

## TECHNICAL INSTRUCTIONS



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



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Technical data

TYPE	CentroPlus-B 25		
	wood	pellets	oil
Nominal heat output (kW)	25	25	25
Heat output range (kW)	15-25	7,5-25	7,4-25
Boiler class	1	3	-
Required chimney underpressure (Pa)	17		
Water amount in boiler (lit.)	192		
Exhaust gas temperature at nominal heat output (°C)	205	170	115
Exhaust gas temperature at minimum heat output (°C)	160	95	95
Exhaust mass flow at nominal heat output (kg/s)	0,029	0,015	0,012
Exhaust mass flow at minimum heat output (kg/s)	0,030	0,005	0,007
Standby heat losses (kW)			
Boiler resistance on water side at nominal output (mbar)	10	10	10
Combustion period at nominal output (h)	2	34	-
Fuel type	woods	pellets	oil
Maximum heat input (kW)			
Fuel moisture content (%)	max. 12		
Fuel size (mm)	max. 500x150x150	φ 6 x max.50	-
Firebox volume / Tank volume (l)	79	330	-
Wood feeding opening AxB (mm)	320x220	-	-
Combustion chamber dimensions (mm)	561x600x420	571x320x378	571x320x378
Combustion chamber volume (l)	141	69	69
Combustion chamber type	underpressure	overpressure	overpressure
Required minimum accumulation next to boiler (lit./kW)	by EN 303-5 point 4.2.5		
Electrical power input (W)	250		
Temp. and press. of water from water supply line into DHW Tank (°C/bar)	10-15 °C, 2 bar		
Supply voltage (V~)	230		
Frequency (Hz)	50		
Current type	~		
Boiler dimensions with casing	Lenght (A) (mm)	1070	
	Width (B) (mm)	915	
	Height (C) (mm)	1560	
Boiler body mass (kg)	460		
Total mass - (boiler with casing and accessories) (kg)	512		
DHW tank volume (lit.)	80		
Max. operating overpressure (bar)	2,5		
Max. operating temperature (°C)	90		
Uptake tube – external diameter (mm)	150		
Boiler connections	Flow and return pipe (male thread) (R)	5/4"	
	Charge / discharge (female thread) (R)	1/2"	
	Connector of exchanger sensor (female thread) (R)	1/2"	
DHW tank connections	Hot sanitary water (female thread) (R)	3/4"	
	Cold sanitary water (female thread) (R)	3/4"	
	Circulation (female thread) (R)	3/4"	

Total system dimensions		Solid	Solid / oil	Solid / pellets
		25 kW	25 kW	25 kW
Total lenght (D)	(mm)	1070	1350	1350
Total width (E)	(mm)	915	915	1545
Total height (F)	(mm)	1560	-	1545
Height incl. control unit (G)	(mm)	-	1660	1700

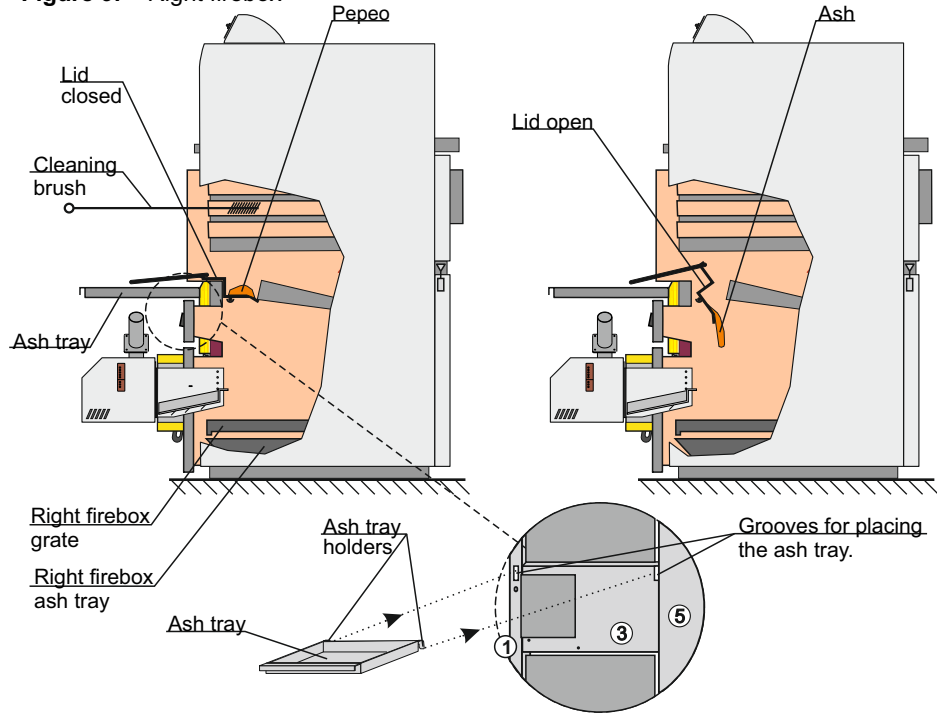
## Technical data

TYPE	CentroPlus-B 35		
	wood	pellets	oil
Nominal heat output (kW)	35	35	35
Heat output range (kW)	25-35	10,5-35	10-35
Boiler class	1	3	-
Required chimney underpressure (Pa)	19		
Water amount in boiler (lit.)	201		
Exhaust gas temperature at nominal heat output (°C)	240	160	135
Exhaust gas temperature at minimum heat output (°C)	195	150	105
Exhaust mass flow at nominal heat output (kg/s)	0,03	0,018	0,017
Exhaust mass flow at minimum heat output (kg/s)	0,032	0,007	0,01
Standby heat losses (kW)			
Boiler resistance on water side at nominal output (mbar)	15	15	10
Combustion period at nominal output (h)	2	24	-
Fuel type	woods	pellets	oil
Maximum heat input (kW)			
Fuel moisture content (%)	12-20	max. 12	-
Fuel size (mm)	max. 500x150x150	φ6 x max. 50	-
Firebox volume / Tank volume (l)	104	330	-
Wood feeding opening AxB (mm)	420x220	-	-
Combustion chamber dimensions (mm)	571x600x420	571x320x380	571x320x380
Combustion chamber volume (l)	143	70	70
Combustion chamber type	underpressure	overpressure	overpressure
Required minimum accumulation next to boiler (lit./kW)	by EN 303-5 point 4.2.5		
Electrical power input (W)	250		
Temp. and press. of water from water supply line into DHW tank (°C/bar)	10-15 °C, 2 bar		
Supply voltage (V~)	230		
Frequency (Hz)	50		
Current type	~		
Boiler dimensions with casing	Lenght (A) (mm)	1070	
	Width (B) (mm)	1015	
	Height (C) (mm)	1560	
Boiler body mass (kg)	476		
Total mass - (boiler with casing and accessories) (kg)	522		
DHW tank volume (lit.)	80		
Max. operating overpressure (bar)	2,5		
Max. operating temperature (°C)	90		
Uptake tube – external diameter (mm)	160		
Boiler connections	Flow and return pipe (male thread) (R)	5/4"	
	Charge / discharge (female thread) (R)	1/2"	
	Connector of exchanger sensor (female thread) (R)	1/2"	
DHW tank connections	Hot sanitary water (female thread) (R)	3/4"	
	Cold sanitary water (female thread) (R)	3/4"	
	Circulation (female thread) (R)	3/4"	

Total system dimensions		Solid	Solid / oil	Solid / pellets
		35 kW	35 kW	35 kW
Total lenght (D)	(mm)	1070	1350	1350
Total width (E)	(mm)	915	915	1545
Total height (F)	(mm)	1560	-	1545
Height incl. control unit (G)	(mm)	-	1660	1700

