Centrometal
HEATING TECHNIQUE

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ENG

TECHNICAL INSTRUCTIONS

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

CE

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

BioTec Plus

BOOK 1/2

TU-BTP-9-2022-ENG

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

Boiler 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 a 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.

An insufficient amount of air for combustion in the boiler room can lead to dangerous conditions.

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

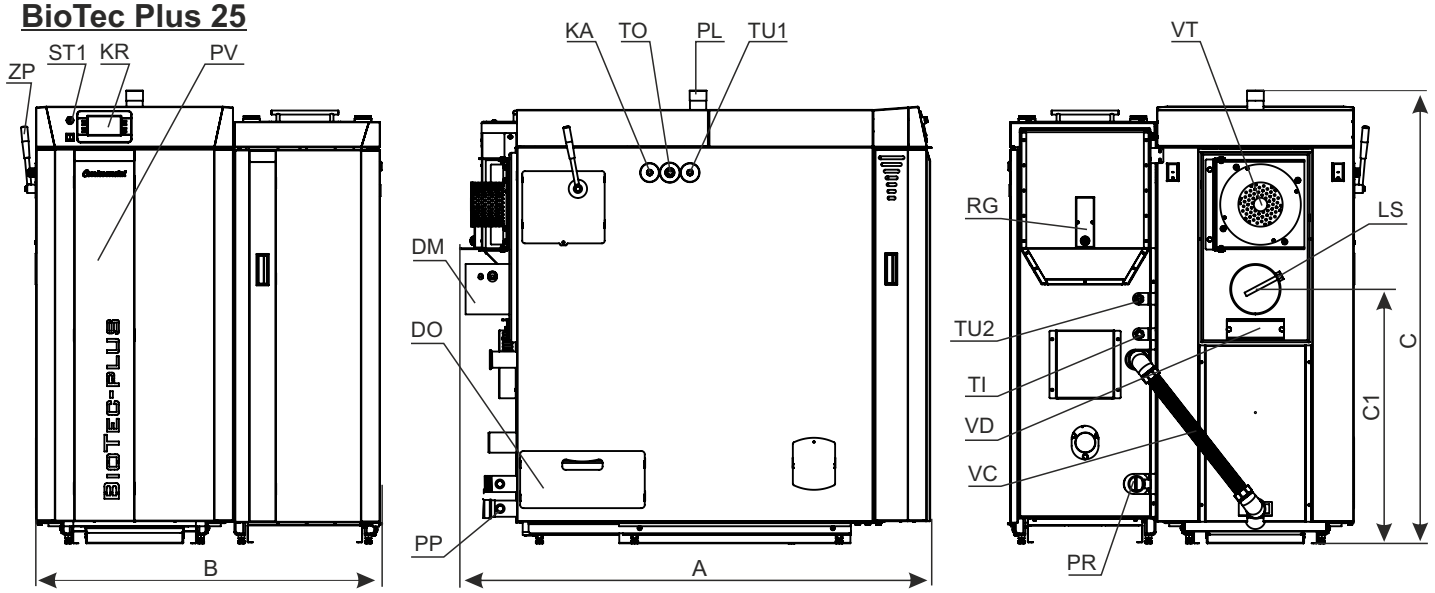
Keep the boiler room door closed.

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

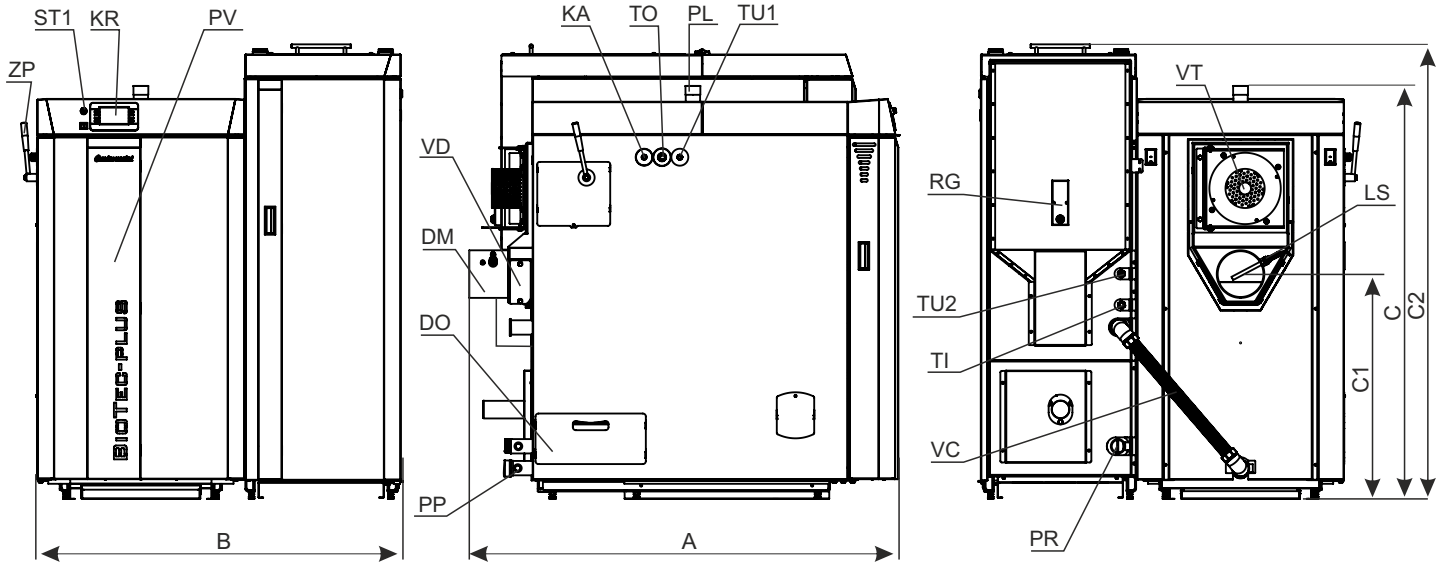
Boiler cannot be placed in operation until above points are not met.

TYPE: BioTec Plus		25	35	45
Nominal heat output	(kW)	25	35	45
Heat output range (wood)	(kW)	12,5-25	17,5-35	22,5-45
Heat output range (wood pellets)	(kW)	7,5-25	10,5-35	13,5-45
Boiler class (wood / wood pellets)		5		
Required chimney underpressure	(Pa)	10		
Water amount in boiler	(l)	138	167	187
Exhaust gas temperature at nominal heat output (wood)	(°C)	90-170	90-170	90-170
Exhaust gas temperature at nominal heat output (wood pellets)	(°C)	90-130	90-130	90-130
Exhaust gas temperature at minimal heat output (wood)	(°C)	70-110	70-110	70-110
Exhaust gas temperature at minimal heat output (wood pellets)	(°C)	60-110	60-110	60-110
Exhaust mass flow at nominal heat output (wood)	(kg/s)	0,019	0,022	0,027
Exhaust mass flow at nominal heat output (wood pellets)	(kg/s)	0,0206	0,030	0,0385
Exhaust mass flow at minimal heat output (wood)	(kg/s)	0,010	0,012	0,014
Exhaust mass flow at minimal heat output (wood pellets)	(kg/s)	0,0055	0,0080	0,0121
Minimum operating time at rated power (nominal Q_N) (wood)	(h)	3,5	4	4
Minimum operating time at rated power (nominal Q_N) (wood pellets)	(h)	-	-	-
Min. inlet water tem. at the boiler supply water connection	(°C)	60		
Cold water tem. and pressure for safety heat exchanger	(°C/bar)	10-15°C / 2 bar		
Setting range for temperature controller (wood / wood pellets)	(°C)	max. 90 / 65 - 90		
Boiler resistance on water side at nominal output (dT=10°C)	(mbar)	12,8	25,1	41,6
Fuel type		**WOOD:** A by 303-5:2012; B by EN ISO 17225-5:2014-09 **WOOD PELLETS:** C1 by EN 303-5:2012; A1 by EN ISO 17225-2		
Fuel moisture content	(%)	max 25 % for wood, max. 12% for wood pellet		
Fuel size		(450-550) x 70 x 50 for wood, fi6		
Fuel loading chamber capacity (wood)	(l)	90	144	176
Fuel loading chamber dimensions (D×W×H) (wood)	(mm)	600×250×600	600×400×600	600×400×735
Firebox volume (wood pellets)	(l)	1,6	1,6	2,5
Combustion chamber volume (wood pellets)	(l)	10,4	10,4	20,2
Pellet tank volume	(l)	80	148	148
Combustion chamber type		underpressure		
Required minimum accumulation volume (tank) next to boiler		by EN 303:2012-point 4.4.6		
Maximal electrical power input (wood)	(W)	1100	1100	1100
Auxiliray power requirements at Q_N (wood)	(W)	110	116	122
Auxiliray power requirements at Q_{min} (wood)	(W)	60	68	75
Standby power (wood)	(W)	5	5	5
Maximal electrical power input (wood pellets)	(W)	1100	1100	1100
Auxiliray power requirements at Q_N (wood pellets)	(W)	45	48	50
Auxiliray power requirements at Q_{min} (wood pellets)	(W)	30	33	35
Standby power (wood pellets)	(W)	5	5	5
Supply voltage	(V~)	230		
Frequency	(Hz)	50		
Max. electrical current	(A)	5,1	5,1	5,1
Current type		~		
Total mass - (boiler with casing and accessories)	(kg)	750	875	930
Max. operating overpressure	(bar)	2,5		
Test pressure	(bar)	5,5		
Max. operating temperature	(°C)	90		
Flue gas tube - external diameter	(mm)	150	160	180
Number of turbulators	(pcs.)	8	10	10
Boiler connections: Flow and return pipe (male thread)	(R)	6/4"		
Boiler connections: Charge/discharge (female thread)	(R)	3/4"		
Boiler connections: Heat exchanger connector (male thread)	(R)	3/8"		
Boiler connections: Connector of exchanger sensor (female thread)	(R)	1/2"		
Heating appliance working		with fan		
Heating appliance working		under non-condensing conditions		

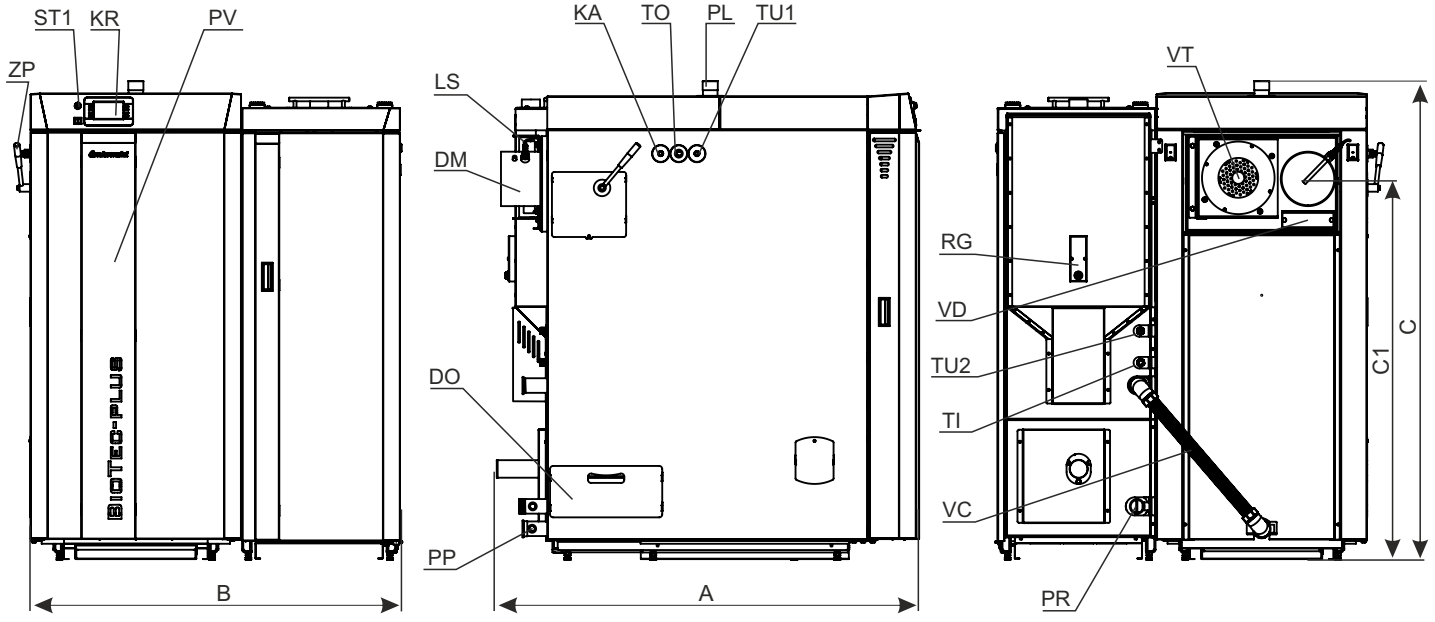
BioTec Plus 25



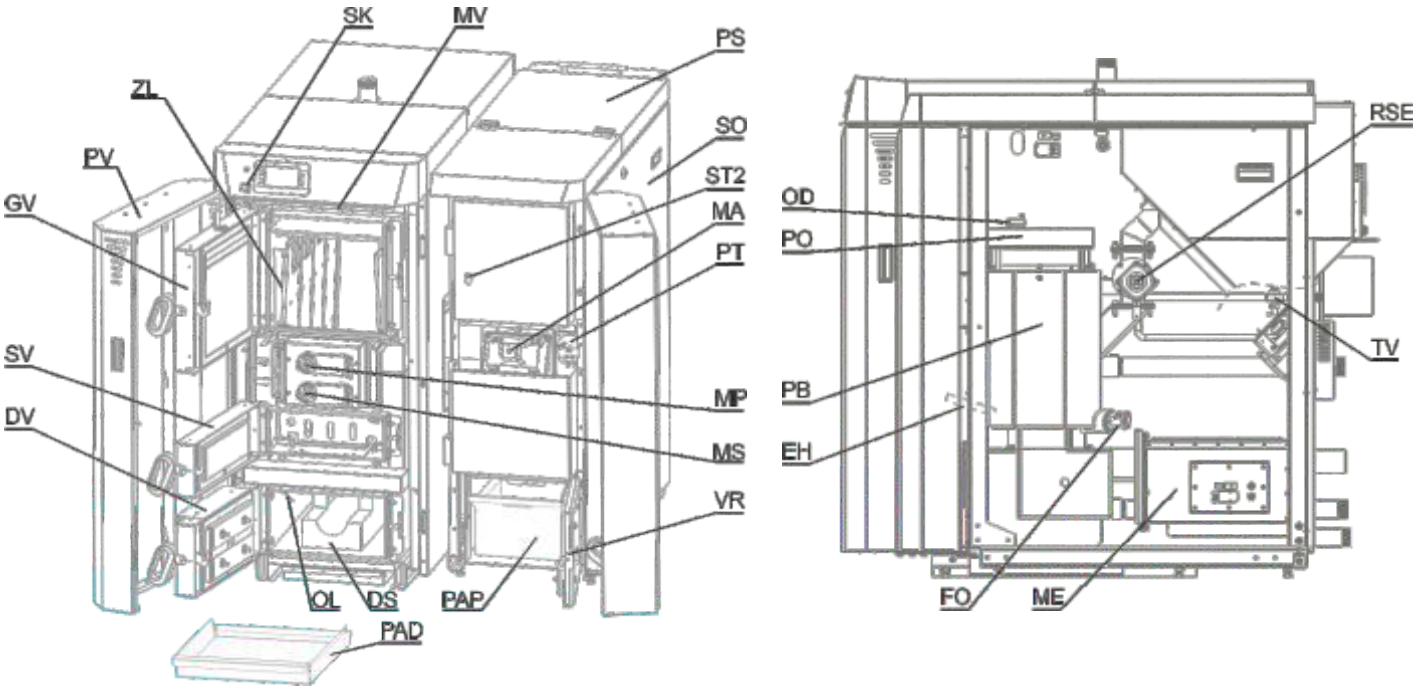
BioTec Plus 35



BioTec Plus 45



INNER PARTS VIEW FOR BOILERS BioTec Plus 25-45

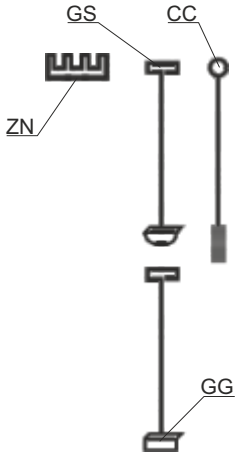


Boiler dimensions	**BioTec Plus 25**	**BioTec Plus 35**	**BioTec Plus 45**
Depth (A)	1400	1450	1450
Width (B)	1055	1255	1260
Height (C)	1350	1450	1585

Other dimensions			
Height (C1)	760	760	1260
Height (C2)	-	1530	-

CLEANING SET:

CC - Flue gas tubes cleaning brush
GG - Scraper for upper refractory stone (chamotte), flue gas chamber and place around lower chamotte cleaning
GS - Scraper for cleaning of the lower refractory stone (chamotte)
ZN - Holder for cleaning set



LEGEND:

DM - Flue gas tube connection
DO - Cover of lower openings of the flue gas chamber
DS - Lower refractory stone (chamotte) (2 parts)
DV - Lower boiler door (wood)
EH - Electric heater (pellets)
FO - Photocell
GV - Upper boiler door (wood)
KA - Heat exchanger connection (safety cooling system) (wood)
KR - Digital boiler controller
LS - Lambda probe
MA - Magnetic valve
ME - Cleaning mechanism assembly (pellets)
MP - Primary air actuator
MS - Secondary air actuator
MV - Upper door microswitch
OD - Air-vent
OL - Combustion chamber temperature sensor
PAD - Ashtray (wood)
PAP - Ashtray (wood pellets)
PB - Pellet burner
PL - Main flow
PO - Door for cleaning of pellet burner
PP - Filling / drainage
PR - Return flow
PS - Pellet tank cover
PT - Pressure switch
RG - Fuel level sensor (pellet)
RSE - Backfire protection valve (RSE)
SK - Main switch
SO - Casing cover (removable) for access to electric parts (pellets)
ST1 - Safety thermostat (wood)
ST2 - Safethy thermostat (wood pellets)
SV - Middle boiler door (wood)
TI - Heat exchanger output (safety cooling system) (pellet)
TO - Thermal safety valve sensor connection (safety cooling system) (wood)
TU1 - Heat exchanger connection - thermal safety valve connection point (safety cooling system) (wood)
TU2 - Heat exchanger input (safety cooling system) (pellet)
TV - Built-in thermal safety valve (safety cooling system)
VC - Connection tube
VD - Opening for cleaning of the flue gas chamber
VR - Lower boiler door (pellet)
VT - Fan
ZL - Sheet metal protection cover (wood)
ZP - Flue gas tube cleaning lever
PV - Front boiler door

1.0. GENERAL

Steel hot water boiler **BioTec Plus** has two separate combustion chambers inside the common boiler water chamber. Boilers **BioTec Plus**, nominal heat output 25, 35 and 45 kW, are designed for wood log firing in left part and wood pellet firing in right part of the boiler. The wood gasification principle enables a complete fuel burning in left part of the boiler. Logs up to 550 mm long can be inserted into the large combustion chamber. The burning period of a single fill of logs is up to 4 hours, depend about nominal heat output. The boiler can keep the glow even 8 hours, which means that in this period it is not necessary to fire up the boiler in order to keep the heating process. In the right side of the boiler is installed the burner for wood pellet firing with the automatic firing and automatic self-cleaning function which enables the reliable operation also with the low quality wood pellets. Boiler operation is controlled with inbuilt boiler control unit using two boiler sensors, sensor in combustion chamber, flue gas sensor and lambda probe, motors for primary and secondary air for combustion and modulating underpressure fan on flue gases outlet from boiler. Boiler must be connected to one adequately designed chimney and to the central heating system with return flow protection and adequately designed water accumulation (buffer) tank (CAS).

1.1. CHARACTERSTICS OF THE BioTec Plus BOILER

The BioTec Plus boiler is produced in compliance with the **EN 303-5:2012** norm, which enables the required level of functioning and minimal environmental pollution, through the firing with wood logs and wood pellets. The system of flue gases conduction and their additional burning out, enables its high efficiency, which makes this product extremely economical.

Widely sized left side fuel loading door enables firing with large pieces of wood logs and very simple and easy cleaning and maintenance. The wood gasification principle enables a complete fuel burning so maintenance of left part of the boiler is set to minimum. One filling of logs lasts up to 4 hours, depend about nominal heat output. There is also a possibility of prolonging the firing process to the entire day, if the heating requirement is decreased. The boiler can keep the glow up to 8 hours (depends on the quality of the wood), during which period it is not necessary to repeat the start firing process.

In the right side of the boiler is installed the burner for wood pellet firing with the automatic firing and automatic self-cleaning function which enables the reliable operation also with the low quality wood pellets.

The boiler must be connected to the central heating system with return flow protection and with properly sized water accumulation (buffer) tank(s).

Boiler operation is managed with inbuilt boiler control unit using two boiler sensors, sensor in combustion chamber, flue gas sensor and lambda probe, motors for primary and secondary air intake for combustion and modulating underpressure fan on flue gases outlet from boiler. Boiler control unit can run return flow protection, buffer tank management, one heating circuit with circulation pump and 3-way mixing valve with actuator steered by outdoor temperature sensor and room corrector and DHW water heater tank pump.

With boiler **BioTec Plus** it is easy to handle, integrated control unit with color touch screen assures reliable and simple boiler operation. With installed accumulation (buffer) tank excess of produced heat is accumulated into the tank and can be consumed when needed. Because of accumulation tank, firing of the wood can be planned in a reasonable time, and in the case of mild outside temperature, space heating and DHW heating without firing boiler is also possible for several days, or just start pellet side of the boiler.

The boiler is delivered together with thermal insulation, covered by a metal casing on two wood pallets.

Concerning the specific need of sanitary hot water, the **BioTec Plus** boiler can be connected to one of water heaters produced by our company. We suggest the combination with wall hanged SKB Digi or LKB Digi water heaters, as well as with floor standing TB water heaters or accumulation (buffer) tanks CAS-B. If the future connection to the solar system has been planned, boiler can be connected to combined accumulation (buffer) tank CAS-BS or STB solar water heater. Boiler is tested and certified according to the European standard EN **303-5:2012** and meets **class 5**. It is manufactured in compliance with ISO 9001 and ISO 14001 standards.
Although the boiler has two separate furnaces, boiler connects to one properly selected chimney.

1.2. SAFETY PRECAUTIONS

The boiler and related accessories are state of the art and meet all applicable safety regulations. The control unit, wiring chamber, el. heater, safety cut-out STB thermostat, fan, grid cleaning mechanism, flue gas tubes cleaning mechanism and pellet supply mechanism are integrated into the BioTec Plus. They are operate at a voltage of 230V AC. Improper installation or repair can pose the danger of life-threatening electric shock. Installation may beperformed 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. WOOD GASIFICATION COMBUSTION PROCESS (wood side)

Combustion process is carried out in double combustion chamber in several phases. After filling the upper chamber with logs, glow dry the logs, and at temperature 100÷300°C logs are beeing gasified. The gases created in such process are mixed with the oxygen from air and burn out completely with high temperature.

Fuel: wood logs with moisture content up to 20% (max. 25%), minimum size must be bigger than a nozzle in refractory stone (chamotte) of the upper chamber. This demand for moisture content is fulfilled with wood dried on air at least 12 months.

1.5. FIRING PROCESS IN WOOD PELLET SIDE

Wood pellets are used as fuel in right side of BioTec Plus boiler. Wooden pellets are bio-fuel made of wooden wastes. Pellets can be packed in different packaging: in bags (15 kg or 1000 kg), or as bulk in large (underground) tanks (4 - 15 m^3) or in basement spaces. Recommended properties of pellets for firing in BioTec Plus boilers are the following:

- heating value >= **5 kWh/kg** (18 MJ/kg)
- diameter <= **6 mm**
- max. moisture content <= **12 %**
- max. dust content <= **1,5 %.**

2.0. DELIVERY PACKAGE

Boiler **BioTec Plus** is delivered in parts for easier transportation and mounting to boiler room.

Basic equipment is delivered separately:

- left part of the boiler for wood firing with mounted thermal insulation (on wood pallet) with inbuilt:
- color touch screen display control unit
- combustion chamber sensor - Temperature sensor - Thermocouple (32728)
- flue gas temperature sensor - Temperature sensor PT 1000 - Teflon l=1700 (62330)
- boiler sensor - Temperature sensor NTC 5K - PVC l=1000 (12041)
- lambda probe
- 2 actuators for primary and secondary air
- flue gas modulating fan
- microswitch for upper boiler door
- STB safety thermostat

- right part of the boiler for wood pellet firing with mounted thermal insulation (on wood pallet) with inbuilt:
- photocell
- BOILER SENSOR - Temperature sensor NTC 5K - PVC l=1000 (12041)
- cleaning mechanism with movable grate
- pellet tank
- feeder screw
- backfire protection by rotation valve (RSE)
- pellet level sensor - Fuel level sensor CMSR 100 (26199)
- magnetic valve for air
- thermal safety valve
- electric heater
- pressure switch
- STB safety thermostat
- ashtray

- Additional equipment in basic delivery:
- 2 × Acc. (buffer) temperature sensor - Temperature sensor NTC 5K - PVC l=1000 (12041)
- 1 × Outdoor temperature sensor - Outdoor temperature sensor NTC 5K (31428)
- 1 × Main/Return flow sensor/hydraulic crossover- SET temperature sensor NTC 5K - PVC l=2000 (32685)
- 1 × DHW sensor/hydraulic crossover - Temperature sensor NTC 5K - PVC l=2000 (26226)
- 1 × Room corrector (CSK) - Room corrector CSK (32680)

- cleaning brush, two scrapers and holder for cleaning set and portable ashtray (for left part of the boiler (wood))
- set for connecting left and right side of the boiler: gaskets, screws, nuts.
- connection tube for connecting left and right side of the boiler

2.1. ADDITIONAL EQUIPMENT

Additional equipment is not included in basic delivery. **Obligatory additional** equipment **must be** purchased separately. Other additional equipment **can be** purchased **optionally**.

1) OBLIGATORY ADDITIONAL EQUIPMENT:

- accumulation (buffer) tank for heating system (CAS (min. liter according to local regulation), minimum 50 litres / kW of boiler).
- return flow protection - 3-way mixing valve with actuator (protection valve) or 3-way thermostat valve (60°C) (like ESBE VTC 512, VTC 531, LTC 261, LTC 271).

Recommendations for the VTC valve, circulation pump and water accumulator CAS - according to the boiler output:

Heat output range (kW)	Connection VTC 512 (outer thread)	Connection VTC 531 (internal thread)	Circulation pump type		Volume of CAS accumulation (buffer) tank for BioTec Plus wood gasification boilers
			Grundfos	Wilo	
25	5/4"	6/4"	Alpha1 32-40	Yonos PICO 30/1-4	Minimum 50 litres / kW of boiler
35	5/4"	6/4"	Alpha1 32-60	Yonos PICO 30/1-6	
45	5/4"	6/4"	Alpha1 32-80	Yonos PICO 30/1-8	

Recommendations for the LTC units and the water accumulations (buffer) CAS - according to the boiler output:

Heat output range (kW)	Connection LTC 261 (internal thread)	Connection LTC 271 (internal thread)	Volume of CAS accumulation (buffer) tank for BioTec Plus wood gasification boilers
25, 35	5/4"	--	Minimum 50 litres / kW of boiler
45	--	6/4"	

For closed heating systems:

- Thermal safety valve
- Safety-airvent group (2,5 bar)
- Expansion vessel for closed heating systems (size according the volume of heating installation, including buffer tank volume)

For open heating systems:

- Open expansion vessel (size according the volume of heating installation, including buffer tank volume)

2) OTHER ADDITIONAL EQUIPMENT:

CAL alarm box (light/speaker)

CM2K module for regulation 2+ heating circuits (max. 4 units.)

GSM alarm module for mobile network

Cm WiFi-box (Internet supervision)

Room corrector (CSK-Touch)

- **Automatic flue gas tubes cleaning (Flue pass. Cleaner)**
- **Pellet suction system CVT + CentroPelet box (pellet feeding box)**
- **Pellet suction system CVT + Screw feeder**

Screw refill (CPSP-BP 800 - System for the pellet supply by the screw transporter from 800 lit. pellet tank)

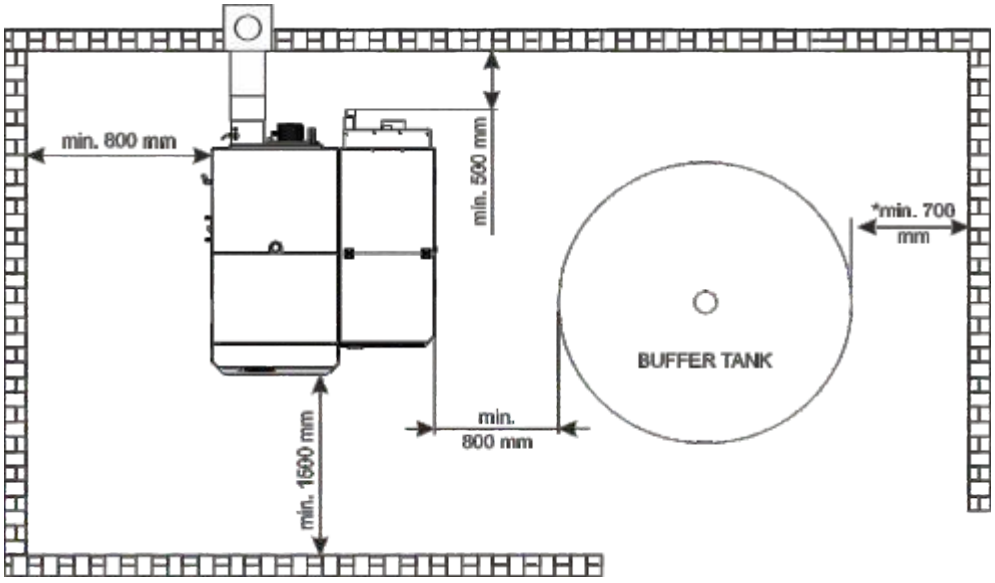
3.0. BOILER / ADDITIONAL EQUIPMENT POSITIONING AND ASSEMBLY

The positioning of the boiler has to be carried out the authorized person. We suggest the positioning on the solid concrete basis, which height is between 50-100 mm. The boiler room has to be absolutely protected from freezing and properly ventilated. The boiler has to be positioned in order to enable its connecting to the chimney (see point 3.) and heating installation as well as its servising during the functioning process, cleaning and maintenance (Figure 1). The connection of the boiler to the central heating system is obligatory with the one or more **CAS water accumulations (buffer) tanks**, depending of the boiler's power. It is recommended to connect minimum **50 liters water accumulation to each 1 kW boiler power** (i.e. for the 45 kW boiler minimal water accumulation should be 2.250 liters). The boiler should not be used without being connected to the water accumulation tank. It must be connected to the CAS water accumulation obligatory with **return flow protection** through an 3-way mixing valve with actuator (protection valve) or 3-way thermic valve (like ESBE VTC 512, VTC 531 (60°C), LTC 261, LTC 271 (60°C)).

WARNING!

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

Figure 1. Minimum distance from the boiler room walls



*valid for closest tank to the wall

3.1. INSTALLATION OF DELIVERED PARTS

BioTec Plus is delivered on two wooden pallets. It must be mounted like is described on next pages of these technical instructions. After the boiler is mounted, should be positioned in the boiler room (see point 2.0.). Base protection with stone wool push under the boiler as shown in figure 2.a.

In upper chamber of the left side of the boiler are delivered (figure 2.b):

1. holder for cleaning set and 2 cleaning scrapers and cleaning brush

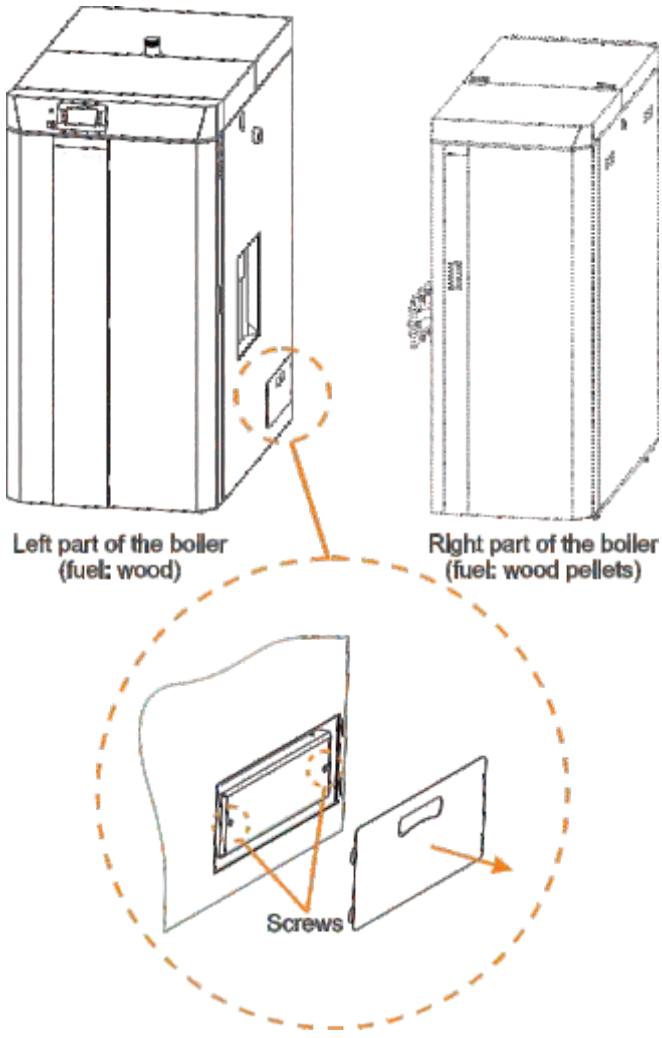
2. room corrector and sensors (2 Acc. (buffer) temperature sensors, 1 return flow sensor, 1 DHW temperature sensor, 1 outdoor temperature sensor)

Holder for cleaning set can be positioned on lateral side of the boiler (A) or to the wall (B), near the boiler and easy accessible. On this holder should be placed cleaning set (2 scrapers and brush).

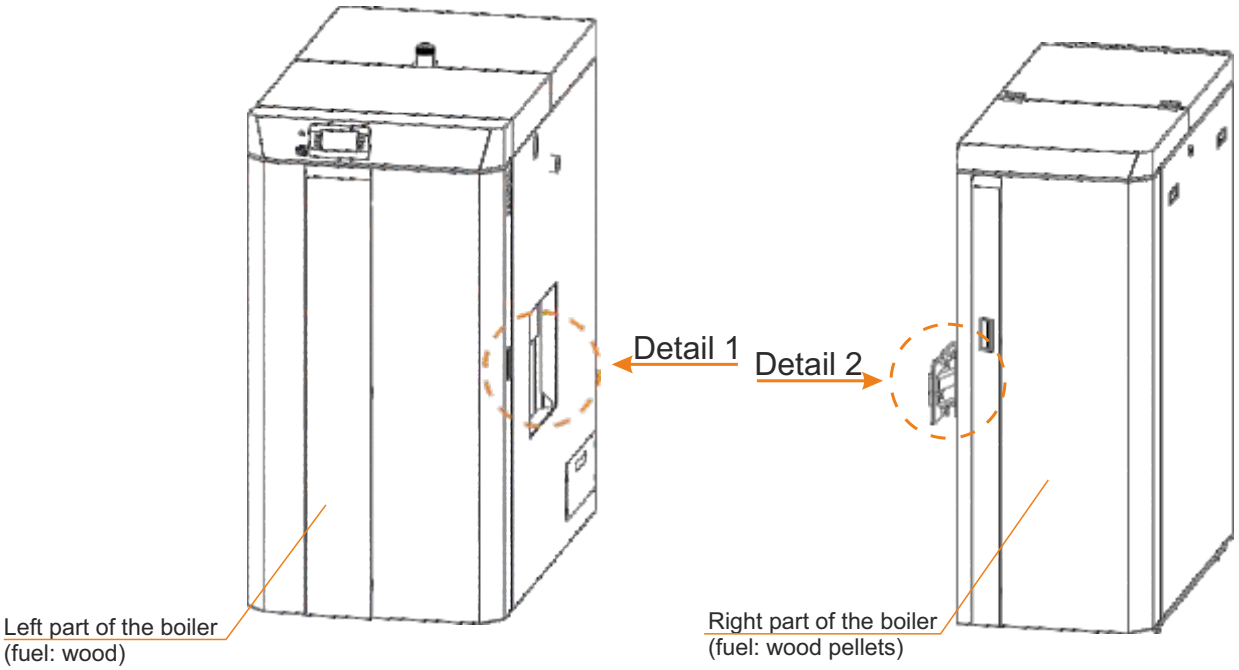
Sensors and room corrector should be connected according heating installation and connecting scheme.

CHECKING FLUE GAS CHAMBER LID

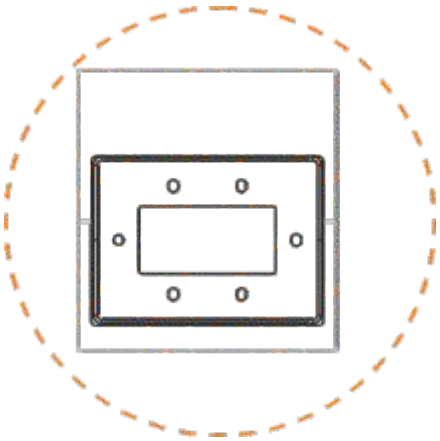
Before connecting of left (fuel: wood) and right (fuel: wood pellets) sides of boiler is necessary to check if is right flue gas chamber lid it properly tight. Remove casing cover lid and additionally tight screws on flue gas chamber lid (like is shown on figure below). Access to right flue gas chamber will be disabled after connection left and right side of the boiler.



CONNECTING LEFT AND RIGHT SIDE OF THE BOILER

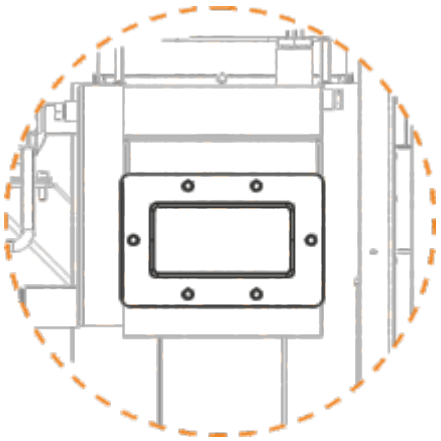


Detail 1



Prepared flange with holes on left part of the boiler. First hole (left) have circle shape, other five holes are slitted (have possibility for height niveling).

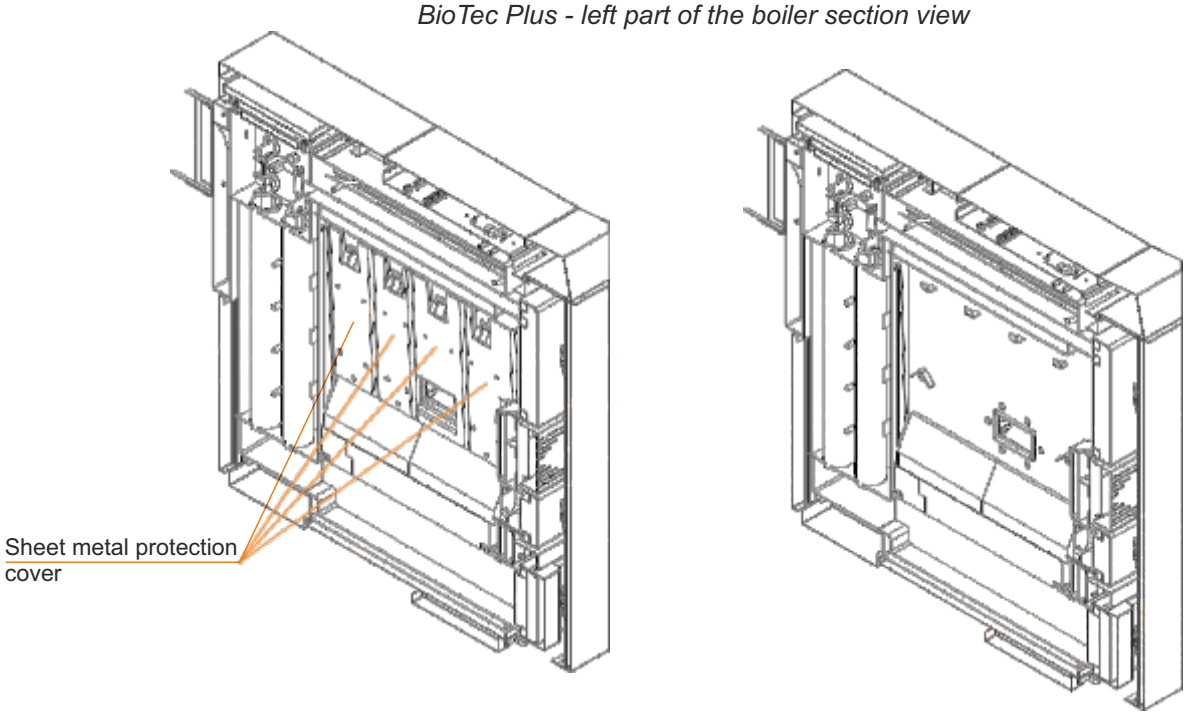
Detail 2



Prepared flange on right side of the boiler. Flange have factory glued gasket and factory mounted six screws M12.

