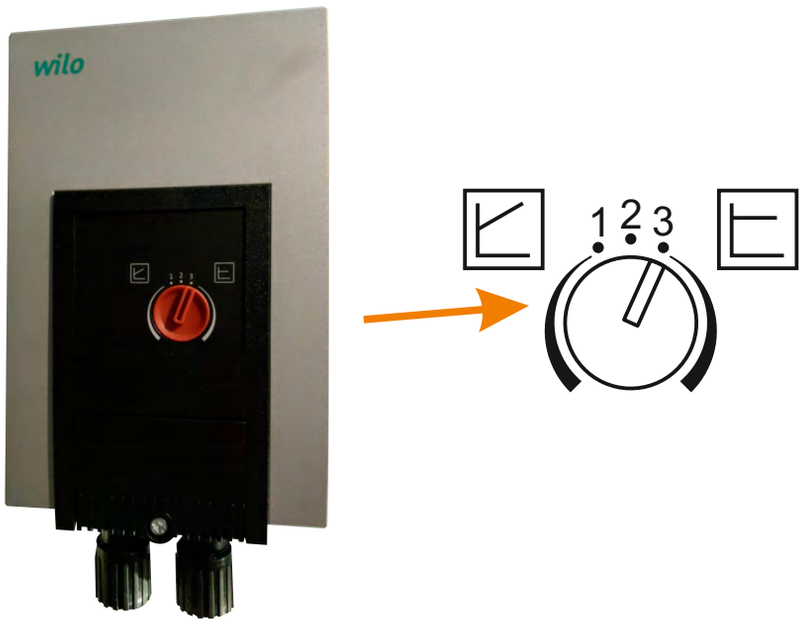


Warning: Before starting any work at the pump, switch off the power supply. Make sure that the power supply cannot be switched on accidentally.

Warning:
This appliance can be used by children over 8 years old and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they are under have been given supervision or if they are given instruction concerning use of the appliance in a safe way and if they understand the involved hazards. Children must not play with the appliance. Children must not clean or maintain the device without supervision.

PUMP SETTING - WILO YONOS PARA HF 30/12 (BIO-SC 96)