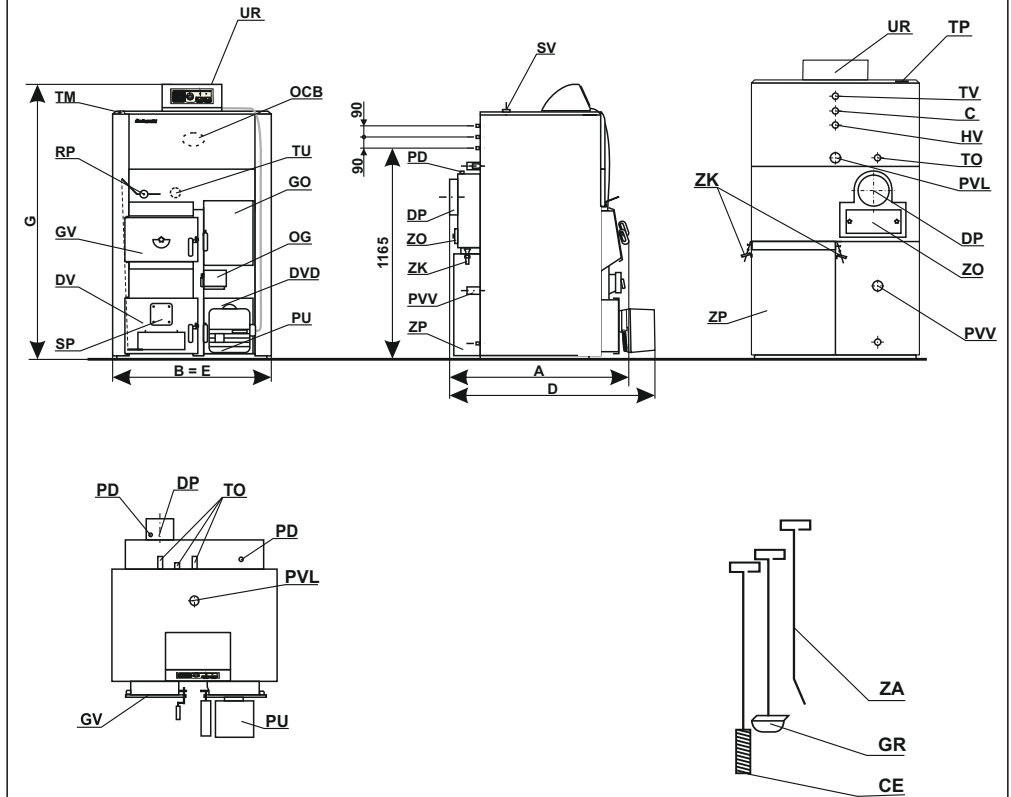


Figure 9. – Right firebox



- When cleaning uptake tubes of the right firebox, an ash tray has to be placed below the upper right door.
- Ash tray holders have to be put into holes on side ① and ③.

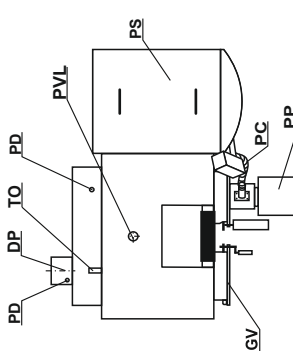
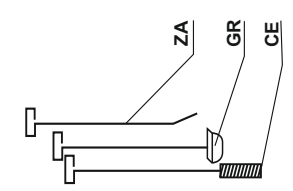
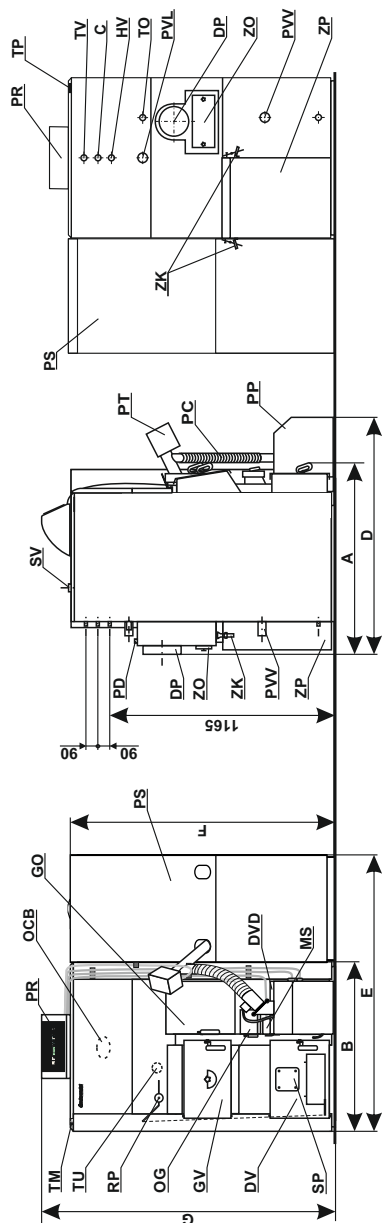
Solid fuel / Oil



- PS - pellet tank CPSP
- PT - pellet feeder CPPT
- PU - oil burner
- PVL -inlet line
- PVV - outlet line
- RP - draught controller (CALEFFI 529 500 or ESBE C 20/25)
- SP - blind plate
- SV - security line
- TM - thermometer
- TO - thermal protection connectors

- TP -pump thermostat
- TU - sensor sleeve
- TV - hot sanitary water
- UR - oil-control unit EKO-CK/CKB
- ZA - poker
- ZK - back ash tray holder
- ZO - cleaning opening
- ZP - back ash box

Solid fuel / woods pellets



\* For symbol description see legend (page 4,5)

**10.3. SOLID FUEL / EL FUEL OIL FIRED BOILER**

Checking of all control and safety elements, and oil burner with pertaining equipment by a certified serviceman / fitter is recommended once per year.

**Solid fuel burner:**

First, main switch at boiler control unit has to be turned off. Spaces below grate, firebox and uptake tubes have to be cleaned every day. Uptake tubes are cleaned through upper door, but it is necessary first to remove the lid located between the middle and upper register (upper lid). Opening for cleaning of uptake chamber (see page 6) is located on the back boiler side through which, after lid is removed, deposits generated during boiler operation and cleaning can be removed.

Ash tray in the lower boiler part should be cleaned as required. Before firing, upper lid should be returned to its position, close the grate on lower door and check supply of primary air on lower door.

**The right firebox and set for firing with EL fuel oil:**

First, main switch at boiler control unit has to be turned off. The right boiler firebox has to be thoroughly cleaned at least once per year through upper and lower boiler door. An ash tray has to be placed into prepared holes (Figure 9) below the boiler door. Open the upper boiler door, remove turbulators and clean uptake tubes by supplied brush. Then lift the right firebox lid (Figure 9) so that ash and deposits fall to the bottom of the right firebox. Open lower boiler door (with burner) and clean the bottom of the right fire box. The back ash tray located on the back boiler side, (page 5, ZP) has to be emptied as well.

**Cleaning:**

First, main switch at boiler control unit has to be turned off.  
 The right firebox can be cleaned through upper and lower boiler door (page 6).  
 Ash box should be placed below upper boiler door into prepared holes (Figure 9).  
 Open upper boiler door, take turbulators out and clean uptake tube (flue gas pipe) using supplied brush. After that, lift the right firebox lid (Figure 9) so that ash and deposits fall on the right firebox grate. Open lower door (with burner on it) and clean the right firebox grate, empty ash tray and clean the burner grate.  
 It is recommended to clean the burner and boiler firebox after one pellet tank is consumed (approx. 200 kg).  
 Intervals between cleaning can be increase or decrease in relation to the recommended ones, as needed, and it depends on quality of used pellets (see 8.2.1.) and turning on / off frequency of the burner. For maintenance and cleaning of equipment for pellet firing refer to Technical instructions for use and maintenance of Cm Pelet-set for boilers CentroPlus and CentroPlus-B (fired with solid fuel and wooden pellets) and technical instructions for pellet tank and screw feeder.

Remove the grate and ash tray from the right firebox. Check whether all boiler openings are closed tightly. For proper boiler operation it is necessary to set the burner and control unit EKO-CK/CKB correctly, depending on the boiler size, required output and temperature.

### 10.0. BOILER MAINTENANCE AND CLEANING

Ash remaining in boiler after solid fuel firing should be disposed into metal containers with a lid. Protective gloves must be used (see Figure 8).

DHW tank should be cleaned as needed, through the cleaning opening (Figures 6 and 7), depending on hardness and cleanness of DHW (sanitary water).

### 10.1. SOLID FUEL FIRED BOILER (EQUIPMENT FOR WOODEN PELLETS AND OIL IS NOT BUILT IN YET)

Spaces under the grate, firebox and uptake tubes have to be clean on daily basis. Uptake (flue gas) tubes are cleaned through upper door, but it is necessary first to remove a lid located between the middle and upper register (upper lid). Opening for uptake chamber cleaning (see page 4) is located on the back boiler side through which, after lid is taken out, deposits generated during boiler operation and cleaning can be removed. Ash tray in the lower boiler part should be cleaned as required. Before firing, return upper lid to its position, close the grate on lower door and check supply of primary air at lower door. Checking of all control and safety elements once per year by authorised serviceman / fitter is recommended.

### 10.2. SOLID FUEL / WOODEN PELLET FIRED BOILER

Checking of all control and safety elements once per year by authorised serviceman/fitter is recommended.

#### **Firebox for solid fuel firing:**

First, main switch at boiler control unit has to be turned off. Spaces under the grate, firebox and uptake tubes have to be clean on daily basis. Uptake tubes are cleaned through upper door, but it is necessary first to remove the lid located between the middle and upper register (upper lid). Opening for cleaning of uptake chamber (see page 6) is located on the back boiler side through which, after lid is removed, deposits generated during boiler operation and cleaning can be removed. Ash tray in the lower boiler part should be cleaned as required. Before firing, upper lid should be returned to its position, close the grate on lower door and check supply of primary air on lower door.

#### **Right firebox and equipment for pellet firing:**

Care should be taken of:

- Ash amount in ash trash and to empty it as required;
- Deposits in boiler firebox and to clean it as required;
- Deposit at burner grate and to clean it as required;
- Ash amount in the ash box on the boiler back side and to empty it as required (page 6, ZP)

### 1.0. GENERAL

Hot water boiler **CentroPlus-B** is of modern design, made of proofed high-quality materials, welded by state-of-the art technology and meets all requirements for connection to central heating system.