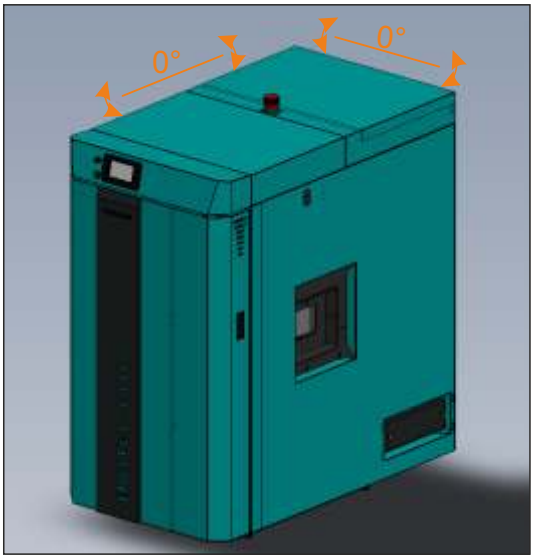
STEP 1:

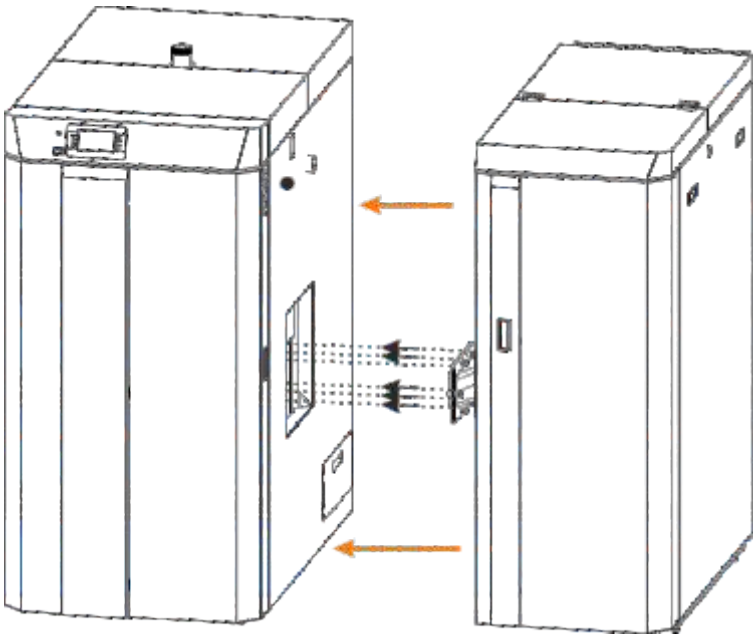
BioTec Plus - left part of the boiler section view



Remove sheet metal protection cover through the upper boiler door.

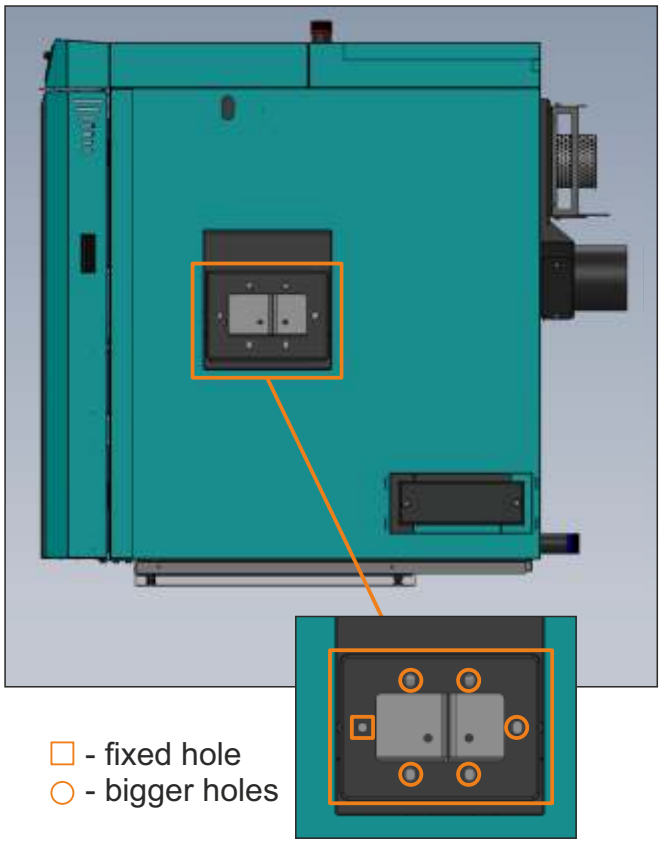
STEP 2:





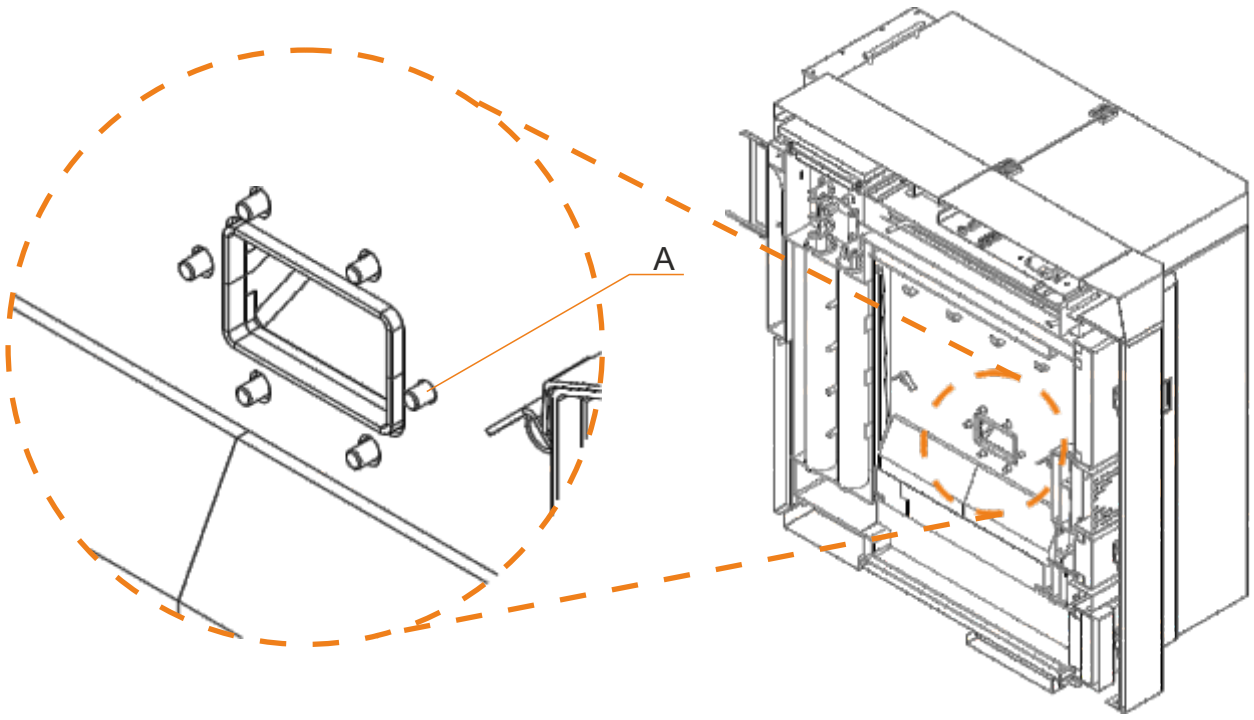
It's necessary draw closer left side of the boiler to right side of the boiler. Screws from flange on right side of the boiler must get into flange holes on left side of the boiler.

Flange has 1 fixed hole and 5 bigger holes
to be able to level righ part of the boiler body.



□ - fixed hole
○ - bigger holes

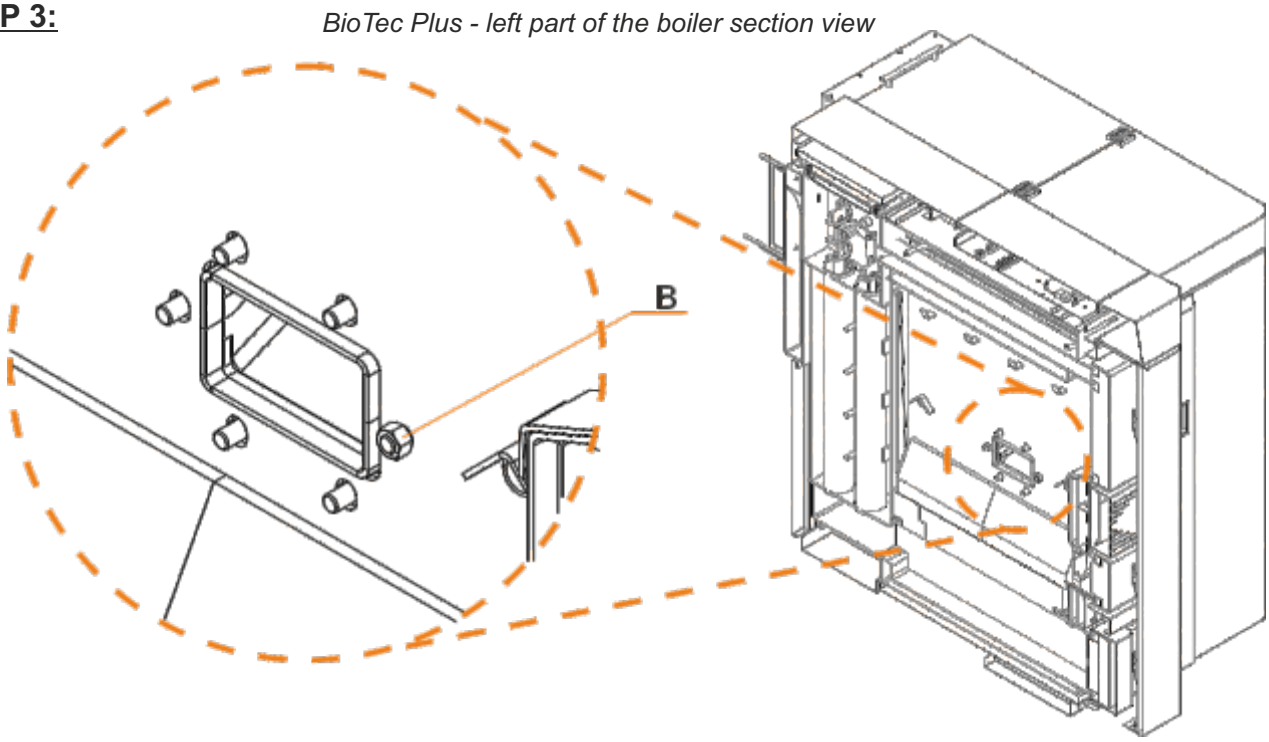
BioTec Plus - left part of the boiler section view



A - hole with circle shape; other holes are slitted for height niveling possibility. Screws from flange on right side of the boiler must get into flange holes on left side of the boiler like is shown on figure below.

STEP 3:

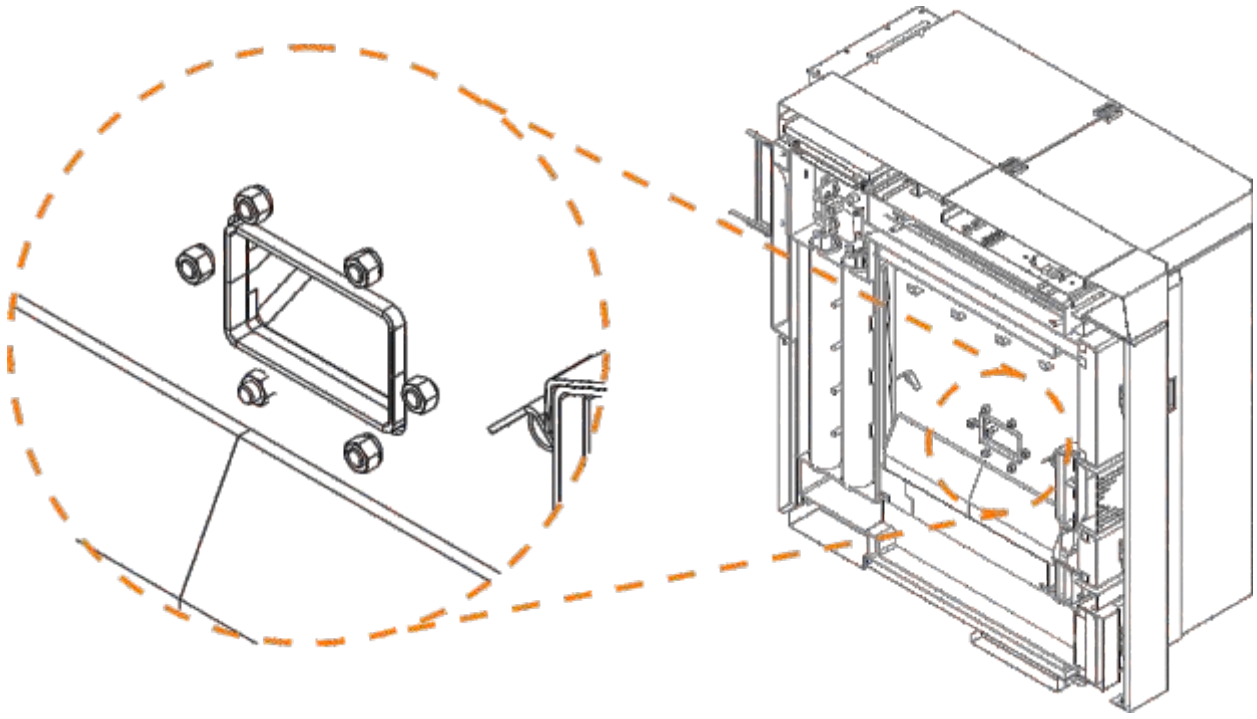
BioTec Plus - left part of the boiler section view



Put washer, toothed washer and nut on screw like shown on figure above (B). Tight nut but not completely tight. Level the body of the right part of the boiler with 4 leveling screws.

STEP 4:

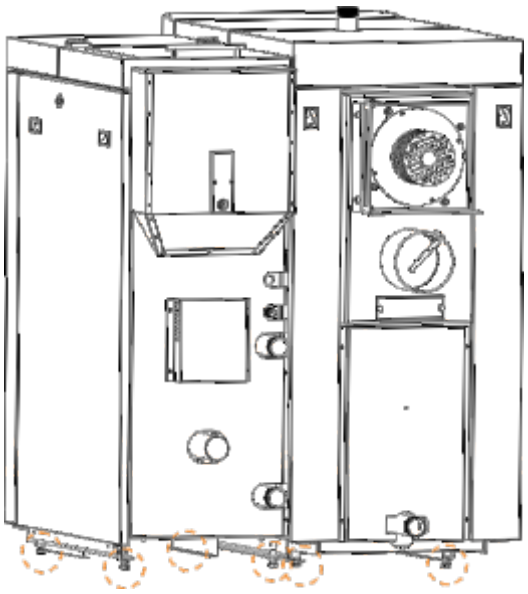
BioTec Plus - left part of the boiler section view



Put washers, toothed washers and nuts on all other screws and start tigth them. If is needed, nivel boiler (holes are slitted for niveling).

Thight hard all six nuts.

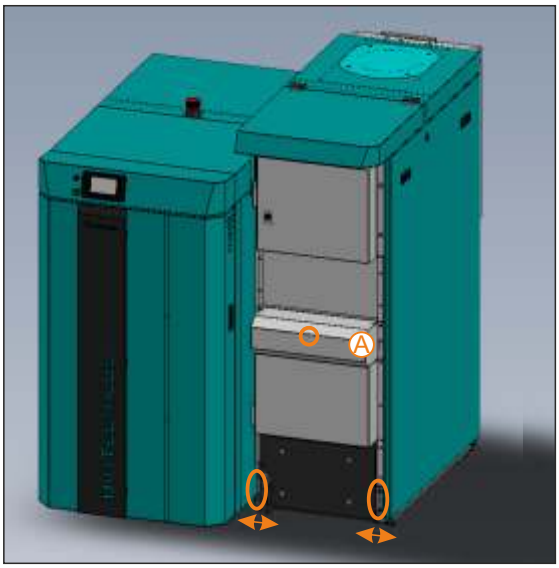
STEP 5:



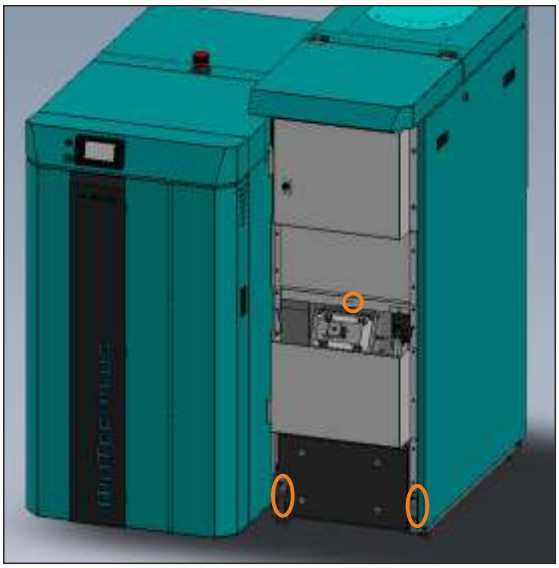
□ - Leveling screw - fixed
○ - Leveling screws - adjustable

Left and right side of the boiler have adjustable foots. Adjust it if is necessary. Boiler foots must touching boiler room floor. Level left part of the boiler (wood) front right screw is fixed and leveling must be done by other 3 adjusting screws.

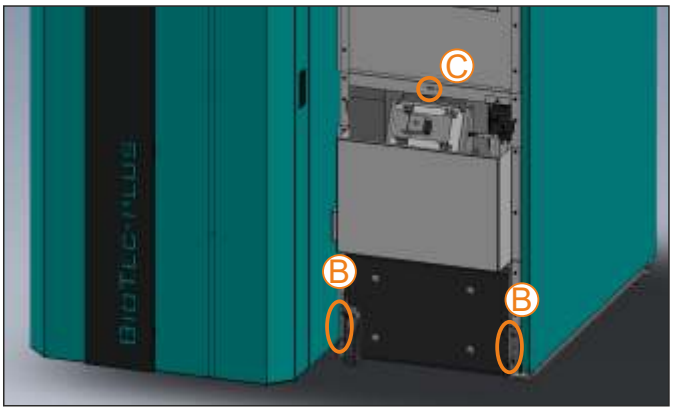
PELLET SIDE COVER ADJUSTMENT - FRONT SIDE



Right boiler part has adjustable cover. Cover is fixed with screws. To be able to align it with left boiler cover, screws must be unscrewed. (note: cover can be adjusted only left-right).



To have access to the middle fixing screw remove el-mag. valve cover (A).

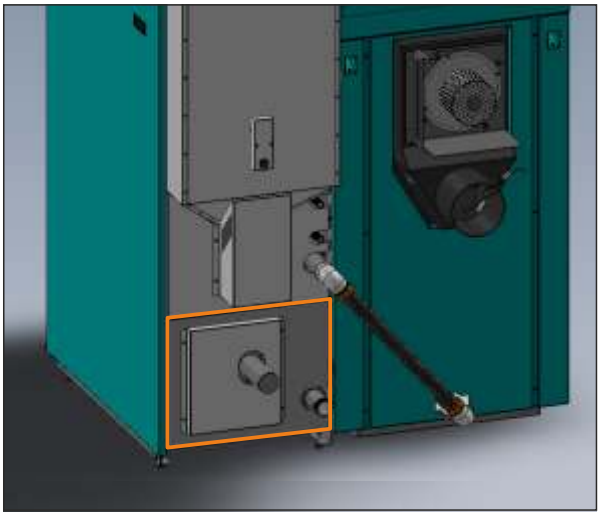


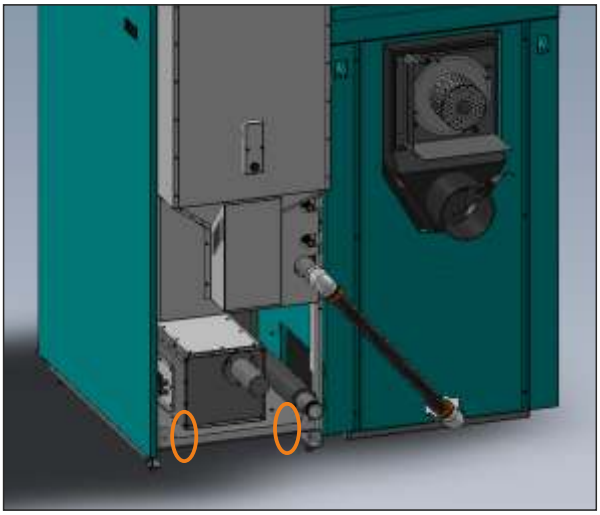
In some cases there are 3 screws on the left and rigt lower adjusting positions (B). Remove the middle screws and unscrew the upper and lower screw (do not remove this 2 screws). Also in some cases there can be 2 screws in the upper adjusting position (C). Remove the screw that is in small hole and unscrew the screw that is in big hole (do not remove screw in big hole)

After adjusting right boiler part cover according to the left boiler part cover, fix it with 4 lower and 1 upper screw.

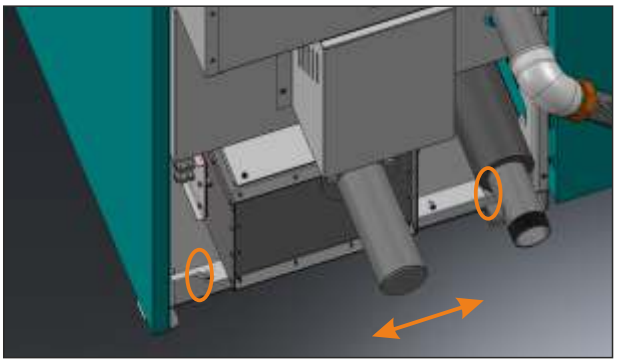
NOTE: on front side, left and right corner porters are separate adjustable.

PELLET SIDE COVER ADJUSTMENT - BACK SIDE



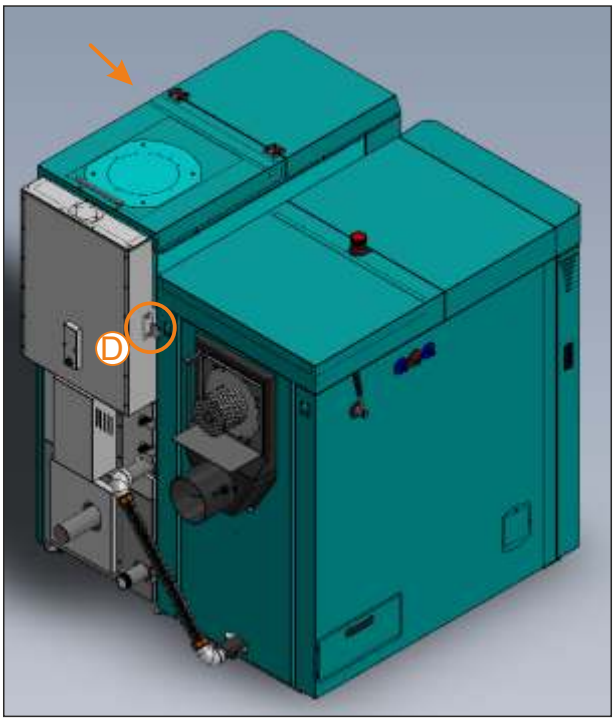


On the back side remove lower cover to have access to the screws for adjusting the back part of the cover.

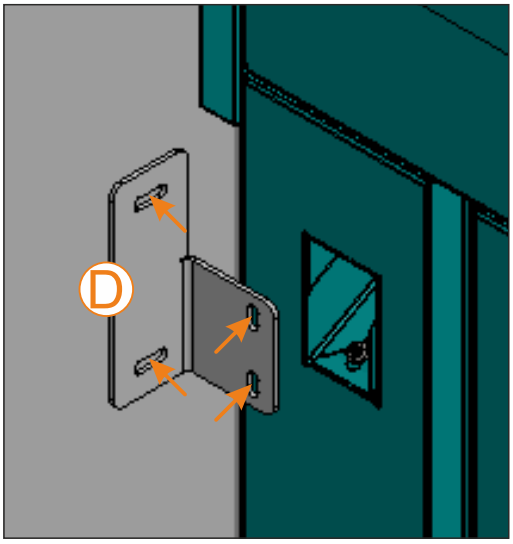


Unscrew 2 M8 screws (do not remove them) to be able to adjust back side of the cover (left-right). After adjusting the cover according to the left boiler part cover, fix it with 2 M8 screws.

NOTE: on the back side, left and right corner porters are connected with lower part and adjusted together.

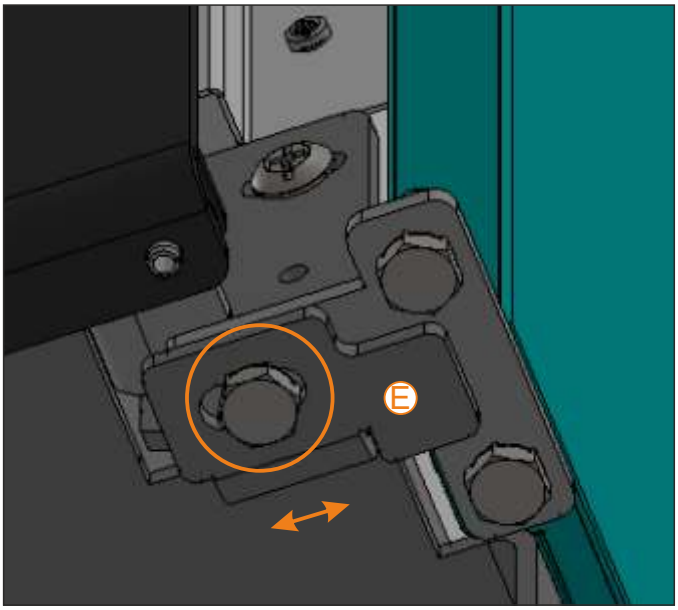


Push the left boiler part cover to the right boiler part cover and fix them together with L-profile part and 4 screws (D).



PELLET SIDE COVER ADJUSTMENT - COVER DOOR

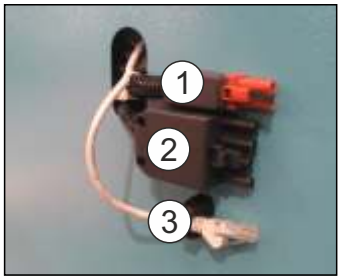
Front cover door of right boiler part can be adjusted with the lower adjusting screw so it is aligned with the rest of the cover.



Unscrew M8 screw (do not remove it) to be able to adjust lower porter of the cover door (left-right). After adjustig, fix it with M8 screw.

STEP 6:

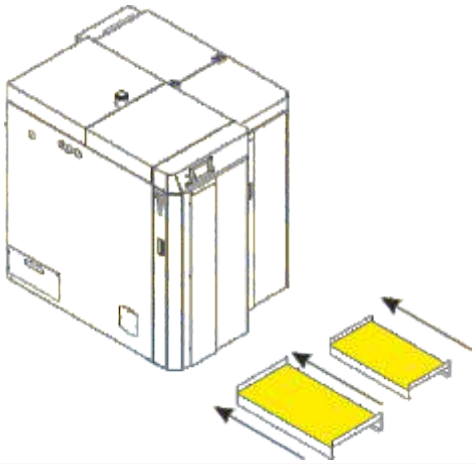
prepared sockets on left side of the boiler (wood)



prepared plugs on right side of the boiler (wood pellets)

On left side of the boiler (wood) are prepared sockets, on right side of the boiler (wood pellets) are prepared plugs. Cables must be connected in right order: 1-1; 2-2; 3-3;

Figure 2.a Base protection with mineral wool

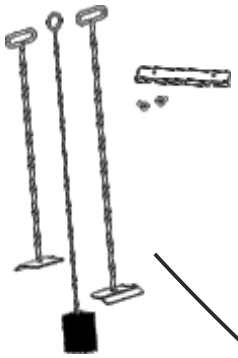


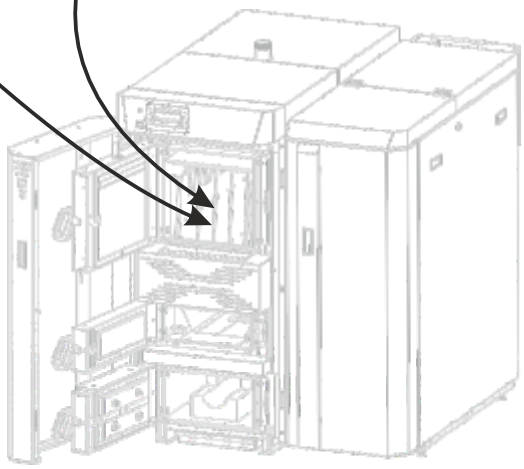
Push base protection under the boiler

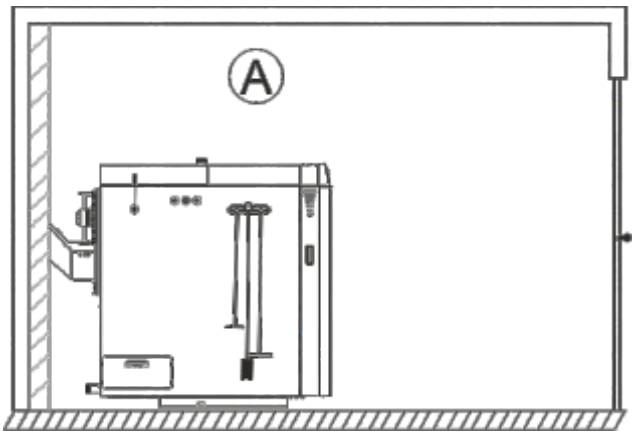
Figure 2.b Delivered parts

Sensor set

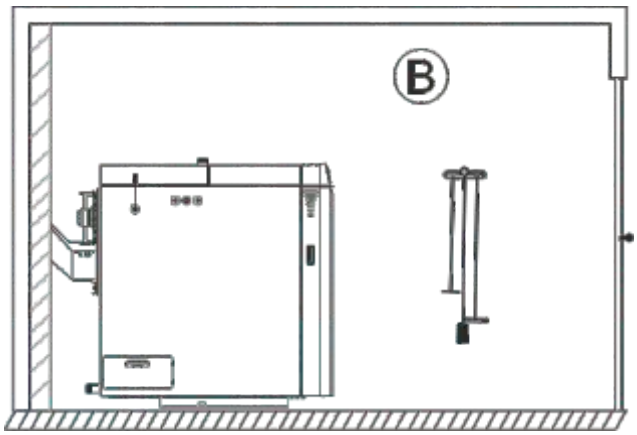
Cleaning set







Position od cleaning set - **on the boiler**.

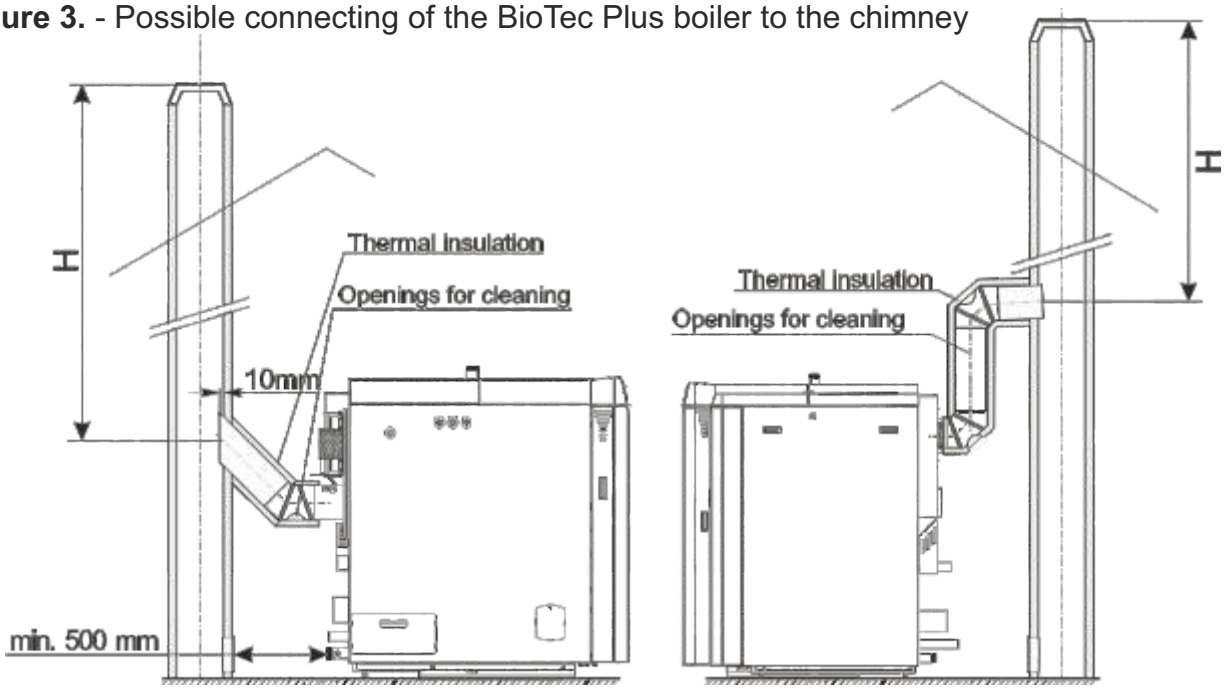


Position od cleaning set - **on the wall**.

4.0. CONNECTION TO THE CHIMNEY

Properly dimensioned and built chimney is the precondition for a safe and reliable operation of the boiler and economic heating. The chimney has to be good insulated, gas-proof and smooth. On the lower part of the chimney, a cleaning door has to be built in. Brick layed chimney has to have 3 layers with an stone wool thermal insulation in the middle. The thickness of the insulation should be 30 mm, if the chimney is situated inside the building, i.e. 50 mm if the chimney is situated outside the building. **Inside chimney diameter dimensions depend on its height and on the boiler thermal output (Figure 5.).** The temperature of the flue gases on chimney exit point should be minimum 30°C higher then the temperature of their condensating point. The choice and the construction of the chimney should be performed by an authorized person. Minimal distance between boiler and the chimney is 500 mm. The flue gas tube has to have an inclination of 30-45° to the chimney (Figure 3.). In order to unable entering of the condensate from the chimney into the boiler, 10 mm of the flue gas tube length has to be inserted deaper inside the chimney. **It is obligatory to insulate the chimney connection tube with a mineral stone wool** of 30-50 mm thickness. All installation works must be made in accordance with valid national and European standards.

Figure 3. - Possible connecting of the BioTec Plus boiler to the chimney



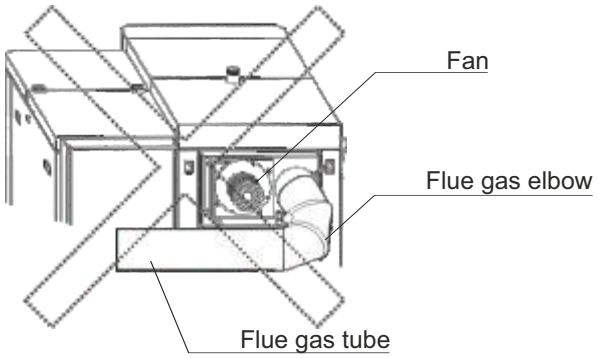
Possible way of connecting to the chimney of the BioTec Plus 25-35 boiler (**recommendation**)
H - Useful chimney height

Possible way of connecting to the chimney of the Bio-Tec Plus boiler (**Only BioTec Plus 45** because of position of the fan)

At connecting a boiler to the chimney, flue gas tubes and elbows must not pass behind the fan since in that case the cleaning and maintenance will not be possible. An example of incorrect position of flue gas tubes and elbows in relation to the fan is presented at the Figure 4.

Figure 4. Incorrect connecting the boiler to the chimney - not possible cleaning of the fan

BioTec Plus 45



BioTec Plus 25 / 35

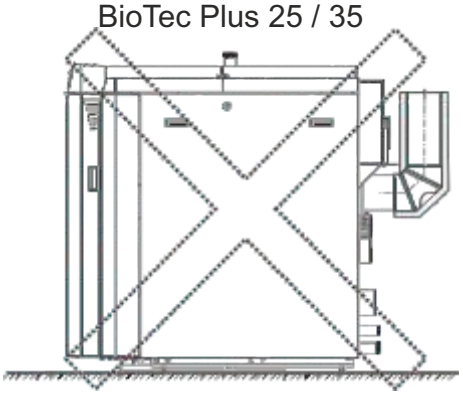
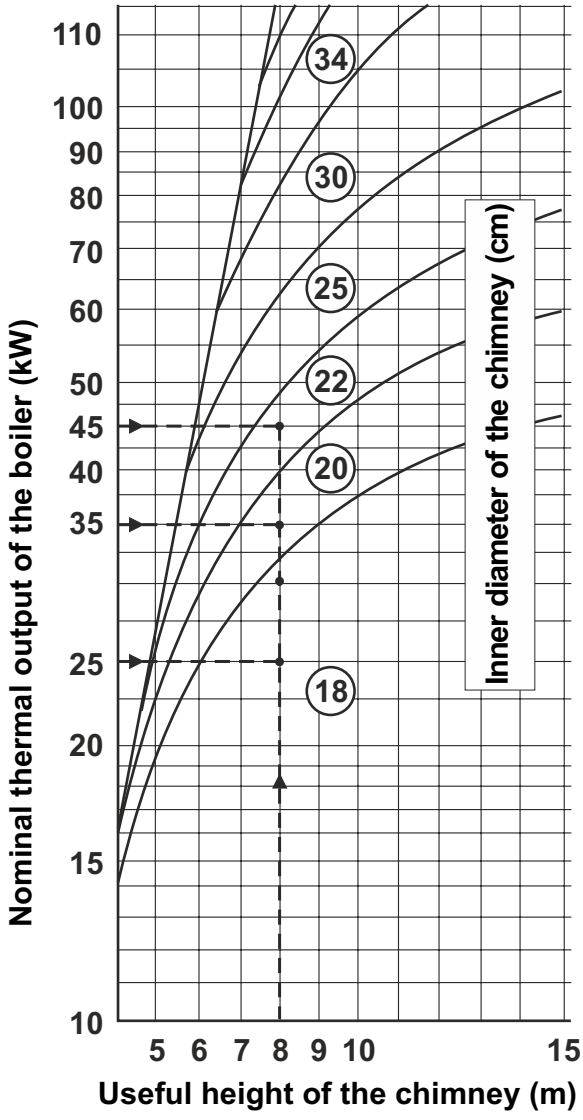


Figure 5. - Dimensioning of the chimney for BioTec Plus boilers



An example of the chimney selection:

- boiler output: 25 kW
- Fuel: wood logs, wood pellets
- required useful chimney height: H=8 m
- required inner chimney diameter: 18 cm

- boiler output: 35 kW
- Fuel: wood logs, wood pellets
- required useful chimney height: H=8 m
- required inner chimney diameter: 20 cm

- boiler output: 45 kW
- Fuel: wood logs, wood pellets
- required useful chimney height: H=8 m
- required inner chimney diameter: 22 cm

Useful chimney height - from flue gas tube connection to the top of chimney
Inner chimney diameter - interior chimney diameter.

4.1. FRESH AIR OPENING

Boiler room **must be equipped with an opening** for supply of fresh air which is dimensioned in accordance with boiler thermal output (minimum opening area according to 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.

Equation for calculate opening area: $A = 6{,}02 \cdot Q$

A - opening area in cm^2
Q - boiler output in kW

5.0. CONNECTION TO THE CENTRAL HEATING SYSTEM

All installation works must be made in accordance with valid national and European standards. Boiler BioTec Plus can be built to closed and open central heating system. In both cases boiler must be fired with wood logs or wood pellets. Installation has to be made in according to technical standards, by a professional who will be responsible for proper boiler operation. The main flow pipe from the boiler to the central heating system must not pass above the top back casing cover (PD), otherwise the removal of the turbulators and cleaning of flue gas tubes is impossible (see Figure 6a. and 6b). 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 minimum distances required for boiler cleaning and maintenance.