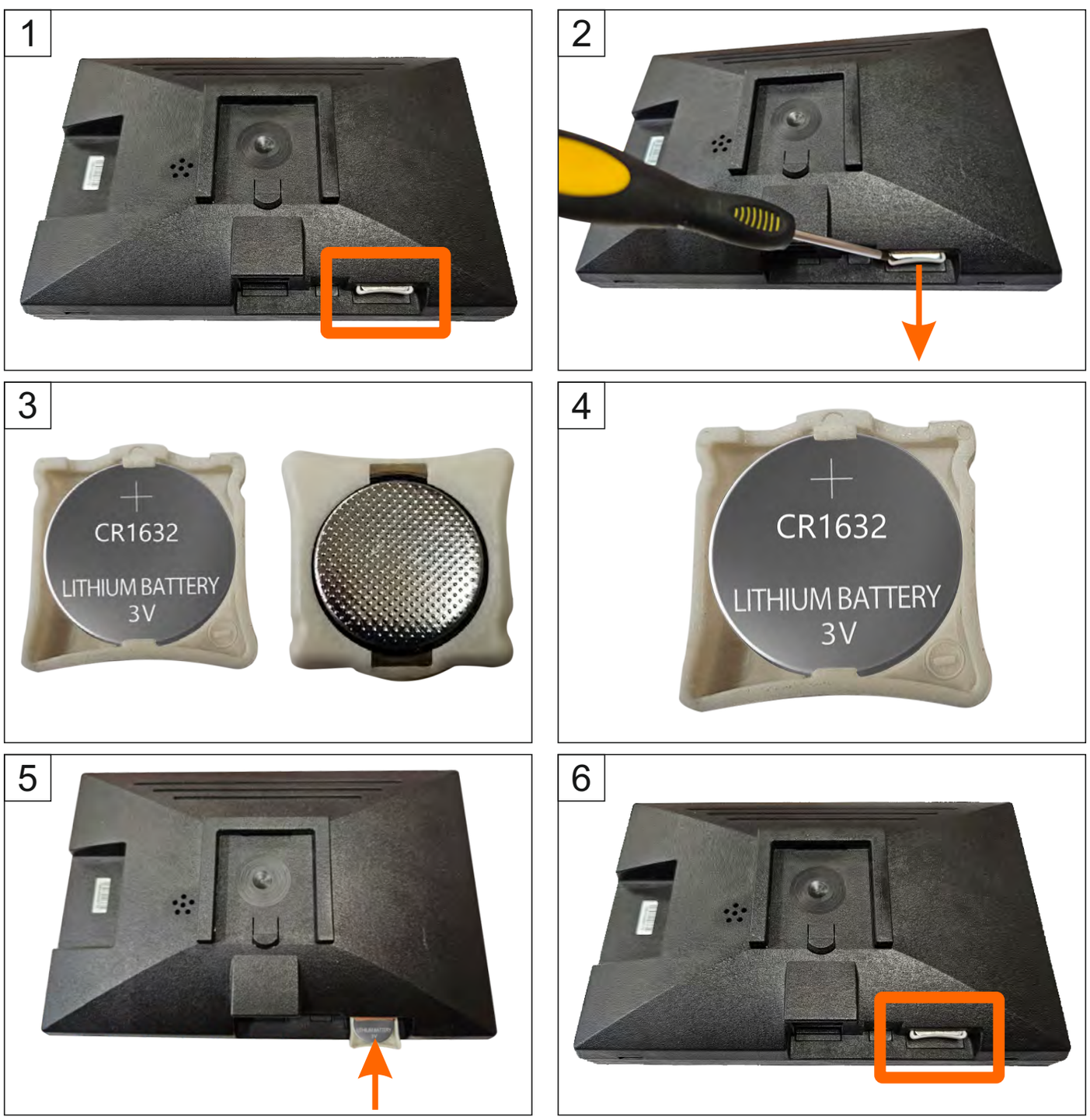
Pump is factory preset to maximum constant curve.



9.0. CHANGING THE BOILER CONTROLLER SCREEN BATTERY (CR 1632)

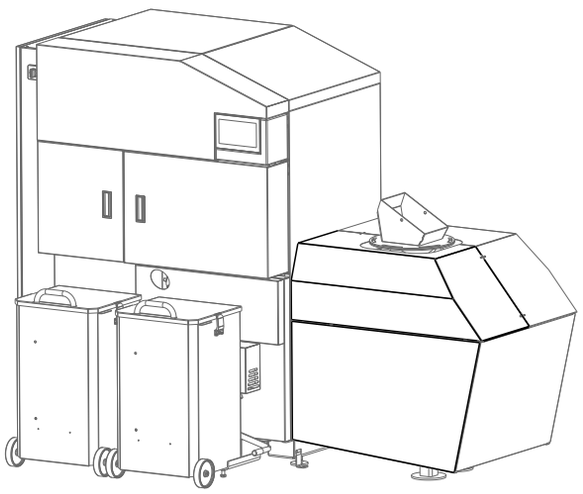
If there is a significant clock delay or the clock settings are automatically set to 00:00 and the date to 1.1.2020. (after turning OFF/ON the main switch of the boiler or after a power failure) it is necessary to replace the battery located on the bottom side of the screen (battery type CR 1632). The battery needs to be replaced even if the warning W 9 or error E 48 appears. The clock can be wrong, the delay can be 2-3 minutes per month which is considered normal, we recommend that you adjust it periodically. How to adjust the clock is described in the technical instructions for controller_book_2/2.

The battery is located on the bottom side of the screen (1). First, use a small thing to pull out the plastic box battery (2), which has two polarities (3). Replace the battery and make sure it is turned the right way (4). Place the battery in the plastic box (5) and insert it to the end of the slot so that it is in its original position, aligned with the metal part (6).