### 1.1. BOILER DESCRIPTION

Steel hot water boiler **CentroPlus-B** with built-in sanitary water DHW tank involves two separate combustion chambers inside the common boiler's water chamber. The left combustion chamber, intended for solid fuel firing, has large heating area and small resistance, and large door enable simple feeding of big-size fuel. The right combustion chamber, intended for wooden pellet or liquid fuel firing, is characterised with 3-passes flue gas system with turbulator and large heating area which ensures high boiler utilisation rate, and large water volume in boiler enables longer burner work and reduces number of burner turning on and extends burner's life time. Boiler cleaning is very simply and can be done from the front and back side. Depending on built-in additional equipment, there are three modes of boiler utilisation:

- **solid fuel firing,**
- **solid fuel and wooden pellet firing,**
- **solid fuel and EL fuel oil firing .**

Boiler is supplied without the above mentioned additional equipment which has to be ordered additionally, according to preferences. Additional equipment is supplied in a separate packing, and it is installed onto boiler at boiler room after boiler is installed (connected) to central heating installation.

### 1.2. DELIVERY OF CentroPlus-B BOILER

For easier transport and positioning into boiler room, boiler CentroPlus-B is not supplied with built-in thermal insulation and casing but separately as follows:

- **the boiler body with boiler door is delivered on a wooden pallet (with lid of the left firebox door, lid of the right firebox register, ash trays, left and right firebox grates and turbulators);**
- **in board box with boiler casing, thermal insulation, thermometer, draught controller (such as CALEFFI 529 500 or ESBE C 20/25), back ash box, cleaning accessories (accessories holder, brush, scraper and poker), protective box for extension for pellet burner and set of screws and snappers.**

### 1.3. OBLIGATORY ADDITIONAL EQUIPMENT OF BOILER CentroPlus-B INSTALLED TO CLOSED CENTRAL HEATING SYSTEM

- **Thermal shut off valve (such as CALEFFI 543 513)-1 piece**



#### 1.4. ADDITIONAL EQUIPMENT OF Boiler CentroPlus-B 25 / 35

Depending on preferred boiler utilisation mode, appropriate additional equipment has to be built in:

##### 1) Additional equipment for solid fuel / wooden pellet firing:

- pellet burner CPPL-35, digital boiler control unit CPREG for pellet burner CPPL-35;
- pellet tank CPSP;
- pellet feeder CPPT 14-35.

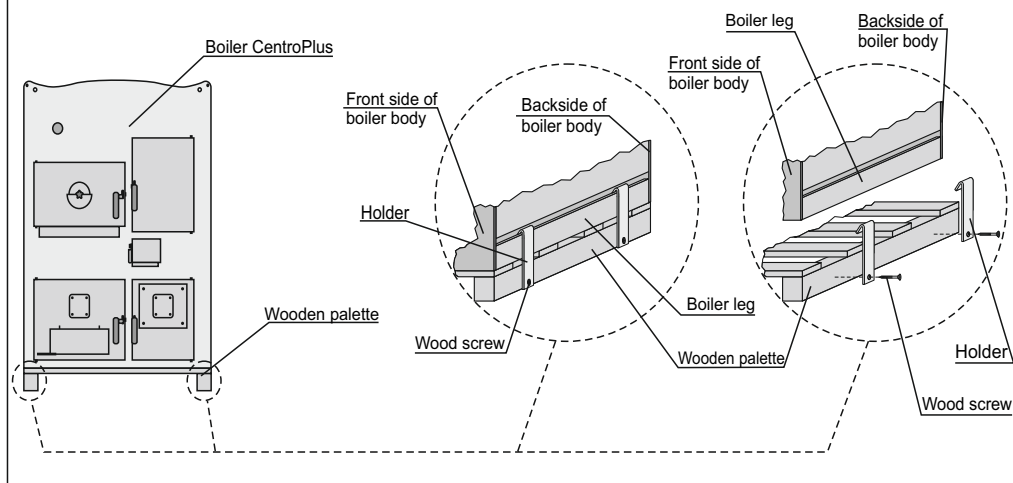
##### 2) Additional equipment solid fuel / EL fuel oil firing:

- boiler control unit EKO-CK/CKB for oil burner;
- oil burner with appertaining equipment.

#### 2.0. BOILER / ADDITIONAL EQUIPMENT POSITIONING AND ASSEMBLY

Boiler body is delivered on a wooden pallet to which it is fixed with four holders. Before placing boiler body onto its location in the boiler room, it should be removed from pallet (Figure 1). Boiler positioning and assembly and building in of additional equipment must be performed by a qualified person. We recommend that boiler is placed on a concrete base having height of 50 to 100 mm above the floor. Boiler room must be frost-proof and well ventilated. Boiler has to be positioned so that it can be properly connected to the chimney (see 4.0) and simultaneously, enabling tending of boiler and additional equipment, control during operation, and cleaning and maintenance (see Figure 4a). Boiler casing should be assembled according to instructions (Figure 2).

Figure 1. – Removal of boiler from wooden pallet



Check if globe valves toward heating bodies are open. If you are sure that energy from boiler will be consumed, made firing up:

- Put small pieces of wood (chips), crumpled paper, then again pieces of wood (chips), close upper boiler door and ignite chips and paper through the lower door.
- After chips blaze up, close lower boiler door and put, through upper boiler door, some smaller pieces of wood (logs), close upper boiler door, wait until logs fully blaze up, and fill the firebox with logs, and make fine tuning of draught controller and monitor its operation during the whole period of combustion of one firebox charge.
- Check whether heating system pump turn on/off at approx. 68°C.
- Train user how to use boiler.

For adding fuel into firebox, the door has to be firstly kept slightly open (about 1 cm) 3 to 5 seconds, and then fully open it.

**At firing with pellets**, it is necessary to check whether movable parts of the right fire box are placed to foreseen positions (right firebox lid, burner grate, right firebox grate, right firebox ash tray, turbulators in flue gas tubes and back ash tray) - Figure 7. Check whether all parts of pellet firing set are properly assembled and installed. Check whether boiler control unit CPREG is connected to power supply and whether all openings at boiler are closed tightly. For proper boiler operation to select pellets having properties given in point 8.2.1. For detailed description see Technical instructions for start up and setting of Cm Pelet-set for boiler CentroPlus and CentroPlus-B (fired with solid fuel and wooden pellets).

#### 9.3. BOILER FIRED WITH SOLID FUEL / EL FUEL OIL

Check if boiler control unit EKO-CK/CKB is connected to power supply and whether heating pump is connected through boiler control unit EKO-CK/CKB and pump thermostat.

Check whether boiler and equipment are installed and connected according to these technical instructions - from point 1.0 to 8. Check whether chimney meets requirements set in point 4 herein. Check whether boiler room meets all requirements set in instructions.

**At firing with solid wood** it has to be checked whether fuel meet all requirements set in instructions. Check whether movable parts of the left fire box are placed to foreseen positions (lid - door protection, lid - registers, lower door grate and ash tray) (Figure 6). Draught controller (such as CALEFFI 529 500, ESBE C 20/25) has to be set for solid fuel firing so that the boiler temperature, at normal burning, does not exceed 85 - 90°C, and does not fall below 65°C. Fuel with max. 25 % moisture can be used. Circulation pump switch must be turned on (Figure 5, pos.3) during boiler operation. Check if globe valves toward heating bodies are open. If you are sure that energy from boiler will be consumed, made firing up:

- Put small pieces of wood (chips), crumpled paper, then again pieces of wood (chips). Close upper boiler door and ignite chips and paper through lower door.
- After chips blaze up, close lower boiler door and put, through upper boiler door, some relatively dry smaller pieces of wood (logs), close upper boiler door, wait until logs fully blaze up, and fill the firebox with logs, and make fine tuning of draught controller and monitor its operation during the whole period of combustion of one firebox charge.
- Check whether heating system pump turns on/off at approx. 68°C.

For adding fuel into firebox, the door has to be firstly kept slightly open (about 1 cm) 3 to 5 seconds, and then fully open it.

**At oil firing** check whether movable parts of the right firebox are placed to foreseen positions (the right firebox lid and turbulators in flue gases tubes), Figure 7.



Remove the grate and ash tray from the right firebox. Check whether all boiler openings are closed tightly. Start-up of oil burner must be done by a certified serviceman.

### 9.0 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 a person responsible for their safety. Children must be supervised in the vicinity of the product. Protective gloves must be used (Figure 8).

### 9.1 SOLID FUEL FIRING (EQUIPMENT FOR WOODEN PELLETS OR OIL HAS NOT BEEN BUILT IN YET)

**At firing with solid fuel** it is necessary to check whether movable parts of the left firebox are placed to foreseen positions (lid – door protection, lid – registers, lower door grate and ash tray) – Figure 6. Draught controller (such as CALEFFI 529 500, ESBE C 20/25) has to be set for solid wood firing so that the boiler temperature, at normal burning, does not exceed 85 - 90°C, and does not fall below 65°C. Fuel with max. 25% moisture content may be used.