Figure 6a. Examples of main flow constructions (good)

PD - Top back casing cover
PL - Main flow

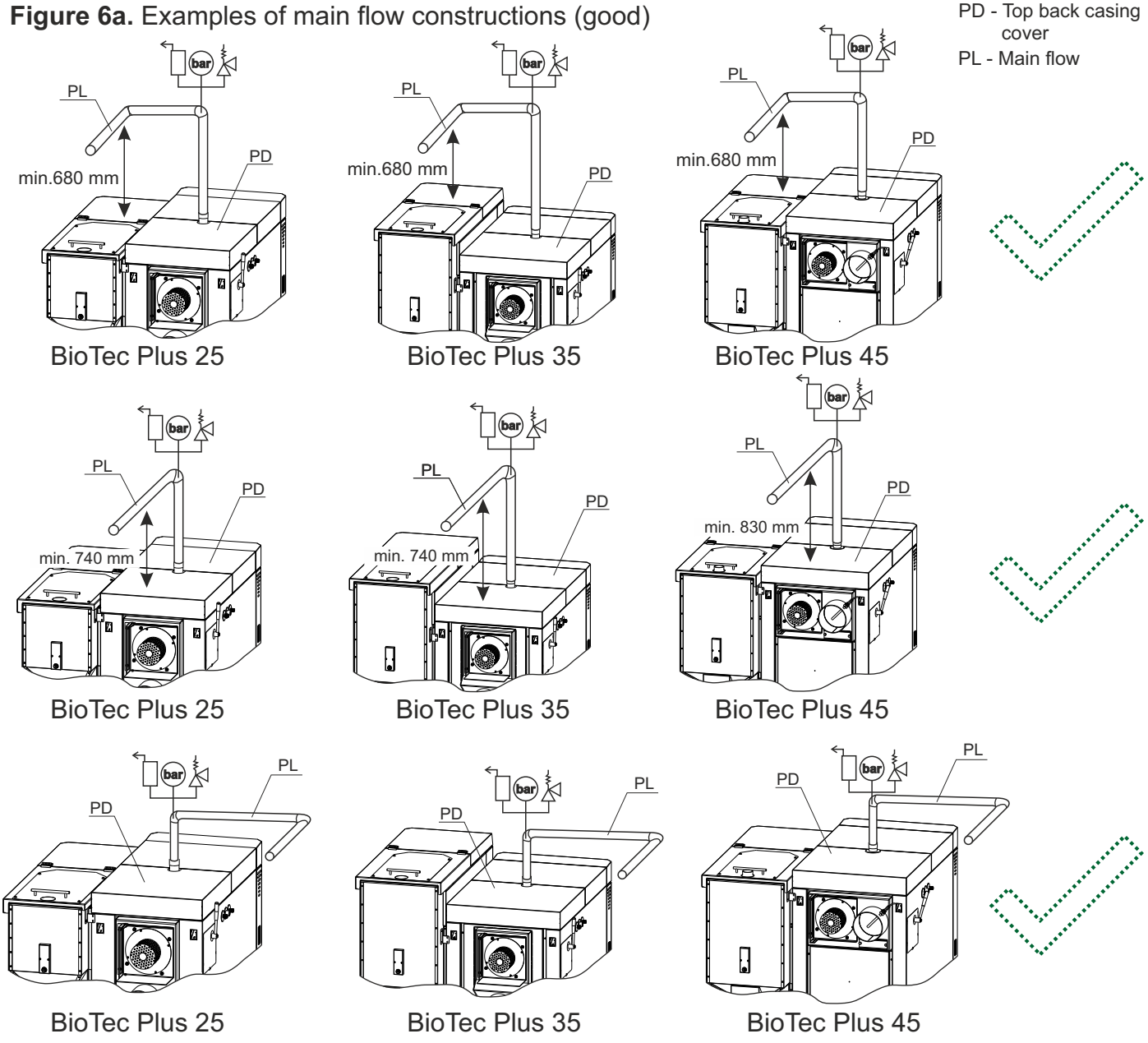
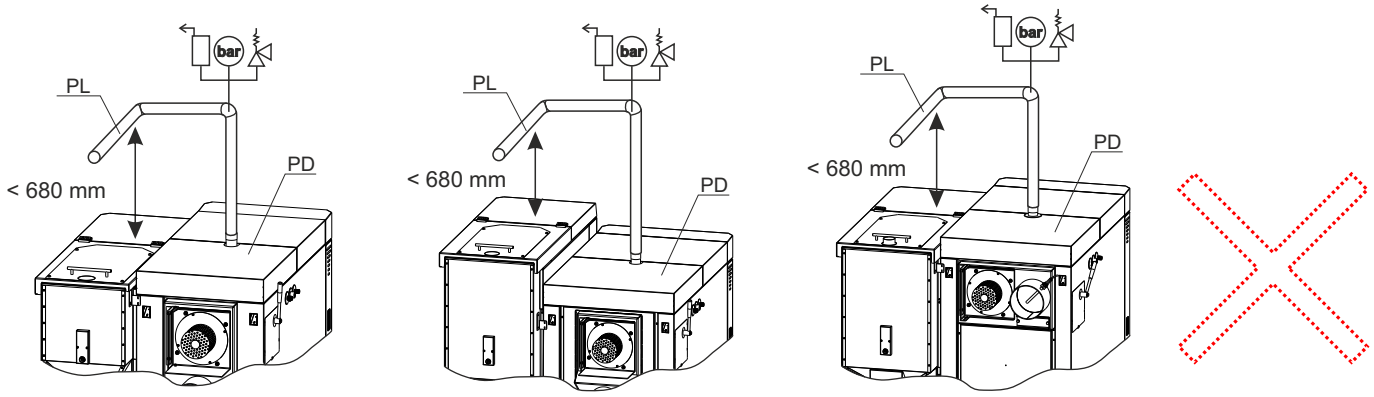
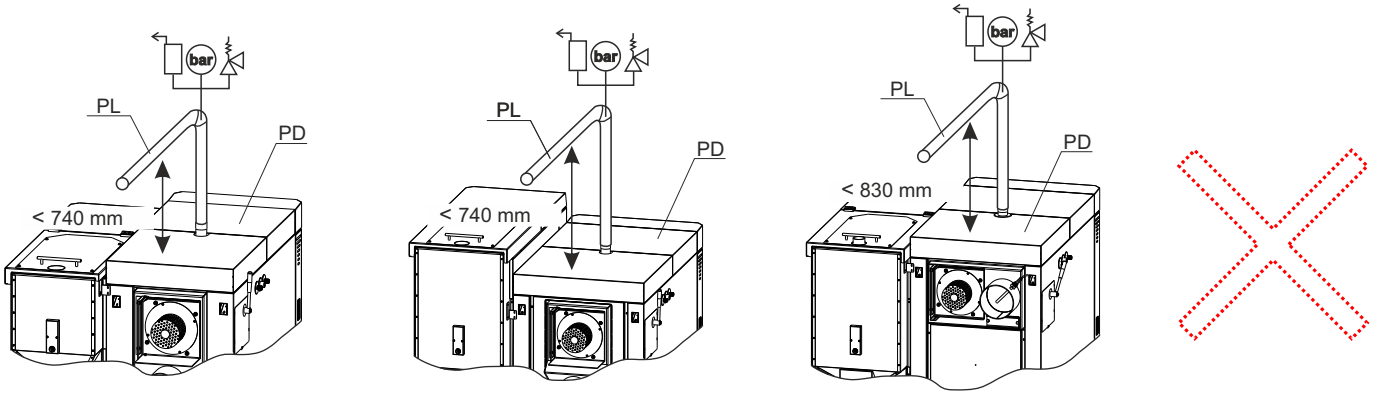


Figure 6b. Examples of main flow constructions (bad)

PD - Top back casing cover
PL - Main flow

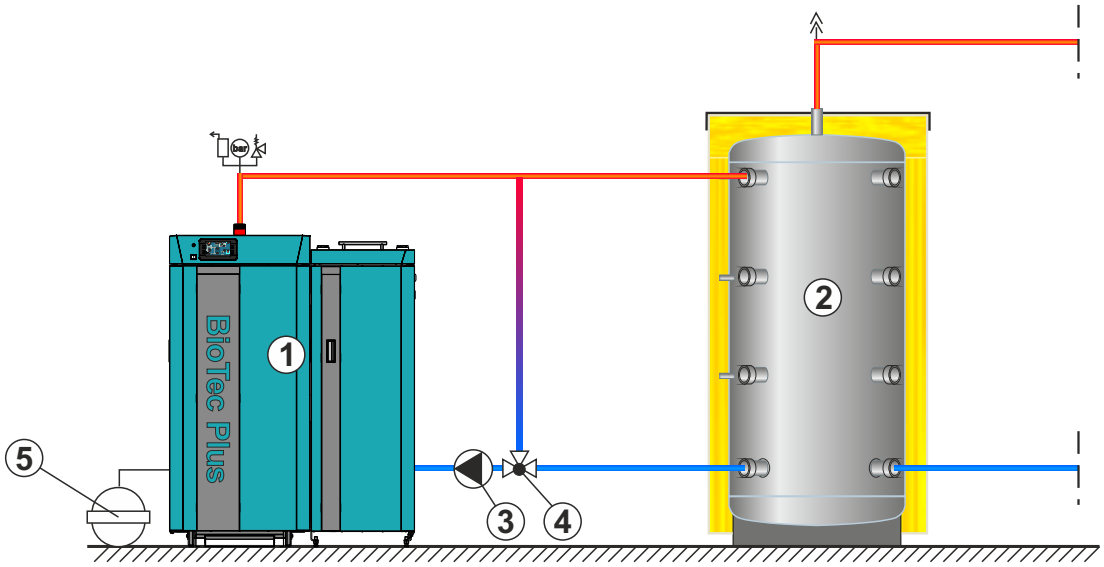


BioTec Plus 25 | BioTec Plus 35 | BioTec Plus 45

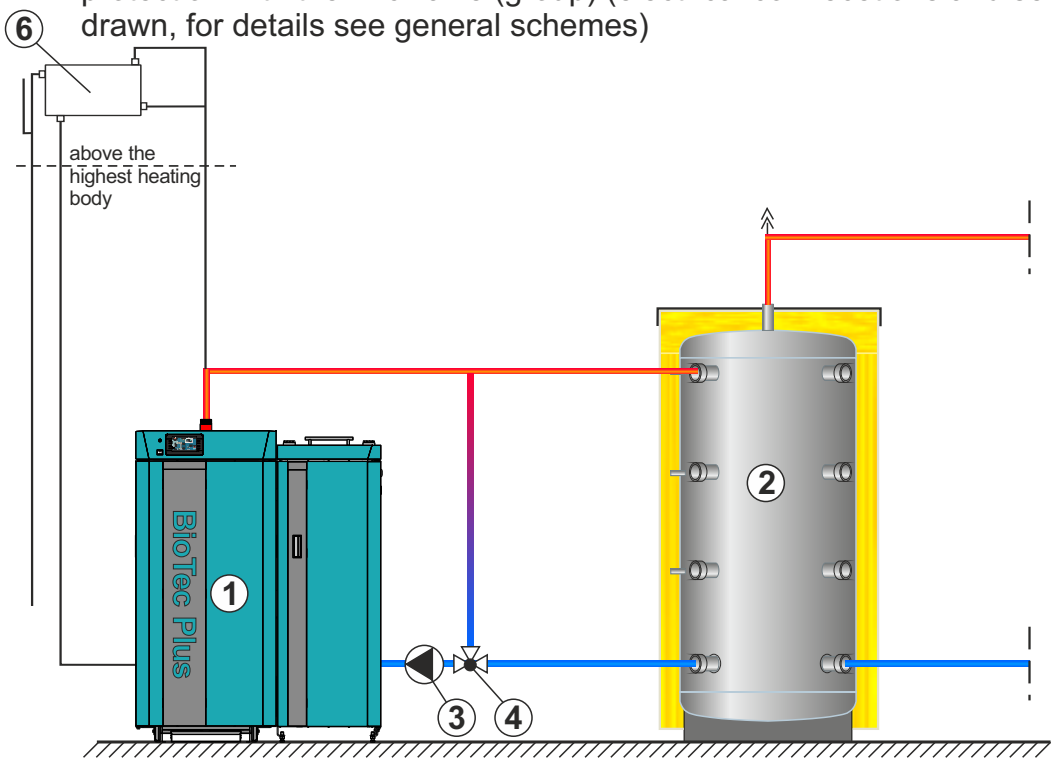


BioTec Plus 25 | BioTec Plus 35 | BioTec Plus 45

Scheme 1a. - Basic scheme for boiler instalation on closed central heating system with return flow protection with thermic valve (group) (electrical connections and sensor are not drawn, for details see general schemes)



Scheme 1b. - Basic scheme for boiler instalation on open central heating system with return flow protection with thermic valve (group) (electrical connecetions and sensors are not drawn, for details see general schemes)



1 - Boiler BioTec Plus

2 - Accumulation (buffer) tank "CAS"

3 - Boiler pump

4 - Return flow protection by 3-way mixing valve with actuator (protection valve) or by 3-way thermic valve (like Esbe LTC, VTC..., 60°C)

5 - Expansion vessel for closed heating systems (approx. 10% of the total volume of installation)

6 - Open expansion vessel for open heating systems (OPC) (approx. 7% of total volume of installation)

5.1. CONNECTION TO THE OPEN CENTRAL HEATING SYSTEM

If the boiler is aimed to be integrated into an open central heating system, one of possible way how to connect the boiler to the system is shown on Scheme 1b. In case of BioTec Plus boilers, the boiler pump obligatory **has to be** connected to the boiler control unit, in order to make turning on and off of the pump depending on the temperature of the water in the boiler, to avoid boiler condensation.
Connection to an open central heating system requires the implementation of an open expansion vessel (OPC) above the level of the highest heating body (radiator). If the expansion vessel is situated inside the non heated room, it has to be insulated. The volume of the open expansion vessel is about 7% of the volume of entire heating installation. The boiler **has** to be connected with one or more CAS water accumulations, depending on its nominal power. It is recommended to connect minimum 50 liters water accumulation to each 1 kW boiler nominal power (i.e. for the 45 kW boiler minimal water accumulation should be 2250 liters) and always check the local regulation about the needed minimum volume. The boiler should not be used without being connected to the water accumulation (buffer) tank with needed min. volume. It must be connected to the CAS water accumulation (buffer) obligatory through an 3-way mixing valve with actuator (protection valve) or 3-way thermic valve (like ESBE VTC 512, VTC 531 (60°C), LTC 261, LTC 271 (60°C)).

5.2. CONNECTION TO THE CLOSED CENTRAL HEATING SYSTEM

In closed heating system (as in example shown in Scheme 1a) it is **obligatory** to build in certified safety valve with opening pressure of 2,5 bar, minimum seat diameter of 15 mm, minimum inlet connection of 1/2", minimum exit connection of 3/4" and a membrane expansion vessel. Safety valve and expansion vessel must be built in accordance with professional rules and any valve must not be located between safety valve and expansion vessel and boiler. The closed heating system must have the installed expansion vessel of larger volume (vessel volume must be approx. 10% of the heating installation volume). In all boiler types the heating pump **must be** connected to boiler control unit so that the heating pump switching on and off would depend on water temperature in the boiler.
The boiler has to be connected with one or more CAS water accumulations, depending of its power. It is recommended to connect 50 liters water accumulation to each 1 kW boiler power (i.e. for the 45 kW boiler minimal water accumulation should be 2250 liters). The functioning of boiler control unit is shown in Technical manual "Digital boiler control unit BioTec Plus". The boiler should not be used without being connected to the water accumulation. It must be connected to the CAS water accumulation obligatory through an 3-way mixing valve with actuator (protection valve) or 3-way thermic valve (like ESBE VTC 512, VTC 531 (60°C), LTC 261, LTC 271 (60°C)).

5.2.1. BOILER THERMAL PROTECTION

According to European EN standards, boiler thermal protection **must be** installed in **closed** heating system. Boiler is factory prepared for installation of thermal protection. Heat exchanger is factory installed on left side of the boiler (wood), and thermal safety valve (7) should be installed according to Scheme 2. On right side of the boiler (wood pellet) is also factory installed heat exchanger with factory installed thermal safety valve. In case of any damage of boiler installed in the closed heating system due to its overheating, and boiler or system are not equipped with any thermal protection at all, or do not have properly installed thermal protection, guarantee will not be applied.

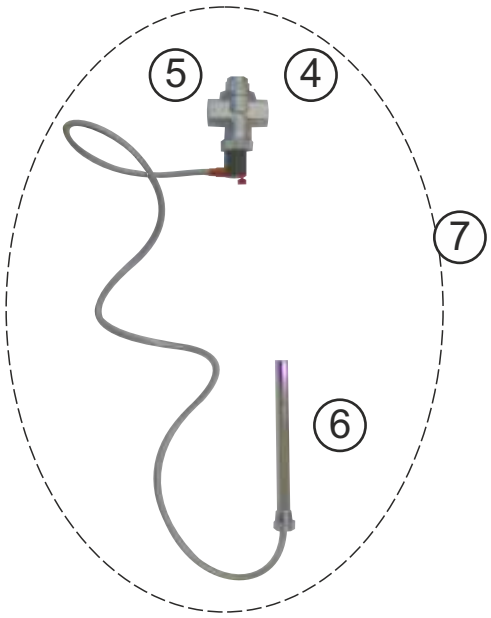
IMPORTANT:
Thermal protection must be connected to the water supply installation of the premises supplied from the public water supply line and not from hydrophor. Namely, in case of failure of power supply, boiler could be overheated, and then hydrophor is not able to ensure required water supply.

THERMAL PROTECTION:
Left side of the boiler (wood):
Thermal protection for left side of the boiler BioTec Plus consists of a **heat exchanger** which is factory built in boiler, and **thermal safety valve (7)** (such as CALEFFI 543 513) (see Scheme 2).
Thermal valve (**7**) is installed into prepared connector (male thread 3/4") in the upper part of left lateral side of the boiler casing.
Right side of the boiler (wood pellets):
Thermal protection for right side of the boiler BioTec Plus consists of a **heat exchanger** which is factory built in boiler, and **thermal safety valve (11)** which is also factory built in boiler.

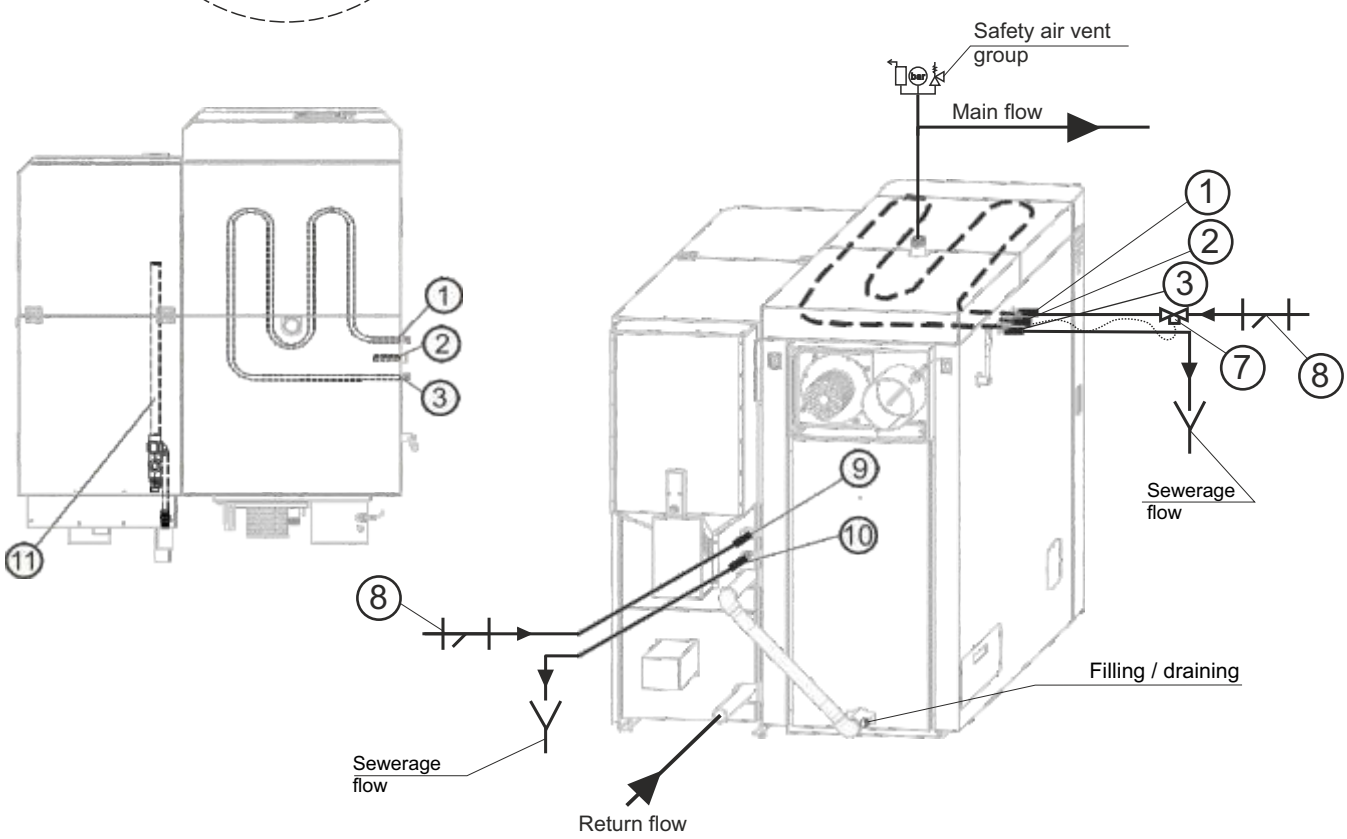
INSTALLATION (according to Scheme 1.):
Left side of the boiler (wood):
- screw the thermal safety valve sensor **(6)** (outer thread 1/2") into the sleeve joint **(2)** (inner thread 1/2").
- fix the connection **(4)** (inner thread 3/4") of the thermal safety valve to the city plumbing cold water inlet and the connection **(5)** (inner thread 3/4") to the connection point of the heat exchanger **(1)** (outer thread 1/2") - the arrow shows the direction.
- fix the tube connected to the sewage outlet at the connecting point **(3)** (outer thread 1/2").

Right side of the boiler (wood pellets):
- fix the connection **(9)** (inner thread 3/4") to the city plumbing cold water inlet.
- fix the tube connected to the sewage outlet at the connecting point **(10)** (outer thread 1/2").

Scheme 2. - Thermal protection in an closed heating system



① - Heat exchanger connection (to thermal safety valve)
(left side of the boiler - wood)
② - Connection for the thermal safety valve sensor
(left side of the boiler - wood)
③ - Heat exchanger connection (to the sewerage)
(left side of the boiler - wood)
④ - Thermal safety valve connection
(cold water inlet)
⑤ - Thermal exchanger connection (to the boiler)
(to the boiler)
⑥ - Thermal safety valve-sensor
⑦ - Thermal safety valve
⑧ - Dirt filter (recommended)
⑨ - Heat exchanger connection
(right side of the boiler - wood pellet)
⑩ - Heat exchanger connection (to the sewerage)
(right side of the boiler - wood pellets)
⑪ - Factory inbuilt thermal safety valve
(right side of the boiler - wood pellets)



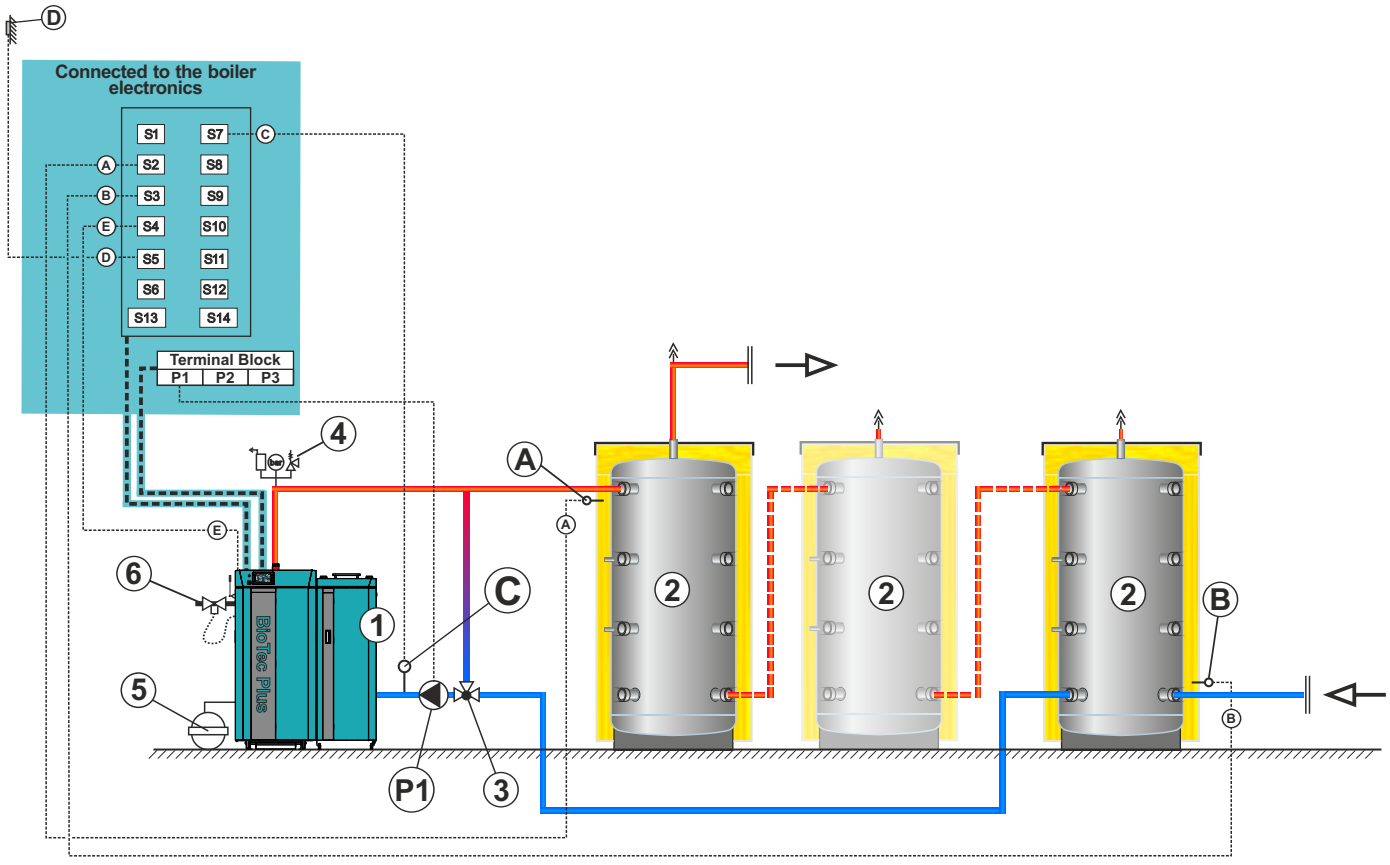
5.3. GENERAL CONNECTION SCHEMES

Each heating scheme with BioTec Plus has option of installing up to 4 pcs CM2K modules (additional heating circuits management, DHW preparation and recirculation).

Scheme 3. - General scheme of closed central heating system with 2 or more accumulation (buffer) tanks.

1 - Boiler "BioTec Plus"
*2 - "CAS" accumulation (buffer) tank
*3 - Return flow protection (3-way mixing valve with actuator (protection valve) or 3-way thermic valve (60°C), VTC 512, VTC 531, LTC 261, LTC 271)
*4 - Safety airvent unit
*5 - Expansion vessel for closed systems (min. 10% of the total volume of installation)
*6 - Thermal safety valve

*P1 - Pump P1 (boiler pump)
A - Accumulation (buffer) tank sensor (upper)
B - Accumulation (buffer) tank sensor (lower)
**C - Return flow temperature sensor
D - Outdoor temperature sensor
E - Flue gas sensor



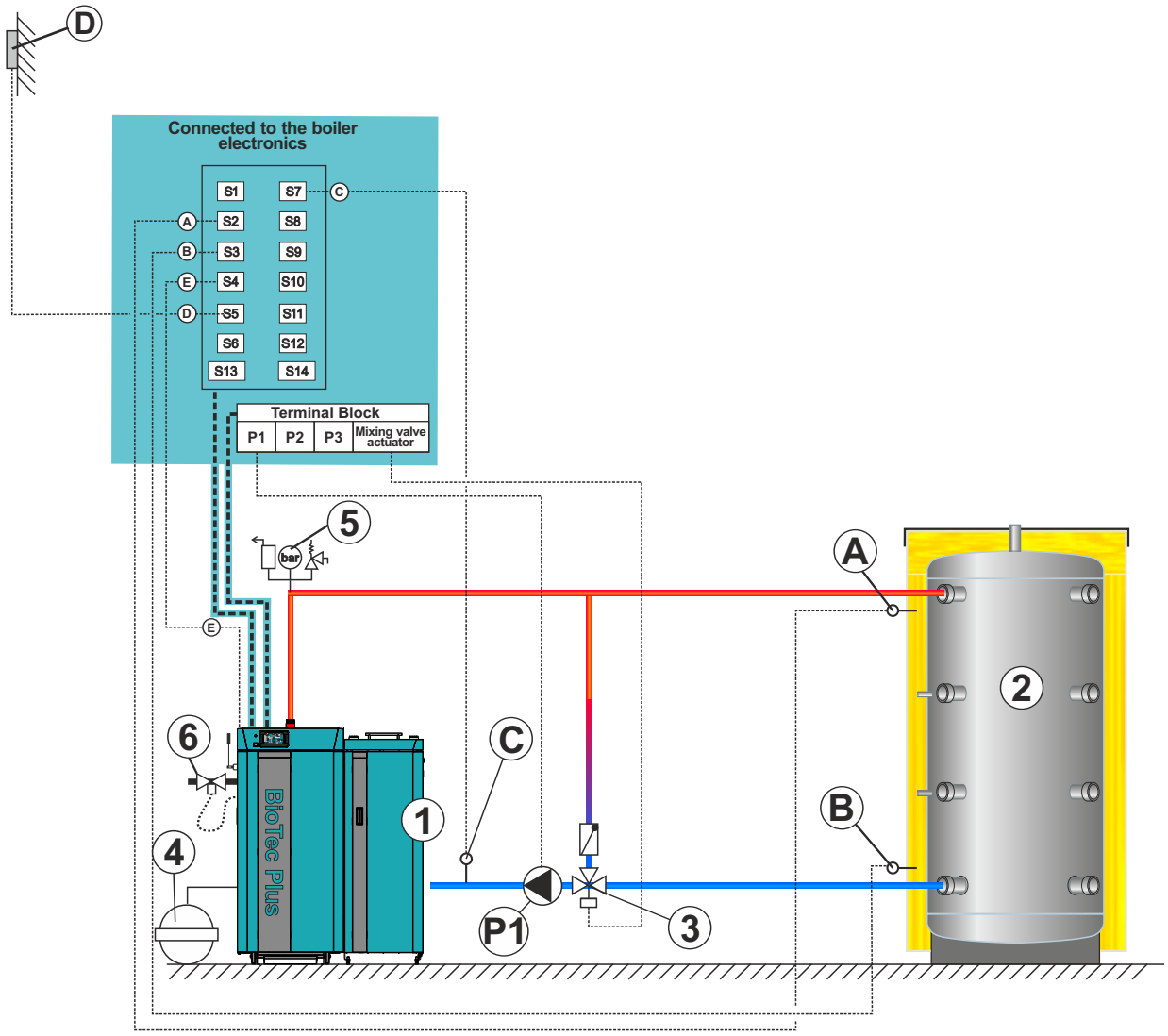
*Not included in delivery of boiler BioTec Plus (need additional order)
**Can be used only if it's on position „3" installed actuator

**All general schemes hereafter will be shown with one accumulation (buffer) tank, but they can be performed with two or more accumulation (buffer) tanks (buffer tanks).
Pay attention to electrical and sensors connections on general schemes!**

Scheme 4. - General scheme of closed central heating system with 1 accumulation (buffer) tank, boiler return flow protection with 3 - way mixing valve with electric actuator.

1 - Boiler "BioTec Plus".
*2 - "CAS" accumulation (buffer) tank
3 - Return flow protection (3-way mixing valve with actuator (protection valve)
*4 - Expansion vessel for closed systems (min. 10% of the total volume of installation)
*5 - Safety airvent unit
*6 - Thermal safety valve

*P1 - Pump P1 (boiler pump)
A - Accumulation (buffer) tank sensor (upper)
B - Accumulation (buffer) tank sensor (lower)
C - Return flow temperature sensor
D - Outdoor temperature sensor
E - Flue gas temperature sensor



* Not included in delivery of boiler BioTec Plus (need additional order)

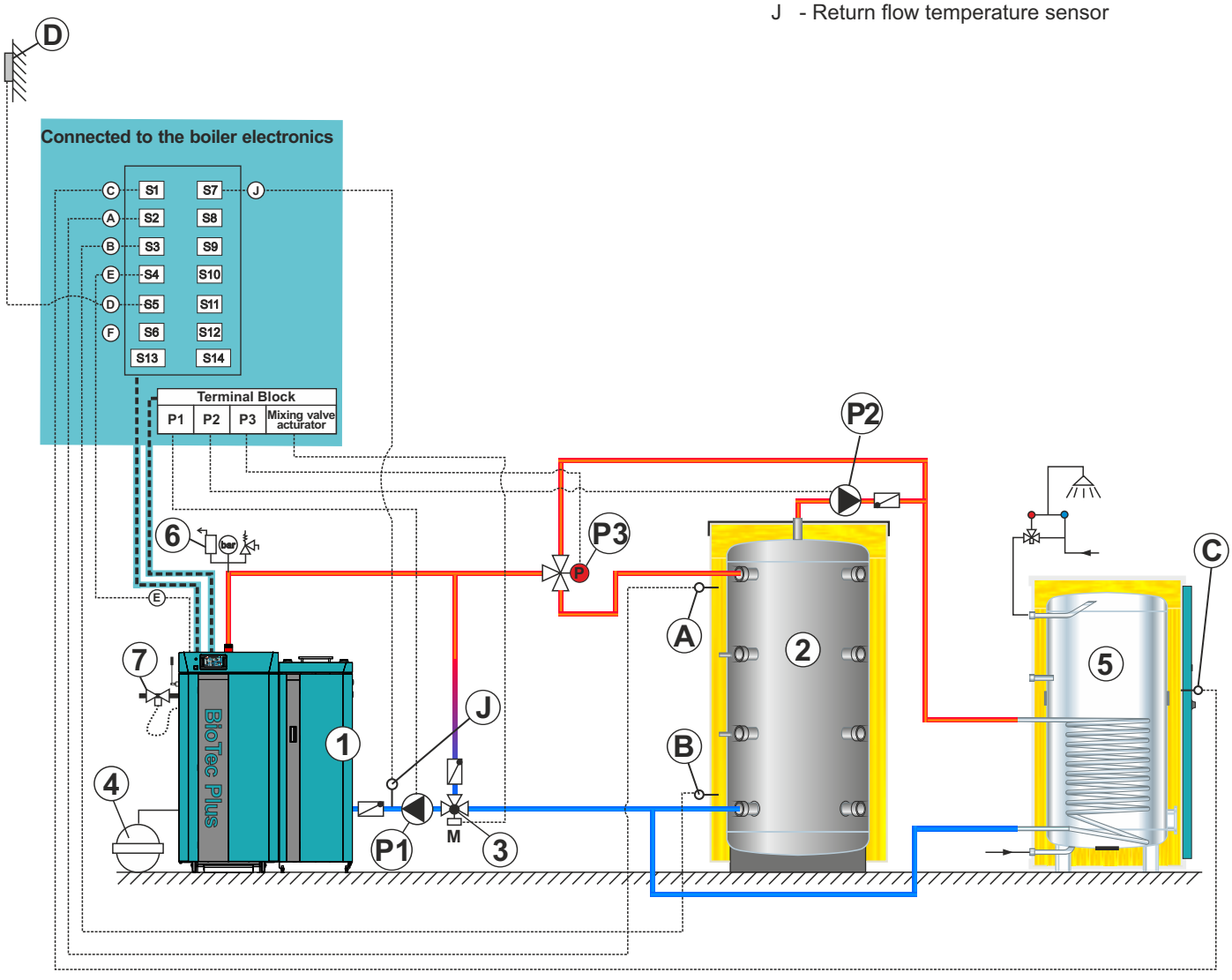
NOTE:
- According to this scheme is possible to preform version for open central heating system (see point 5.1, Connection to the open central heating system).
- Return flow protection (3) can be also performed by 3-way thermic valve ((60°C), VTC 512, VTC 531, LTC 261, LTC 271).

Scheme 5.- General scheme of closed central heating system with 1 accumulation (buffer) tank and DHW preparation in front/behind accumulation (buffer) tank.

IMPORTANT! This way of connecting DHW tank is necessary if in some part of the year we only want to use pellets for heat DHW tank.

1 - Boiler "BioTec Plus".
*2 - "CAS" accumulation (buffer) tank
*3 - Return flow protection (3-way mixing valve with actuator
*4 - Expansion vessel for closed systems (min. 10% of the total volume of installation)
*5 - Sanitary water tank (SKB-Digi/LKB-Digi/TB/STB)
*6 - Safety airvent unit
*7 - Thermal safety valve

*P1 - Pump P1 (boiler pump)
*P2 - Pump P2 (DHW pump)
*P3 - 3-way diverter valve P3
A - Accumulation (buffer) tank sensor (upper)
B - Accumulation (buffer) sensor (lower)
C - DHW sensor (domestic hot water)
D - Outdoor temperature sensor
E - Flue gas temperature sensor
F - Main flow sensor
J - Return flow temperature sensor



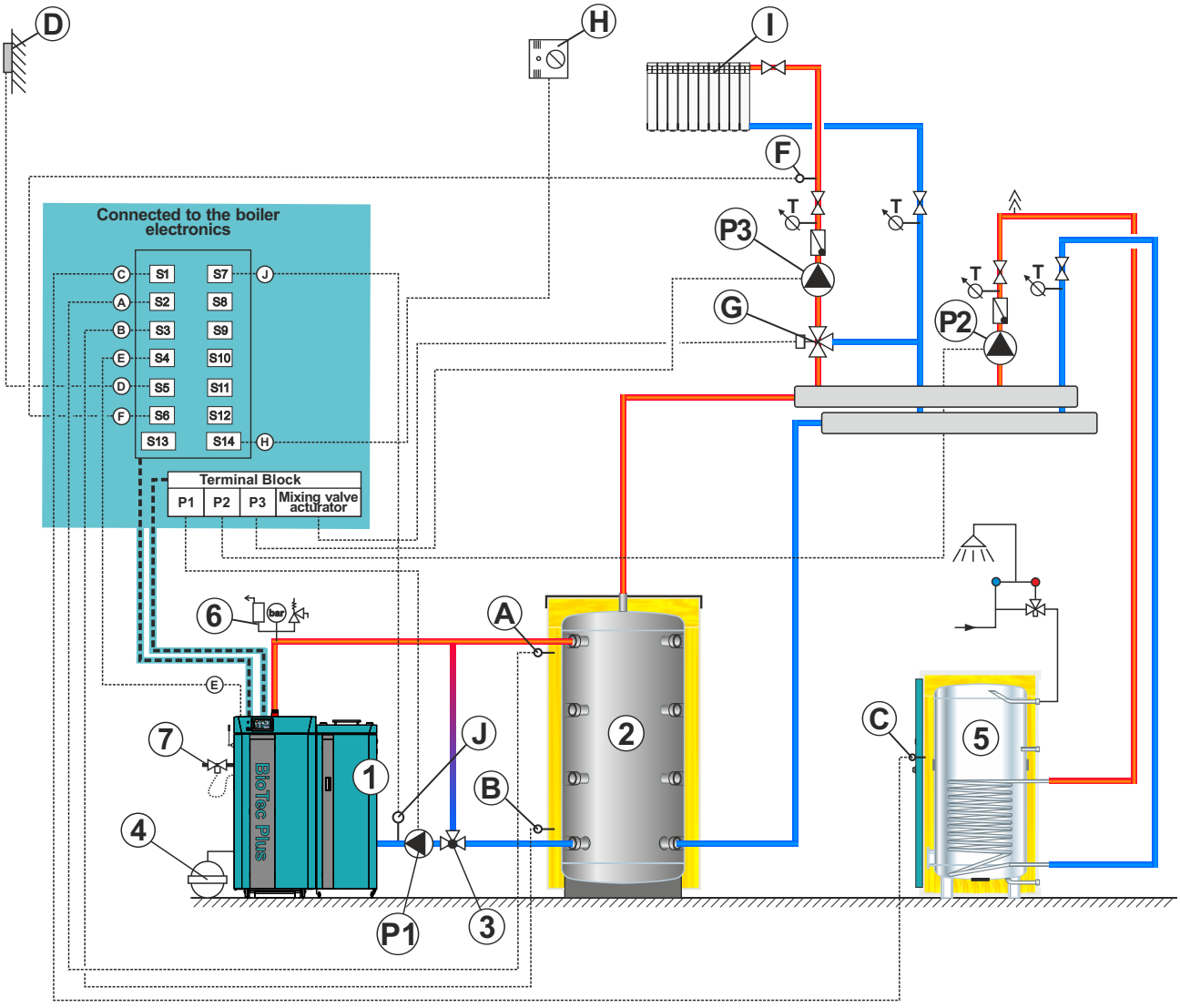
* Not included in delivery of boiler BioTec Plus (need additional order)

NOTE:
- According to this scheme is possible to perform version for open central heating system (see point 5.1, Connection to the open central heating system).

Scheme 6. - General scheme of closed central heating system with 1 accumulation (buffer) tank, heating system behind accumulation (buffer) tank, 1 heating circuit with 3-way mixing valve with actuator (or without actuator), and DHW preparation.

1 - Boiler "BioTec Plus".
*2 - "CAS" accumulation (buffer) tank
*3 - Return flow protection (3-way mixing valve with actuator (protection valve) or 3-way thermic valve (60°C), VTC 512, VTC 531, LTC 261, LTC 271)
*4 - Expansion vessel for closed systems (min. 10% of the total volume of installation)
*5 - Sanitary water tank (SKB-Digi/LKB-Digi/TB/STB)
*6 - Safety airvent unit
*7 - Thermal safety valve

*P1 - Pump P1 (boiler pump)
*P2 - Pump P2 (DHW pump)
*P3 - Pump P3 (heating pump)
A - Accumulation (buffer) tank sensor (upper)
B - Accumulation (buffer) tank sensor (lower)
C - DHW sensor (domestic hot water)
D - Outdoor temperature sensor
E - Flue gas temperature sensor
F - Main flow temperature sensor
*G - 3-way mixing valve with actuator or manual 3-way mixing valve
**H - Room corrector (CSK)
*I - Heating circuit
***J - Return flow temperature sensor



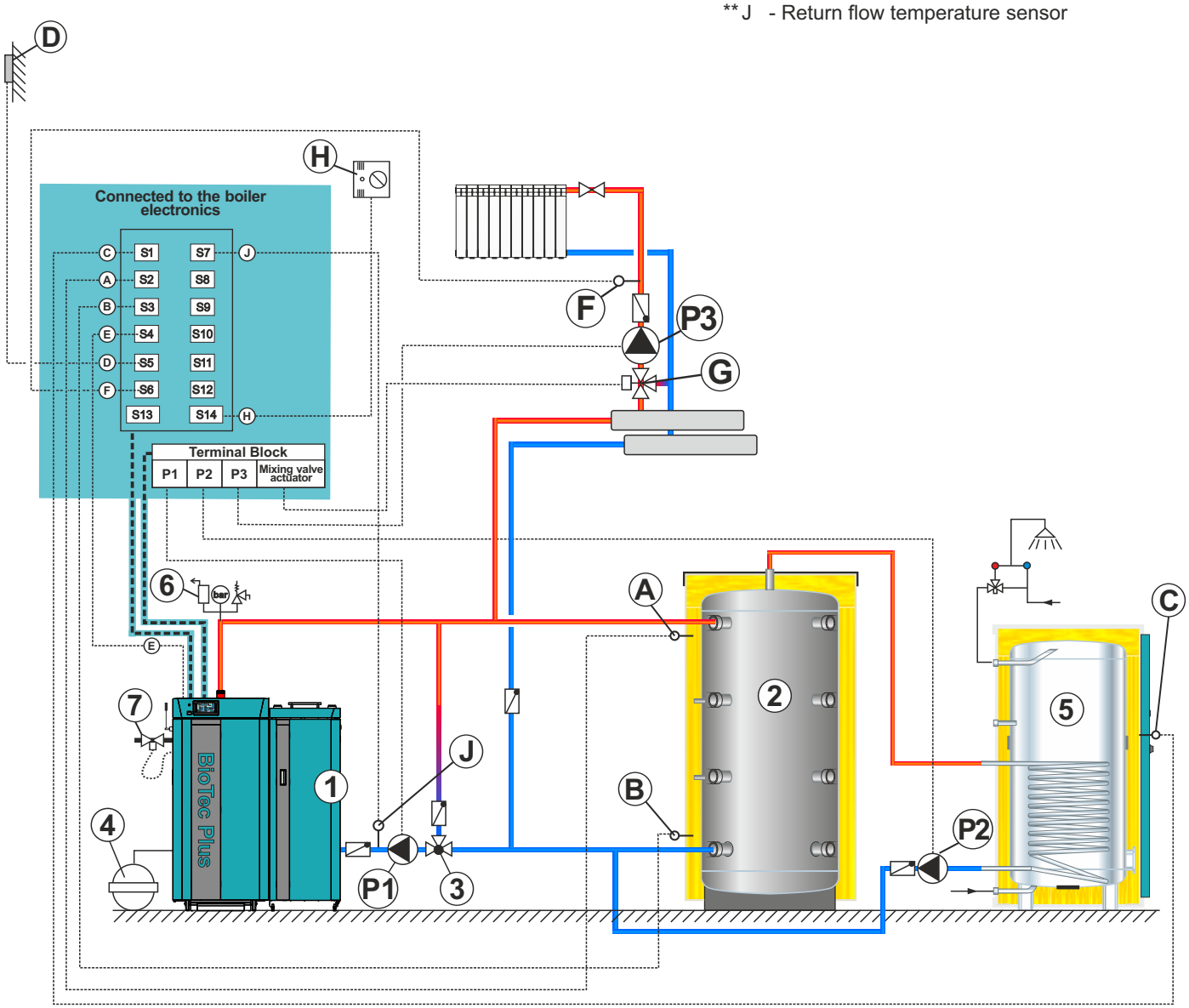
* Not included in delivery of boiler BioTec Plus (need additional order)
** Can be used only if it's on position „G" installed actuator
*** Can be used only if it's on position „3" installed actuator

NOTE:
- According to this scheme is possible to preform version for open central heating system (see point 5.1, Connection to the open central heating system).
- Actuator can be installed only on position „G" or position „3" and noway on any other positions.