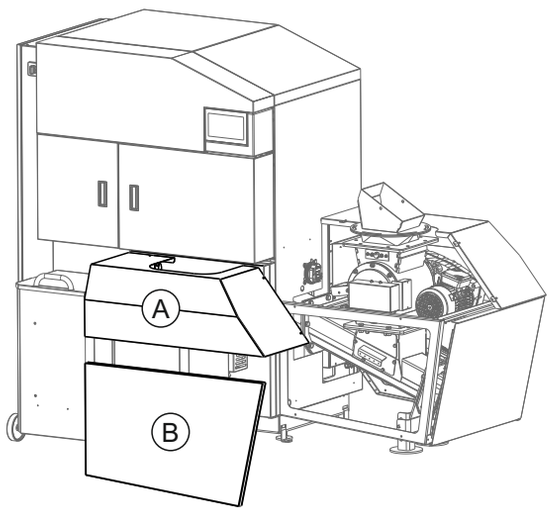


10.0. INSTALLATION OF THE FUEL WEIGHING METAL SHEET (ONLY FOR AUTHORIZED SERVICERS)

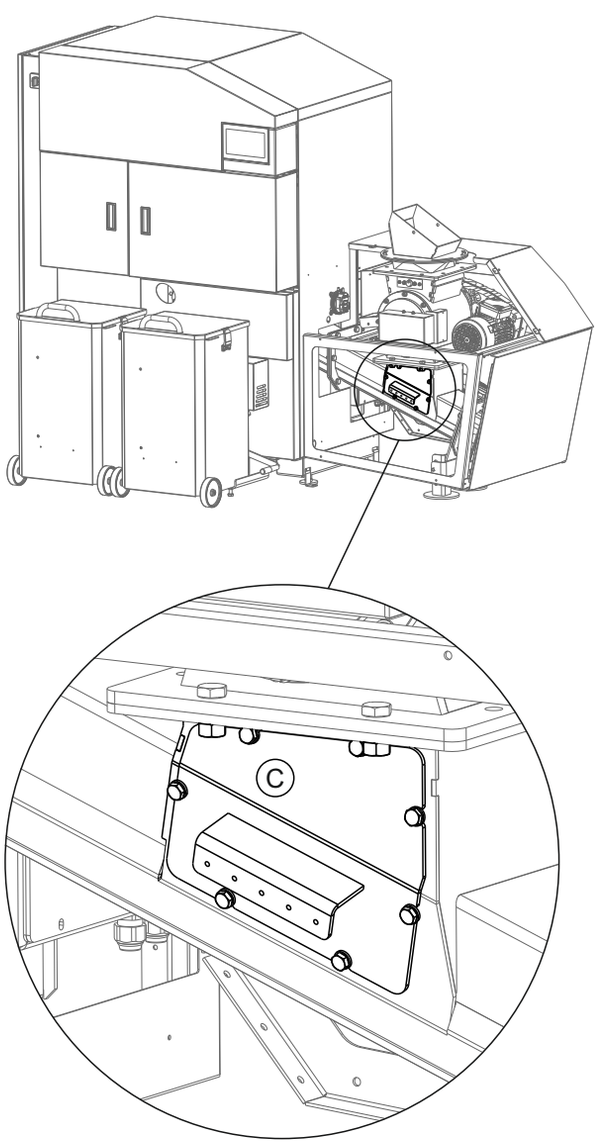
1



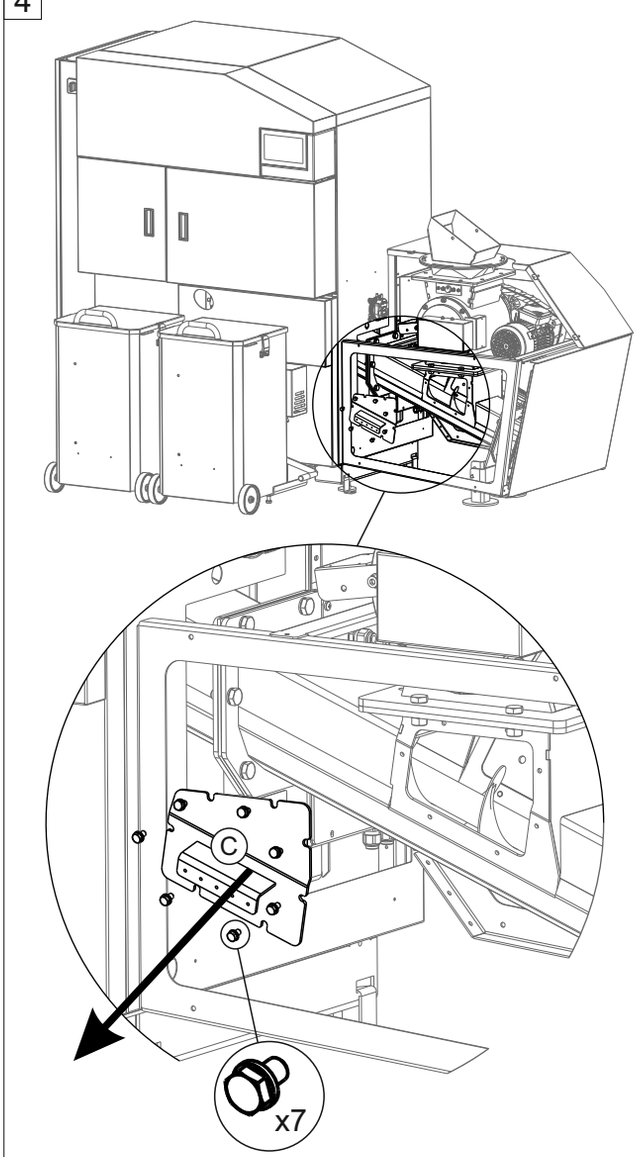
2



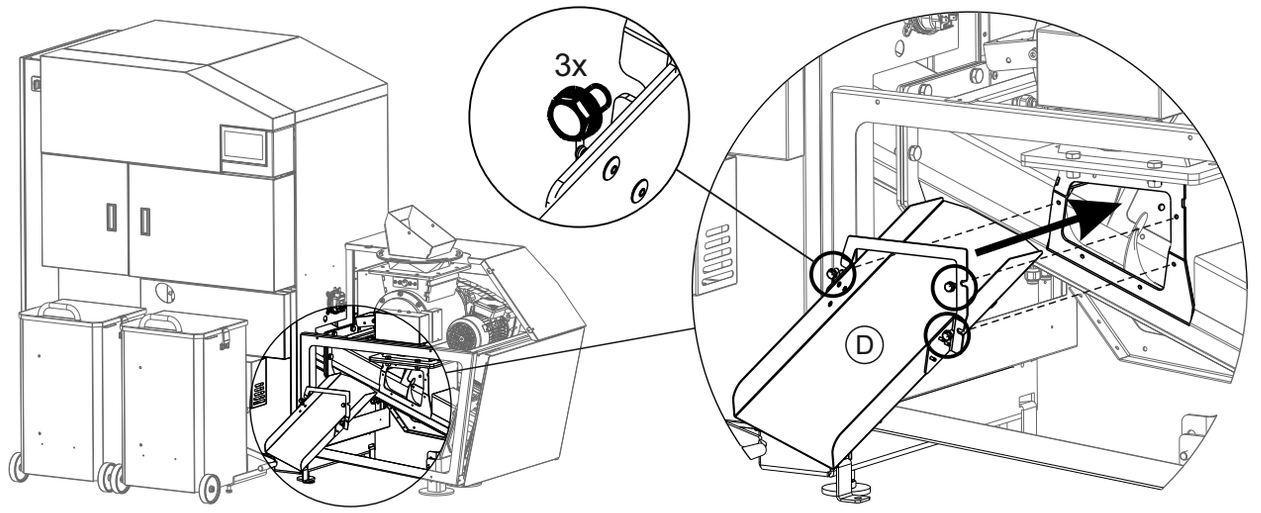
3



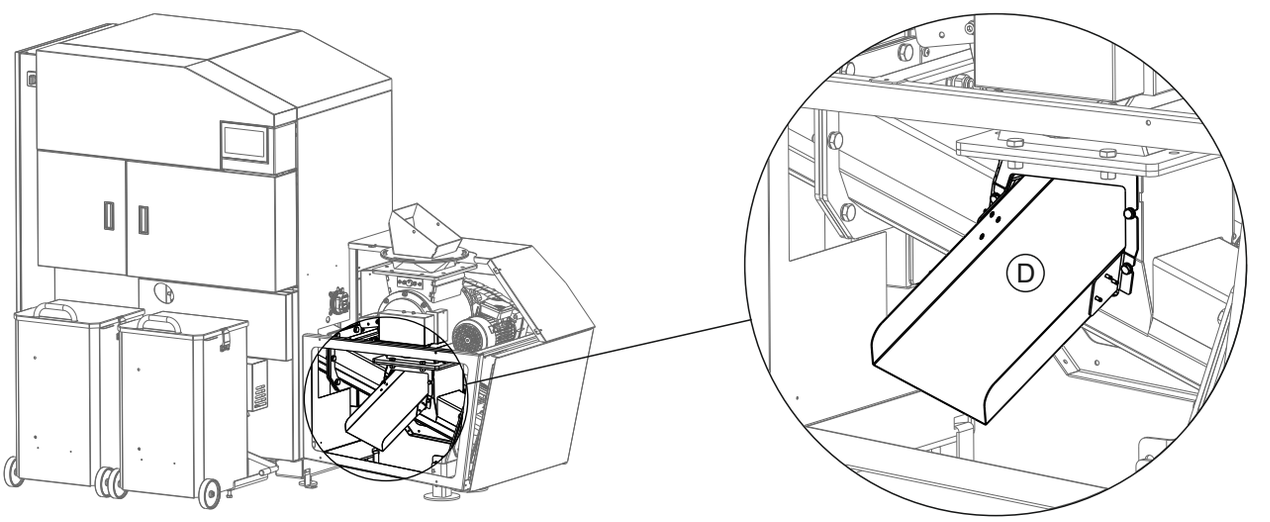
4



5



6

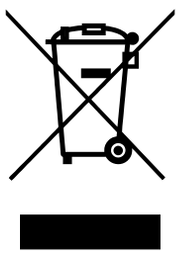


1. BIO-SC boiler with conveyor-1 and dosing valve.
2. Remove the side covers (A and B).
3. Find the protective lid (supply cover) (C).
4. Unscrew 7 screws and remove the supply cover (C).
5. Place the fuel weighing metal sheet (D) in the same place and attach it to the holes provided on the metal sheet with 3 screws.
6. View of the fuel weighing metal sheet (D) on the BIO-SC boiler.

After weighing, return all parts to their place (to the state before the weighing procedure began), but in reverse order.

CORRECT DISPOSAL OF THIS PRODUCT

Your boiler is marked in accordance with Directives: 2006/42/EC, 2014/30/EU, 2014/35/EU and contains electrical components.
According to EU Regulation 2015/1189 implementing Directive 2009/125/EC with regard to Eco-Design requirements for solid fuel boilers, we draw your attention to the following:



MARK FOR MARKING SEPARATE EE WASTE COLLECTION

This marking on the product indicates that the product contains electrical and electronic parts and must be disposed of separately, it must not be mixed with other waste. Your boiler is labeled in accordance with the Waste Electrical and Electronic Equipment Regulation (WEEE) and can be returned through the return and collection system available to you.

Household users should contact the retailer from whom they purchased this product, their local distributor, or their state agency for details on where and how to dispose of this product. Business users should contact their supplier and review the terms of the sales contract or contact a government agency for details on where and how to dispose of this product.

Centrometal

HEATING TECHNIQUE

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