Check if globe valves toward heating bodies are open. If you are sure that energy from boiler will be consumed, made firing up for one filling of the firebox:

- Put small pieces of wood (chips), crumpled paper, then again pieces of wood (chips), close upper boiler door and ignite chips and paper through lower door.
- After chips blaze up, close lower boiler door and put, through upper boiler door, some relatively dry smaller pieces of wood, close upper boiler door, wait until wood pieces fully blaze up, and make fine tuning of draught controller and monitor its operation during the whole period of combustion of one firebox charge.
- Check whether heating system pump turn on/off at approx. 68°C.

For adding fuel into firebox, the door has to be firstly kept slightly open (about 1 cm) 3 to 5 seconds, and then fully open it.

### 9.2. BOILER FIRED WITH SOLID FUEL / WOODEN PELLETS

Check whether boiler control unit CPREG is connected to power supply and whether heating and sanitary water pumps are connected through boiler control unit CPREG. Also check whether the boiler and equipment are built in and connected in accordance with these Technical instructions including all points from 1.0 to 8.0. Check whether chimney meet requirements under point 4 therein. Check whether boiler room meets all requirements therein.

**At firing with solid fuel** check if fuel fulfils all requirements therein (max. 25% moisture). Check whether movable parts of the left firebox are placed to foreseen positions (lid – door protection, lid – registers, lower door grate and ash tray) – Figure 6. Draught controller (such as CALEFFI 529 500, ESBE C 20/25) has to be set for solid wood firing so that the boiler temperature, at normal burning, does not exceed 85 - 90°C, and does not fall below 65°C. During firing of solid fuel, boiler control unit CPREG must be turned on (main switch in position 1).

### 2.1. SOLID FUEL FIRED BOILER (EQUIPMENT FOR WOODEN PELLETS AND OIL IS NOT BUILT IN YET)

Draught controller should be installed to the boiler left side (such as CALEFFI 529 500, ESBE C 20/25) and connect it by a chain to the moving lid at the boiler lower door. Electrical connector and heating pump should be connected according to electrical diagram (Scheme 5).

### 2.2. SOLID FUEL / WOODEN PELLETS FIRED BOILER

Install draught controller to the boiler left side (such as CALEFFI 529 500, ESBE C 20/25) and connect it by a chain to the movable lid at the boiler lower door. Install CPPL burner onto the right lower door. Install pellet control unit CPREG to the casing cover. Install a micro switch to the casing above the right lower door. Place pellet tank CPSP with feeder CPPT next to the boiler right side. Detailed description of installation of pellet equipment is presented in Technical instructions for start up and setting of Cm Pellet set for boilers CentroPlus and CentroPlus-B (fired with solid fuel and wooden pellets) and Technical instruction for pellet tank and screw feeder supplied with equipment for firing of wooden pellets.

### 2.3. SOLID FUEL / OIL FUEL FIRED BOILER

Install draught controller to the boiler left side (such as CALEFFI 529 500, ESBE C 20/25) and connect it by a chain to the movable lid at the boiler lower door. Remove blind plate from the ceramic socket for oil burner on the right lower door. Install oil burner to the opening of ceramic plate and connect it to fuel supply. Install boiler control unit EKO-CK/CKB for oil burner to the casing plate and connect it to burner, electrical connection and heating pump according to electrical scheme 6.

#### 2.3.1. INSTALLATION OF OIL BURNER TO BOILER

Installation diagram of oil burner to boiler

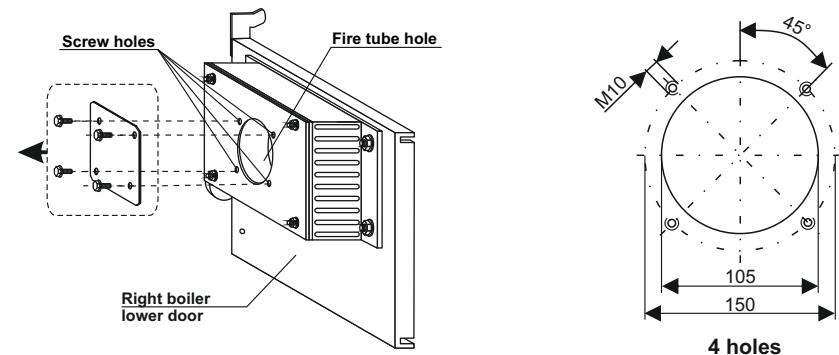
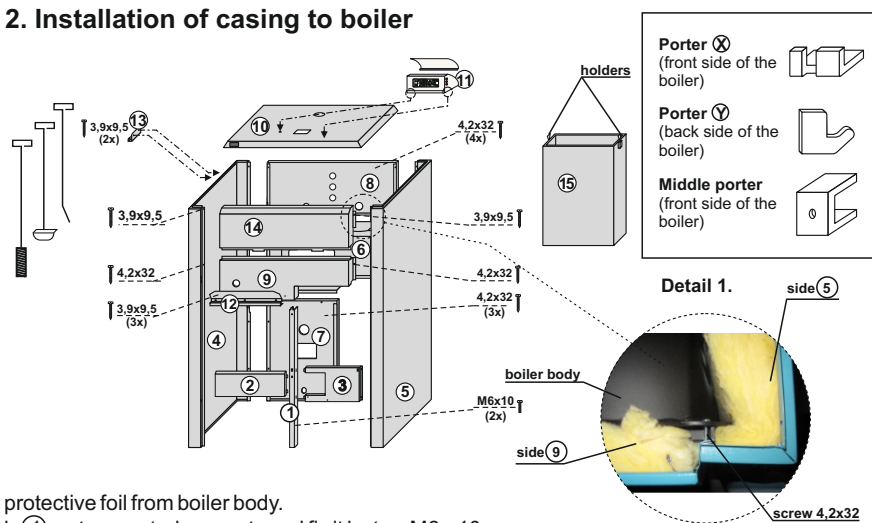


Figure 2. Installation of casing to boiler



- Remove protective foil from boiler body.
- Place side ① on two central supports and fix it by two M6 x 10 mm screws.
- Place side ② into grooves on side ① and push it onto left lower support X.
- Place side ③ into grooves on side ① and push it onto right lower support X.
- Pull control sensors through opening in cover ⑩ (pellet control CPREG or boiler control EKO-CK/CKB are included in additional equipment if it has been purchased, and if not, skip this step and proceed to the next step of installation) and push it into sensor sleeve from the top boiler side.
- Tighten (half way) sheet-metal screws 4.2x15 mm in prepared openings in casing cover ⑩ and put boiler control ⑪ so that it is latched onto screws.
- Push side ⑨ on side ① and to left and right upper support X.
- Place lateral left side ④ on two back left supports Y and then put it on two front left supports X so that side ② and side ⑨ are linked.
- Fix side ⑨ and side ④ to the boiler body using screw 4.2x 32 in direction from boiler toward casing (Detail 1).
- Place lateral right side ⑤ on two back right supports Y. Place two front right supports X so that side ③ and side ⑨ are linked.
- Fix side ⑨ and side ⑤ to the boiler body using screw 4.2x 32 in direction from boiler toward casing (Detail 1).
- Place side ⑥ to uptake box and push it and fix into grooves on lateral sides ④ and ⑤.
- Put side ⑦ on back central support and fix it onto lateral left sides ④ and ⑥ using three screws 4.2 x 32 mm.
- Fix side ⑧ to lateral left side ⑤ and lateral right side ⑤ using four screws 4.2x 32 mm so that side ⑥ is also embraced.
- Place side ⑭ into grooves on side ⑨ and fix it by 3,9 x 9,5 mm screws on side ④ and side ⑤.
- Put cover ⑩ onto boiler.
- Fix protective sheet ⑫ onto side ⑨ using three screws 3.9 x 9.5 mm.
- Drill two holes on lateral left side ④ and fix holder of cleaning accessories ⑬ onto lateral back side ④ using two screws 3.9 x 9.5 mm.
- Place back ash tray ⑭ on the back boiler side below the uptake chamber onto prepared holders using two snaps (see page 5, pos. ZP and ZK) which have to be adjusted so that tray rests well.

Detailed description is given in Technical instructions for start up and setting of Cm Pelet-set for boilers CentroPlus and CentroPlus-B (fired with solid fuel and wooden pellets) and Technical instruction for pellet tank and screw feeder supplied with equipment for firing of wooden pellets.

### 8.2.1. PROPERTIES OF WOODEN PELLETS

Wooden pellets are used as fuel in boilers with built-in pellet burner CPPL.

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<sup>3</sup>) or in basement spaces. Recommended properties of pellets for firing in CentroPlus boilers are the following:

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

### 8.3. BOILER FIRED WITH SOLID FUEL / EL FUEL OIL

Check if boiler control unit EKO-CK/CKB is connected to power supply and whether heating pump is connected through boiler control unit EKO-CK/CKB and pump thermostat (Scheme 5). Check whether boiler and equipment are installed and connected in accordance with these technical instructions from point 1.0 to 8.0. Check whether chimney meets requirements set in point 4 herein.