Scheme 7. - General scheme of closed central heating system with 1 accumulation (buffer) tank, heating system in front of accumulation (buffer) tank, 1 heating circuit with 3-way mixing valve with actuator, room corrector, and DHW preparing.

1 - Boiler "BioTec Plus".
*2 - "CAS" accumulation (buffer) tank
*3 - Return flow protection
*4 - Expansion vessel for closed systems (min. 10% of the total volume of installation)
*5 - Sanitary water tank (SKB-Digi/LKB-Digi/TB/STB)
*6 - Safety airvent unit
*7 - Thermal safety valve

*P1 - Pump P1 (boiler pump)
*P2 - Pump P2 (DHW pump)
*P3 - Pump P3 (heating pump)
A - Accumulation (buffer) tank sensor (upper)
B - Accumulation (buffer) tank sensor (lower)
C - DHW sensor (domestic hot water)
D - Outdoor temperature sensor
E - Flue gas temperature sensor
F - Main flow temperature sensor
*G - 3-way mixing valve with actuator
*H - Room corrector (CSK)
I - Heating circuit
**J - Return flow temperature sensor



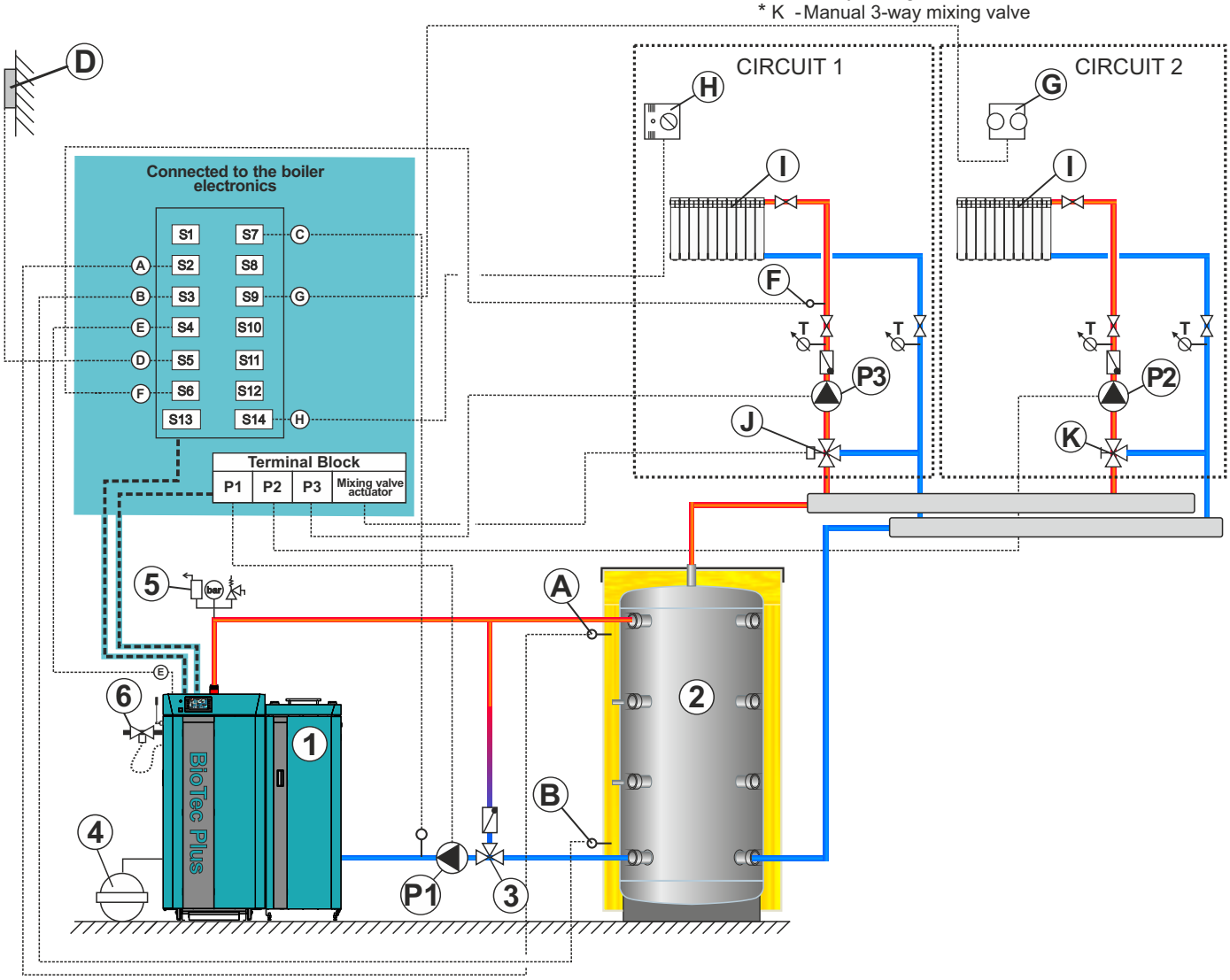
* Not included in delivery of boiler BioTec Plus (need additional order)
** Can be used only if it's on position „3" installed actuator

NOTE:
According to this scheme is possible to preform version for open central heating system (see point 5.1, Connection to the open central heating system).

Scheme 8. - General scheme of closed central heating system with 1 accumulation (buffer) tank, heating system behind accumulation (buffer) tank, 2 heating circuit with 3-way mixing valve (one with actuator, other manually operated).

1 - Boiler "BioTec Plus".
*2 - "CAS" accumulation (buffer) tank
*3 - Return flow protection (3-way mixing valve with actuator (protection valve) or 3-way thermic valve (60°C), VTC 512, VTC 531, LTC 261, LTC 271)
*4 - Expansion vessel for closed systems (min. 10% of the total volume of installation)
*5 - Safety airvent unit
*6 - Thermal safety valve

*P1 - Pump P1 (boiler pump)
*P2 - Pump P2 (heating pump circuit 2)
*P3 - Pump P3 (heating pump circuit 1)
A - Accumulation (buffer) tank sensor (upper)
B - Accumulation (buffer) tank sensor (lower)
***C - Return flow temperature sensor
D - Outdoor temperature sensor
E - Flue gas temperature sensor
*F - Main flow temperature sensor
**G - Room thermostat
H - Room corrector (CSK)
* I - Heating circuit
* J - 3-way mixing valve with actuator or manual 3-way mixing valve
* K - Manual 3-way mixing valve



* Not included in delivery of boiler BioTec Plus (need additional order)
** Can be used only if it's on position „J" installed actuator
*** Can be used only if it's on position „3" installed actuator

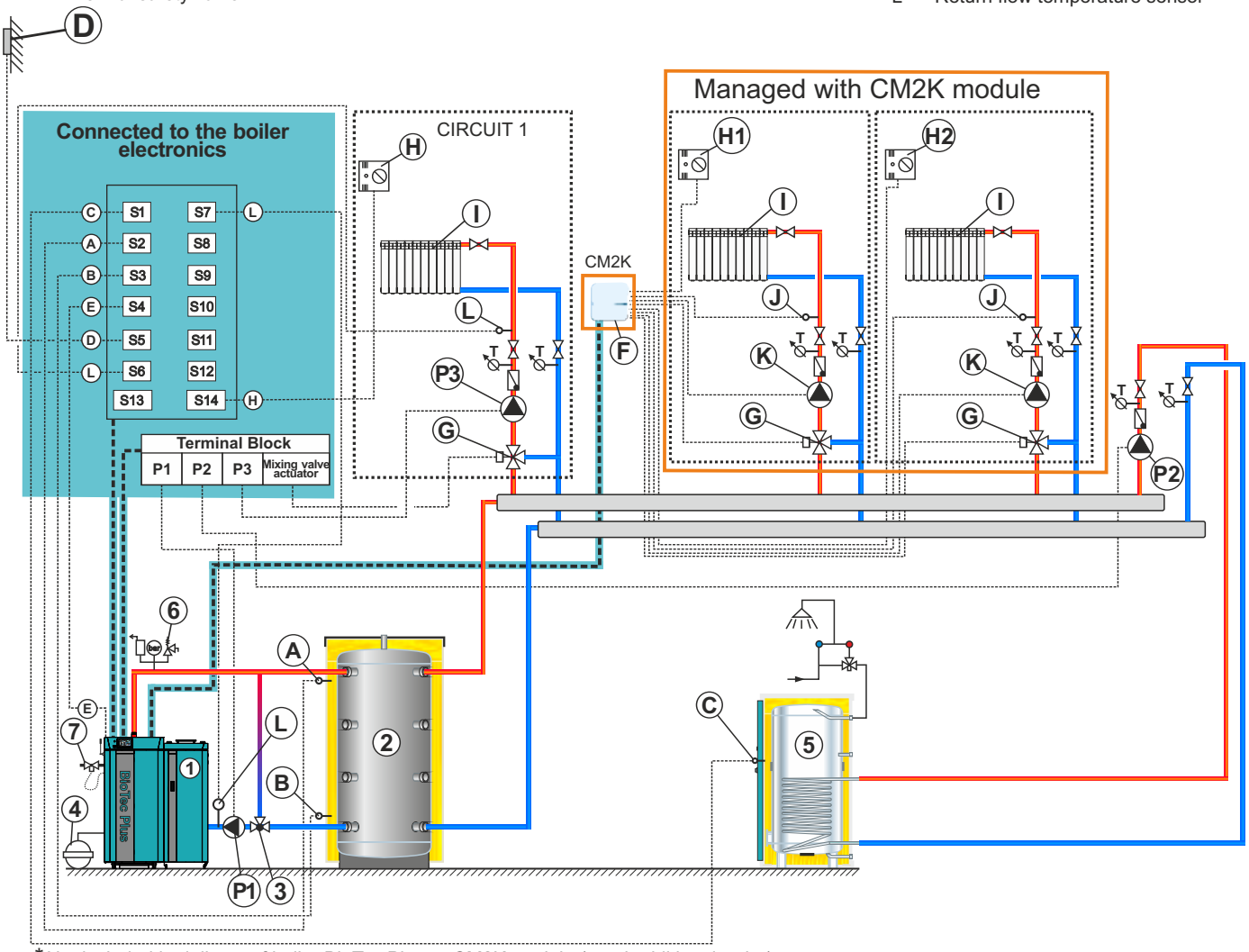
NOTE:
- According to this scheme is possible to preform version with heating system in front accumulation (buffer) tank.
- According to this scheme is possible to preform version for open central heating system (see point 5.1, Connection to the open central heating system).
- Actuator can be installed only on position „J" or position „3" and noway on any other positions.

Scheme 9. - General scheme of closed central heating system with 1 accumulation (buffer) tank, heating system behind accumulation (buffer) tank, 3 heating circuit with 3-way mixing valve and DHW preparing.

1 - Boiler "BioTec Plus".
*2 - "CAS" accumulation (buffer) tank
*3 - Return flow protection (3-way mixing valve with actuator (protection valve) or 3-way thermic valve (60°C), VTC 512, VTC 531, LTC 261, LTC 271)
*4 - Expansion vessel for closed systems (min. 10% of the total volume of installation)
*5 - Sanitary water tank (SKB-Digi/LKB-Digi/TB/STB)
*6 - Safety airvent unit
*7 - Thermal safety valve

*P1 - Pump P1 (boiler pump)
*P2 - Pump P2 (DHW pump)
*P3 - Pump P3 (heating pump circuit 1)
A - Accumulation (buffer) tank sensor (upper)
B - Accumulation (buffer) tank sensor (lower)
C - DHW sensor (domestic hot water)
D - Outdoor temperature sensor
E - Flue gas temperature sensor
L - Main flow temperature sensor
***H - Room corrector 1 (CSK)

**F - CM2K module (can be expanded to max. 4 units connected in series)
*G - 3-way mixing valve with actuator or manual 3-way mixing valve
*H1 - Room corrector 2 (CSK)
*H2 - Room corrector 3 (CSK)
*I - Heating circuit
J - Main flow temperature sensor in circuit CM2K. (must be** installed with 3-way mixing valve with actuator)
*K - Heating pump (managed by CM2K)
****L - Return flow temperature sensor



*Not included in delivery of boiler BioTec Plus or CM2K module (need additional order)
**Included in basic delivery of CM2K module
*** Can be used only if it's on position „G" installed actuator
**** Can be used only if it's on position „3" installed actuator

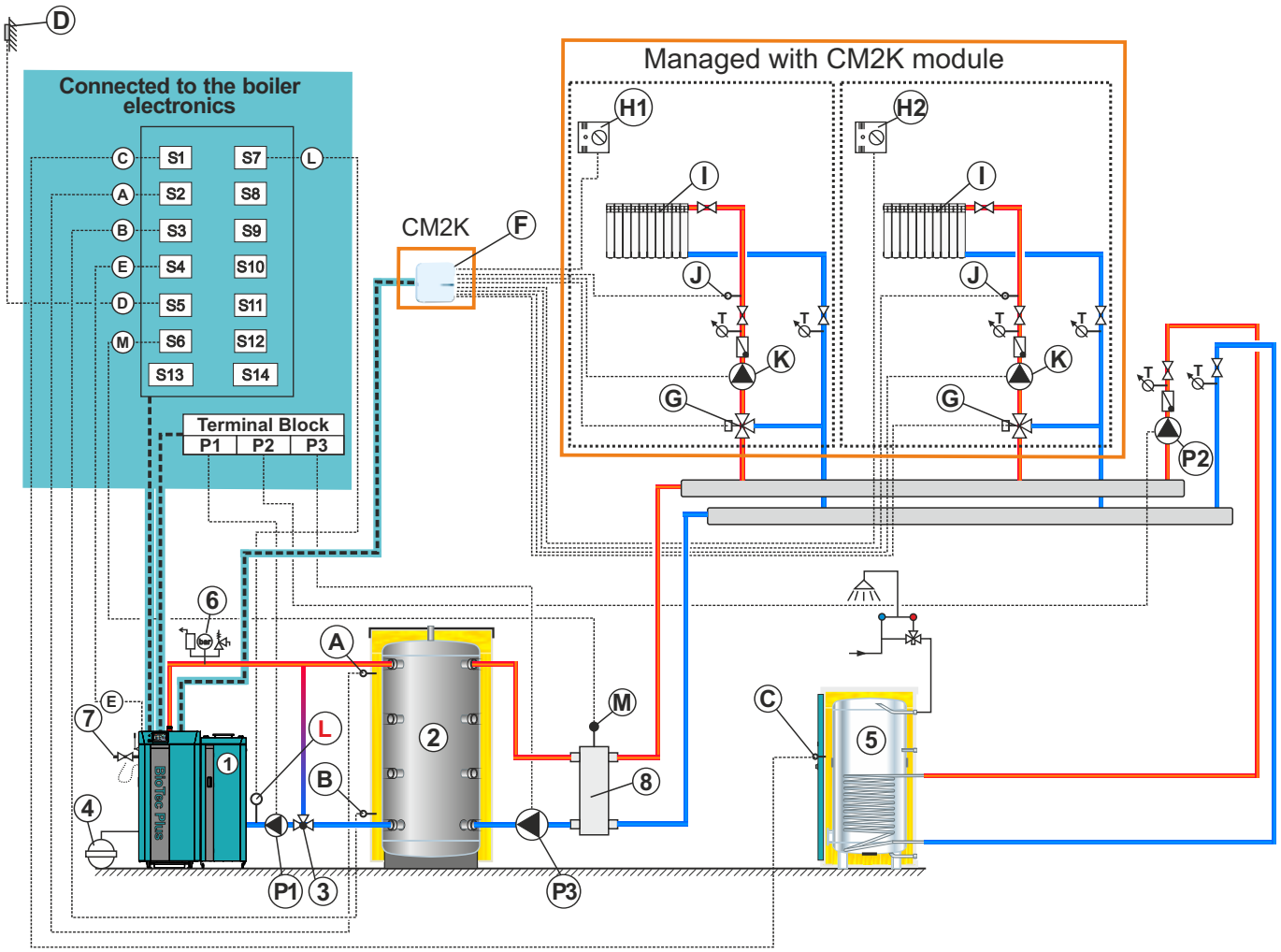
NOTE:
- According to this scheme is possible to preform version for open central heating system (see point 5.1, Connection to the open central heating system).
- It's possible to expand system of heating circuit lead by CM2K module with installing additional CM2K modules (max. 3 pcs) in serial connection.
- Actuator can be installed only on position „G" or position „3" and noway on any other positions.

Scheme 10. - General scheme of closed central heating system with 1 accumulation (buffer) tank, hydraulic crossover behind accumulation (buffer) tank, 2 heating circuits with 3-way mixing valve with actuator managed by CM2K module, DHW preparing.

1 - Boiler "BioTec Plus".
*2 - "CAS" accumulation (buffer) tank
*3 - Return flow protection (3-way mixing valve with actuator (protection valve) or 3-way thermic valve (60°C), VTC 512, VTC 531, LTC 261, LTC 271)
*4 - Expansion vessel for closed systems (min. 10% of the total volume of installation)
*5 - Sanitary water tank (SKB-Digi/LKB-Digi/TB/STB)
*6 - Safety airvent unit
*7 - Thermal safety valve
*8 - Hydraulic crossover

*P1 - Pump P1 (boiler pump)
*P2 - Pump P2 (DHW pump)
*P3 - Pump P3 (hydraulic crossover pump)
A - Accumulation (buffer) tank sensor (upper)
B - Accumulation (buffer) tank sensor (lower)
C - DHW sensor (domestic hot water)
D - Outdoor temperature sensor
E - Flue gas temperature sensor
M - Hydraulic crossover sensor (delivered as flow temperature sensor)

**F - CM2K module (can be expanded to max. 4 units connected in series)
*G - 3-way mixing valve with actuator or manual 3-way mixing valve
H1 - Room corrector 1 (CSK) (1x room corrector CSK included in basic boiler delivery)
*H2 - Room corrector 2 (CSK)
*I - Heating circuit
J - Main flow temperature sensor in circuit CM2K (must be** installed with 3-way mixing valve with actuator)
*K - Heating pump (managed by CM2K)
***L - Return flow temperature sensor



*Not included in delivery of boiler BioTec Plus or CM2Kmodule (need additional order)
**Included in basic delivery of CM2K module
***Can be used only if it's on position „3" installed actuator

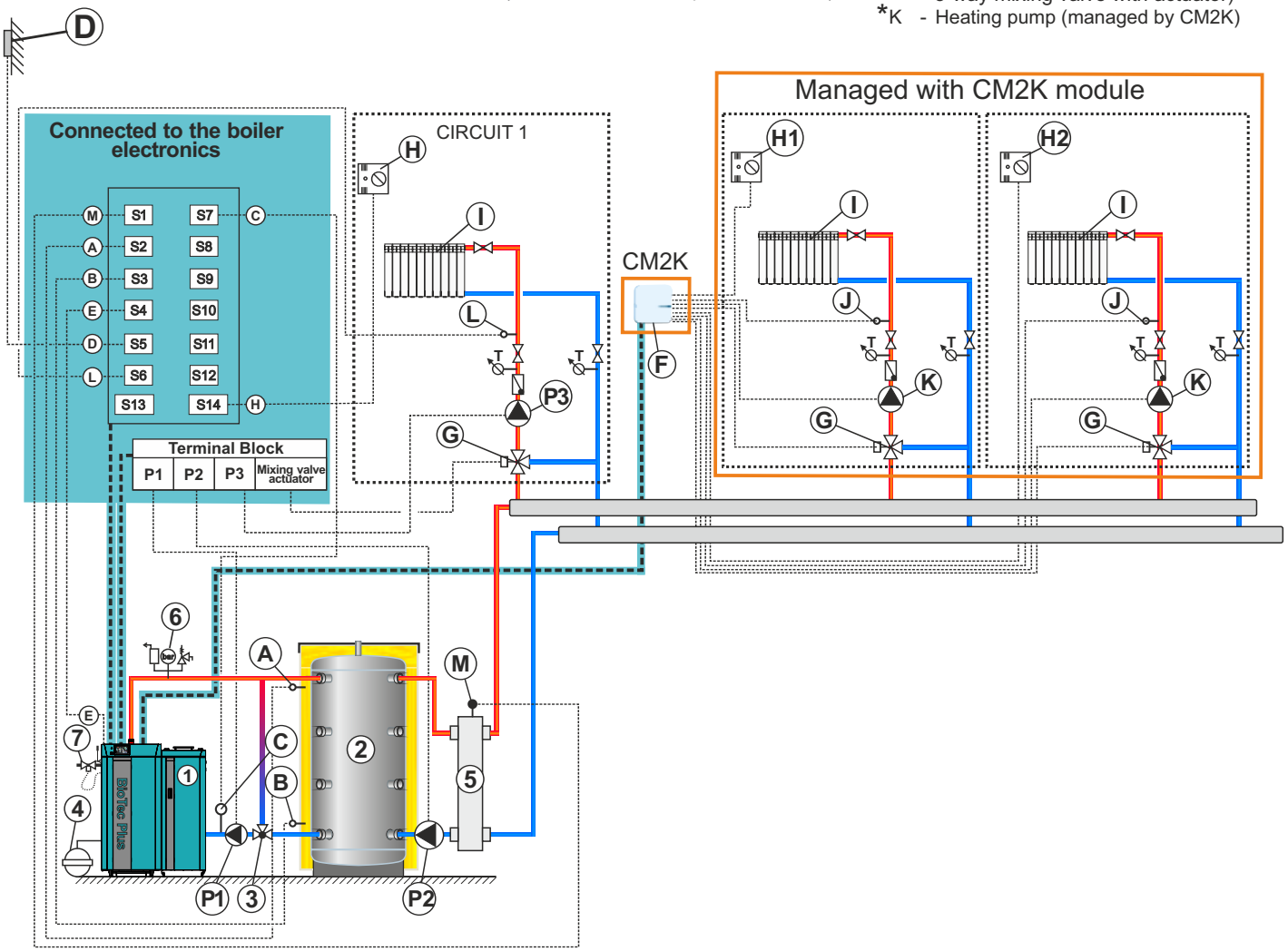
NOTE:
- According to this scheme is possible to preform version for open central heating system (see point 5.1, Connection to the open central heating system).
- It's possible to expand system of heating circuit lead by CM2K module with installing additional CM2K modules (max. 3 pcs) in serial connection.

Scheme 11. - General scheme of closed central heating system with 1 accumulation (buffer) tank, hydraulic crossover behind accumulation (buffer) tank, 3 heating circuits with 3-way mixing valve with actuator (1 direct heating circuit and 2 circuits managed by CM2K module).

1 - Boiler "BioTec Plus".
*2 - "CAS" accumulation tank (buffer tank)
*3 - Return flow protection (3-way mixing valve with actuator (protection valve) or 3-way thermic valve (60°C), VTC 512, VTC 531, LTC 261, LTC 271)
*4 - Expansion vessel for closed systems (min. 10% of the total volume of installation)
*5 - Hydraulic crossover
*6 - Safety airvent unit
*7 - Thermal safety valve

*P1 - Pump P1 (boiler pump)
*P2 - Pump P2 (hydraulic crossover pump)
*P3 - Pump P3 (heating circuit 1 pump)
A - Accumulation (buffer) sensor (upper)
B - Accumulation (buffer) sensor (lower)
****C - Return flow temperature sensor
D - Outdoor temperature sensor
E - Flue gas temperature sensor
**H - Room corrector 1 (CSK)
L - Main flow temperature sensor (circuit 1)
M - Hydraulic crossover sensor (delivered as flow temperature sensor)

**F - CM2K module (can be expanded to max. 4 units connected in series)
*G - 3-way mixing valve with actuator or manual 3-way mixing valve
H1 - Room corrector 2 (CSK) (1x room corrector CSK included in basic boiler delivery)
*H2 - Room corrector 3 (CSK)
*I - Heating circuit
J - Main flow temperature sensor in circuit CM2K (must be** installed with 3-way mixing valve with actuator)
*K - Heating pump (managed by CM2K)



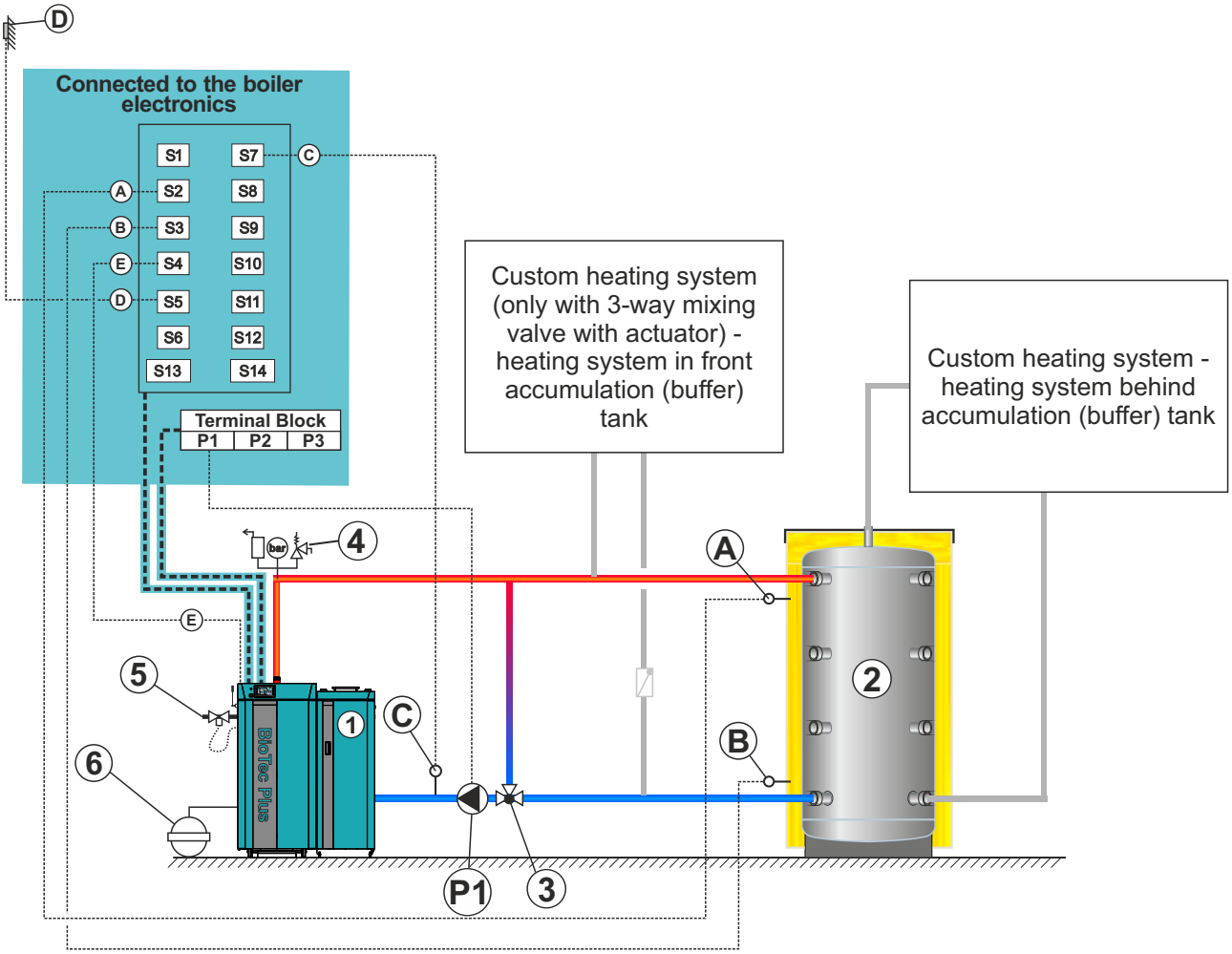
* Not included in delivery of boiler BioTec Plus or CM2K module (need additional order)
** Included in basic delivery of CM2K module
*** Can be used only if it's on position „G" installed actuator
**** Can be used only if it's on position „3" installed actuator

NOTE:
- According to this scheme is possible to preform version for open central heating system (see point 5.1, Connection to the open central heating system).
- It's possible to expand system of heating circuit lead by CM2K module with installing additional CM2K modules (max. 3 pcs) in serial connection.
- Actuator can be installed only on position „G" or position „3" and noway on any other positions.

Scheme 12. - General scheme of closed central heating system with 1 accumulation (buffer) tank, custom heating system

1 - Boiler "BioTec Plus".
*2 - "CAS" accumulation (buffer) tank
*3 - Return flow protection (3-way mixing valve with actuator (protection valve) or 3-way thermic valve (60°C), VTC 512, VTC 531, LTC 261, LTC 271)
*4 - Safety airvent unit
*5 - Thermal safety valve
*6 - Expansion vessel for closed systems (min. 10% of the total volume of installation)

*P1 - Pump P1 (boiler pump)
A - Accumulation tank sensor (upper)
B - Accumulation tank sensor (lower)
**C - Return flow temperature sensor
D - Outdoor temperature sensor
E - Flue gas temperature sensor



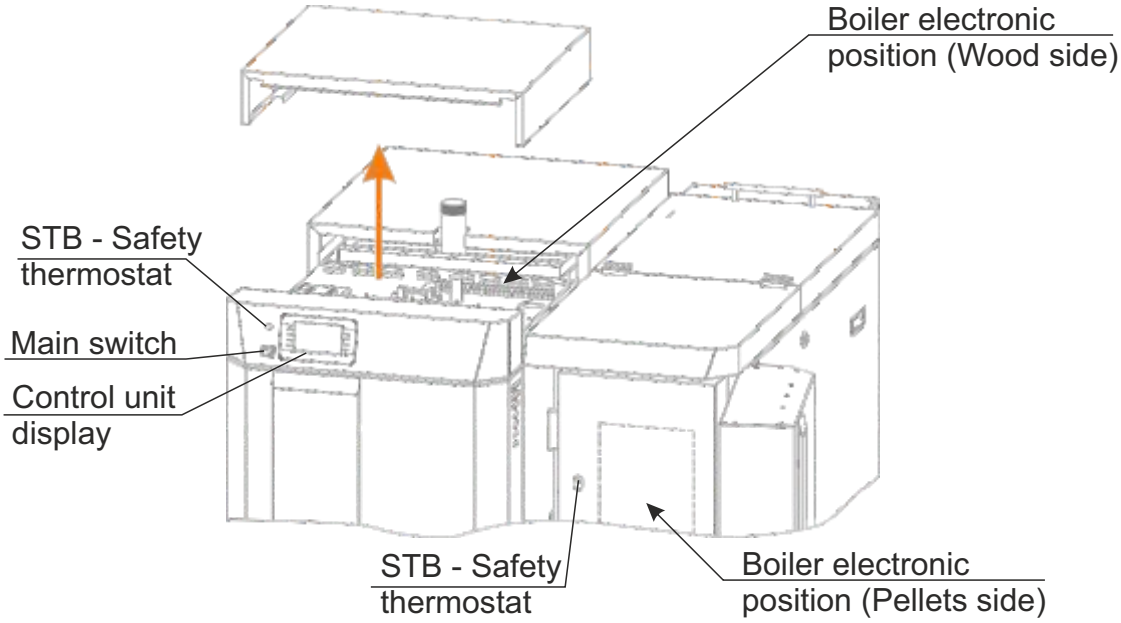
* Not included in delivery of boiler BioTec Plus (need additional order)
** Can be used only if it's on position „3" installed actuator

NOTE:
- According to this scheme is possible to preform version for open central heating system (see point 5.1, Connection to the open central heating system).

6.0. BOILER CONTROLLER (REGULATION)

6.1. BOILER CONTROLLER POSITIONING

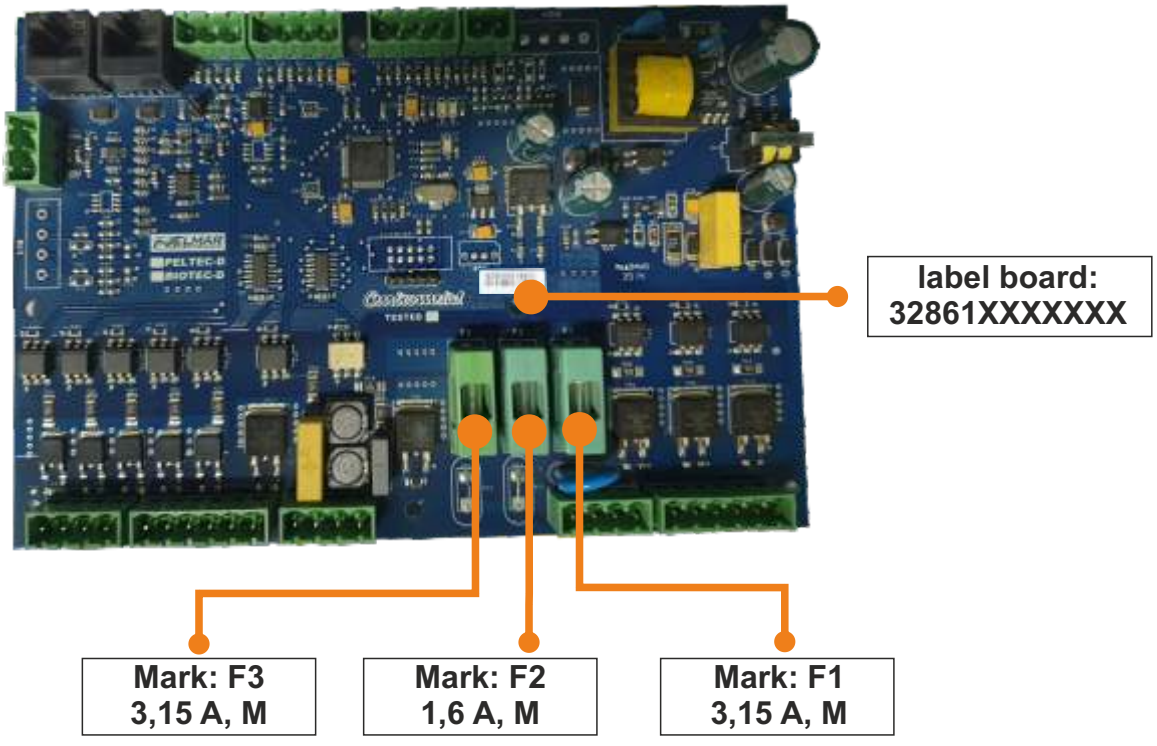
Figure 7. Boiler electronic



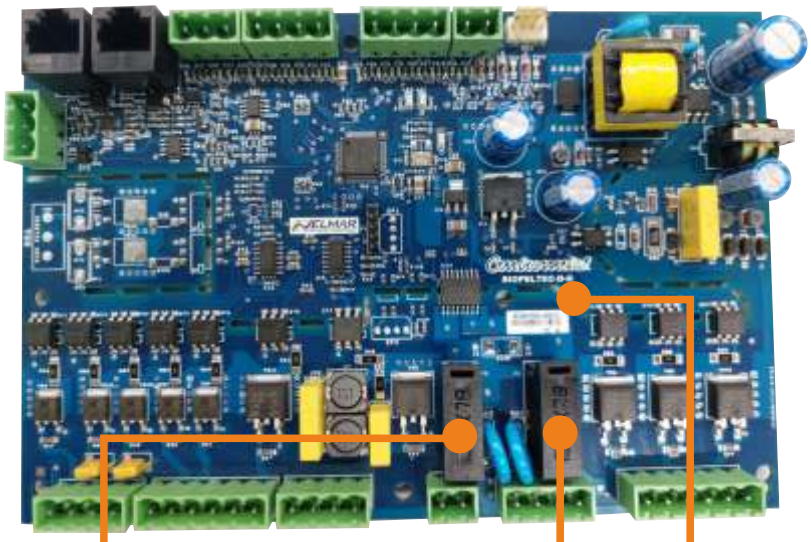
6.2. FUSES

Wood side: can be installed **32861XXXXXXX** or **BIOPELTEC-D-G (32861XXXXXXX G)** PCB (printed circuit board).

PCB: 32861XXXXXXX



PCB: BIOPELTEC-D-G (32861XXXXXXX "G")



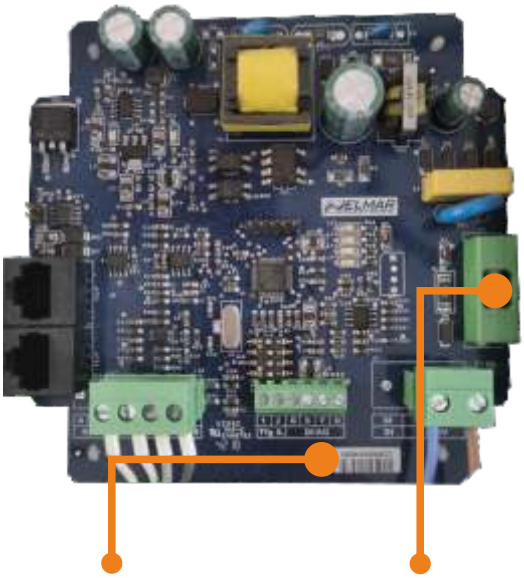
Mark: F2
3,15 A, M

Mark: F1
3,15 A, M

Label board:
BIOPELTEC-D-G
(32861XXXXXXX "G")

It can be installed lambda **22995XXXXXXX** or **LC-21-GS V1 (22005XXXXXXX "G")** PCB (printed circuit board).

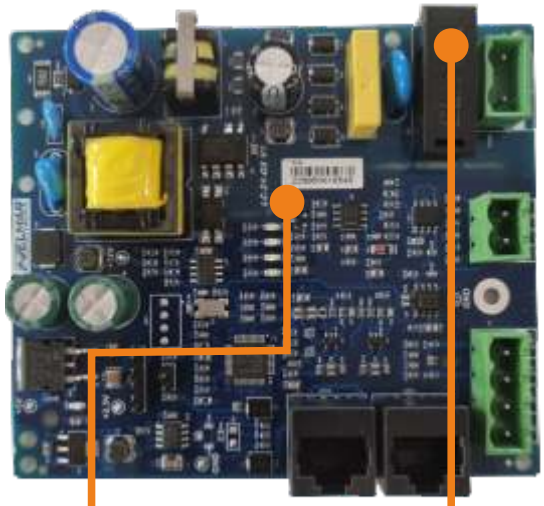
Lambda - PCB:
22995XXXXXXX



Label board:
22995XXXXXXX

Mark: F1
3,15 A, M

Lambda - PCB:
LC-21-GS V1 (22005XXXXXXX "G")

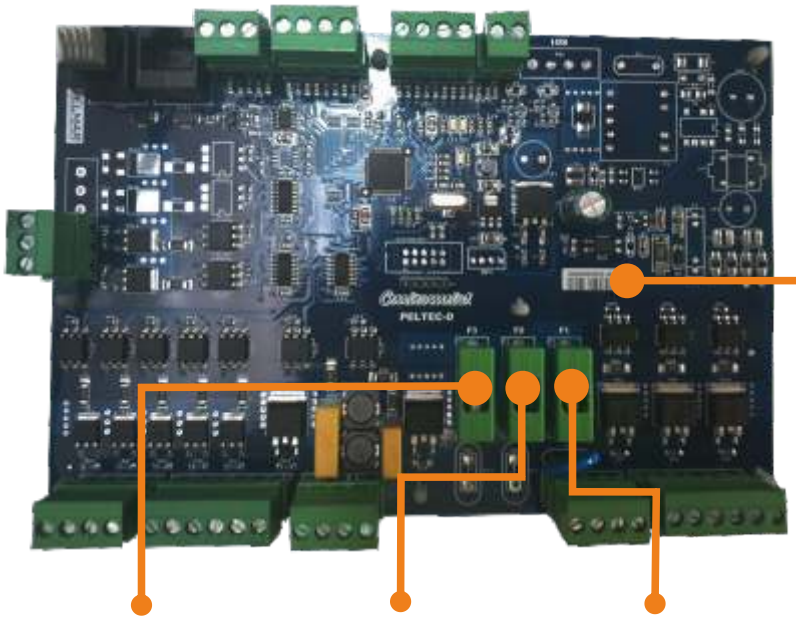


Label board:
LC-21-GS V1
(22005XXXXXXX "G")

Mark: F1
3,15 A, M

Pellet side: can be installed **51229XXXXXXX** or **BIOPELTEC-D-G (51229XXXXXXX "G")** PCB (printed circuit board).

PCB: 51229XXXXXXX



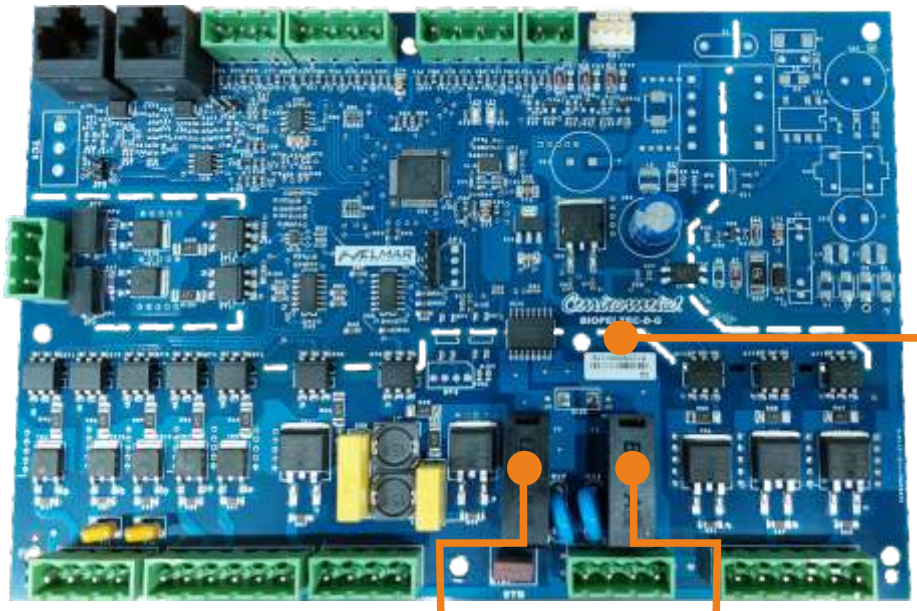
Label board: 51229XXXXXXX

Mark: F3 3,15 A, M

Mark: F2 1,6 A, M

Mark: F1 3,15 A, M

PCB: BIOPELTEC-D-G (51229XXXXXXX "G")



Label board: BIOPELTEC-D-G (51229XXXXXXX "G")

Mark: F2 3,15 A, M

Mark: F1 3,15 A, M

PCB: 32861XXXXXXX

MARK	FUSE	DEVICES
F1	3,15 A, M	- pumps P1, P2, P3 - controller (power supply)
F2	1,6 A, M	- secondary air control motor - primary air control motor - mixing valve motor
F3	3,15 A, M	- fan

PCB: BIOPELTEC-D-G (32861XXXXXXX "G")

MARK	FUSE	DEVICES
F1	3,15 A, M	- pumps P1, P2, P3 - controller (power supply)
F2	3,15 A, M	- secondary air control motor - primary air control motor - mixing valve motor - fan

PCB: 51229XXXXXXX

MARK	FUSE	DEVICES
F1	3,15 A, M	- screw refill - electromagnetic valve
F2	1,6 A, M	- pellet feeder screw - dosing rotary valve (RSE) - grate cleaner motor - set for automatic flue gas tubes cleaning (Flue pass. Cleaner)
F3	3,15 A, M	- electric heater

PCB: BIOPELTEC-D-G (51229XXXXXXX "G")

MARK	FUSE	DEVICES
F1	3,15 A, M	-
F2	3,15 A, M	- screw refill - electromagnetic valve - pellet feeder screw - dosing rotary valve (RSE) - grate cleaner motor - set for automatic flue gas tubes cleaning (Flue pass. Cleaner) - electric heater

Lambda - PCB: 22995XXXXXXX

MARK	FUSE	DEVICES
F1	3,15 A, M	- lambda probe power supply

Lambda - PCB: LC-21-GS V1 (22005XXXXXXX "G")

MARK	FUSE	DEVICES
F1	3,15 A, M	- lambda probe power supply

Note: Be sure to use proper acting fuses M (M = Medium)!

IMPORTANT: When replacing a fuse, be sure turn off the boiler at the main switch and unplug the power cord.

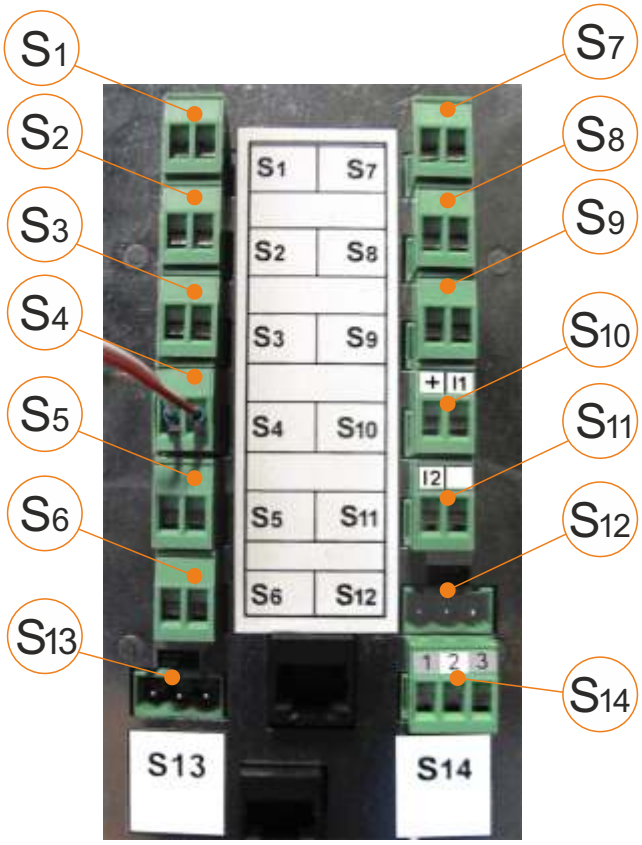
6.3. BOILER OPERATION PROCEDURE

The boiler is controlled with digital control unit, built in the upper part of the boiler, below upper casing. Control unit controls boiler operation, one heat circuit through 3-way mixing valve with motor actuator and outdoor temperature sensor and DHW tank. On the front boiler panel is main switch for switching on/off the boiler control unit, safety thermostat and touch screen.

7.0. ELECTRIC CONNECTION

All electrical works must be performed by a certified professional in accordance with valid national and European standards.
A device for switching of all power supply poles must be installed in electrical installation in accordance with the national regulations on electrical installations.

When connecting any electrical part be sure to unplug the boiler at the main switch and disconnect the power supply.



S1 - DHW sensor / hydraulic crossover sensor * - Temperature sensor NTC 5K - PVC l=2000 (26226)
S2 - Acc. (buffer) temperature sensor upper - Temperature sensor NTC 5K - PVC l=1000 (12041)
S3 - Acc. (buffer) temperature sensor lower - Temperature sensor NTC 5K - PVC l=1000 (12041)
S4 - Flue gas temperature sensor - Temperature sensor PT 1000 - Teflon l=1700 (62330)
S5 - Outdoor temperature sensor - Outdoor temperature sensor NTC 5K (31428)
S6 - Main flow temperature sensor / hydraulic crossover sensor *- SET temperature sensor NTC 5K - PVC l=2000 (32685)
S7 - Return flow temperature sensor - SET temperature sensor NTC 5K - PVC l=2000 (32685)
S8 - Not used
S9 - Room thermostat (voltage-freecontact)
S10 - Alarm output 1 (Additional equipment)
S11 - Alarm output 2 (Additional equipment)
S12 - Fuel level sensor (pellet) - CMSR 100 (26199)
S13 - Not used
S14 - Room corrector - CSK (32680)

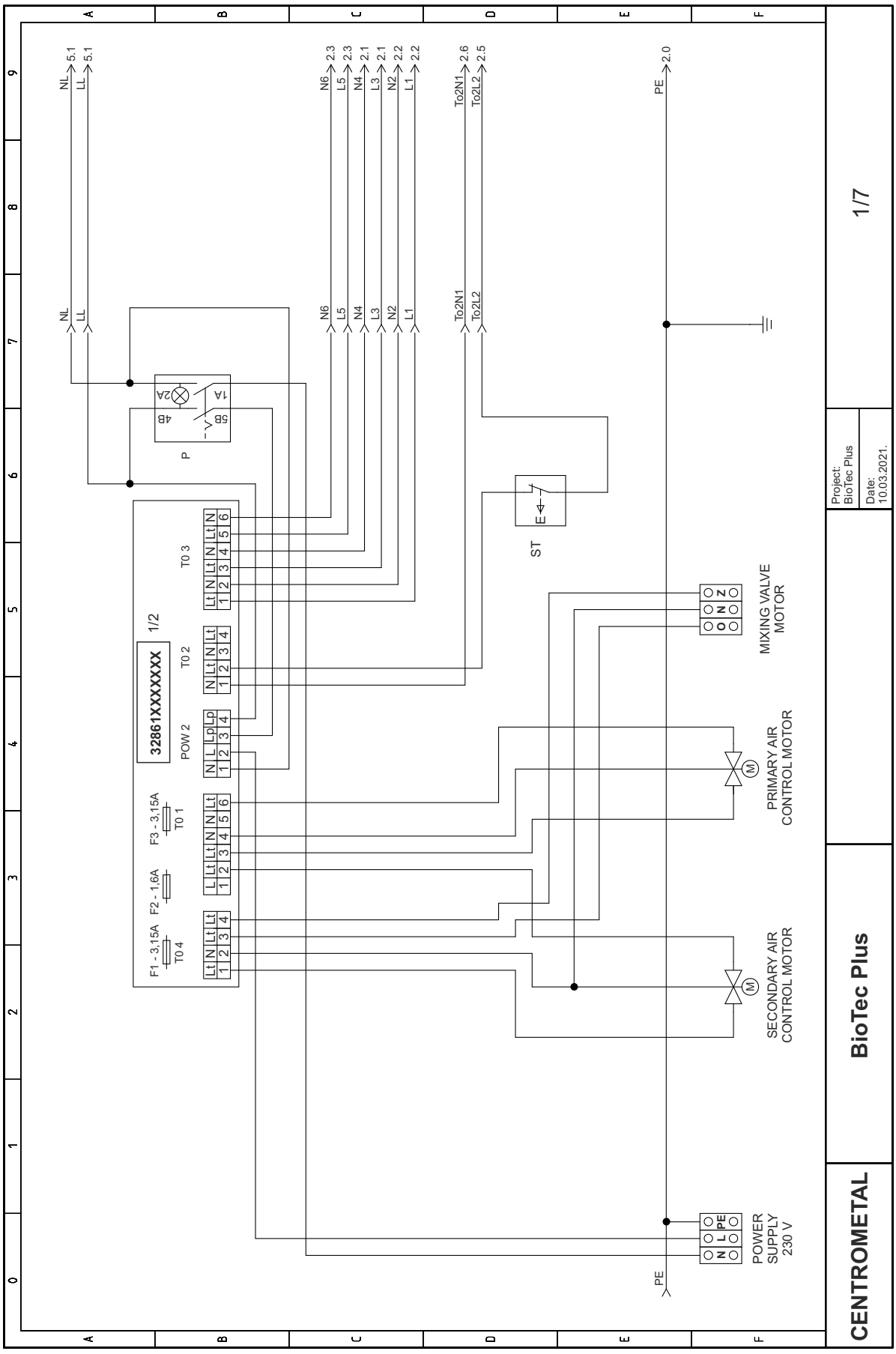
*If the configuration contains a hydraulic crossover, a DHW sensor or main flow sensor is used for the hydraulic crossover sensor, depending on the other elements of the configuration.
When configuration contains hydraulic crossover and DHW, then hydraulic crossover temp. sensor must be connected to connector S6, in other cases hydraulic crossover temp. sensor must be connected to the connector S1.

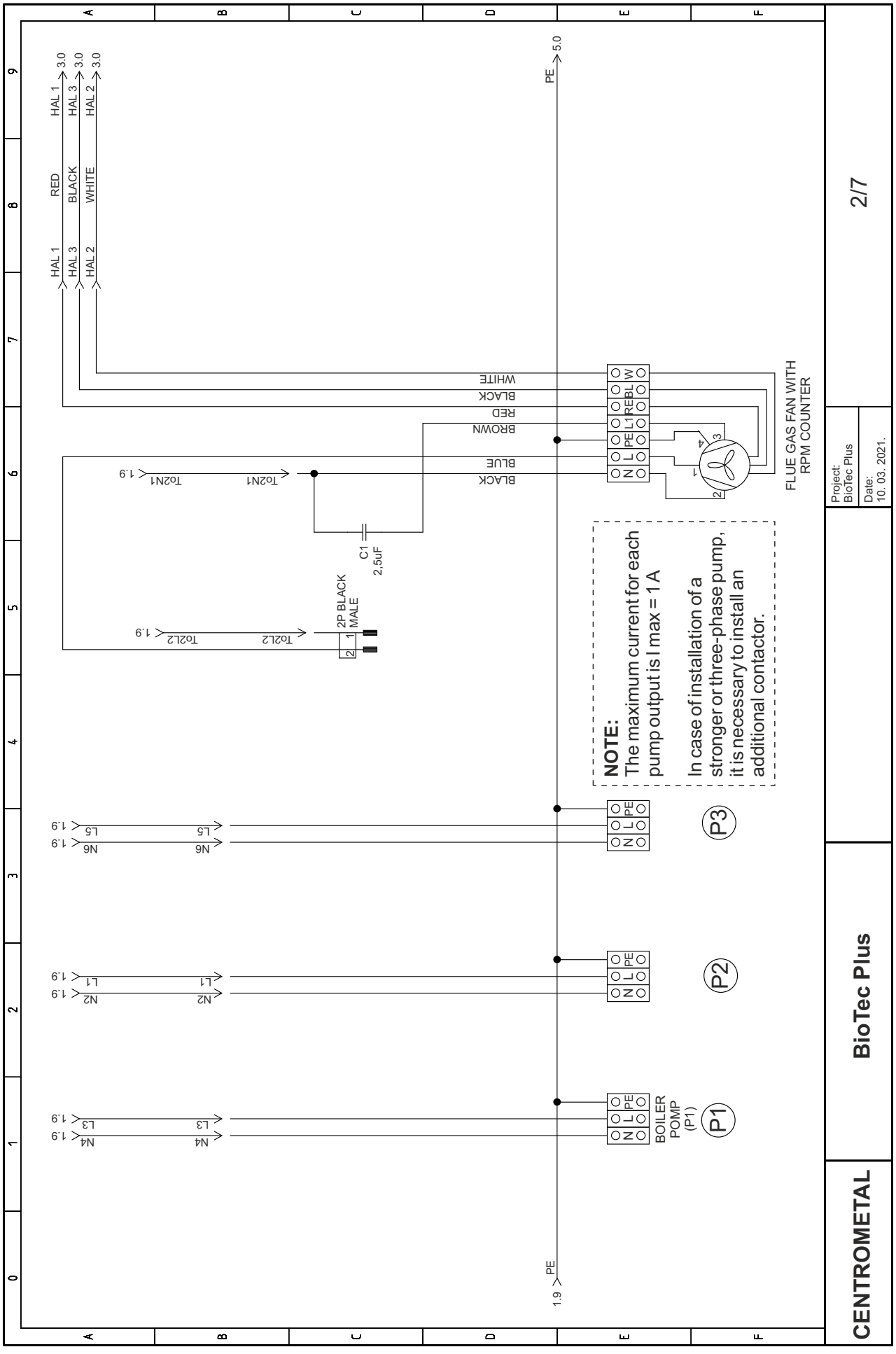
Terminal Block & Strip Connector

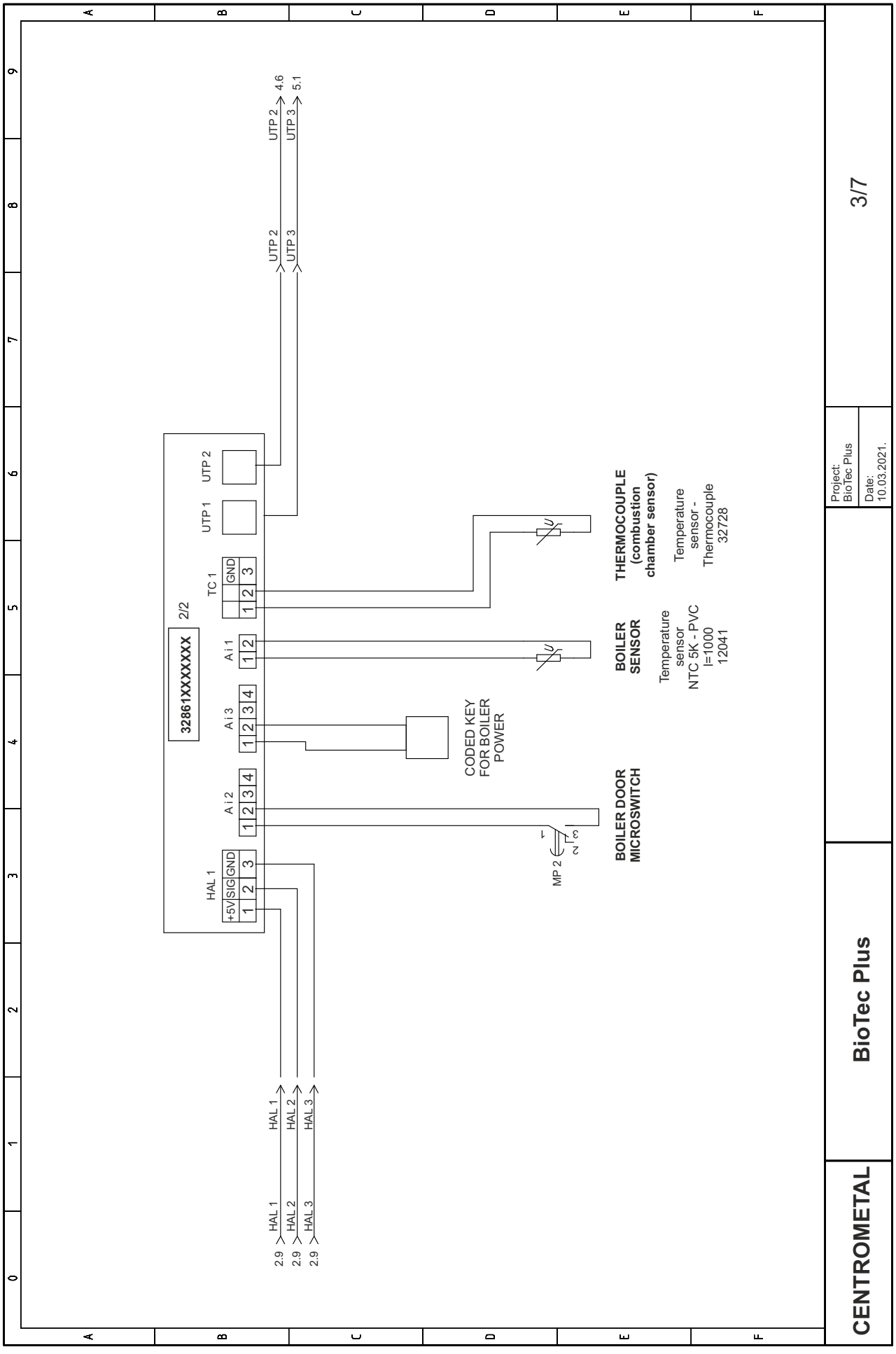
N	L	⏚	N	L	⏚	N	L	⏚	N	L	⏚	N	L	N	▲	▼	N	L	⏚	L1	Red	Black	White			
Automatic cleaning of boiler flue passagees			P1			P2			P3			MD		Mix valve actuator			Fan				RPM counter					
			Pump P1 (Boiler pump)			Pump P2			Pump P3			Screw refill		Motor													

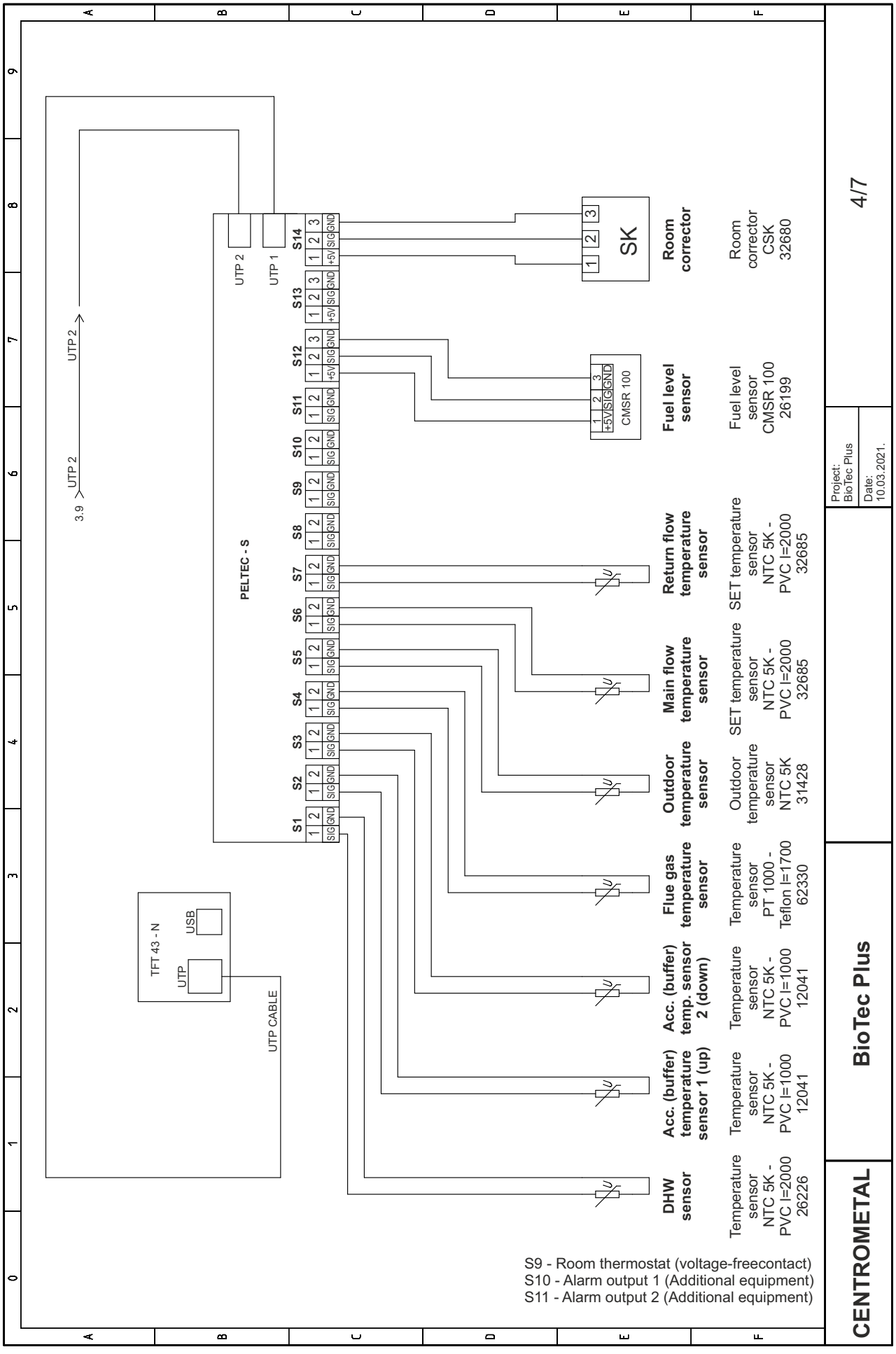
N	L	PE
Power supply 230 V		

7.1. ELECTRICAL SCHEME INSTALLATION - built-in 32861XXXXXXX and 51229XXXXXXX PCB (printed circuit board)

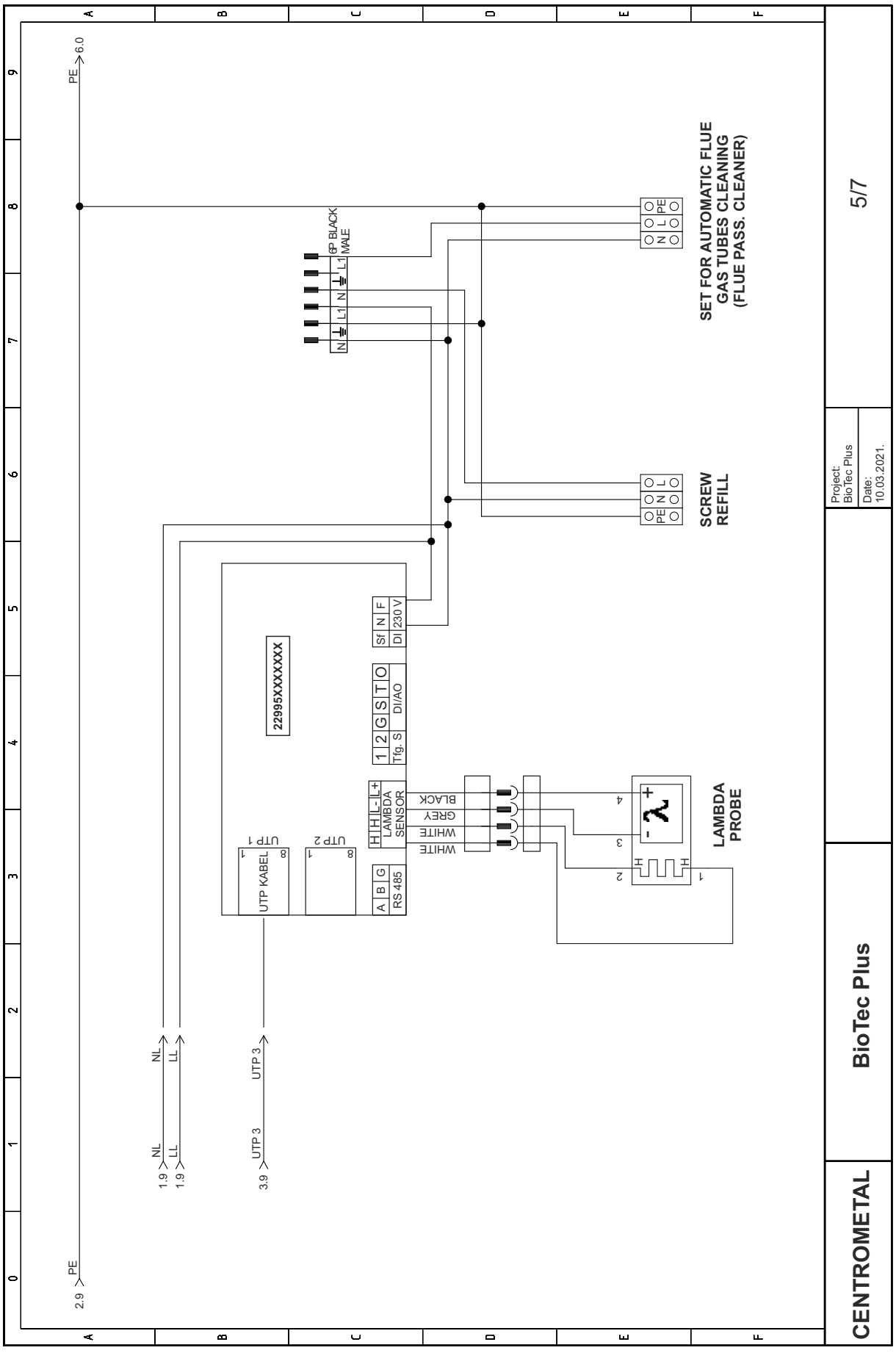



CENTROMETAL
BioTec Plus
2/7
Project:
BioTec Plus
Date:
10. 03. 2021.
FLUE GAS FAN WITH
RPM COUNTER
WHITE
BLACK
RED
BROWN
BLUE
BLACK
HAL 1
HAL 3
HAL 2
RED
BLACK
WHITE
3.0
PE
5.0
1.9
To2N1
To2L2
C1
2,5uF
2P BLACK
MALE
NOTE:
The maximum current for each
pump output is I max = 1 A
In case of installation of a
stronger or three-phase pump,
it is necessary to install an
additional contactor.
BOILER
POMP
(P1)
P1
P2
P3
N
L
PE
L1
REBL
W
L3
L5
N2
N4
N6

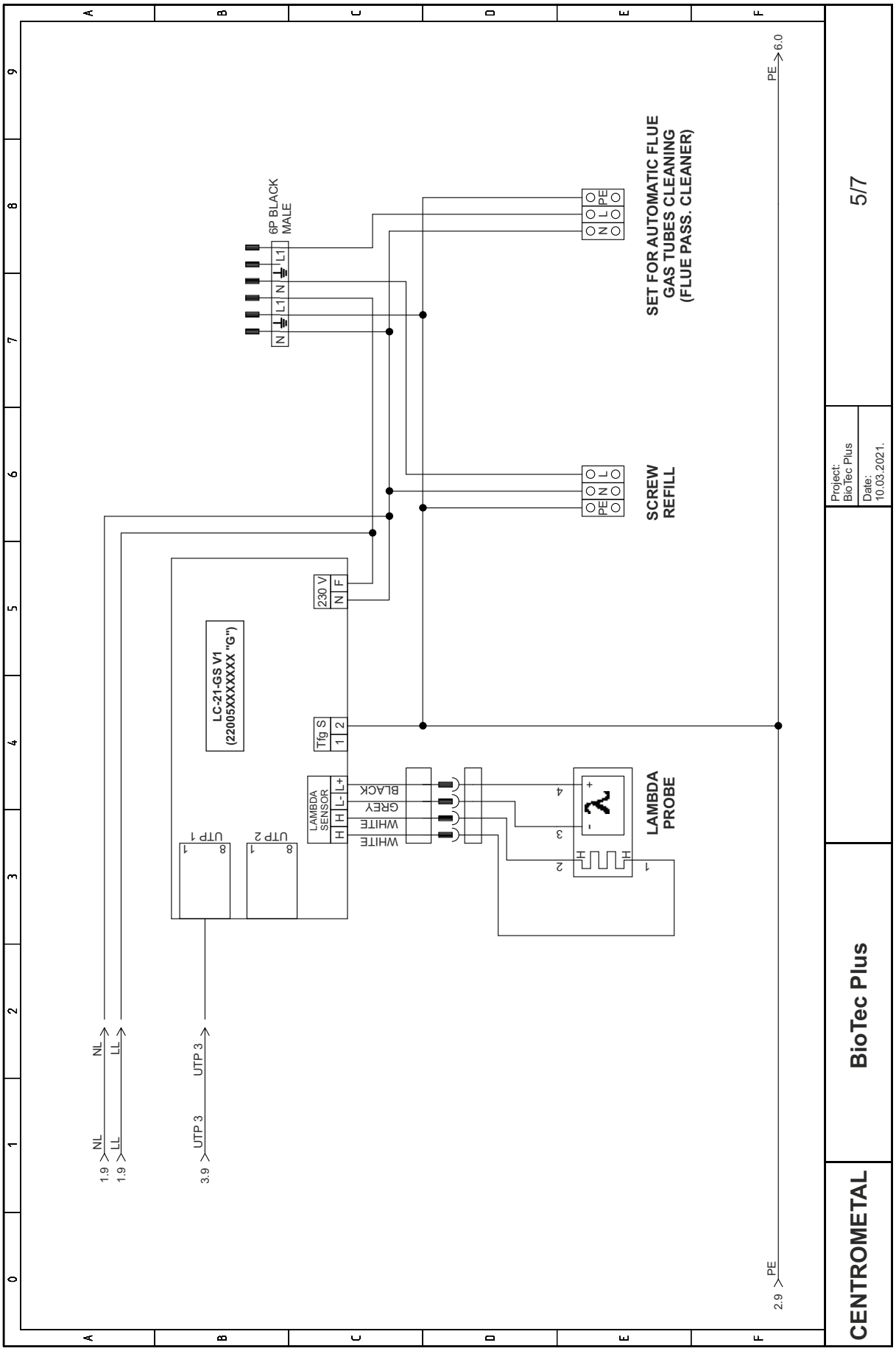

CENTROMETAL
BioTec Plus
3/7
Project:
BioTec Plus
Date:
10.03.2021.
32861XXXXXXX
2/2
HAL 1
+5V SIG GND
1 2 3
Ai 2
1 2 3 4
Ai 3
1 2 3 4
Ai 1
1 2
TC 1
GND
1 2 3
UTP 1
UTP 2
UTP 2
UTP 3
UTP 2 4.6
UTP 3 5.1
HAL 1
HAL 2
HAL 3
2.9
2.9
2.9
HAL 1
HAL 2
HAL 3
MP 2
BOILER DOOR MICROSWITCH
CODED KEY FOR BOILER POWER
BOILER SENSOR
Temperature sensor NTC 5K - PVC l=1000 12041
THERMOCOUPLE (combustion chamber sensor)
Temperature sensor - Thermocouple 32728

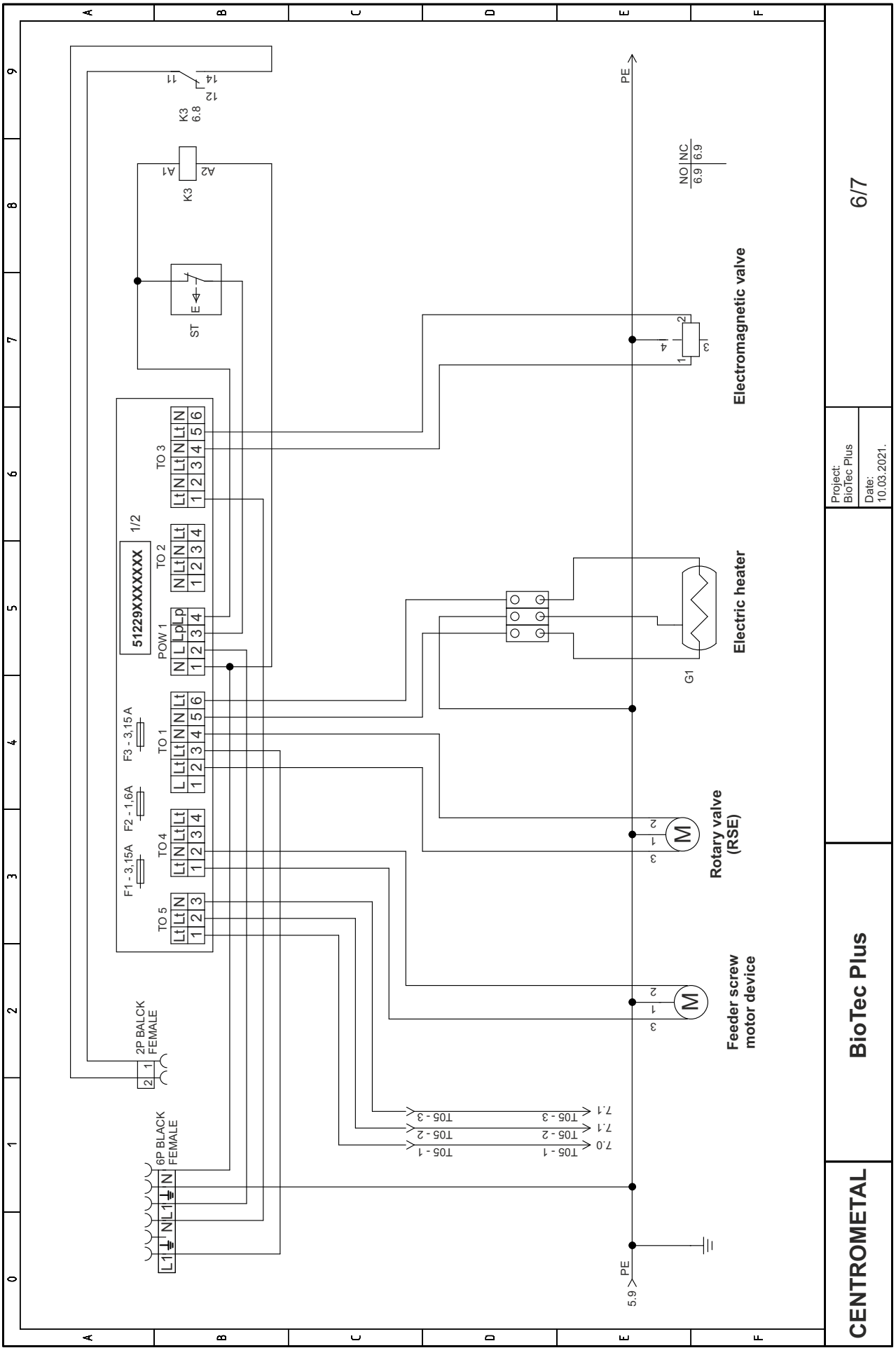

PELTEC - S
UTP 1
UTP 2
3.9
TFT 43 - N
USB
UTP
UTP CABLE
S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14
SIG GND +5V
SK
CMSR 100
DHW sensor
Temperature sensor NTC 5K - PVC l=2000 26226
Acc. (buffer) temperature sensor 1 (up)
Temperature sensor NTC 5K - PVC l=1000 12041
Acc. (buffer) temp. sensor 2 (down)
Temperature sensor NTC 5K - PVC l=1000 12041
Flue gas temperature sensor
Temperature sensor PT 1000 - Teflon l=1700 62330
Outdoor temperature sensor
Outdoor temperature sensor NTC 5K 31428
Main flow temperature sensor
SET temperature sensor NTC 5K - PVC l=2000 32685
Return flow temperature sensor
SET temperature sensor NTC 5K - PVC l=2000 32685
Fuel level sensor
Fuel level sensor CMSR 100 26199
Room corrector
Room corrector CSK 32680
S9 - Room thermostat (voltage-freecontact)
S10 - Alarm output 1 (Additional equipment)
S11 - Alarm output 2 (Additional equipment)
CENTROMETAL
BioTec Plus
Project: BioTec Plus
Date: 10.03.2021.
4/7

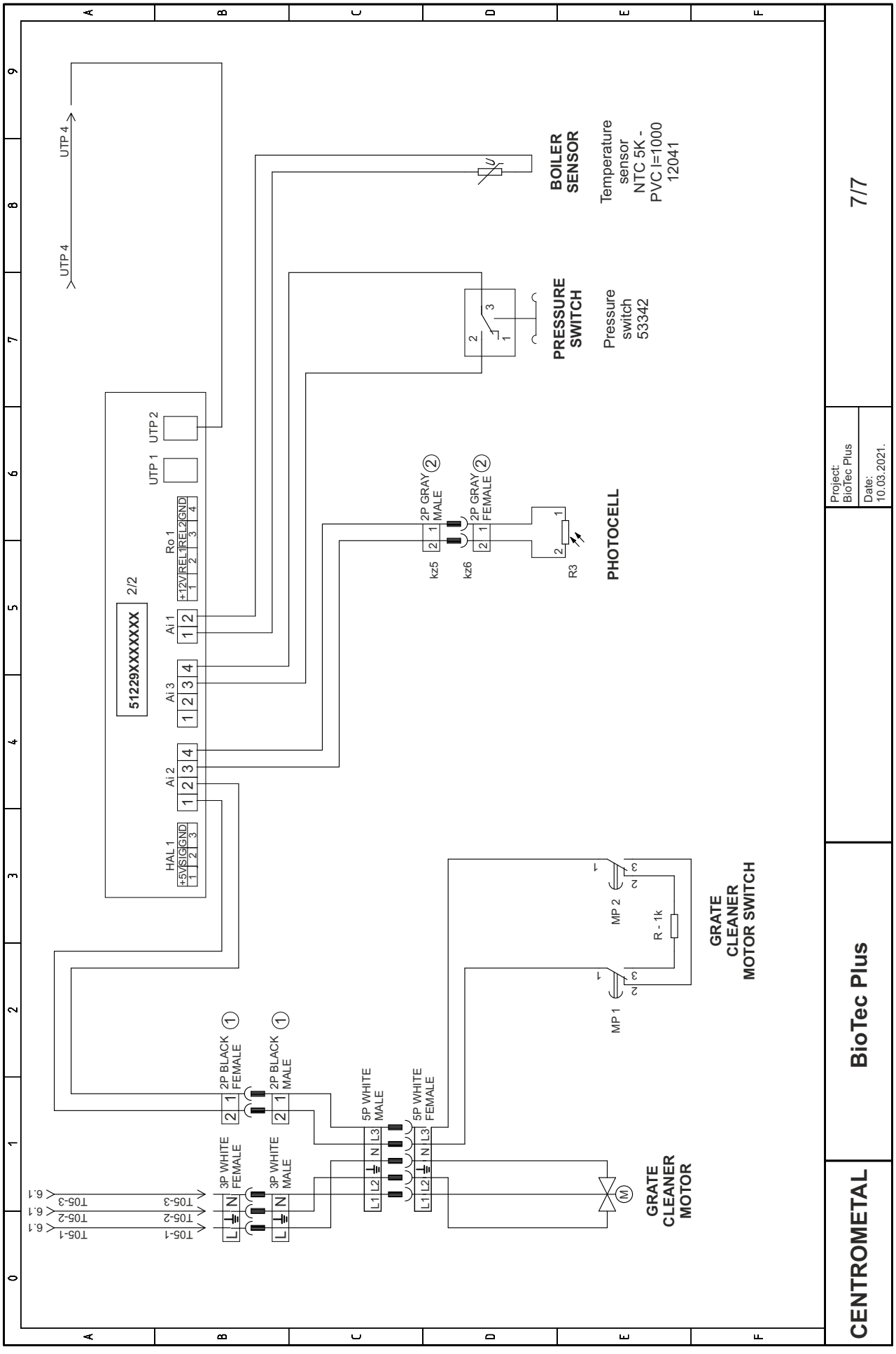
a) Installed lambda PCB 22995XXXXXXX



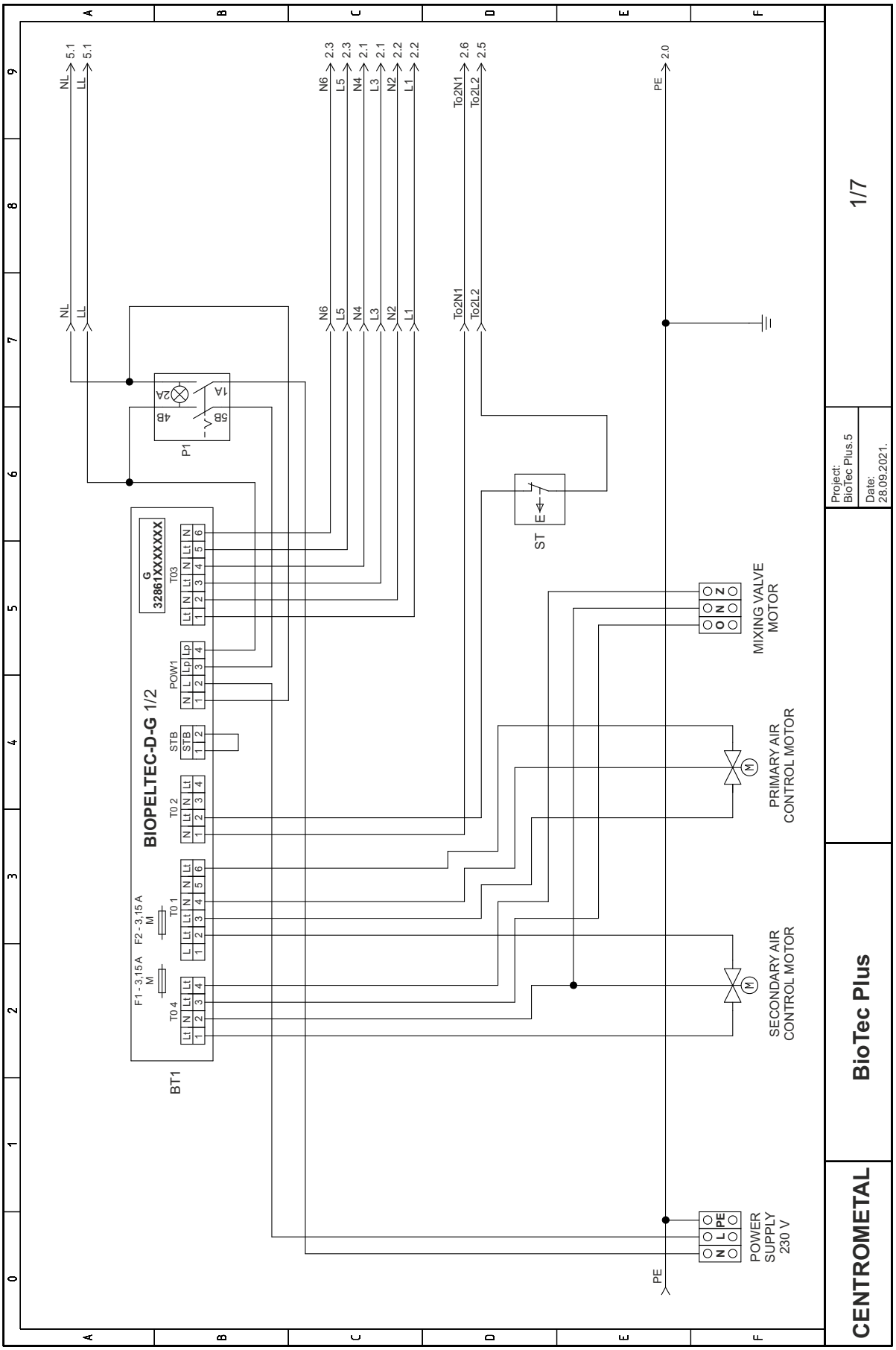
b) Installed lambda PCB LC-21-GS V1 (22005XXXXXXX "G")