**At firing with solid fuel** it is necessary to check whether boiler room meets all requirements herein. Check whether fuel meets all requirements set herein. Check whether movable parts of the left firebox are placed to foreseen positions (lid-door protection, lid-registers, lower door grate and ash tray)-Figure 6. Draught controller (such as CALEFFI 529 500, ESBE C 20/25) has to be set for solid wood firing so that the boiler temperature, at normal burning, does not exceed 85 - 90°C, and does not fall below 65°C. Circulation pump switch must be turned on (Figure 5, pos.3) during boiler operation. Check if globe valves toward heating bodies are open.

If you are sure that energy from boiler will be consumed, made firing up for one filling of the firebox:

- Put small pieces of wood (chips), crumpled paper, then again pieces of wood (chips), close upper boiler door and ignite chips and paper through lower door.
- After chips blaze up, close lower boiler door and put through upper boiler door, some relatively dry smaller logs, close upper boiler door, wait until logs fully blaze up, and fill the firebox with logs, and make fine tuning of draught controller and monitor its operation during the whole period of combustion of one firebox charge.
- Check whether heating system pump turn on/off at approx. 68°C.
- Train user how to use boiler.

For adding fuel into firebox, the door has to be firstly kept slightly open (about 1 cm) 3 to 5 seconds, and then full open it.

**At oil firing** check whether movable parts of the right firebox are placed to foreseen positions (the right firebox lid and turbulators in flue gases tubes), Figure 7.

## Start up

Check if globe valves toward heating bodies are open. If you are sure that energy from boiler will be consumed, made firing up for one filling of the firebox:

- Put (max. 25 % moisture) small pieces of wood (chips), crumpled paper, then again pieces of wood (chips).
- After chips blaze up, close lower boiler door and put, through upper boiler door, some relatively dry smaller logs (max. 25 % moisture), close upper boiler door, wait until logs fully blaze up, and fill the firebox with logs, and make fine tuning of draught controller and monitor its operation during the whole period of combustion of one firebox charge.
- Check whether heating system pump turn on/off at approx. 68°C.
- Train user how to use boiler.

For adding fuel into firebox, the door has to be firstly kept slightly open (about 1 cm) 3 to 5 seconds, and then fully open it.

### 8.2. BOILER FIRED WITH SOLID FUEL / WOODEN PELLETS

Start up of pellet firing must be done by a certified serviceman. Check whether boiler control unit CPREG is connected to power supply and whether heating and sanitary water pumps are connected through boiler control unit CPREG. Also check whether the boiler and equipment are built in and connected in accordance with these Technical instructions including all points from 1.0 to 8.0. Check whether chimney meet requirements under point 4 therein.

**At firing with solid fuel** check if fuel fulfils all requirements therein (max. 25 % moisture). Check whether movable parts of the left firebox are placed to foreseen positions (lid - door protection, lid - registers, lower door grate and ash tray) - Figure 6. Draught controller (such as CALEFFI 529 500, ESBE C 20/25) has to be set for solid wood firing so that the boiler temperature, at normal burning, does not exceed 85 - 90°C, and does not fall below 65°C. During firing of solid fuel, boiler control unit CPREG must be turned on (main switch in position 1). Check if globe valves toward heating bodies are open.

If you are sure that energy from boiler will be consumed, made firing up for one filling of the firebox:

- Put small pieces of wood (chips), crumpled paper, then again pieces of wood (chips), close upper boiler door and ignite chips and paper through the lower door.
- After chips blaze up, close lower boiler door and put, through upper boiler door, some smaller logs, close upper boiler door, wait until logs fully blaze up, and fill the firebox with logs, and make fine tuning of draught controller and monitor its operation during the whole period of combustion of one firebox charge.
- Check whether heating system pump turn on/off at approx. 68°C.
- Train user how to use boiler.

For adding fuel into firebox, the door has to be firstly kept slightly open (about 1 cm) 3 to 5 seconds, and then full open it.

**At firing with pellets**, it is necessary to check whether movable parts of the right fire box are placed to foreseen positions (right firebox lid, burner grate, right firebox grate, ash tray of the right firebox, turbulators in flue gas tubes and back ash tray) - Figure 7.

Check whether all parts of pellet firing set are properly assembled and installed. Check whether boiler control unit CPREG is connected to power supply and whether all openings at boiler are closed tightly. For proper boiler operation it is necessary to set correctly control unit CPREG according to the boiler size and required output and to select pellets having properties given in point 8.2.1.

## Make up air opening, connection to chimney

### 3.0. MAKE UP AIR OPENING

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

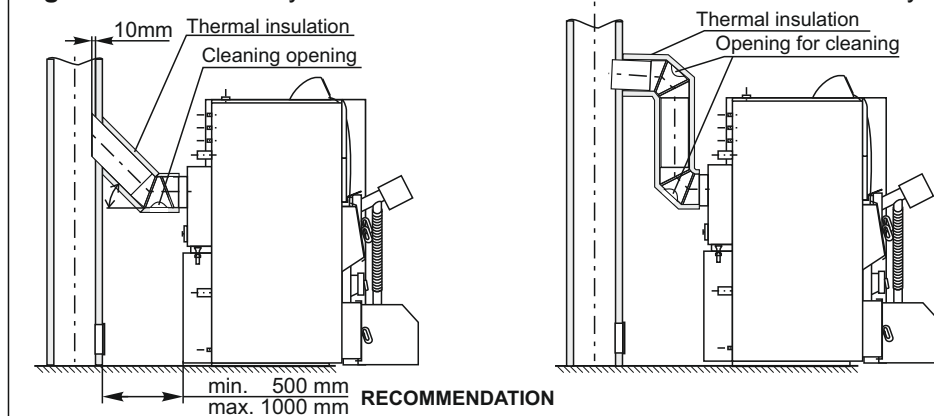
$$A = 6,02 \cdot Q$$

A - opening area in cm<sup>2</sup>  
Q - boiler output in kW

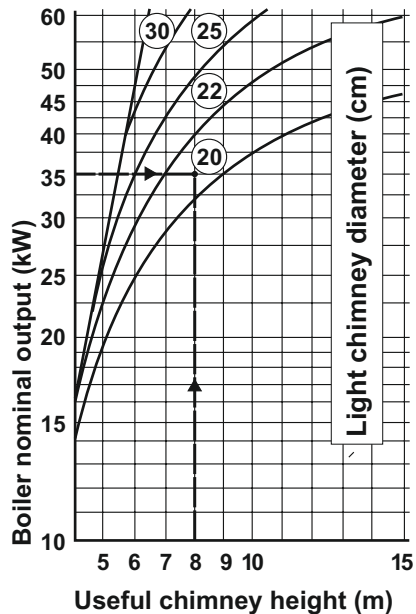
### 4.0. CONNECTION TO CHIMNEY

Properly dimensioned and built chimney is a precondition for safe boiler operation and heating efficiency. A chimney must be thermally insulated, gas-tight and smooth. Cleaning door must be made in the lower part of a chimney. Chimney made of bricks must include 3 layers with central insulation layer made of mineral wool. Thickness of thermal insulation should be min. 30 mm of chimneys is built against to interior wall, and min. 50 mm if it is built on the outer side. **Internal dimensions of the chimney light diameter depend on chimney height and boiler output and they have to be selected in accordance with diagram shown in Figure 4.** The chimney usable height is the measure from connection spot of smoke pipe to the chimney top. As these boilers can be fired with solid fuel at any time, chimney has to be selected according to the solid fuel diagram. Fuel gas temperature at the chimney exist must be min. 30°C higher than condensation temperature of combustion gases. Selection and building of a chimney must be made by a professional. Required maximum distance from boiler to chimney is 1000 mm, and minimum distance is 500 mm. Uptake tube must be installed at an angle (min. 5°) with a gradient from chimney to boiler (Figure 3). In order to prevent condensate from chimney to enter the boiler, uptake tube must be placed 10 mm deeper into chimney. Connecting uptake tube between boiler and chimney must be thermally insulated with a mineral wool layer having thickness of 30 to 50 mm. All installation works must be made in accordance with valid national and European standards.

Figure 3. Possible ways of connections of boilers CentroPlus-B to chimney



**Figure 4.** Chimney dimensioning for boilers CentroPlus-B



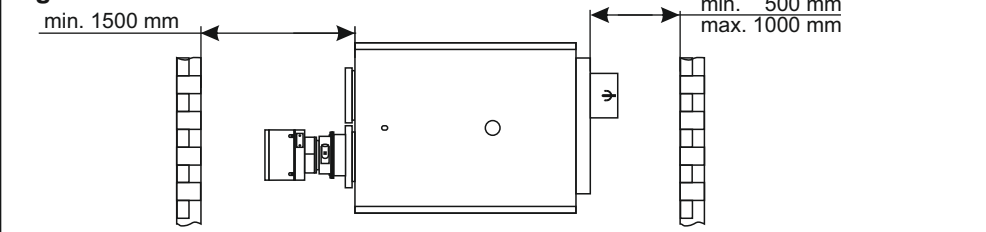
**An example of selection of a chimney:**

- Boiler heat output: **35 kW**
- Fuel: **wood, wooden pellets, EL fuel oil**
- Required usable chimney height: **H = 8 m**
- Required chimney light diameter: **20 cm**
- **Usable chimney height** - chimney height from connection spot of smoke pipe to the chimney top.
- **Light chimney diameter** - interior chimney diameter.