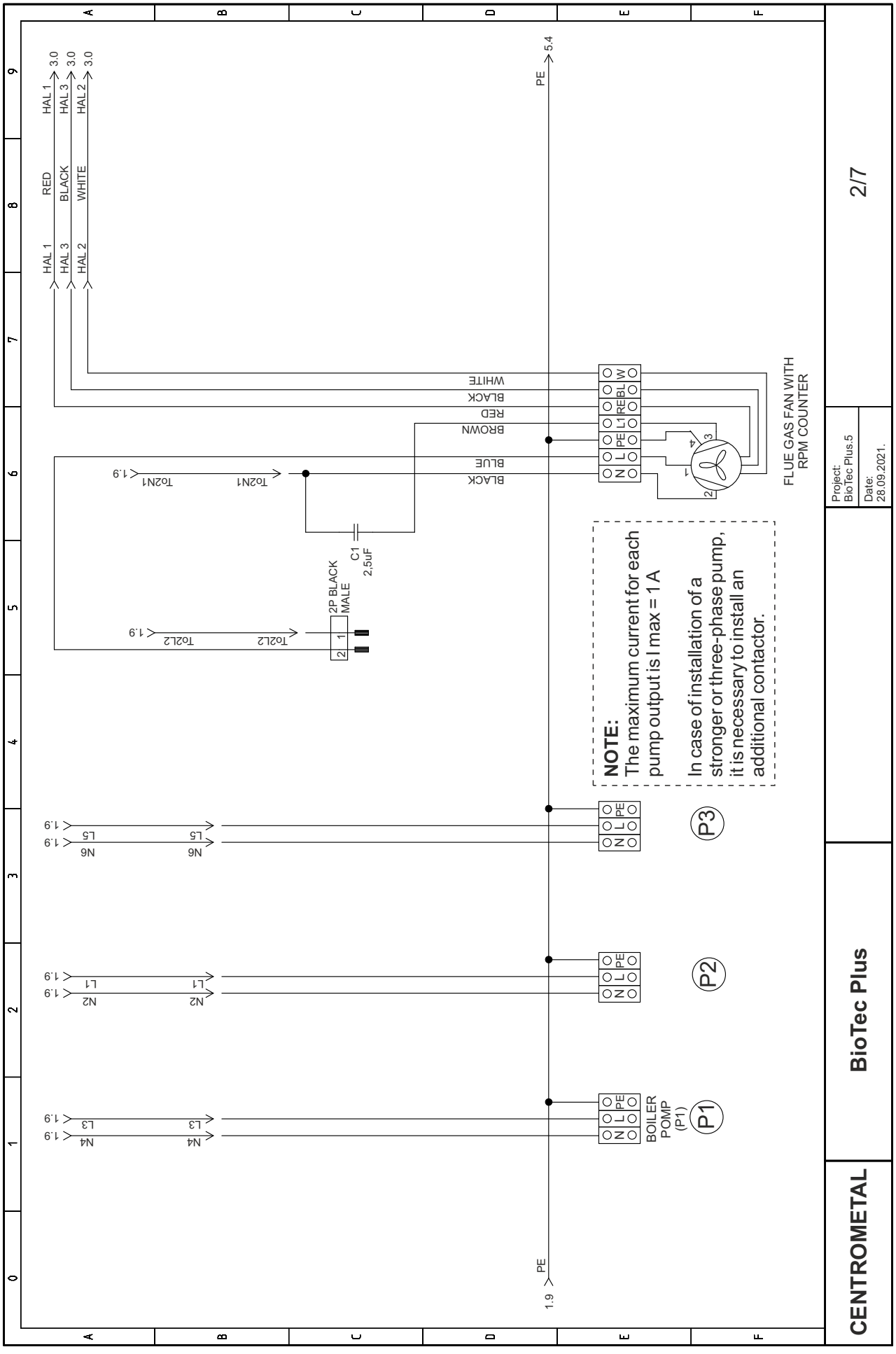


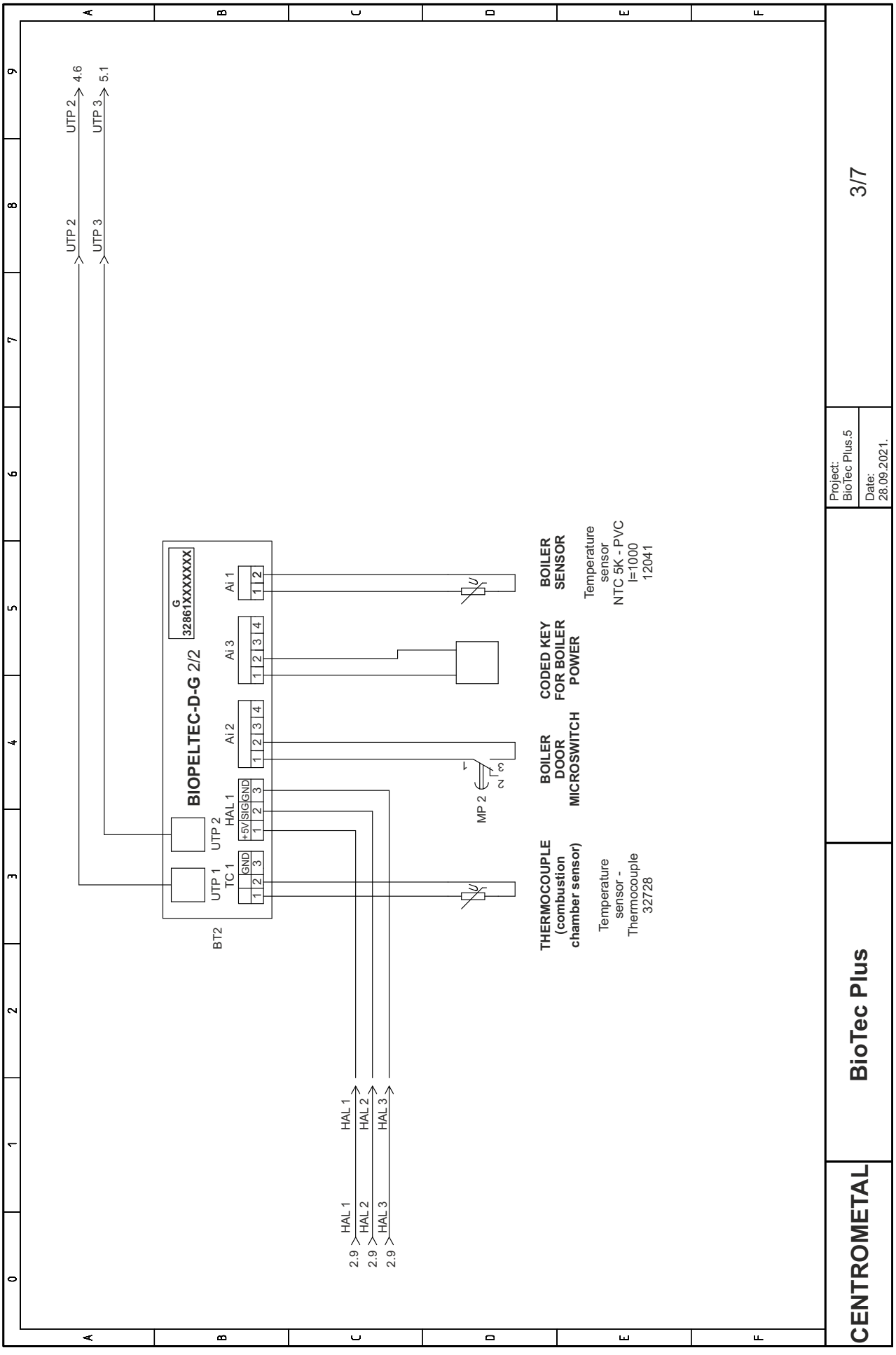

CENTROMETAL
BioTec Plus
6/7
Project: BioTec Plus
Date: 10.03.2021.
51229XXXXXX 1/2
POW 1
TO 1
TO 2
TO 3
TO 4
TO 5
F1 - 3,15A
F2 - 1,6A
F3 - 3,15 A
K3
6.8
ST
NO NC
6.9 6.9
Electromagnetic valve
Electric heater
G1
Rotary valve
(RSE)
Feeder screw
motor device
2P BALCK
FEMALE
6P BLACK
FEMALE
PE
5.9
7.0
7.1
TO5 - 1
TO5 - 2
TO5 - 3

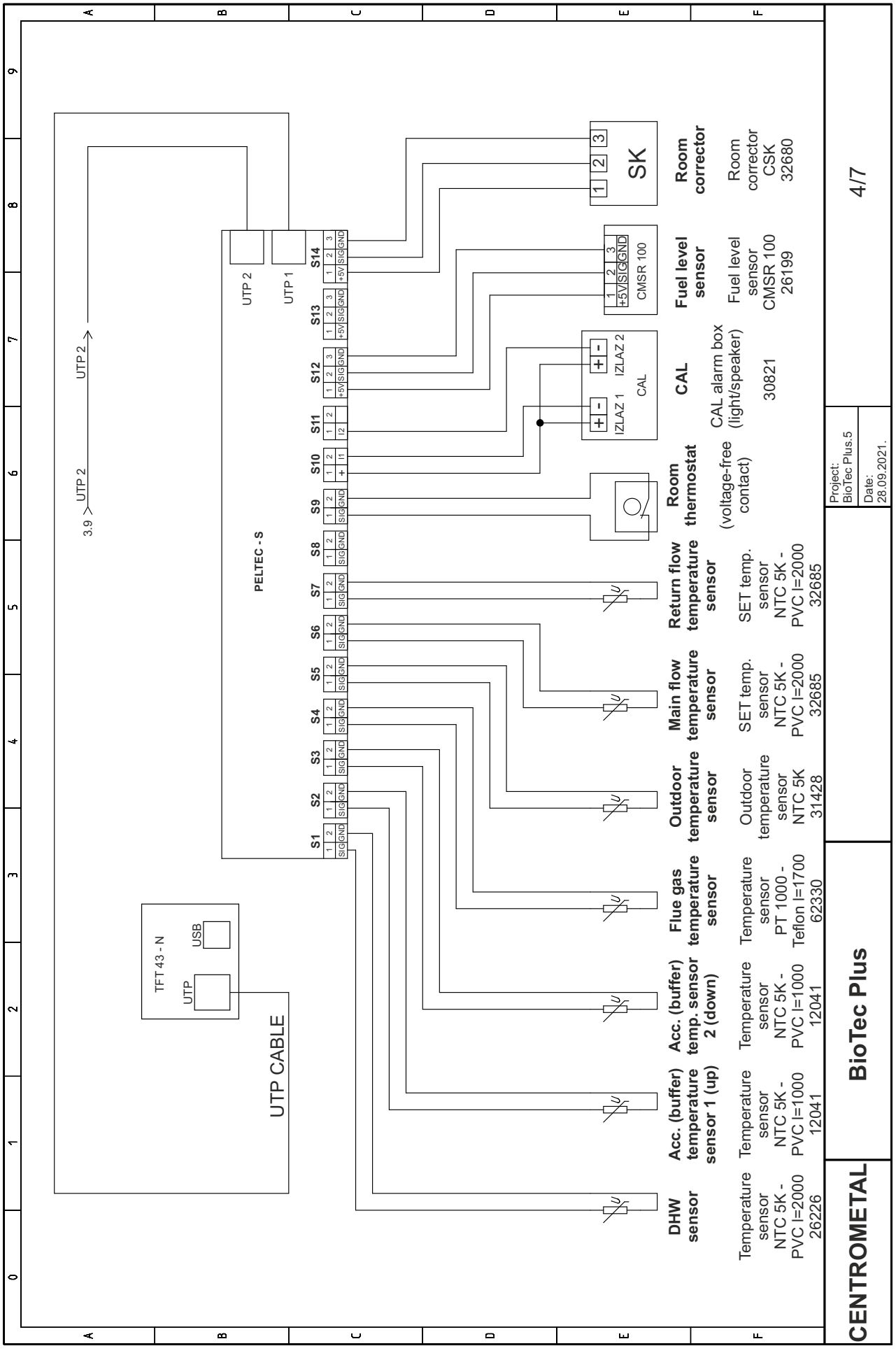

CENTROMETAL
BioTec Plus
7/7
Project: BioTec Plus
Date: 10.03.2021.
BOILER SENSOR
Temperature sensor NTC 5K - PVC l=1000 12041
PRESSURE SWITCH
Pressure switch 53342
PHOTOCELL
GRATE CLEANER MOTOR SWITCH
GRATE CLEANER MOTOR
51229XXXXXXX
2/2
UTP 1
UTP 2
UTP 4
Ro 1
+12V REL1 REL2 GND
Ai 1
Ai 3
Ai 2
HAL 1
+5V SIG GND
2P GRAY MALE
2P GRAY FEMALE
kz5
kz6
R3
2P BLACK FEMALE
2P BLACK MALE
3P WHITE FEMALE
3P WHITE MALE
5P WHITE MALE
5P WHITE FEMALE
L1 L2 N L3
MP 1
MP 2
R - 1k
TO5-1
TO5-2
TO5-3
6.1

7.2. ELECTRICAL SCHEME INSTALLATION - built-in BIOPELTEC-D-G (32861XXXXXXX G) and 51229XXXXXXX PCB (printed circuit board)

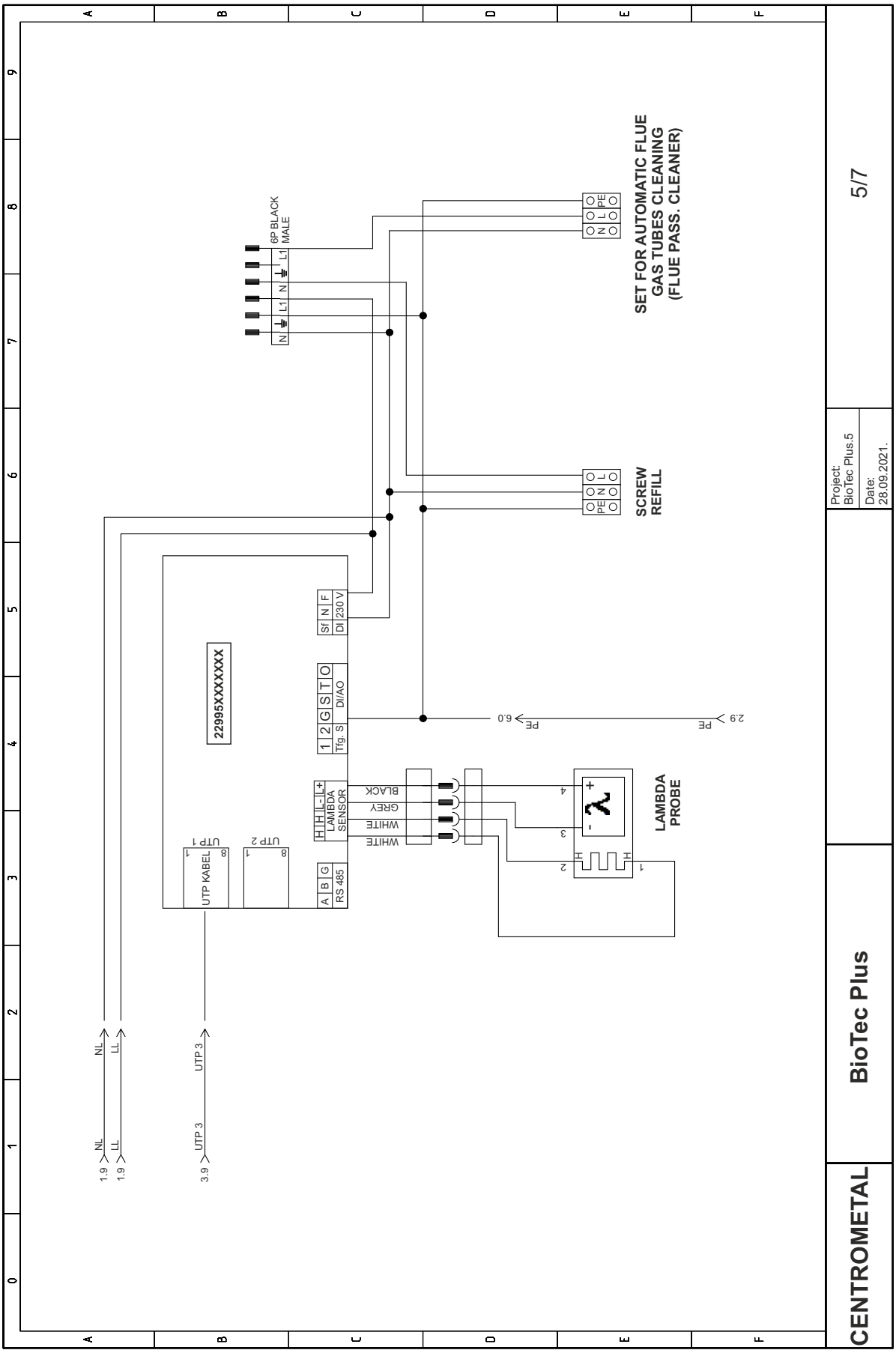



CENTROMETAL
BioTec Plus
2/7
Project:
BioTec Plus.5
Date:
28.09.2021.
FLUE GAS FAN WITH
RPM COUNTER
BOILER
POMP
(P1)
P1
P2
P3
NOTE:
The maximum current for each
pump output is I max = 1A
In case of installation of a
stronger or three-phase pump,
it is necessary to install an
additional contactor.
2P BLACK
MALE
C1
2,5uF
HAL 1
HAL 3
HAL 2
RED
BLACK
WHITE
BROWN
BLUE
PE
5.4
1.9
3.0

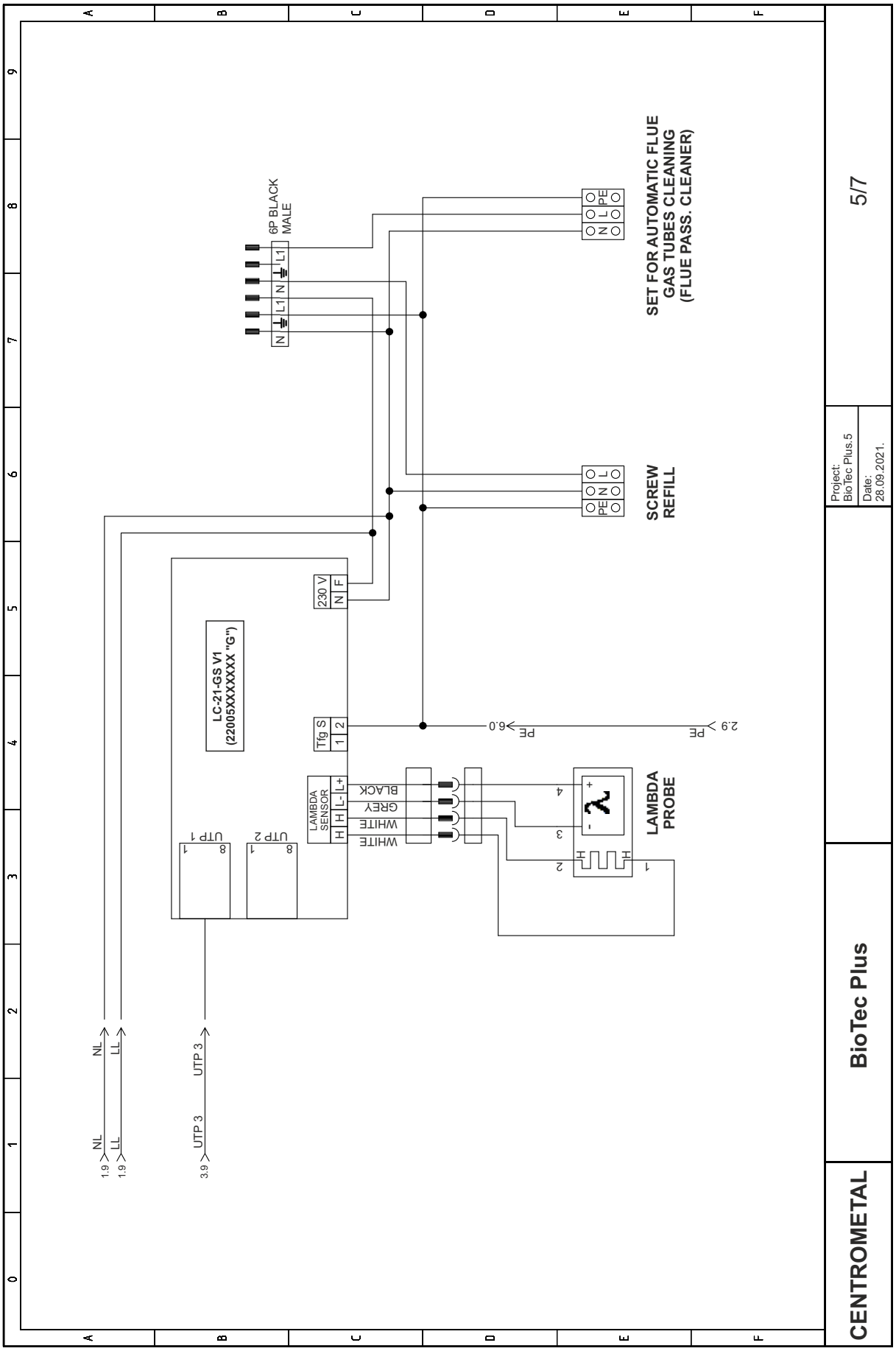

CENTROMETAL
BioTec Plus
3/7
Project:
BioTec Plus.5
Date:
28.09.2021.
BIOPELTEC-D-G 2/2
G
32861XXXXXXX
UTP 1
TC 1
GND
1 2 3
UTP 2
HAL 1
+5V SIG GND
1 2 3
Ai 2
1 2 3 4
Ai 3
1 2 3 4
Ai 1
1 2
BT2
UTP 2
UTP 3
4.6
5.1
HAL 1
HAL 2
HAL 3
2.9
MP 2
THERMOCOUPLE
(combustion
chamber sensor)
Temperature
sensor -
Thermocouple
32728
BOILER
DOOR
MICROSWITCH
CODED KEY
FOR BOILER
POWER
BOILER
SENSOR
Temperature
sensor
NTC 5K - PVC
l=1000
12041

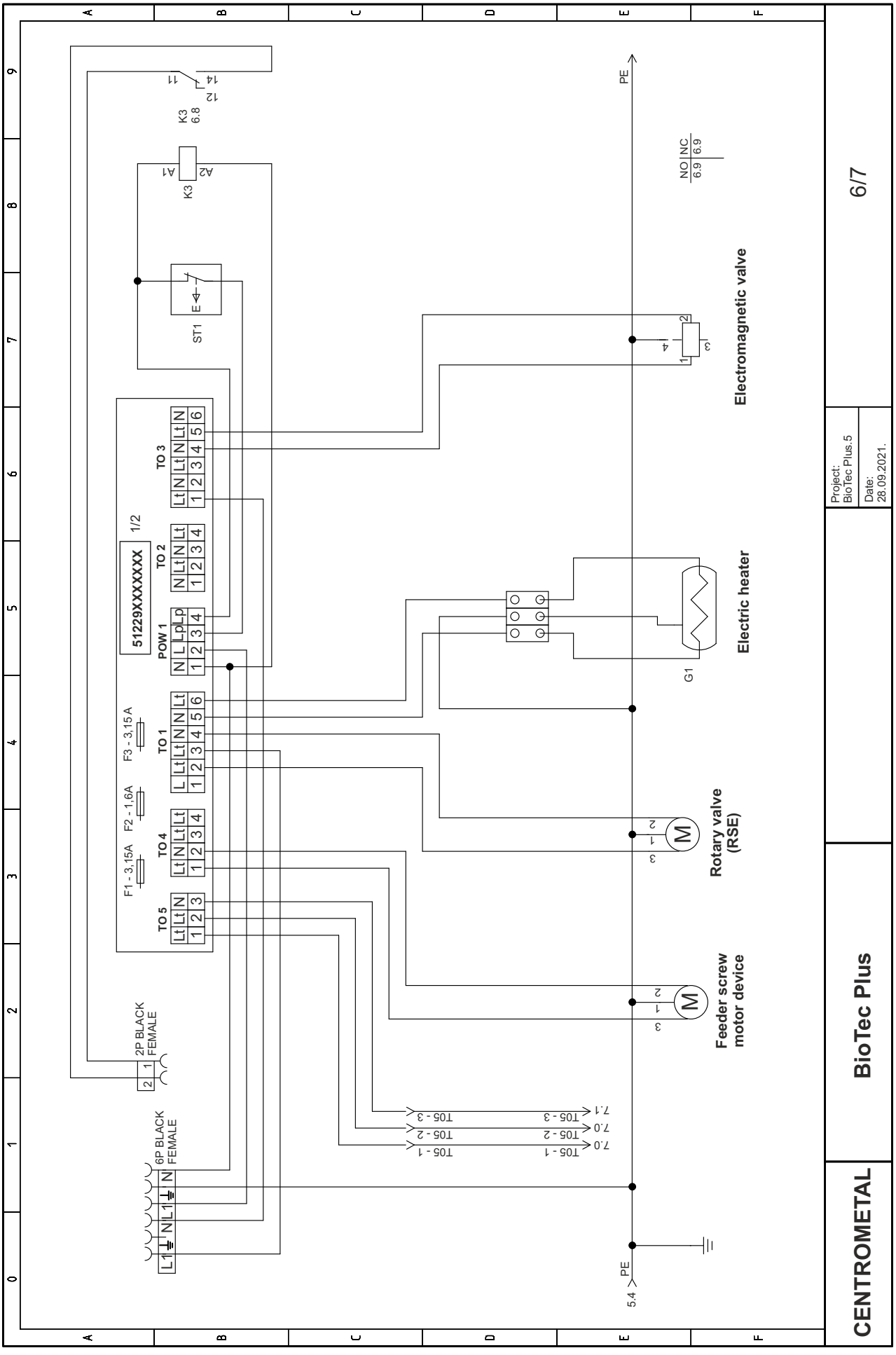

PELTEC - S
UTP 2
UTP 1
UTP 2
UTP 2
3.9
TFT 43 - N
USB
UTP
UTP CABLE
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
SIG GND
+5V SIG GND
I1
I2
SK
CMSR 100
IZLAZ 1
IZLAZ 2
CAL
DHW sensor
Temperature sensor NTC 5K - PVC l=2000 26226
Acc. (buffer) temperature sensor 1 (up)
Temperature sensor NTC 5K - PVC l=1000 12041
Acc. (buffer) temp. sensor 2 (down)
Temperature sensor NTC 5K - PVC l=1000 12041
Flue gas temperature sensor
Temperature sensor PT 1000 - Teflon l=1700 62330
Outdoor temperature sensor
Outdoor temperature sensor NTC 5K 31428
Main flow temperature sensor
SET temp. sensor NTC 5K - PVC l=2000 32685
Return flow temperature sensor
SET temp. sensor NTC 5K - PVC l=2000 32685
Room thermostat
(voltage-free contact)
CAL
CAL alarm box (light/speaker)
30821
Fuel level sensor
Fuel level sensor CMSR 100 26199
Room corrector
Room corrector CSK 32680
CENTROMETAL
BioTec Plus
Project: BioTec Plus.5
Date: 28.09.2021.
4/7

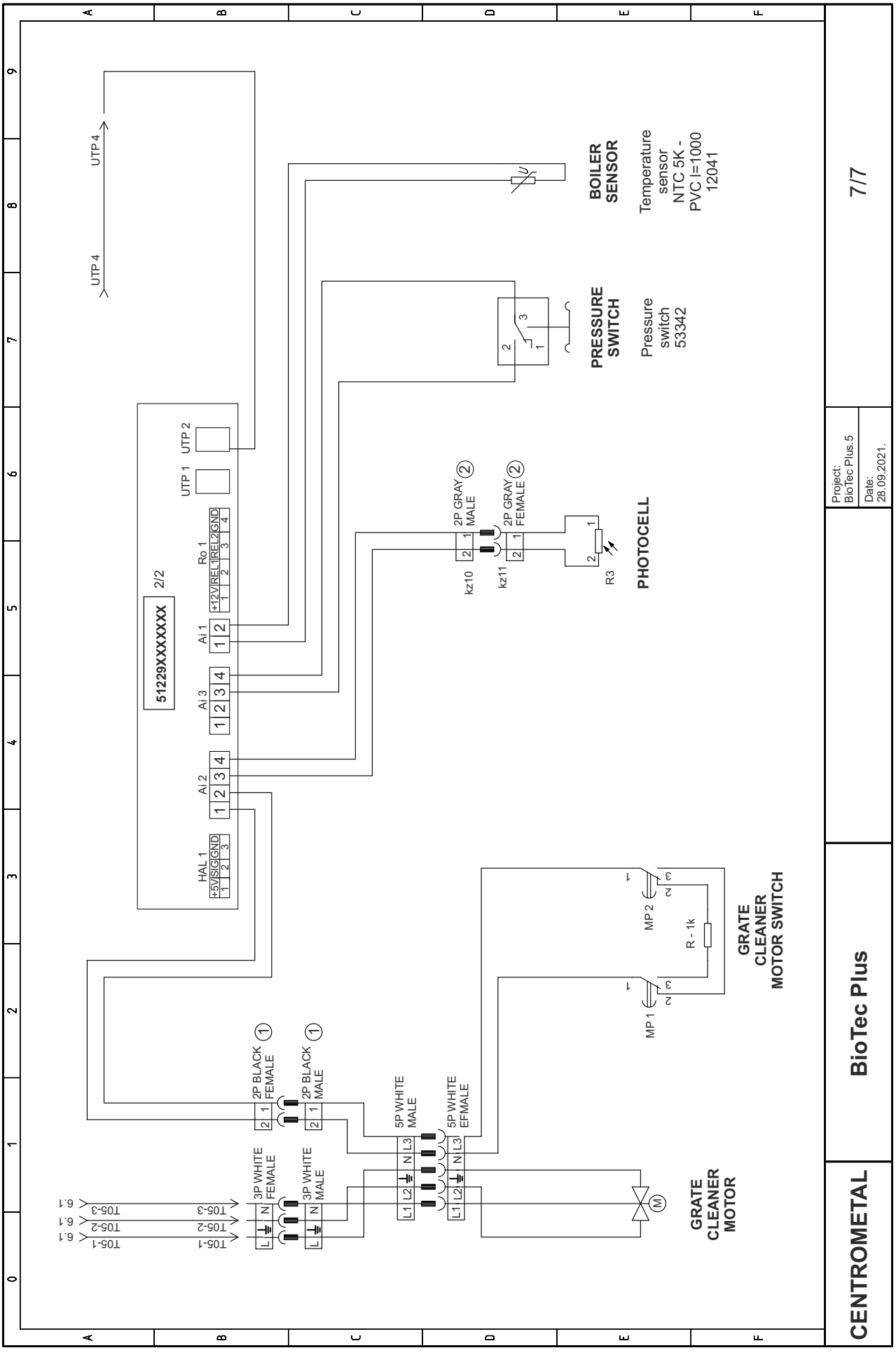
a) Installed lambda PCB 22995XXXXXXX



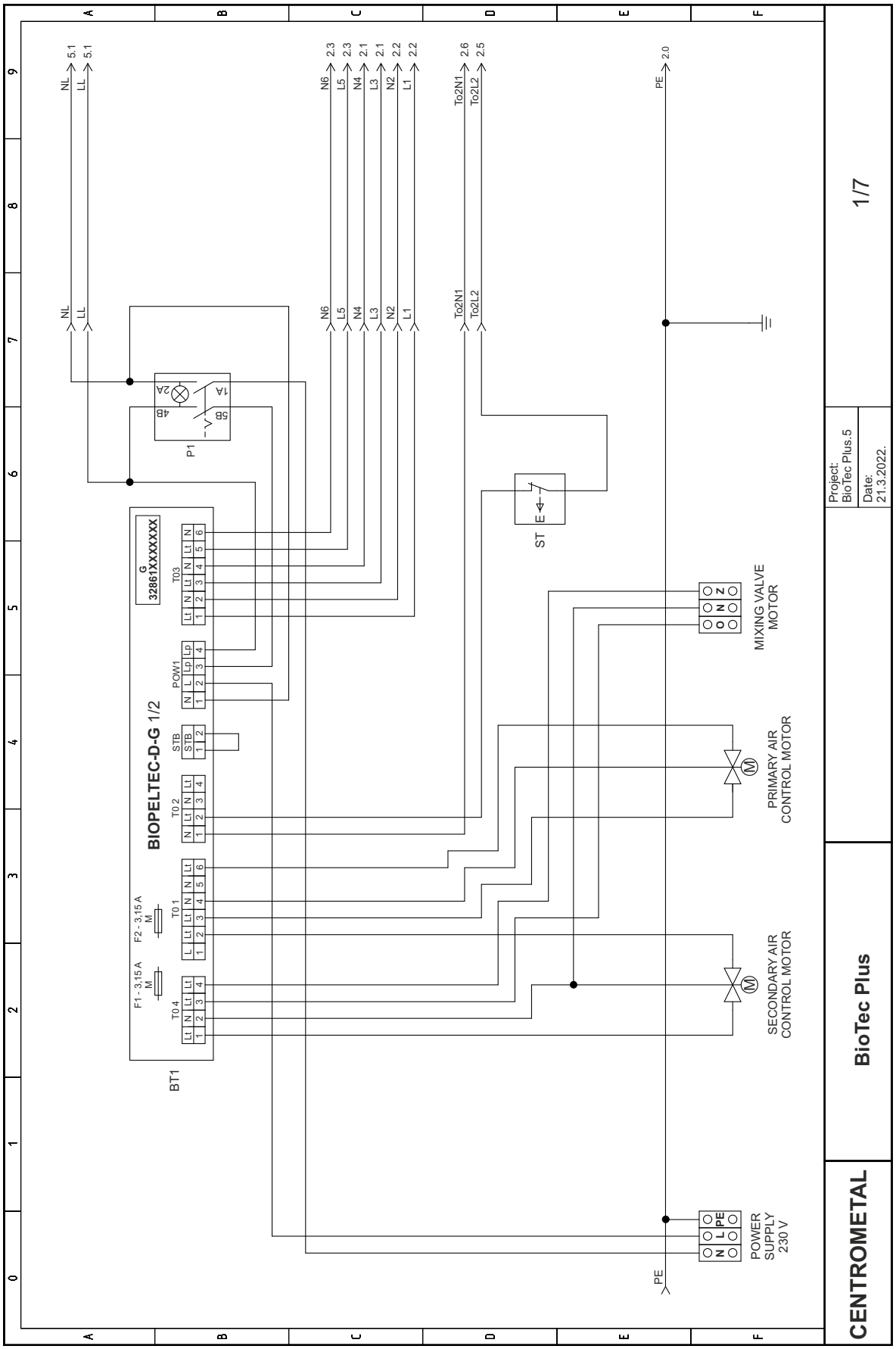
b) Installed lambda PCB LC-21-GS V1 (22005XXXXXXX "G")

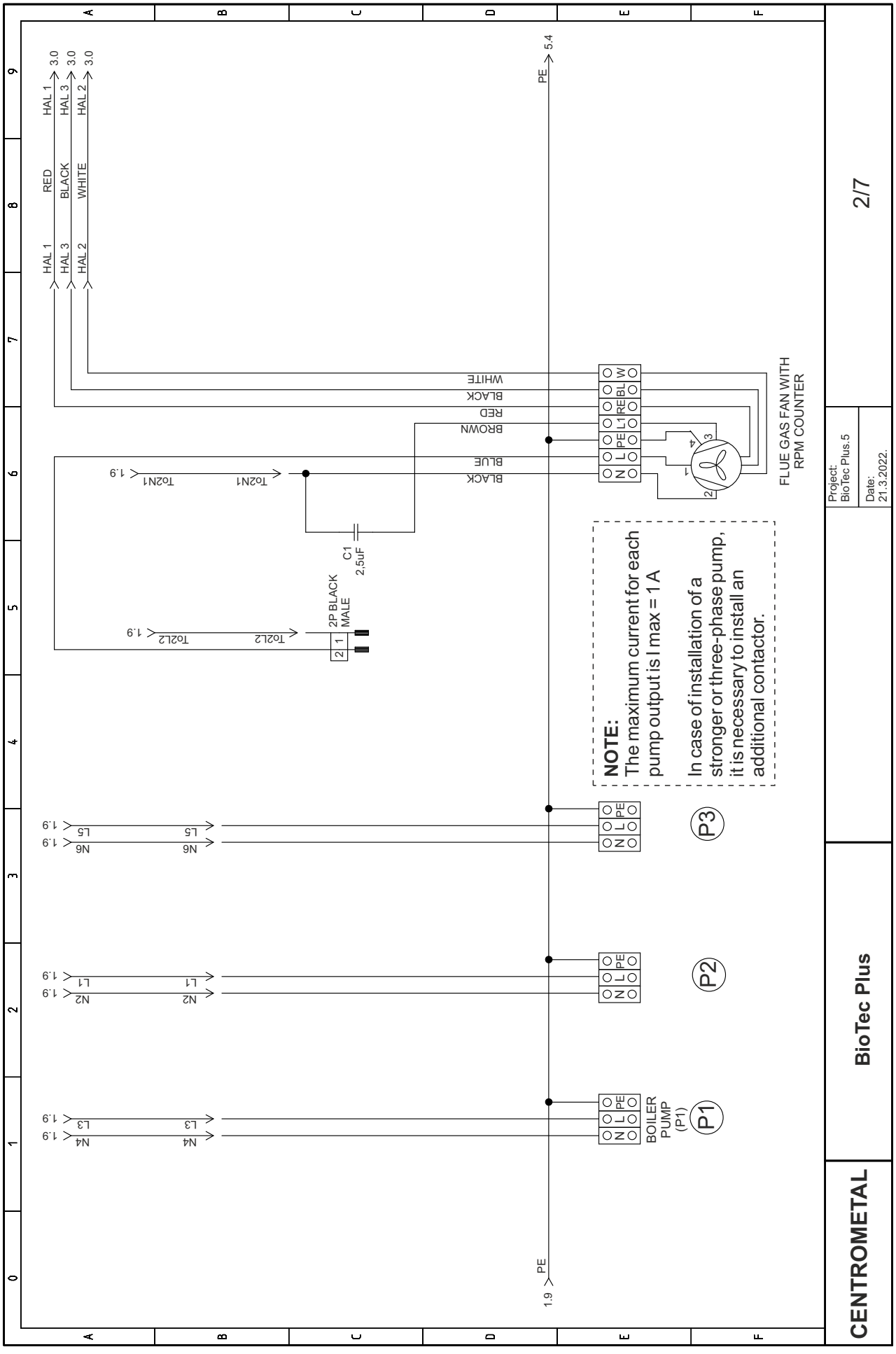


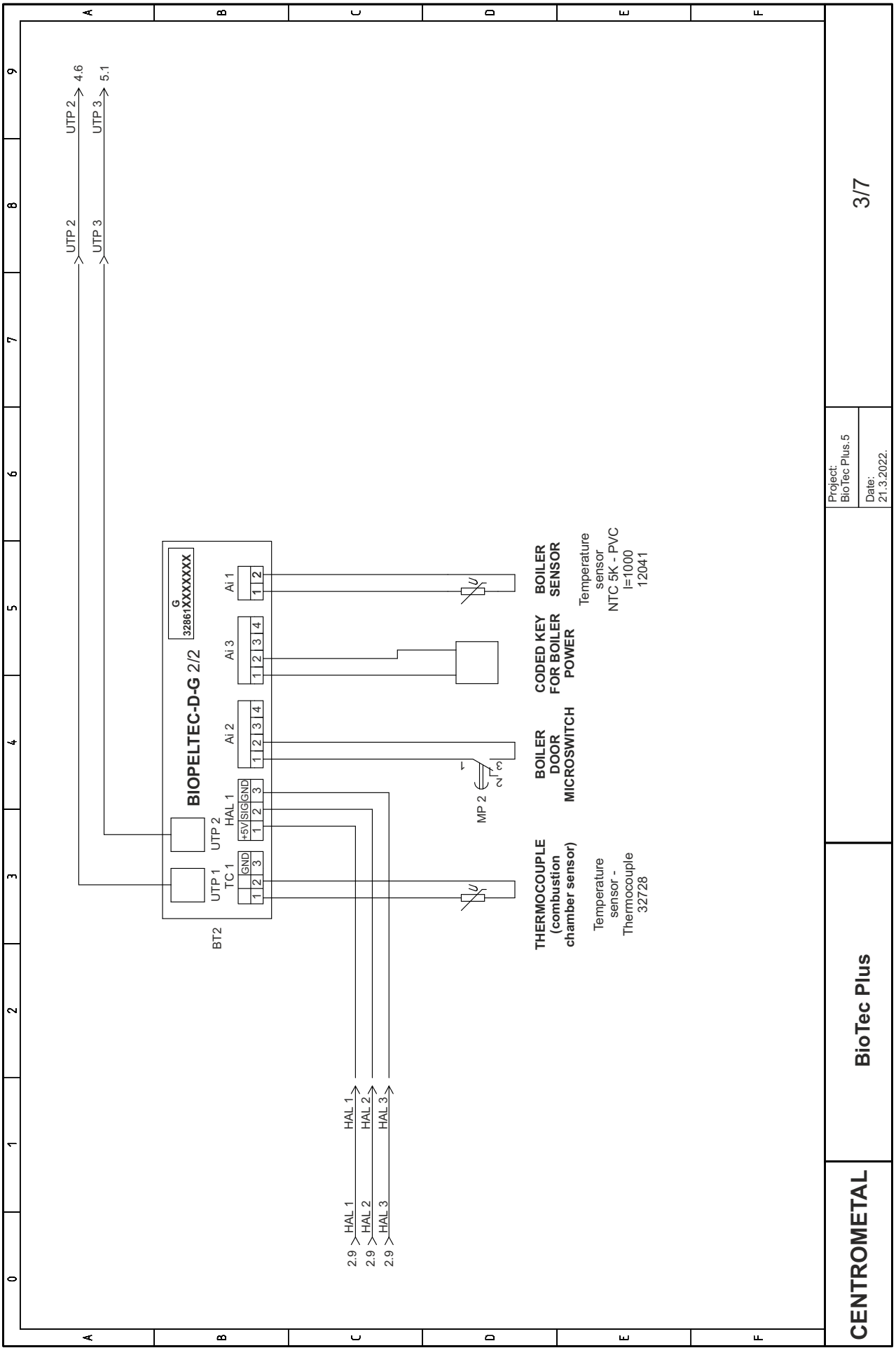

CENTROMETAL
BioTec Plus
6/7
Project:
BioTec Plus.5
Date:
28.09.2021.
Electromagnetic valve
Electric heater
Rotary valve
(RSE)
Feeder screw
motor device
51229XXXXXX
1/2
POW 1
TO 1
TO 2
TO 3
TO 4
TO 5
F1 - 3,15A
F2 - 1,6A
F3 - 3,15 A
K3
6.8
ST1
G1
PE
NO NC
6.9 6.9
2P BLACK
FEMALE
6P BLACK
FEMALE
TO5 - 1
TO5 - 2
TO5 - 3
7.0
7.0
7.1
5.4

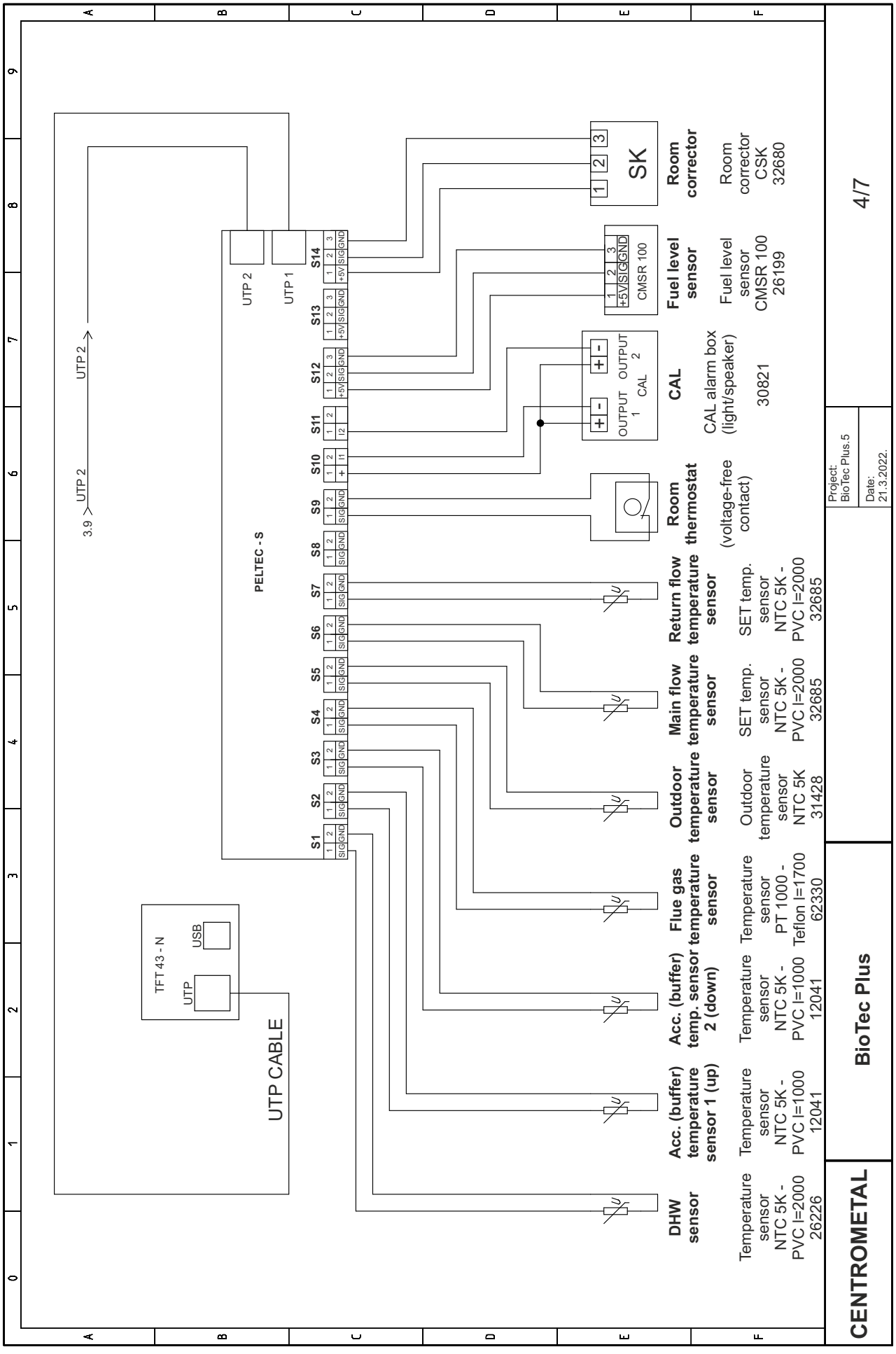

CENTROMETAL
BioTec Plus
7/7
Project:
BioTec Plus.5
Date:
28.09.2021.
BOILER SENSOR
Temperature sensor NTC 5K - PVC l=1000 12041
PRESSURE SWITCH
Pressure switch 53342
PHOTOCELL
R3
kz10
kz11
2P GRAY MALE
2P GRAY FEMALE
GRATE CLEANER MOTOR SWITCH
MP 1
MP 2
R - 1k
GRATE CLEANER MOTOR
2P BLACK FEMALE
2P BLACK MALE
3P WHITE FEMALE
3P WHITE MALE
5P WHITE MALE
5P WHITE EFMALE
TO5-1
TO5-2
TO5-3
6.1
51229XXXXXXX
2/2
UTP 1
UTP 2
UTP 4
Ro 1
+12V REL 1 REL 2 GND
Ai 1
Ai 2
Ai 3
HAL 1
+5V SIG GND

7.3. ELECTRICAL SCHEME INSTALLATION - built-in BIOPELTEC-D-G 32861XXXXXXX "G" and 51229XXXXXXX "G" PCB (printed circuit board)

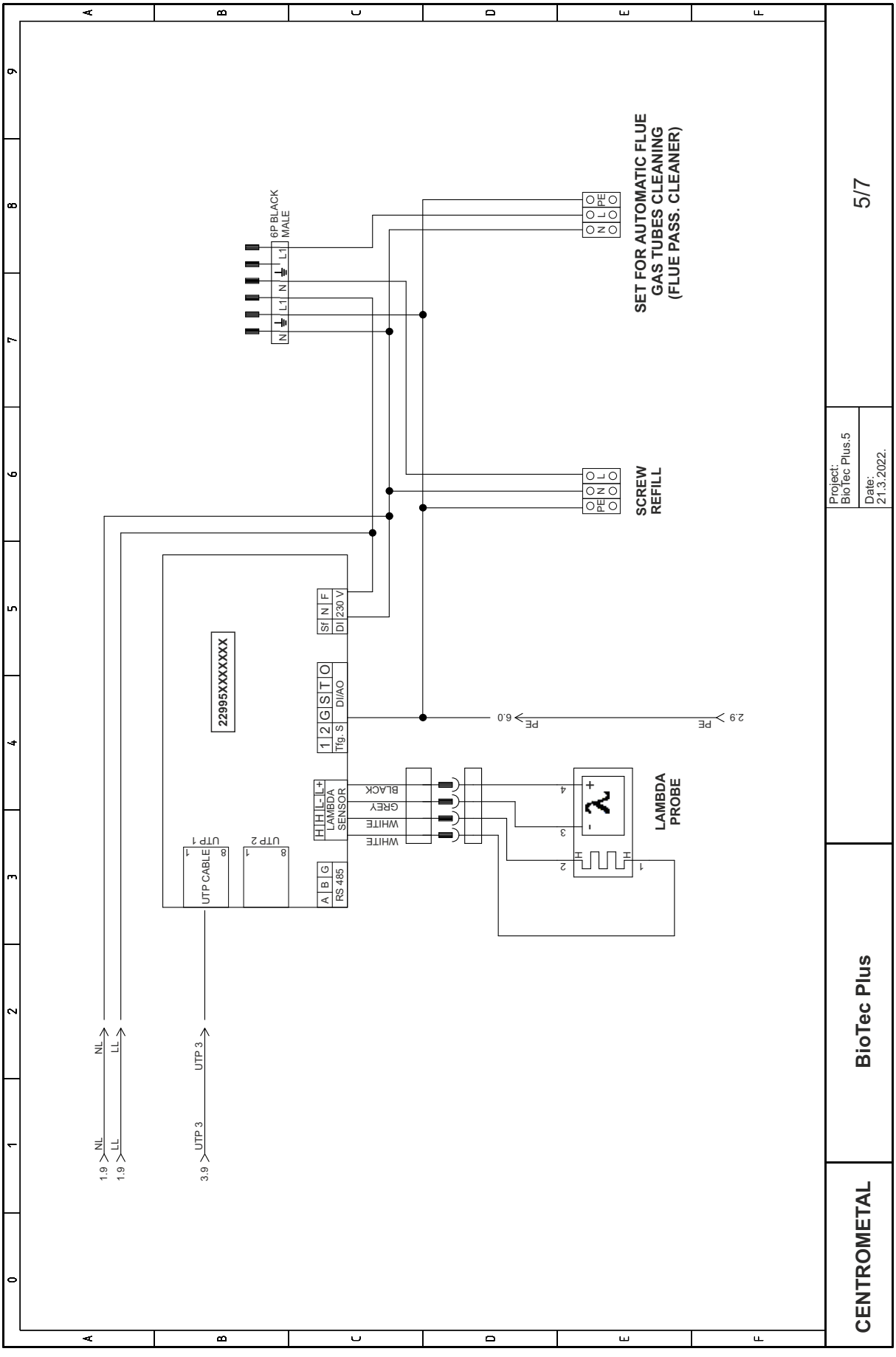



HAL 1
HAL 3
HAL 2
RED
BLACK
WHITE
3.0
PE
5.4
1.9
FLUE GAS FAN WITH RPM COUNTER
BROWN
BLUE
C1
2,5uF
2P BLACK MALE
NOTE:
The maximum current for each pump output is I max = 1 A
In case of installation of a stronger or three-phase pump, it is necessary to install an additional contactor.
BOILER PUMP (P1)
P1
P2
P3
CENTROMETAL
BioTec Plus
2/7
Project: BioTec Plus.5
Date: 21.3.2022.

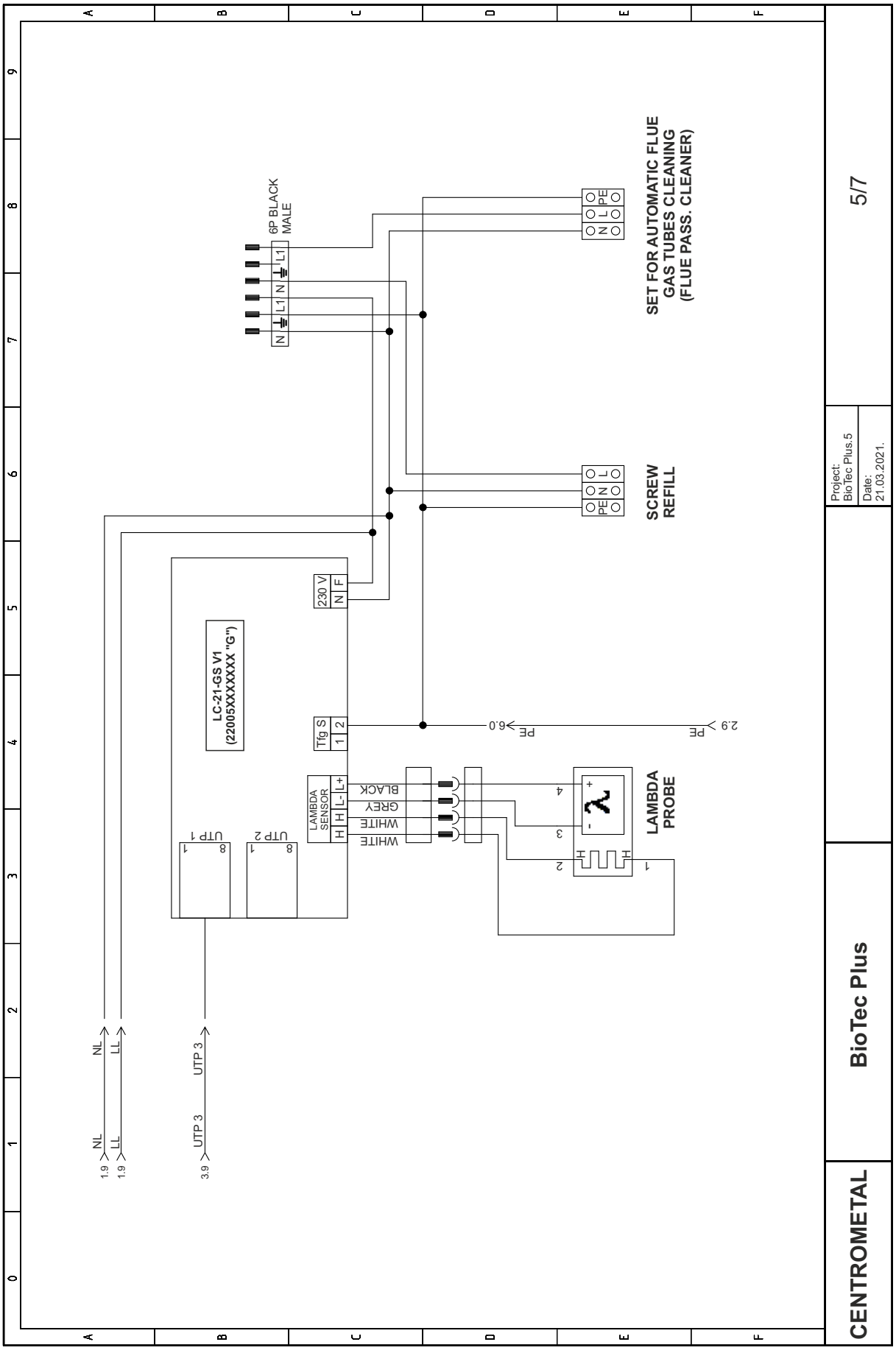

BIOPELTEC-D-G 2/2
G
32861XXXXXX
UTP 1
TC 1
GND
1 2 3
UTP 2
HAL 1
+5V SIG GND
1 2 3
Ai 2
1 2 3 4
Ai 3
1 2 3 4
Ai 1
1 2
BT2
UTP 2
UTP 3
UTP 2 4.6
UTP 3 5.1
THERMOCOUPLE (combustion chamber sensor)
Temperature sensor - Thermocouple 32728
BOILER DOOR MICROSWITCH
MP 2
CODED KEY FOR BOILER POWER
BOILER SENSOR
Temperature sensor NTC 5K - PVC l=1000 12041
HAL 1
HAL 2
HAL 3
2.9 HAL 1
2.9 HAL 2
2.9 HAL 3
CENTROMETAL
BioTec Plus
Project: BioTec Plus.5
Date: 21.3.2022.
3/7

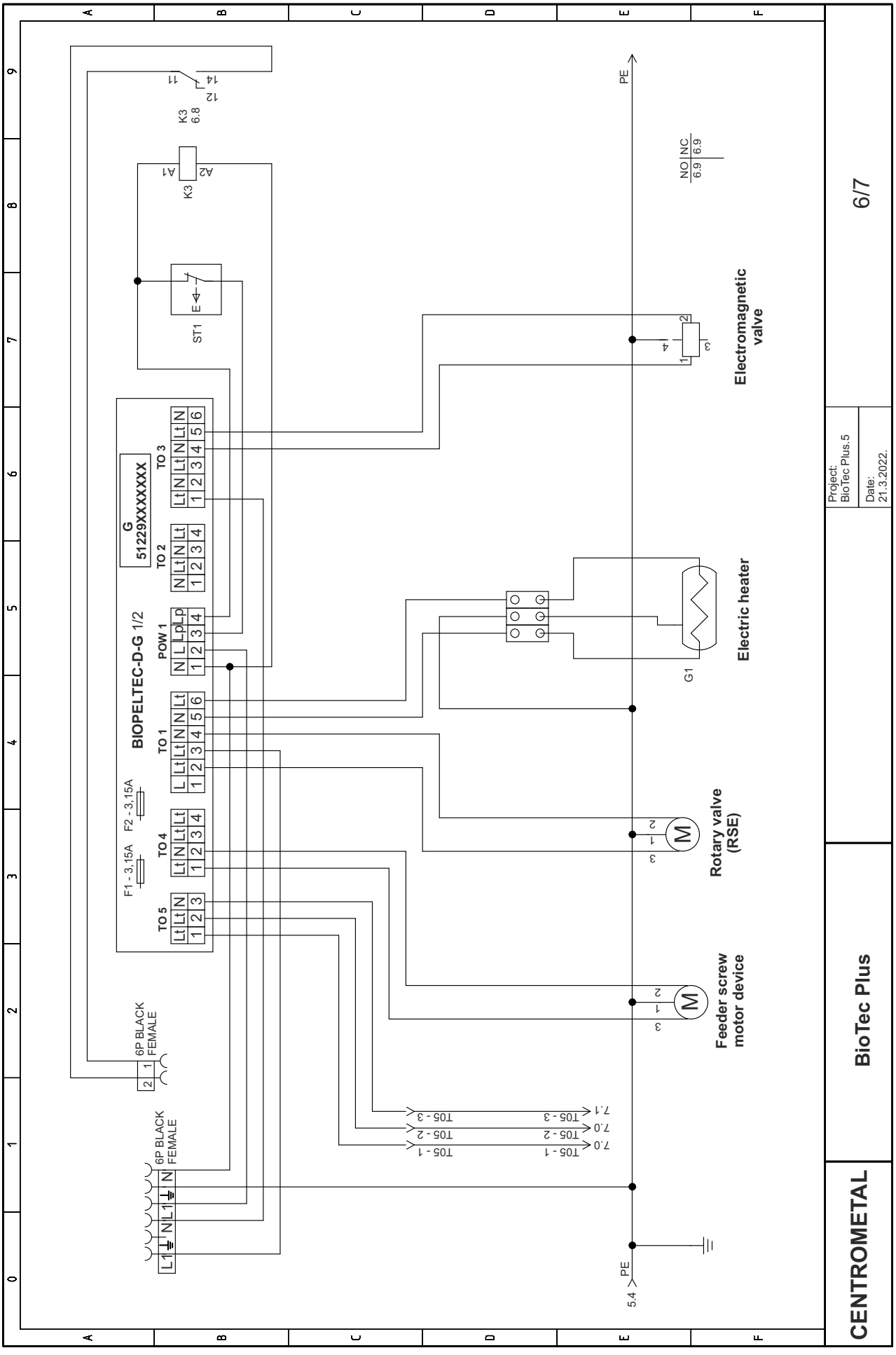

CENTROMETAL
BioTec Plus
4/7
Project: BioTec Plus.5
Date: 21.3.2022.
PELTEC - S
UTP 1
UTP 2
UTP 2
UTP 2
3.9
UTP CABLE
TFT 43 - N
UTP
USB
S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14
SIG GND
+5V SIG GND
I1 I2
OUTPUT 1 CAL
OUTPUT 2
CMSR 100
SK
DHW sensor
Temperature sensor NTC 5K - PVC l=2000 26226
Acc. (buffer) temperature sensor 1 (up)
Temperature sensor NTC 5K - PVC l=1000 12041
Acc. (buffer) temp. sensor 2 (down)
Temperature sensor NTC 5K - PVC l=1000 12041
Flue gas temperature sensor
Temperature sensor PT 1000 - Teflon l=1700 62330
Outdoor temperature sensor
Outdoor temperature sensor NTC 5K 31428
Main flow temperature sensor
SET temp. sensor NTC 5K - PVC l=2000 32685
Return flow temperature sensor
SET temp. sensor NTC 5K - PVC l=2000 32685
Room thermostat
(voltage-free contact)
CAL
CAL alarm box (light/speaker)
30821
Fuel level sensor
Fuel level sensor CMSR 100 26199
Room corrector
Room corrector CSK 32680

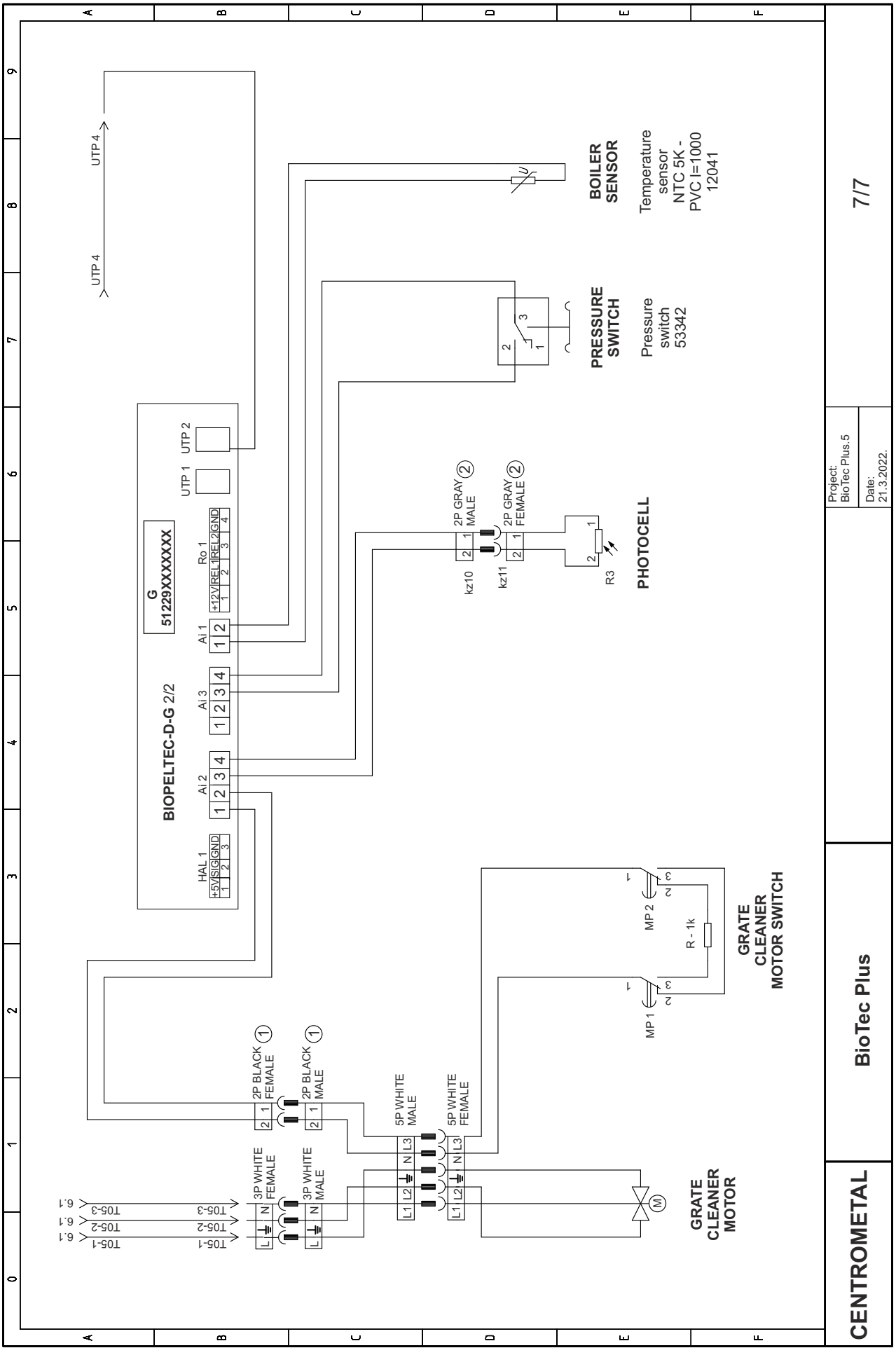
a) Installed lambda PCB 22995XXXXXXX



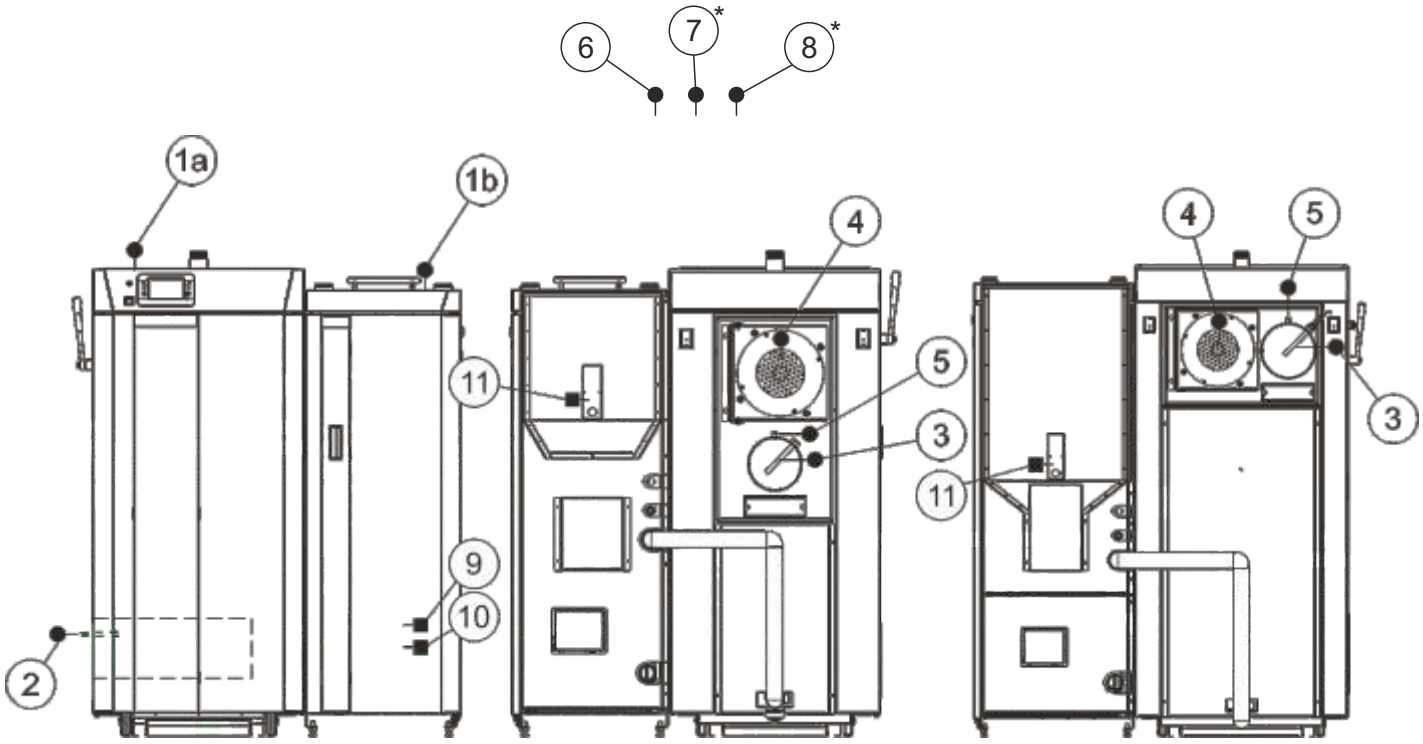
b) Installed lambda PCB LC-21-GS V1 (22005XXXXXXX "G")




CENTROMETAL
BioTec Plus
6/7
Project:
BioTec Plus.5
Date:
21.3.2022.
BIOPELTEC-D-G 1/2
G
51229XXXXXXX
TO 1
TO 2
TO 3
TO 4
TO 5
POW 1
F1 - 3,15A
F2 - 3,15A
K3
6.8
ST1
NO NC
6.9 6.9
PE
Electromagnetic valve
Electric heater
G1
Rotary valve (RSE)
Feeder screw motor device
6P BLACK FEMALE
6P BLACK FEMALE
TO5 - 1
TO5 - 2
TO5 - 3
7.0
7.0
7.1
5.4


CENTROMETAL
BioTec Plus
7/7
Project:
BioTec Plus.5
Date:
21.3.2022.
BOILER SENSOR
Temperature sensor NTC 5K - PVC l=1000 12041
PRESSURE SWITCH
Pressure switch 53342
PHOTOCELL
R3
2P GRAY MALE
2P GRAY FEMALE
kz10
kz11
BIOPELTEC-D-G 2/2
G 51229XXXXXX
UTP 1
UTP 2
UTP 4
Ro 1
+12V IREL 1 REL 2 GND
Ai 1
Ai 2
Ai 3
HAL 1
+5V SIG GND
2P BLACK FEMALE
2P BLACK MALE
3P WHITE FEMALE
3P WHITE MALE
5P WHITE MALE
5P WHITE FEMALE
L1 L2 L3 N
GRATE CLEANER MOTOR
GRATE CLEANER MOTOR SWITCH
MP 1
MP 2
R - 1k
T05-1
T05-2
T05-3
6.1

7.4. BOILER SENSORS AND PROBES



BioTec Plus 25-35 BioTec Plus 45

1a - Boiler temperature sensor (left side of the boiler; fuel: wood) -
Temperature sensor NTC 5K - PVC l=1000 (12041)

1b - Boiler temperature sensor (right side of the boiler; fuel: wood pellets) -
Temperature sensor NTC 5K - PVC l=1000 (12041)

2 - THERMOCOUPLE (combustion chamber sensor) - Temperature sensor - Thermocouple (32728)

3 - Flue gas temperature sensor - Temperature sensor PT 1000 - Teflon l=1700 (62330)

4 - Fan speed sensor (RPM)

5 - Lambda probe

6 - Outdoor temperature sensor - Outdoor temperature sensor NTC 5K (31428)

7 - Main/Return flow temperature sensor / hydraulic crossover sensor -
SET temperature sensor NTC 5K - PVC l=2000 (32685)

8 - DHW sensor / hydraulic crossover - Temperature sensor NTC 5K - PVC l=2000 (26226)

9 - Pressure switch

10 - Photocell

11 - Fuel level sensor (wood pellets) - CMSR 100 (26199)

* - Installed on heating installation

RESISTANCE LIST **Pt1000** SENSOR
(measuring field -30 - +400 °C)

Temperature (°C)	Resis. (W)	Temperature (°C)	Resis. (W)
-30	885	225	1.866
-25	904	230	1.886
-20	923	235	1.905
-15	942	240	1.924
-10	962	245	1.943
-5	981	250	1.963
0	1.000	255	1.982
5	1.019	260	2.001
10	1.039	265	2.020
15	1.058	270	2.040
20	1.077	275	2.059
25	1.096	280	2.078
30	1.116	285	2.097
35	1.135	290	2.117
40	1.154	295	2.136
45	1.173	300	2.155
50	1.193	305	2.174
55	1.212	310	2.194
60	1.231	315	2.213
65	1.250	320	2.232
70	1.270	325	2.251
75	1.289	330	2.271
80	1.308	335	2.290
85	1.327	340	2.309
90	1.347	345	2.328
95	1.366	350	2.348
100	1.385	355	2.367
105	1.404	360	2.386
110	1.424	365	2.405
115	1.443	370	2.425
120	1.462	375	2.444
125	1.481	380	2.463
130	1.501	385	2.482
135	1.520	390	2.502
140	1.539	395	2.521
145	1.558	400	2.540
150	1.578		
155	1.597		
160	1.616		
165	1.635		
170	1.655		
175	1.674		
180	1.693		
185	1.712		
190	1.732		
195	1.751		
200	1.770		
205	1.789		
210	1.809		
215	1.828		
220	1.847		

RESISTANCE LIST **NTC 5k/25°C** SENSOR
(measuring field from -20 - +130 °C)

Temperature (°C)	Resistance (Ω)
-20	48.534
-15	36.465
-10	27.665
-5	21.158
0	16.325
5	12.694
10	9.950
15	7.854
20	6.245
25	5.000
30	4.028
34	3.266
40	2.663
45	2.184
50	1.801
55	1.493
60	1,244
65	1.041
70	876,0
75	740,7
80	629,0
85	536,2
90	458,8
95	394,3
100	340,0
105	294,3
110	255,6
115	222,7
120	190,7
125	170,8
130	150,5

8.0. BOILER USE

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 4.0 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 check if the boiler doors and cover door are closed.

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!

8.1. BOILER CONTROL UNIT USE

For (boiler) boiler control unit use see Technical instructions for BioTec Plus control unit - BOOK 2/2.

9.0. CLEANING AND MAINTENANCE OF THE BOILER

NOTE:
For any electrical connections, be sure to turn off the boiler at the main switch and disconnect the power supply cable.

Every millimeter of soot and dirt on the surfaces of the boiler surface means approx. 5% higher fuel consumption.
Save fuel – clean the boiler on time!

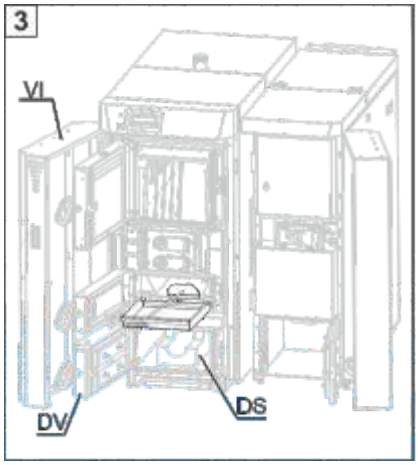
PROTECTIVE GLOVES ARE OBLIGATORY!

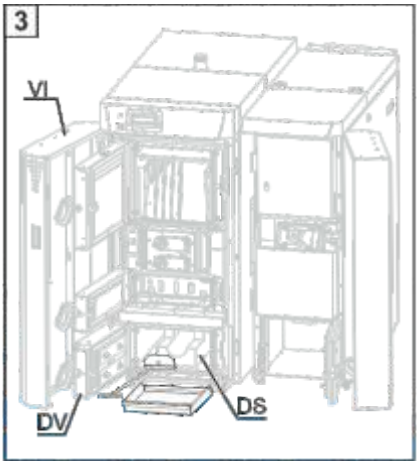
9.1. PERIODIC CLEANING AND MAINTENANCE OF THE BOILER

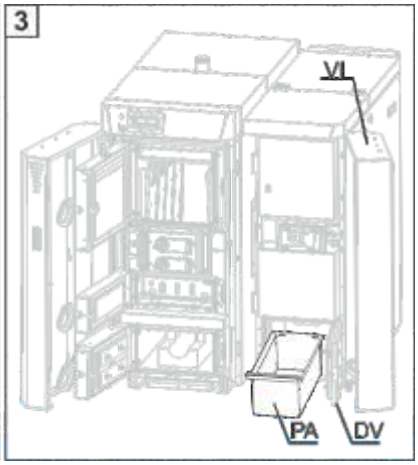
DESCRIPTION OF MAINTENANCE	INTERVAL
Cleaning ash in firebox and under firebox (through middle and lower door - left part of the boiler) and ashtray emptying from right part of the boiler.	Before each ignition.
Flue gas tube cleaning.	Before refilling of fuel / before ignition.
Checking correctness of security valve.	Every 6 months.
Cleaning of flue gas chamber.	At least once per year.
Cleaning and checking the flue installation sealing.	At least once per year.
Cleaning of area over heat exchanger pipes with turbulators.	At least once per year.
Cleaning the blades and box of the fan.	At least once per year.
Photocell cleaning.	At least once per year.

Cleaning / maintenance interval	Boiler type	Description
Before each ignition	25, 35 and 45 kW	Cleaning ash in firebox and under firebox (through middle and lower door - left part of the boiler) and ashtray emptying from right part of the boiler.

Before every ignition is necessary to clean area below firebox and lower refractory stone (DS) (through middle and lower boiler door (DV)) and empty ashtray (PA) from the right side of the boier. Before cleaning is necessary to turn on option "cleaning". Fan will work at maximun speed to reduce the spread of dust to the room. When you finish cleaning, press the "STOP" button. If time of 30:00 minutes has expired cleaning option (fan) will automatically turn off.

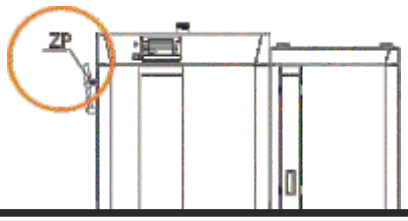






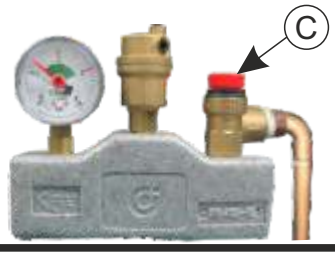
1. Press button ”Cleaning“ on main screen
2. Press button ”OK“
3. Open front boiler door (VI).
4. Open middle boiler door
5. Open lower boiler door (DV).
6. Insert the ashtray to the middle gate (1) and clean up firebox with scraper and push the ash on the ashtray.
7. Insert the ashtray under lower door and use scraper to clean refractory stone(DS) and push ash on the astray.
8. Empty ashtray
9. Take out ashtray (PA) from right side of the boiler.
10. Empty ashtray (PA) and place it back.
11. After cleaning, the boiler is ready for ignition.

Cleaning / maintenance interval	Boiler power	Description
Before refilling of fuel / before ignition	25, 35 and 45 kW	Flue gas tubes cleaning



For flue gas tubes cleaning in necessary to pull lever (ZP) few times.

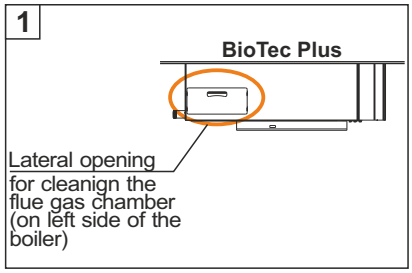
Cleaning / maintenance interval	Boiler power	Description
Every 6 months	25, 35 and 45 kW	Check the correctness of security valve

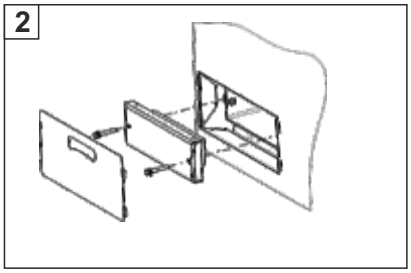


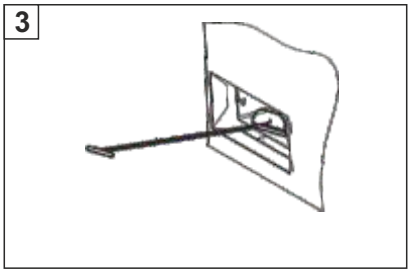
Checking the correctness of security valve

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 / maintenance interval	Boiler power	Description
At least once per year.	25, 35 and 45 kW	Cleaning of flue gas chamber.







1 - Switch off the boiler and disconnect from electric. power.
2 - Before cleaning flue gas chamber, pull lever (ZP) few times (see ”flue gas tubes cleaning“)
3 - Take out insulation cover, unscrew two screws which hold door of flue gas chamber.
4 - Insert ashtray and clean the flue gas chamber with scraper.
5 - Put the doors and insulation cover to original position.

Note: For the proper operation of the boiler it is IMPORTANT to hard tight the doors how it to seal perfectly!

Before this procedure be sure to disconnect boiler from electric. power!

Cleaning / maintenance interval	Boiler power	Description
At least once per year	25, 35 and 45 kW	Cleaning and checking the flue installation sealing

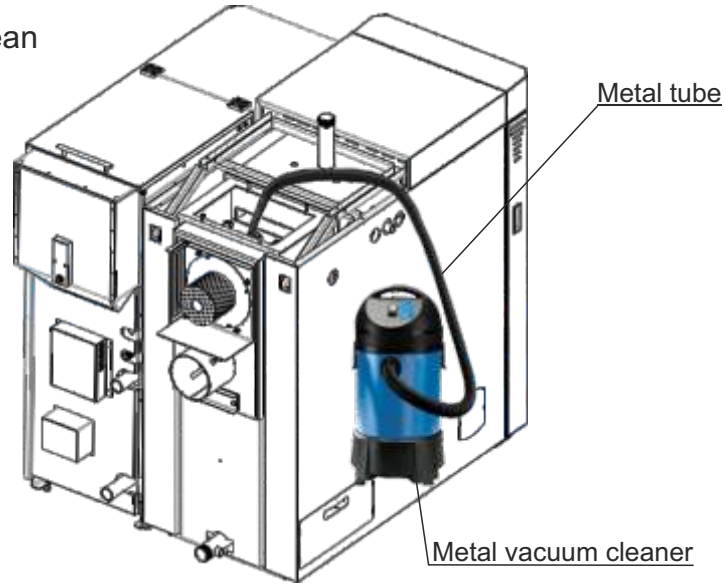
Cleaning and checking the flue installation sealing

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.

Before this procedure be sure to disconnect boiler from electric. power!

Cleaning / maintenance interval	Boiler power	Description
At least once per year	25, 35 and 45 kW	Cleaning of area over heat exchanger pipes with turbulators

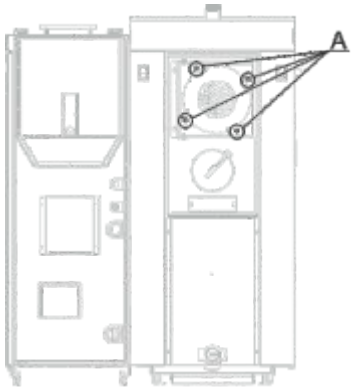
1 - Switch off the boiler and disconnect from electric. power.
2 - Take out last upper cover side.
3 - Open the flue gas chamber.
4 - Use the metal vacuum cleaner to clean dust and ash in flue gas chamber.



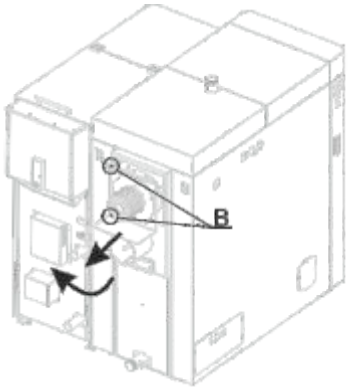
Before this procedure be sure to disconnect boiler from electric. power!

Cleaning / maintenance interval	Boiler power	Description
At least once per year	25, 35 and 45 kW	Cleaning the blades and box of the fan

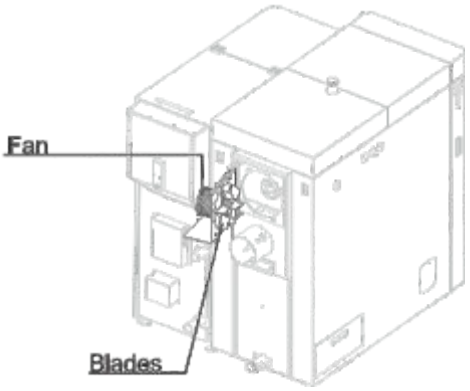
BioTec Plus 25, 35



1.



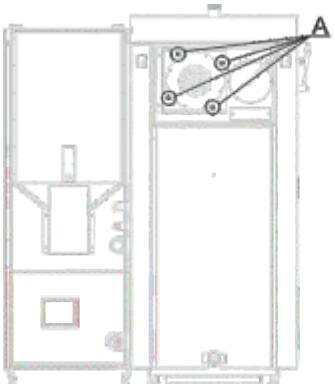
2.



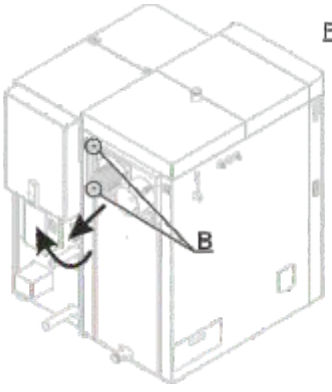
3.

1. Switch off the boiler and disconnect from electric. power.
2. Unscrew nuts (A) shown in Image 1.
3. Relase screws (B) shown in Image 2.
4. Pull out fan with flange to the end od rail, then open it to left side (see Image 2. and Image 3.).