**5.0. BOILER INSTALLATION TO CENTRAL HEATING SYSTEM**

All installation works must be made in accordance with valid national and European standards. Boiler CentroPlus-B can be built to closed and open central heating systems. In both cases boiler can be fired with solid fuel, wooden pellets or EL fuel oil. Installation has to be made, in accordance to technical standards, by a professional who will be responsible for proper boiler operation. Before connecting boiler to central heating system, the system has to be flushed to remove impurities remaining after system installation. It prevents boiler overheating, noise within the system, disturbances at a pump and mixing valve. Boiler should always be connected to central heating system by connectors, never by welding. Figure 4a. shows safe distances required for boiler cleaning and maintenance.

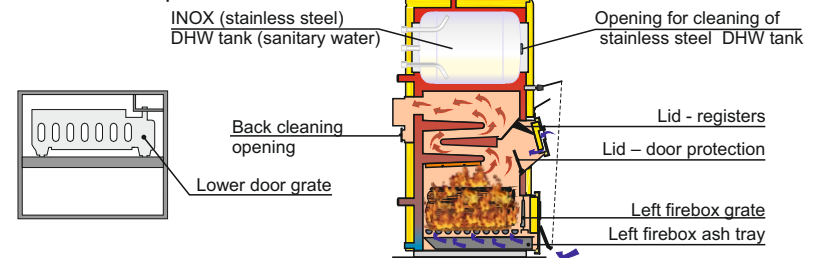
**Figure 4a.** Minimum distance from the room walls



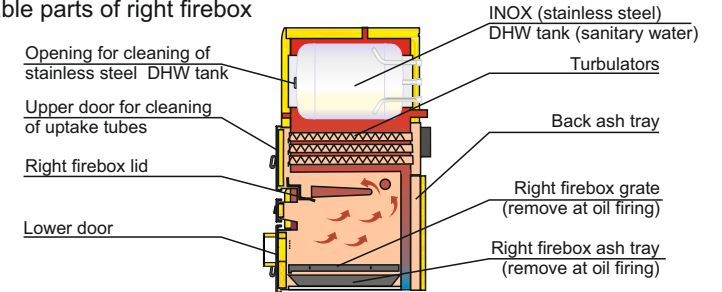
**8.0. START UP**

Check whether boiler and equipment are installed and connected in accordance with technical instructions, including all items from 1.0 to 8.0. Check if chimney meets requirements of point 4 in these instructions. Check if boiler room meets all requirements under these instructions. Check whether fuel meets all requirements set herein. Check whether boiler, sanitary water tank and the whole heating system are filled with water and vented (deaerated). Check if safety elements are properly installed and operating (see previous item). Check if flue gas tube is properly sealed and thermally insulated. Boiler must not run 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 a person responsible for their safety.

**Figure 6.** Movable parts of left firebox



**Figure 7.** Movable parts of right firebox



**Figure 8.** Protective gloves

**Protective gloves are obligatory!**



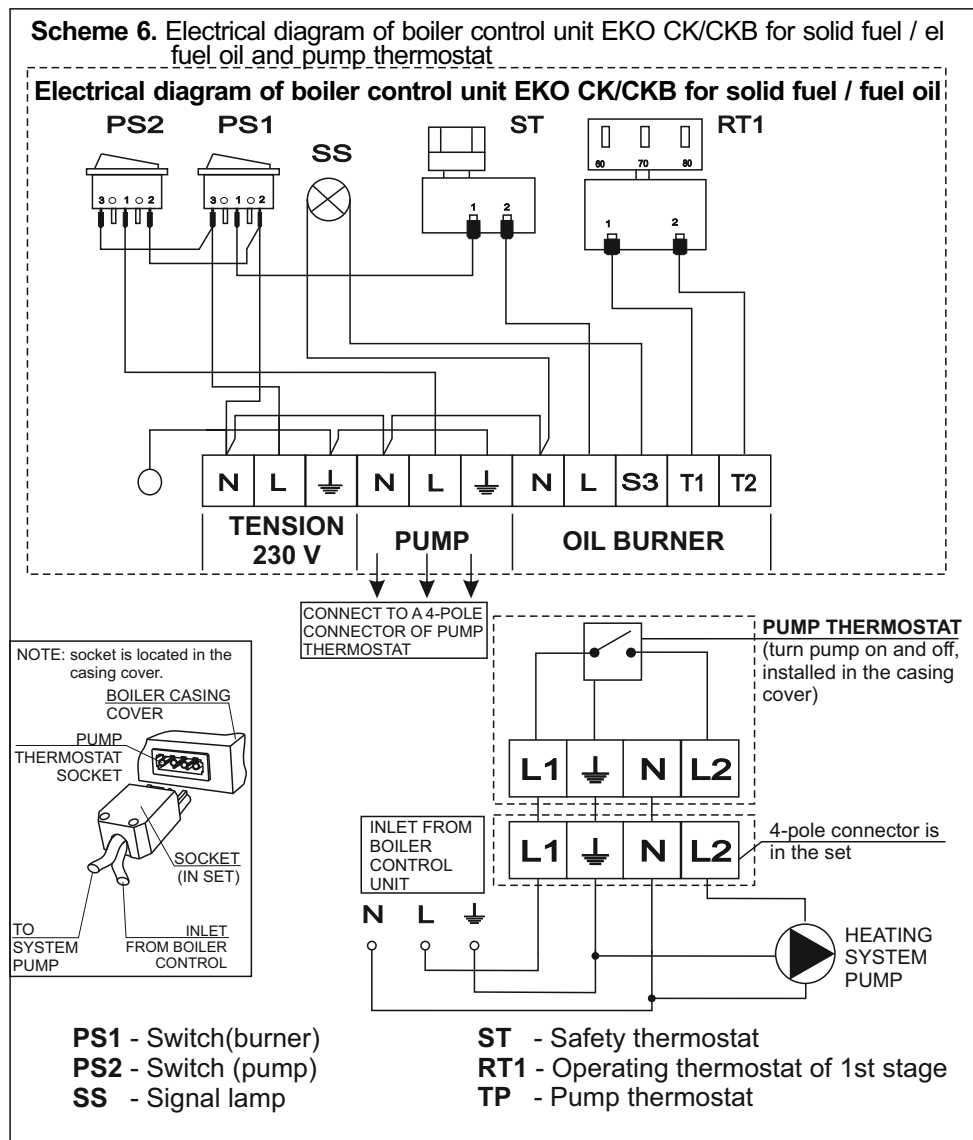
**8.1. SOLID FUEL FIRING (EQUIPMENT FOR WOODEN PELLETS OR OIL HAS NOT BEEN BUILT IN YET)**

**At firing with solid fuel** it is necessary to check whether movable parts of the left firebox are placed to foreseen positions (lid - door protection, lid - registers, lower door grate and ash tray) - Figure 6. Draught controller (such as CALEFFI 529 500, ESBE C 20/25) has to be set for solid wood firing so that the boiler temperature, at normal burning, does not exceed 85 - 90°C, and does not fall below 65°C.



**7.3. BOILER FIRED WITH SOLID FUEL / EL FUEL OIL**

Power source is connected through terminal strip located below the panel of main boiler control unit EKO-CK/CKB and the pump thermostat connector placed at the back boiler side. Scheme 6 shows connecting procedure.

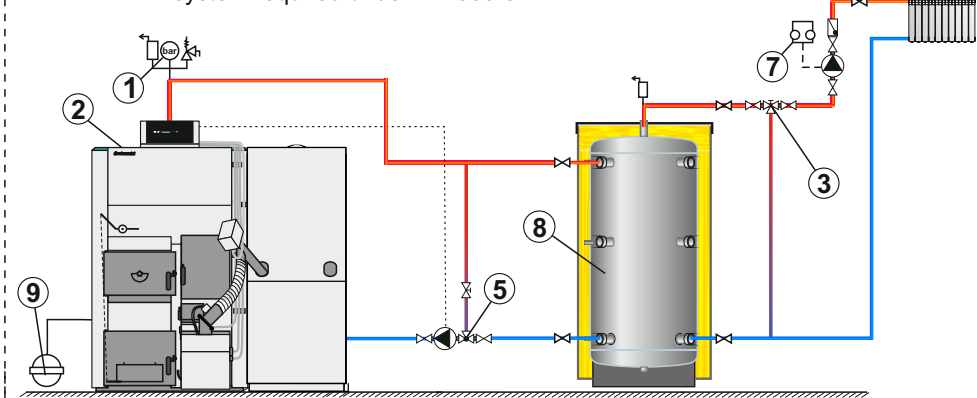


**5.1. BOILER INSTALLATION TO CLOSED HEATING SYSTEM**

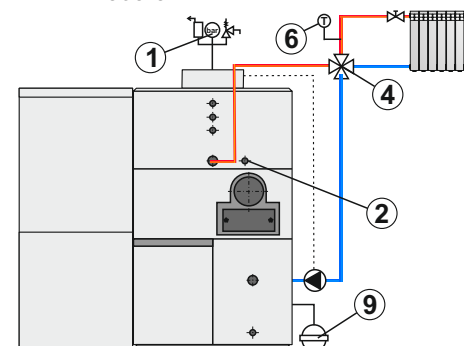
In closed heating system (as in example shown in Scheme 1a and 1b) it is **obligatory** to build in certified safety valve with opening pressure of 2,5 bar, minimum seat diameter of 15 mm, minimum inlet connection of 1/2", minimum exit connection of 3/4" and a membrane expansion vessel. Safety valve 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. In all boiler types the heating pump must be connected according to electric diagram relevant for specific boiler use (point 7 in these Instructions) so that the heating pump switching on and off would depend on water temperature in the boiler. If boiler is connected to the heating system under Diagram 1b., it is recommended that the environment temperature control is made by a 4-ways manual mixing valve.