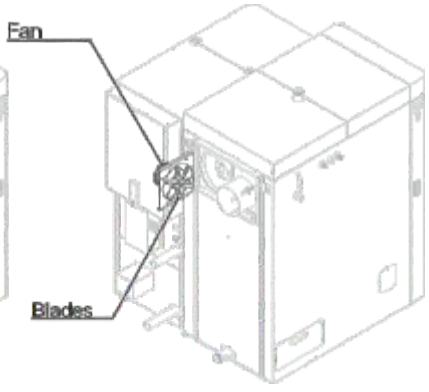
BioTec Plus 45



1.



2.



3.

1. Switch off the boiler and disconnect from electric. power.
2. Unscrew nuts (A) shown in Image 1.
3. Relase screws (B) shown in Image 2.
4. Pull out fan with flange to the end od rail, then open it to left side (see Image 2. and Image 3.).

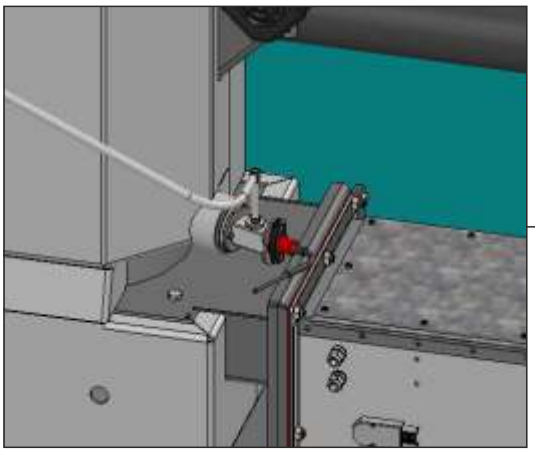
Before this procedure be sure to disconnect boiler from electric. power!

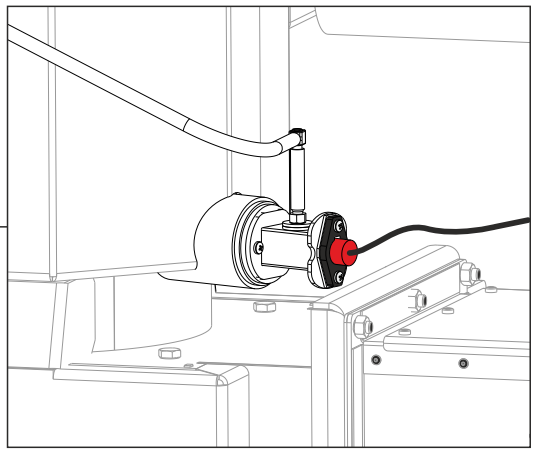
Red photocell		
Cleaning interval	**Boiler type**	**Description**
At least once a year (or if you have problems with the ignition)	25, 35 and 45 kW	Photocell cleaning

Dirty photocell which can result error in ignition or flame dissapear error

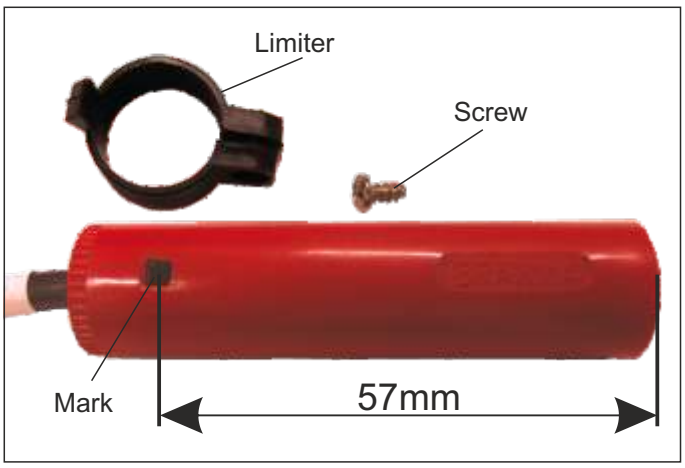
Valid photocell

Carefully remove the photocell from the box and then gently with a cotton swab clean the body and lens of photocell. After cleaning, carefully return photocell to work position.





The photocell should not be set too deep or too shallow in the box. So, limiter determines the proper depth of photocell position. Make sure the limiter is set to black mark. Black mark should be barely visible (see image below).



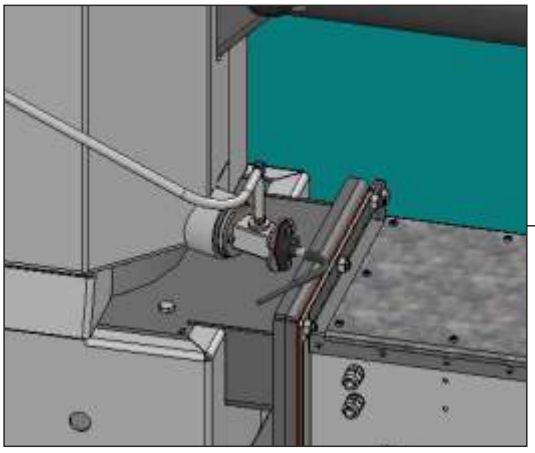
The limiter must be set so that the black mark is barely visible like is shown below (partially covered by hose clamps)

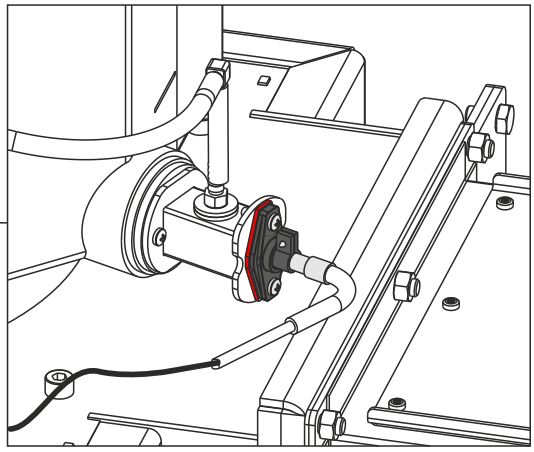
New photocell		
Cleaning interval	**Boiler type**	**Description**
At least once a year (or if you have problems with the ignition)	25, 35 and 45 kW	Photocell cleaning

Dirty photocell which can result error in ignition or flame dissapear error

Valid photocell

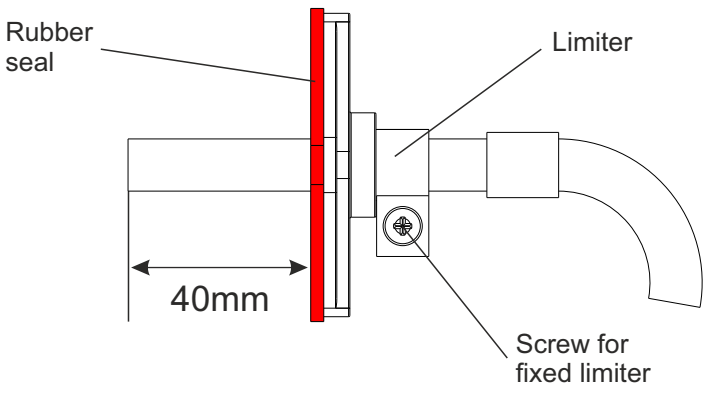
Carefully remove the photocell from the box and then gently with a cotton swab clean the body and lens of photocell. After cleaning, carefully return photocell to work position.





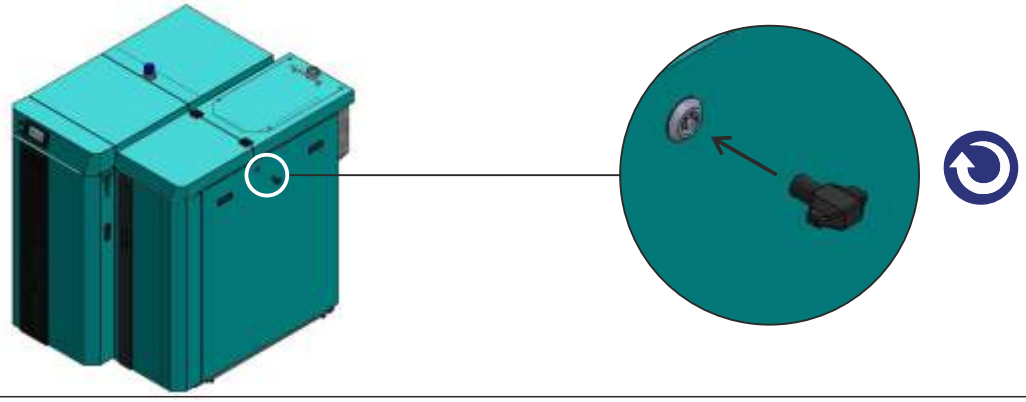
The photocell should not be set too deep or too shallow in the box. So, limiter determines the proper depth of photocell position. Make sure the limiter is set as shown in the illustration below.

The limiter must be placed so that part of the photocell is 40 mm free.



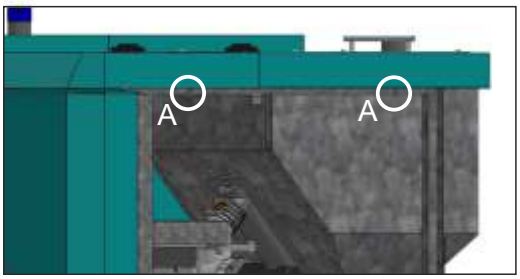
Cover side intended for removal due to access to electrical appliances (side: wood pellets) - **remove**

1. Unlock the cover on the right side of the boiler with a key in a clockwise direction.

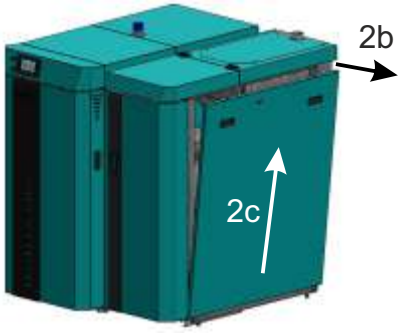


2. Lift the cover slightly upwards (2a) to separate it from the upper hooks (A) and pull it towards you (2b) to separate the upper part of the cover. Then gently lift the cover (2c) and separate from the lower hooks (B).

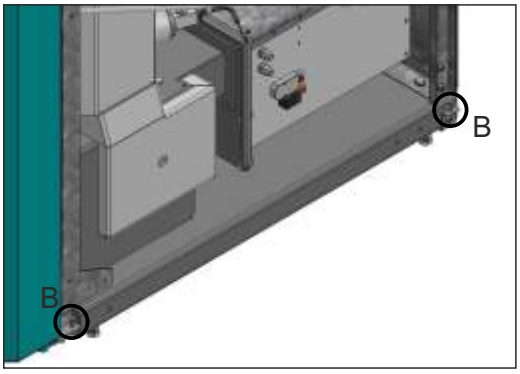

Detail A




Detail A

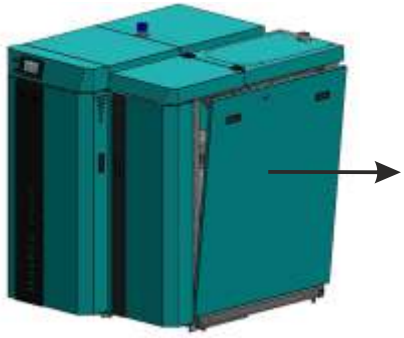


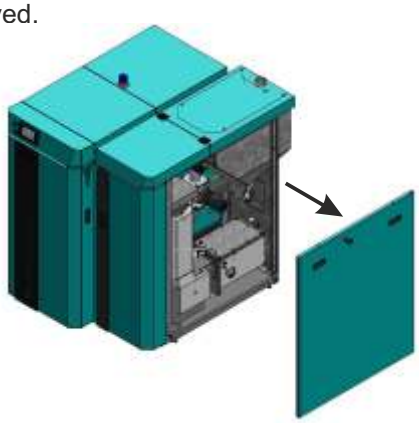

Detail B




Detail B

3. Once the cover has been lifted and separated, it can be removed.

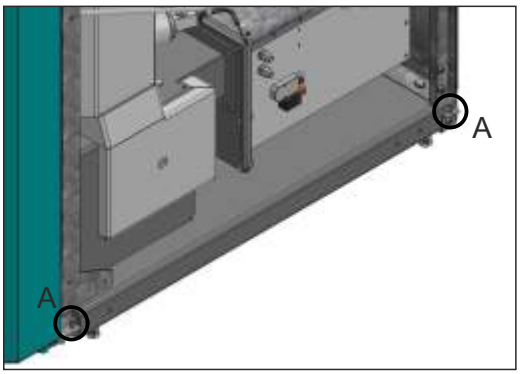




Cover side intended for removal due to access to electrical appliances (side: wood pellets) - **installation**

1. Place the cover on the lower hooks (A) as shown in the figure.

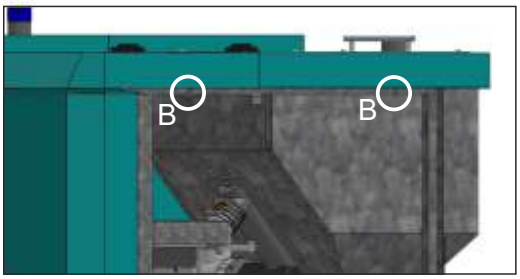
Detail A



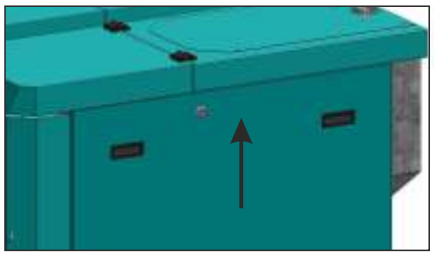
Detail A

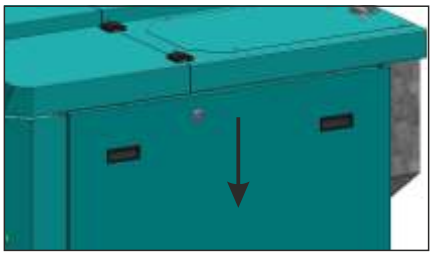
2. Once the cover is firmly on the lower hooks, it should be lifted and attached to the upper hooks (B). After that, just put the cover onto the upper hooks.

Detail B

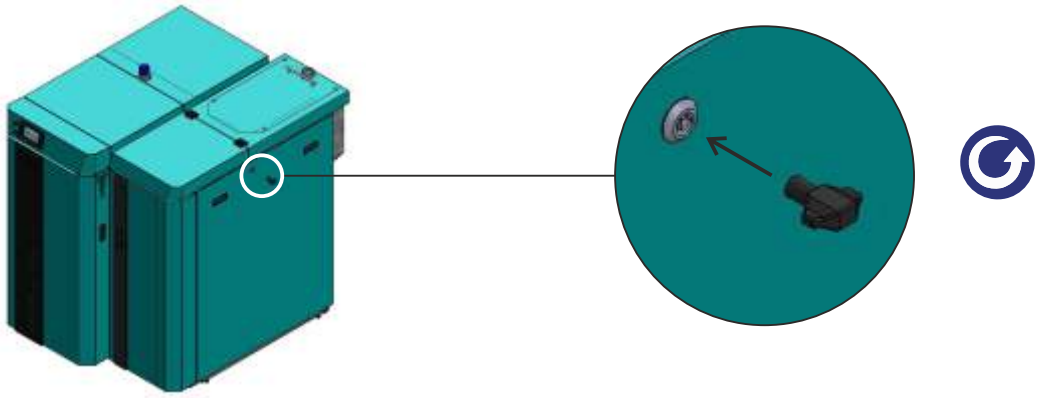


Detail B



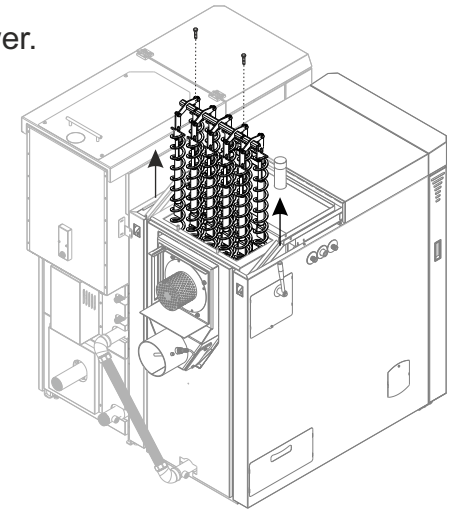


3. Finally, lock the cover with the key in a counterclockwise direction.



9.2. EXTRACTION OF TURBULATORS

1 - Switch off the boiler and disconnect from electric. power.
2 - Take out last upper cover side.
3 - Release 4 nuts and open the flue gas chamber.
4 - Release 2 screws of turbulator axle and
pull out turbulators.

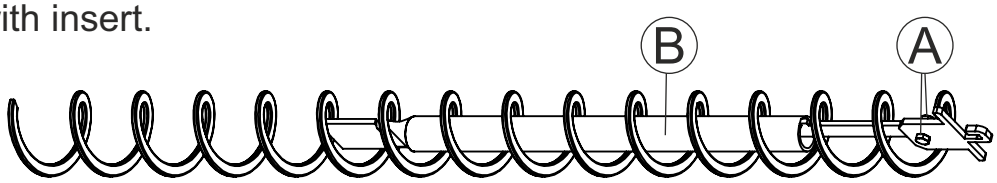


9.3. DESCRIPTION OF EXTRACTION THE INSERT FROM TURBULATORS

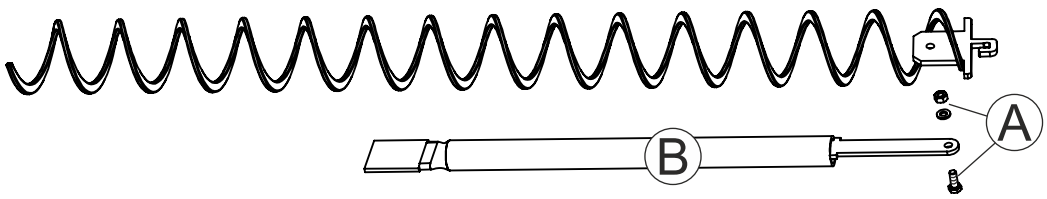
Removing the insert from the turbulators is carried out in case of condensation in the chimney and due to increase of the flue gas temperature and attempt to prevent condensation. This will increase the flue gas temperature (in boiler operation) and probably prevent further chimney condensate. In order to remove the insert from the turbulators is necessary to unscrew the screw and nut (A) and Pull the insert (B) from the bottom.

PROTECTIVE GLOVES ARE OBLIGATORY!

Turbulator with insert.



Extracted insert.



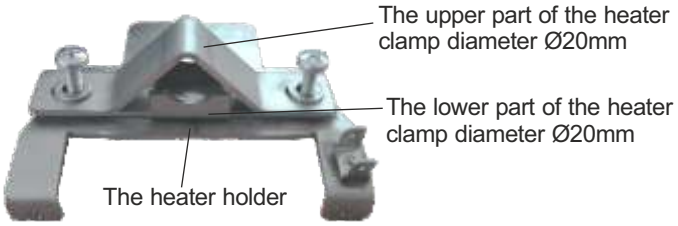
We do not recommend this action until you used all other methods for preventing condensation in the chimney because this reduces boiler efficiency. Number of turbulators from which inserts been removed is determined by authorized person on a case-by-case basis.

This procedure must be done only by authorized person!

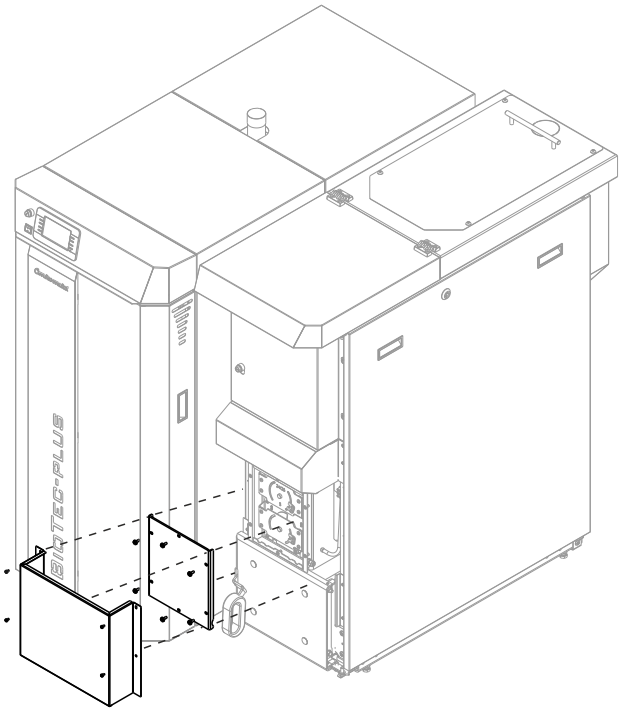
9.4. REPLACEMENT OF THE ELECTRIC HEATER

NOTE:
For any electrical connections, be sure to turn off the boiler at the main switch and disconnect the power supply cable.

Electric heater with a diameter of Ø 20 mm

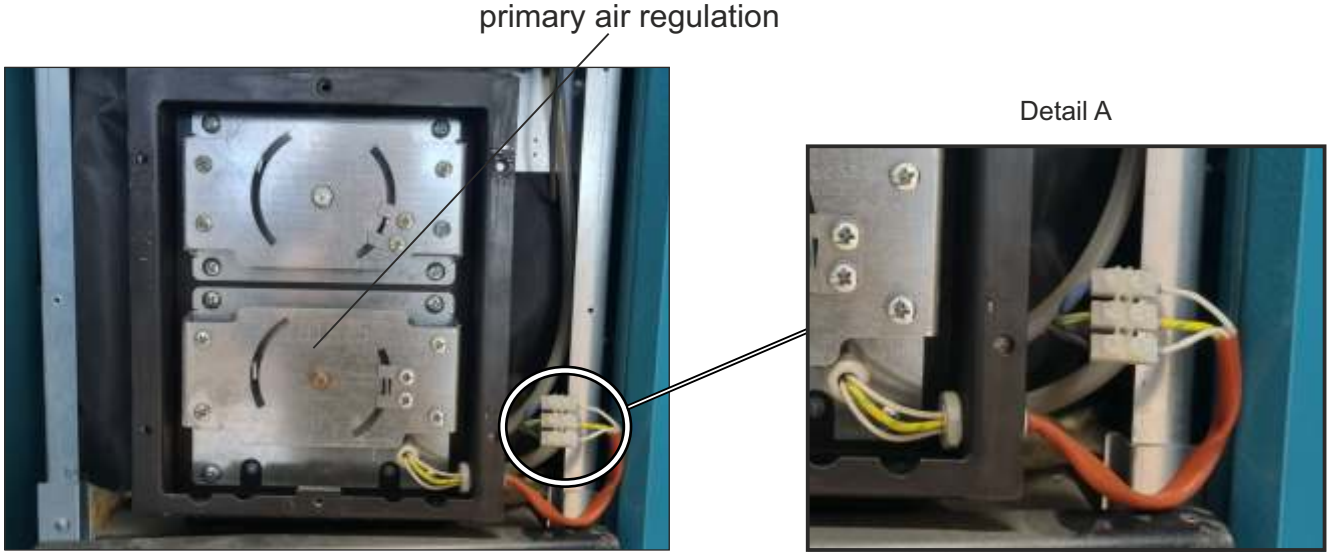


The heater holder with clamp for electric heater with a diameter of Ø 20 mm

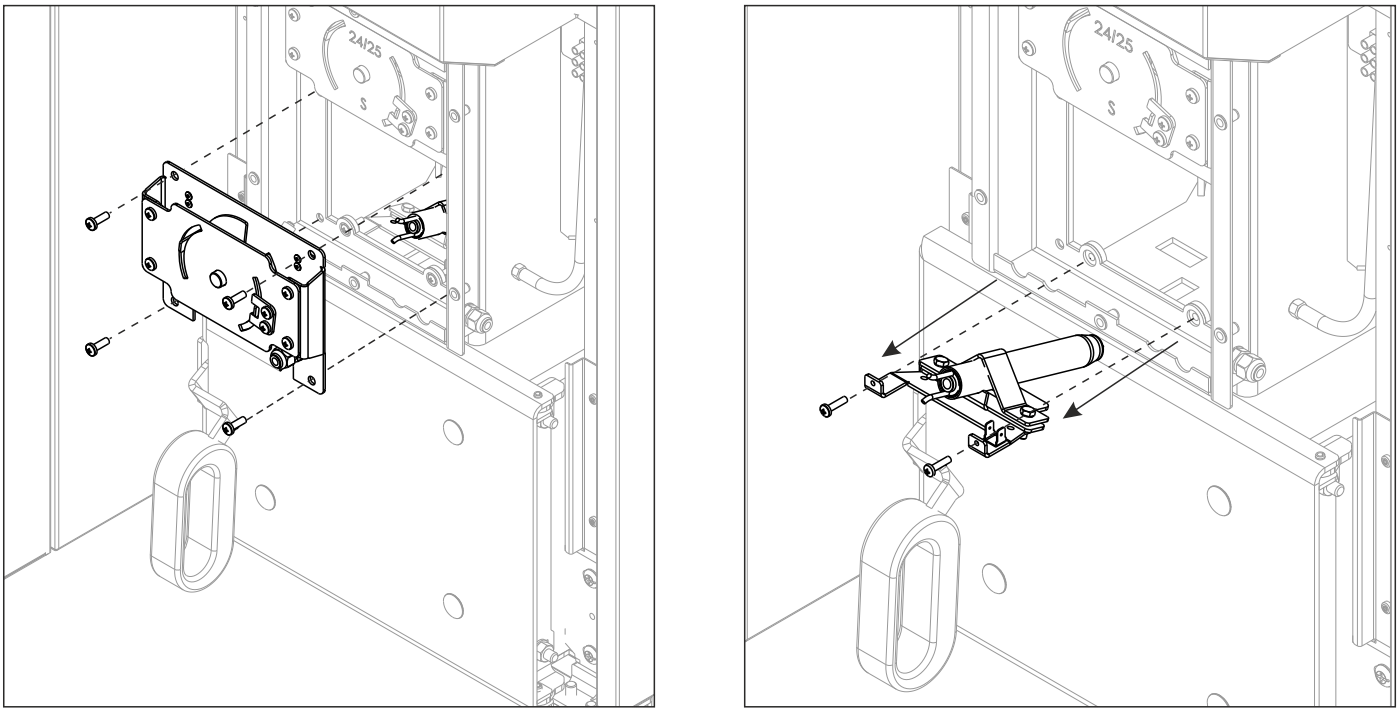


Open the door on the right side of the boiler and unscrew the metal covers to gain access to the place with the electric heater.

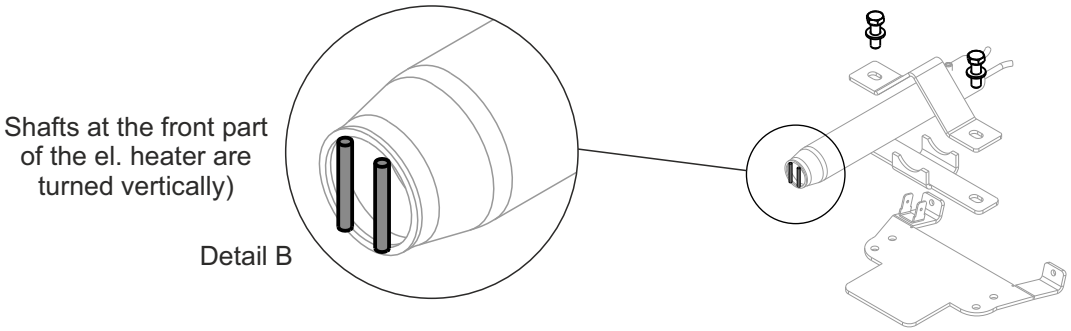
1. Disconnect the wires of the electric heater from the terminal block (Detail A), to be able to remove the primary air regulation.



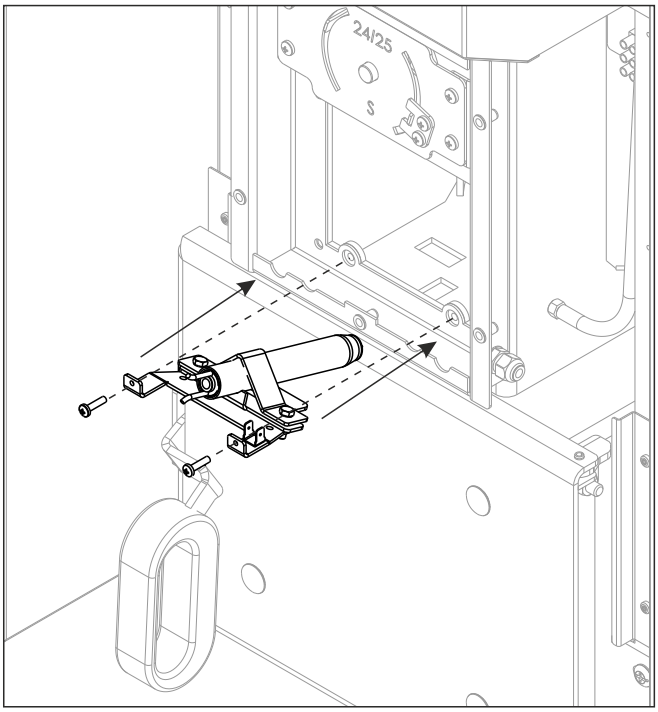
2. Unscrew the 4 screws and remove the primary air regulation. Then unscrew the 2 heater holder screw and pull out heaters holder together with the el. heater.

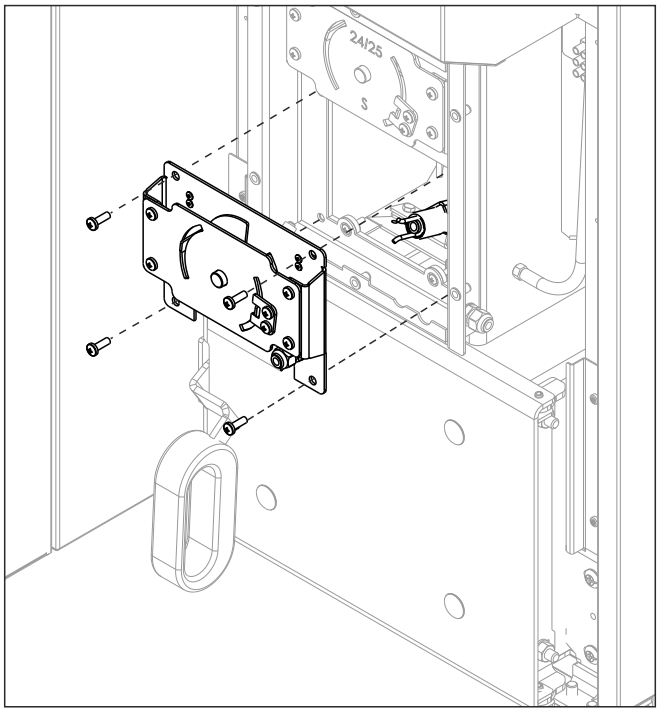


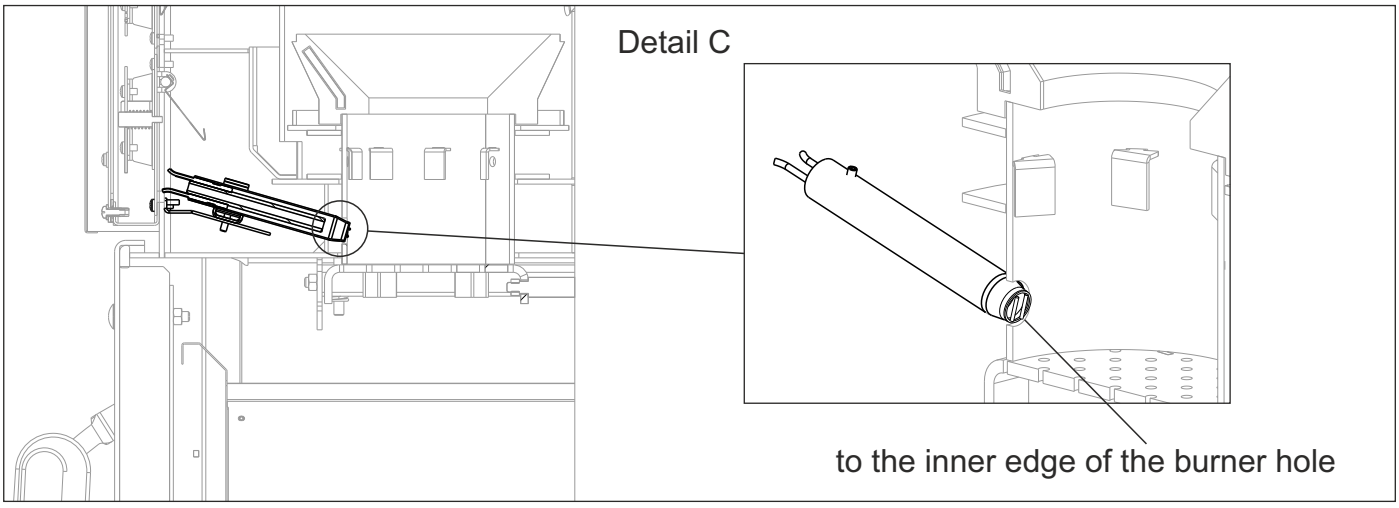
3. Unscrew the two screws and remove the heater clamp. Insert the new el. heater, turn it so that the shafts at the front part of the el heater are turned vertically (see detail B) and gently attach it to the heater holder (Still not fully tightened).



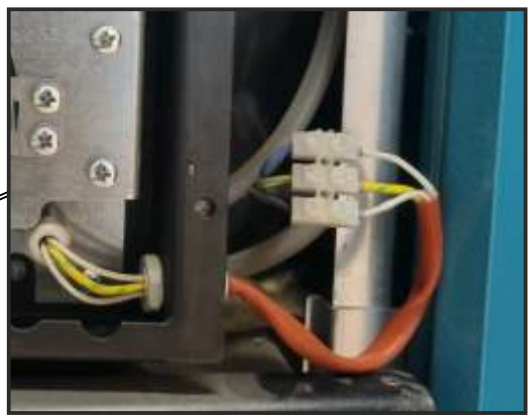
4. Place the el. heater with the holder in place and fasten it with two screws. Set the heater to the inner edge of the burner hole (see detail C). If necessary, loosen the clamp of the heater holder and push the holder until the edge of the burner hole and then tighten the clamp. Place the primary air regulation and connect with 4 screws. Connect the el. heater wires to the terminal block (detail D).







Detail D



10.0. 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.

HR | INFORMACIJSKI LIST
SLO | PODATKOVNA KARTICA
EN | PRODUCT FICHE
DE | PRODUKTDATENBLATT
FR | FICHE PRODUIT
NL | PRODUCTKAART
LV | RAŽOJUMA DATU LAPA
HU | TERMÉKISMERTETŐ ADATLAP
CZ | INFORMAČNÍ LIST VÝROBKU
SK | INFORMAČNÝ LIST VÝROBKU
ITA | SCHEDA DEL PRODOTTO
DK | INFORMATIONSLISTE

(EU) 2017/1369

Centrometal TEHNIKA GRIJANJA
GLAVNA 12, HR-40306 MACINEC - HRVATSKA

Naziv dobavljača / Ime dobavitelja / Supplier name / Name des Lieferanten / Le nom du fournisseur ou la marque commerciale / De naam van de leverancier / Piegādātāja nosaukums A szállító nevét / Szállító neve / Název dodavatel / Meno dodávateľa / Nome del fornitore / Navn på leverandøren:		**Centrometal d.o.o.**				
Dobavljačeva identifikacijska oznaka modela / Dobaviteljeva identifikacijska oznaka modela / Supplier model identifier / Modellkennung des Lieferanten / La référence du modèle donnée par le fournisseur / De typeaanduiding van het model van de leverancier / Piegādātāja modeļa identifikators / A szállító által megadott modellazonosítót / Identifikační značka modelu používaná dodavatel / Identifikačný kód modelu dodávateľa / Codice identificativo del modello del fornitore / Leverandørmodellens id-mærke:		**BioTec Plus 25**	**BioTec Plus 29**	**BioTec Plus 31**	**BioTec Plus 35**	**BioTec Plus 45**
Razred energetske učinkovitosti / Razred energijske učinkovitosti / Energy efficiency class / Energieeffizienzklasse / La classe d'efficacité énergétique du modèle / De energie-efficiëntieklasse van het model / Modeļa energoefektivitātes klase / Energiahatékonysági osztályát / Třída energetické účinnosti / Trieda energetickej účinnosti / Classi di efficienza energetica / Energieffektivitetsklasse:		A+	A+	A+	A+	A+
Nazivna toplinska snaga / Nazivna izhodna moč / Rated heat output / Nennwärmeleistung / La puissance thermique directe / De nominale warmteafgifte / Izteikta nominālā siltuma jauda / Mért hőteljesítmény / Jmenovitý tepelný výkon / Menovitý tepelný výkon / Potenza termica nominale / Nominel varmeydelse:	(kW)	25	29	31	35	45
Indeks energetske učinkovitosti / Indeks energijske učinkovitosti / Energy efficiency index / Energieeffizienzindex / L'indice d'efficacité énergétique / De energie-efficiëntie-index / Energoefektivitātes indekss / Energiahatékonysági mutatót / Index energetické účinnosti / Index energetickej účinnosti / Indice di efficienza energetica / Energieffektivitetsindeks:		118* / 119**	118* / 119**	118* / 119**	118* / 119**	118* / 119**
Sezonska energetska učinkovitost grijanja prostora / Sezonska energijska učinkovitost pri ogrevanju prostorov / Seasonal space heating energy efficiency / Raumheizungs-Jahresnutzungsgrad / L'efficacité énergétique saisonnière pour le chauffage des locaux ηS / De seizoensgebonden energie-efficiëntie voor ruimteverwarming / Telpu apsildes sezonas energoefektivitāte / Szezonális helyiségfűtési hatásfok / Sezonní energetická účinnost vytápění / Sezónna energetická účinnosť vykurovania priestoru / Efficienza energetica stagionale del riscaldamento d'ambiente / Sæsonmæssig energieffektivitet ved rumopvarmning:	(%)	80* / 81**	80* / 81**	80* / 81**	80* / 81**	80* / 81**

Gorivo / Gorivo / Fuel / Brennstoff / Carburante / Brandstof / Degviela / Üzemanyag / Palivo / Palivo / Combustibile / Brændstof:
* Drveni peleti / Leseni peleti / Wood pellets / Holzpellets / Granulés de bois / Houten pellets / Koksnes granulas / Faanyag pellet / Dřevní pelety / Drevené pelety / Pellets di legno / Træpiller:
** Drvo / Les / Wood / Holz / Bois / Hout / Koks / Faanyag / Dřevo / Drevo / Legna / Træ:

- Poštivajte upozorenja i smjernice za ugradnju i periodično održavanje navedene u poglavljima ovog priručnika s uputama.
- Upoštevajte opozorila in navodila za namestitev in redno vzdrževanje, navedena v poglavjih priročnika z navodili.
  Varnostni ukrepi, ki se sprejmejo pri sestavljanju, montaži ali vzdrževanju kotla:
  Kotel ne sme delovati v vnetljivi in eksplozivni atmosferi.
  Pred kakršnim koli posegom na napravi mora biti izklopljeno vse električno napajanje.
- Comply with the warnings and instructions concerning installation and routine maintenance provided in the instruction manual.
- Beachten Sie die Warnungen und Hinweise betreffend die Installation und regelmäßige Wartung in den Kapiteln der Bedienungsanleitung.
- Respecter les avertissements et les indications sur l'installation et l'entretien périodique fournis dans les chapitres du manuel d'instructions.
- Neem de waarschuwingen en instructies voor installatie en periodiek onderhoud in acht zoals aangegeven in de hoofdstukken van de gebruiksaanwijzing.
- Kövesse a használati útmutató. fejezetében közölt Wgyelmeztetéseket, beépítési utasításokat és az időszakos karbantartásra vonatkozó előírásait.
- Dodržujte varování a pokyny pro instalaci a pravidelnou údržbu, které jsou popsány v kapitolách návodu k obsluze.
- Dodržujte varovania a pokyny pre inštaláciu a pravidelnú údržbu, ktoré sú opísané v dodanom návode na obsluhu.
- Seguire le avvertenze e le linee guida per l'installazione e la manutenzione periodica elencate nelle sezioni di questo manuale di istruzioni.
- Følg advarsler og retningslinjer for installation og periodisk vedligeholdelse, der er anført i afsnittene i denne brugsanvisning.

Centrometal
TEHNIKA GRIJANJA

EC IZJAVA O SUKLADNOSTI
EC DECLARATION OF CONFORMITY

Proizvođač Manufacturer: *Naziv i adresa* Name and address:	**Centrometal d.o.o.** HR-40306 Macinec, Glavna 12, Croatia

punom odgovornošću izjavljuje, da
We declare under our sole responsibility that

proizvod Product designation: *tip / model* Type / model:	*Toplovodni kotao za loženje krutim gorivom (drveni peleti-C1 i drvo-A1) sa atomatskim i ručnim ubacivanjem goriva.* Hot-water boiler for solid fuel (wood pellets-C1 and wood-A1) with automatic and with manual fuel supply) **BioTec Plus 25, BioTec Plus 29, BioTec Plus 31, BioTec Plus 35, BioTec Plus 45,**

odgovara zahtjevima slijedećih propisa
is in conformity with the provisions of the following regulations

1.	*MD Direktiva 2006/42/EC* MD Directive 2006/42/EC
2.	*PED Direktiva 2014/68/EU*, PRILOG III, *MODUL B: EU-PREGLED TIPA , 3.2.* PED Directive 2014/68/EU, ANNEX III, MODULE B: EU-TYPE EXAMINATION, 3.2.
3.	*LVD Direktiva 2014/35/EU* LVD Directive 2014/35/EU
4.	*EMC Direktiva 2014/30/EU* EMC Directive 2014/30/EU

i također zadovoljava zahtjeve slijedećih standardi
and also complies with the following standards

LVD Direktiva 2014/35/EU LVD Directive 2014/35/EU	EN 60335-1:*2012/AC:2014*; EN 60335-2-102:*2006*/A1:2010; EN 62233:*2008*
EMC Direktiva 2014/30/EU EMC Directive 2014/30/EU	EN 55014-1:*2017*; *EN* 61000-3-2:*2014*; *EN 61000-3-3*:2013; EN 61000-6-2:2005; EN 61000-6-3:*2007*
MD Direktiva 2006/42/EC MD Directive 2006/42/EC	EN 303-5:2012

Godina izdavanja CE oznake
Year of affixing of CE marking 2017.

Mjesto i vrijeme izdavanja
Place and date of issue

Macinec, 31.10.2017.

Ime, prezime i potpis ovlaštene osobe
Name, surname and signature of authorized person
Tihomir Zidarić

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HEATING TECHNIQUE