**Installation of boiler CentroPlus-B to closed heating system**  
(Solid fuel / wooden pellets firing is presented, installation is same for other fuel types)

**Scheme 1a.** An example of building in of accumulation tank into the central heating system required under EN 303-5



**Scheme 1b.** An example of building in of accumulation tank into the central heating system not required under EN 303-5



- ①-Obligatory installation of air self-venting group (safety valve 2.5 bar)
- ②-Close tightly
- ③-Manual 3-ways mixing valve
- ④-Manual 4-ways mixing valve
- ⑤-Thermostat valve-Temperature of outlet line min. 60°C
- ⑥-Thermometer
- ⑦-Room thermostat
- ⑧-Accumulation tank (CAS)
- ⑨-Closed-type expansion vessel

### 5.1.1. THERMAL PROTECTION OF BOILER

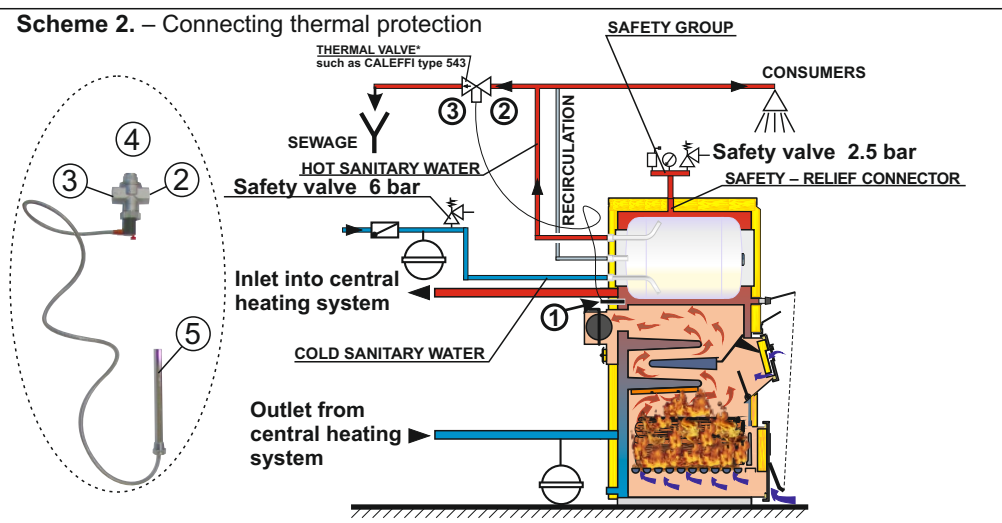
According to European EN standards, boiler thermal protection **must be** installed in closed heating system. Boiler is factory prepare for installation of thermal protection (thermal valve) - see Scheme 2. In case of any damage of boiler installed in the closed heating system due to its overheating, and boiler or system are not equipped with any thermal protection at all, or with 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 water supply line and not from hydrophor. Namely, in case of failure of power supply, boiler could be overheated, and hydrophor is not able to ensure required water supply.

**Installation of thermal fuse:**

- Install safety-venting connection to the safety-relief boiler connection (female thread 3/4")
- Built in a T - piece to inlet of hot sanitary water, whose one branch runs to sanitary water installation and the second one runs to thermal valve (4).
- Connector (2) of thermal valve (female thread 3/4") is connected to inlet of hot sanitary water and connector (3) (female thread 3/4") is connected to sewage system.
- Fix sensor of thermal valve (5) into connector (1) (female thread 1/2", located next to boiler inlet).



\* Position of thermal valve after installation:  
(valve head downward)



### 7.0. CONNECTING BOILER TO ELECTRICAL INSTALLATIONS

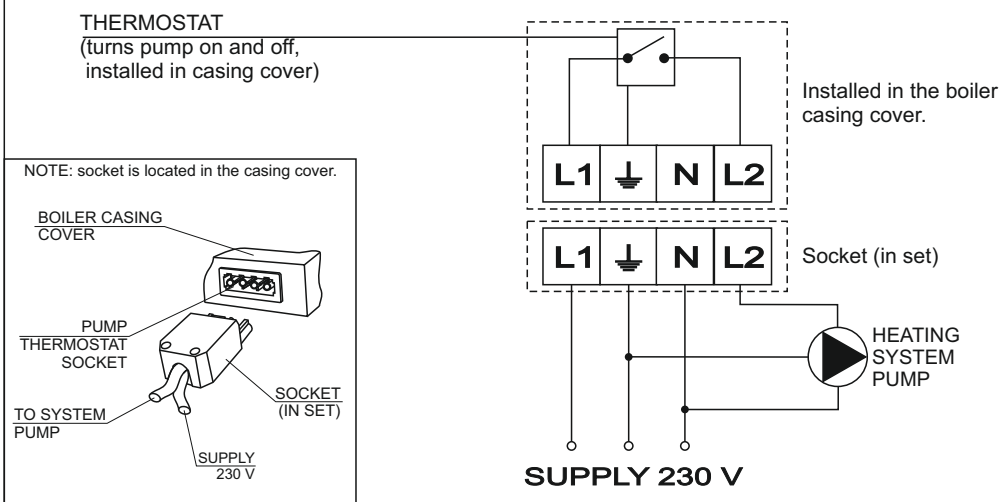
All electrical works must be performed by a certified professional in accordance with valid national and European standards.

A device for switching of all power supply poles must be installed in electrical installation in accordance with the national regulations on electrical installations.

#### 7.1. BOILER FIRED WITH SOLID FUEL (EQUIPMENT FOR WOODEN PELLETS OR OIL HAS NOT BEEN BUILT IN YET)

Heating system pump must be connected through a socket located on the back boiler side (page 4) which is connected to the pump thermostat (Scheme 5).

#### Scheme 5. Electrical connecting diagram for solid fuel firing



#### 7.2. BOILER FIRED WITH SOLID FUEL / WOODEN PELLETS

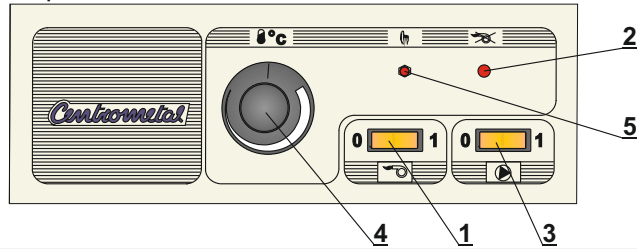
In this type of firing equipment, socket on the back boiler side (page 6), which is connected to pump thermostat is not used. For instructions on electrical connecting of boiler control unit CPREG see Technical instructions for use and maintenance of Cm Pelet-set for boilers CentroPlus and CentroPlus-B (fired with solid fuel and wooden pellets) supplied with equipment for wooden pellets firing.

**6.3.2. EL FUEL OIL FIRING**

Temperature in boiler is controlled by boiler control unit EKO-CK/CKB built on boiler cover (see page 5). On boiler control unit EKO-CK/CKB the burner must be turned on (Figure 5, pos. 1) and control thermostat should be set to preferred temperature in boiler (70-90°C).

**6.3.3. BOILER CONTROL solid fuel / EL fuel oil**

**Figure 5.** Control panel of boiler control unit EKO CK/CKB



**1. BURNER SWITCH**

Switch with signal lamp for burner switching on and off.

**2. BURNER SIGNAL LAMP**

If there are some faults in burner operation, this lamp will turn on.

**3. SWITCH FOR PUMP OF CENTRAL HEATING SYSTEM**

Switch with signal lamp for burner pump switching on and off.

**4. CONTROL THERMOSTAT OF BOILER**

Control range of boiler temperature (35 - 90°C), control is made by button rotation.

**5. SAFETY THERMOSTAT**

It stops the burner if temperature in boiler exceeds 98°C protecting system against damage.

To restart the burner, the following should be done:

- Wait until boiler temperature falls below 70°C.
- Push button, pos. 5, Figure 5.

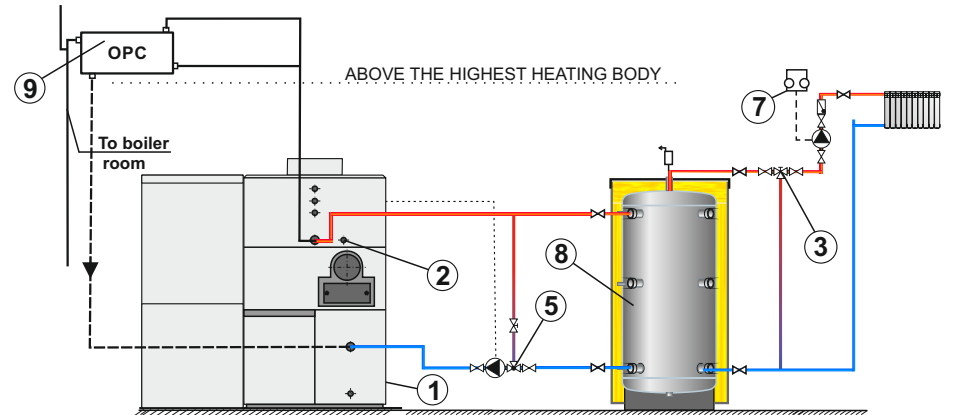
If frequent interruptions in boiler operation continue, call a professional for checking.

**5.2. BOILER INSTALLATION TO OPEN HEATING SYSTEM**

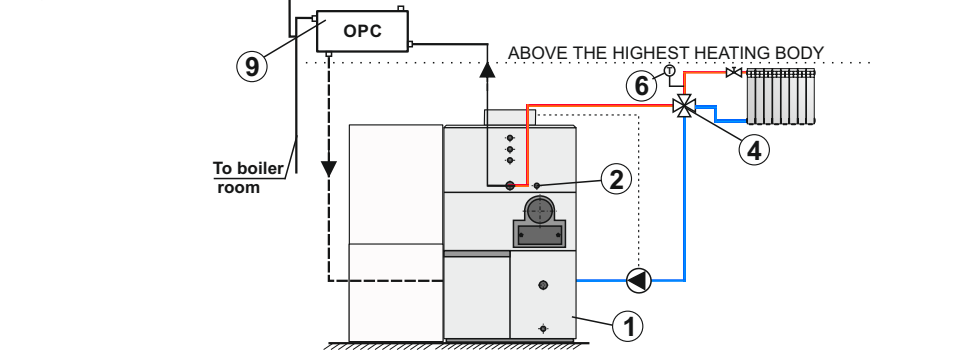
If boiler is installed in an open central heating system, it is recommended that system is made according to Scheme 3a. or 3b. In open system it is necessary to put an open expansion vessel above the height of the highest heating body. If expansion vessel is located in a room without heating, it should be insulated.

**Example of installation of boiler CentroPlus-B in an open heating system**  
(Solid fuel/wooden pellets firing is presented, installation is same for other fuel types)

**Scheme 3a.** An example when building in of accumulation tank into the central heating system required under EN 303-5



**Scheme 3b.** An example when building in of accumulation tank into the central heating system is not required under EN 303-5-5



- |   |                             |
|---|-----------------------------|
| ①-boiler CentroPlus-B   | ⑥-thermometer               |
| ②-close tightly   | ⑦-room thermostat           |
| ③-manual 3-ways mixing valve                                    | ⑧-accumulation tank (CAS)   |
| ④-manual 4-ways mixing valve                                    | ⑨-open expansion vessel OPC |
| ⑤-thermostat valve-ensures temperature in return pipe min. 60°C |                             |



### 5.3. BOILER CONNECTION TO WATER SUPPLY INSTALLATION

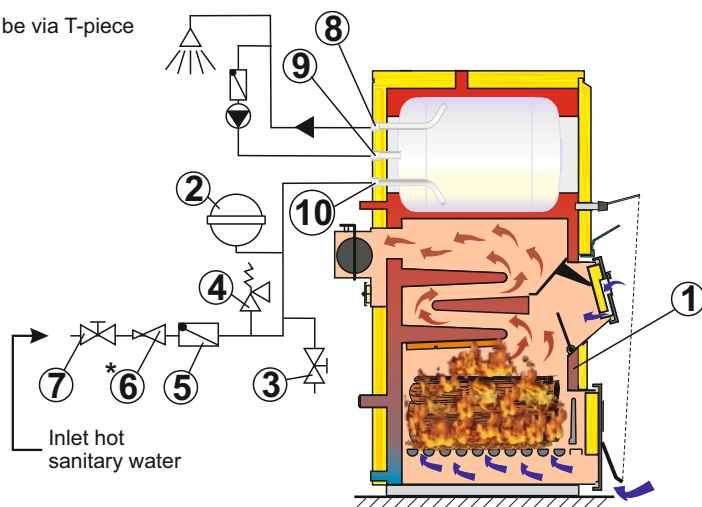
All installation works have to be performed in accordance with national and European standards. Connection of inox boiler to water supply installation has to be done by an expert professional (Scheme 3.). Cold sanitary water supply line has to be connected to lower connecting pipe (connector 3/4") and the upper connecting pipe (connector 3/4") is intended for disposal of hot sanitary water. Connection for circulation line (connector 3/4") is located between hot and cold water connector.

The following has to be installed at the supply line of cold sanitary water in DHW tank

- expansion vessels for sanitary water;
- taps for water discharge from boiler (obligatory through T - piece);
- safety valve with opening pressure of 6 bar;
- reducing valve which reduces cold sanitary water pressure to 4 bar (if its pressure is higher);
- non-return valve.

**Scheme 4.** Example of installation of boiler CentroPlus-B to water supply system

- 1 - Hot water boiler CentroPlus-B
- 2 - Expansion vessel
- 3 - Discharge tap- must be via T-piece
- 4 - Safety valve
- 5 - Non-return valve
- 6 - Pressure controller
- 7 - Stop valve
- 8 - Hot sanitary water
- 9 - Circulation
- 10 - Cold sanitary water



\* It should be built in if inlet water pressure is over 4 bars.

### 6.0. CONTROL OF BOILER TEMPERATURE

#### 6.1. SOLID FUEL FIRING (EQUIPMENT FOR WOODEN PELLETS OR OIL HAS NOT BEEN BUILT IN YET)

Boiler temperature is controlled by a draught controller (such as CALEFFI 529 500, ESBE C 20/25), which is installed on the front left side of boiler (see page 4). The draught controller chain should be adjusted so that, at normal combustion, temperature does not exceed temperature of 85 to 90°C (air opening fully closed) and does not fall below 65°C. Pump of heating system and sanitary water should be connected through a socket on the boiler back side (page 4) which is connected to the pump thermostat (Scheme 5).

#### 6.2. BOILER FIRED WITH SOLID FUEL AND WOODEN PELLETS

Pump of heating system and sanitary water should be connected to boiler control unit CPREG which control pump operation and protects boiler against subcooling.

##### 6.2.1. SOLID FUEL FIRING

Temperature in boiler is controlled by a draught control unit (such as CALEFFI 529 500, ESBE C 20/25) which is installed on the front left side of boiler (see page 4). The draught controller chain should be adjusted so that, at normal combustion, temperature does not exceed temperature of 85 to 90°C (air opening fully closed) and does not fall below 65°C. When solid fuel is fired, boiler control unit CPREG must be turned on (at main switch) to ensure proper pump operation and to enable reading of boiler temperature and sanitary water temperature. For detailed description of boiler control unit CPREG see Technical instructions for use and maintenance of control unit and boilers CentroPlus and CentroPlus-B (fired with solid fuel and wooden pellets) supplied with wooden pellet firing set.

##### 6.2.2. WOODEN PELLET FIRING

Temperature in boiler is controlled by a digital boiler control unit CPREG built on the boiler cover (see page 6). Pump of heating system and sanitary water should be connected to boiler control unit CPREG which controls pump operation and protects boiler against subcooling. For detailed description of boiler control unit CPREG see Technical instructions for use and maintenance of Cm Pelet-set for boilers CentroPlus and CentroPlus-B (fired with solid fuel and wooden pellets) supplied with wooden pellet firing set.

#### 6.3. BOILER FIRED WITH SOLID FUEL AND EL FUEL OIL

Heating system pump should be connected through the pump thermostat to boiler control according to scheme 5 which (if pump switch is in position 1) turns the pump on if temperature in boiler exceeds 68°C and turns the pump off if temperature in boiler falls below 68°C to protect boiler against subcooling.

##### 6.3.1. SOLID FUEL FIRING

Temperature in boiler is controlled by a draught controller (such as CALEFFI 529 500, ESBE C 20/25) which is installed on the front left side of boiler (see page 4). The draught controller chain should be adjusted so that, at normal combustion, temperature does not exceed temperature of 85 to 90°C (air opening fully closed) and does not fall below 65°C. When solid fuel is fired, the heating pump switch operation (Figure 5, pos.3) at boiler control unit EKO-CK/CKB must be ON.