

Centrometal

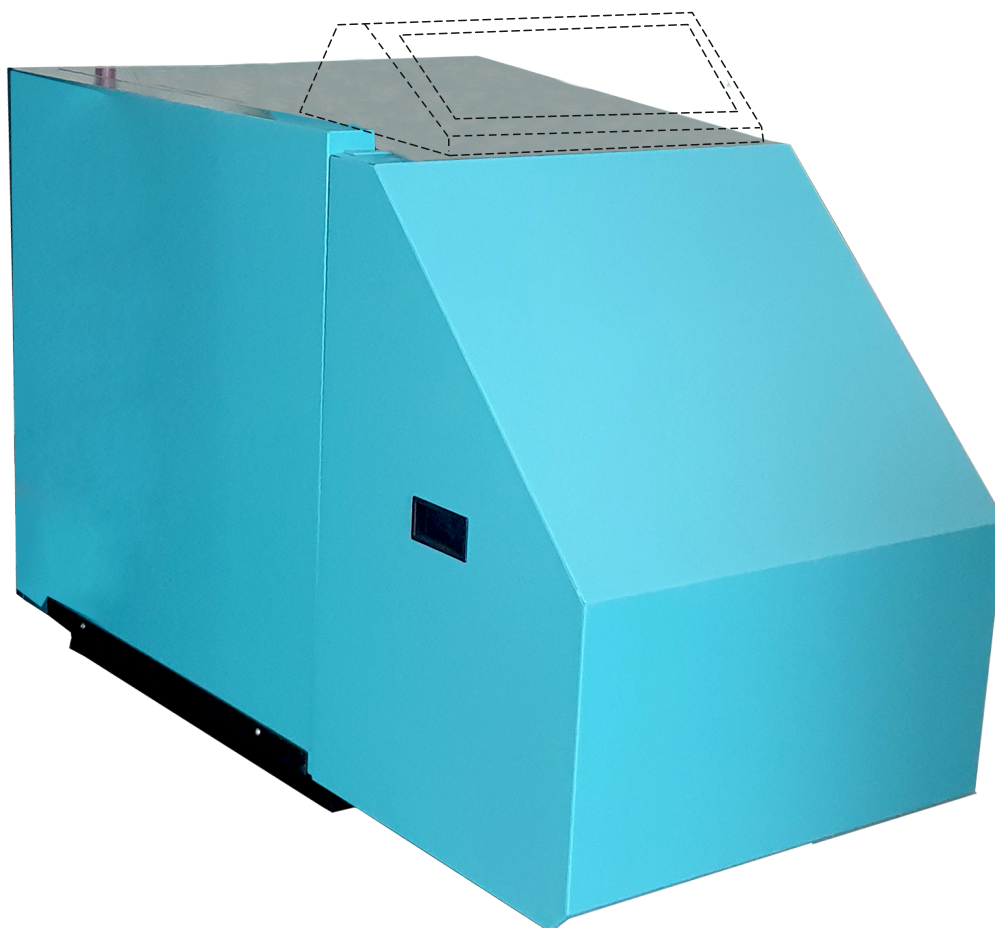
HEATING TECHNIQUE

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ENG

TECHNICAL INSTRUCTIONS

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



EKO-CUP M3



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Make sure the instructions are always with the device, even if it is sold/transferred to another owner, so user or authorized person for maintenance or repairs can consult it.



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 persons 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.



Please note that the installation can only be performed by a qualified heating contractor or service organization. All works on electrical and fuel carrying components must be done by a qualified service technician.

Explosive danger due to flammable fumes!

WHAT TO DO WHEN YOU SMELL SMOKE?



- Shut off main gas /oil supply!
- Open windows and doors!
- No open fire! Do not smoke! Do not use a lighter!
- Avoid generating sparks! Do not use an electrical, switch,telephone, electrical socket or bell!
- Notify homeowner, but do not use a door bell or phone!
- Leave the building!
- Immediately notify the gas or oil supplier from a remote location!
- If necessary, inform police or fire department.
- Immediately leave the building, when you hear or see gas leak!

Insufficient amount of fresh air for combustion in the boiler room can lead to dangerous conditions.

Make sure that the openings for combustion air supply are not reduced or closed.

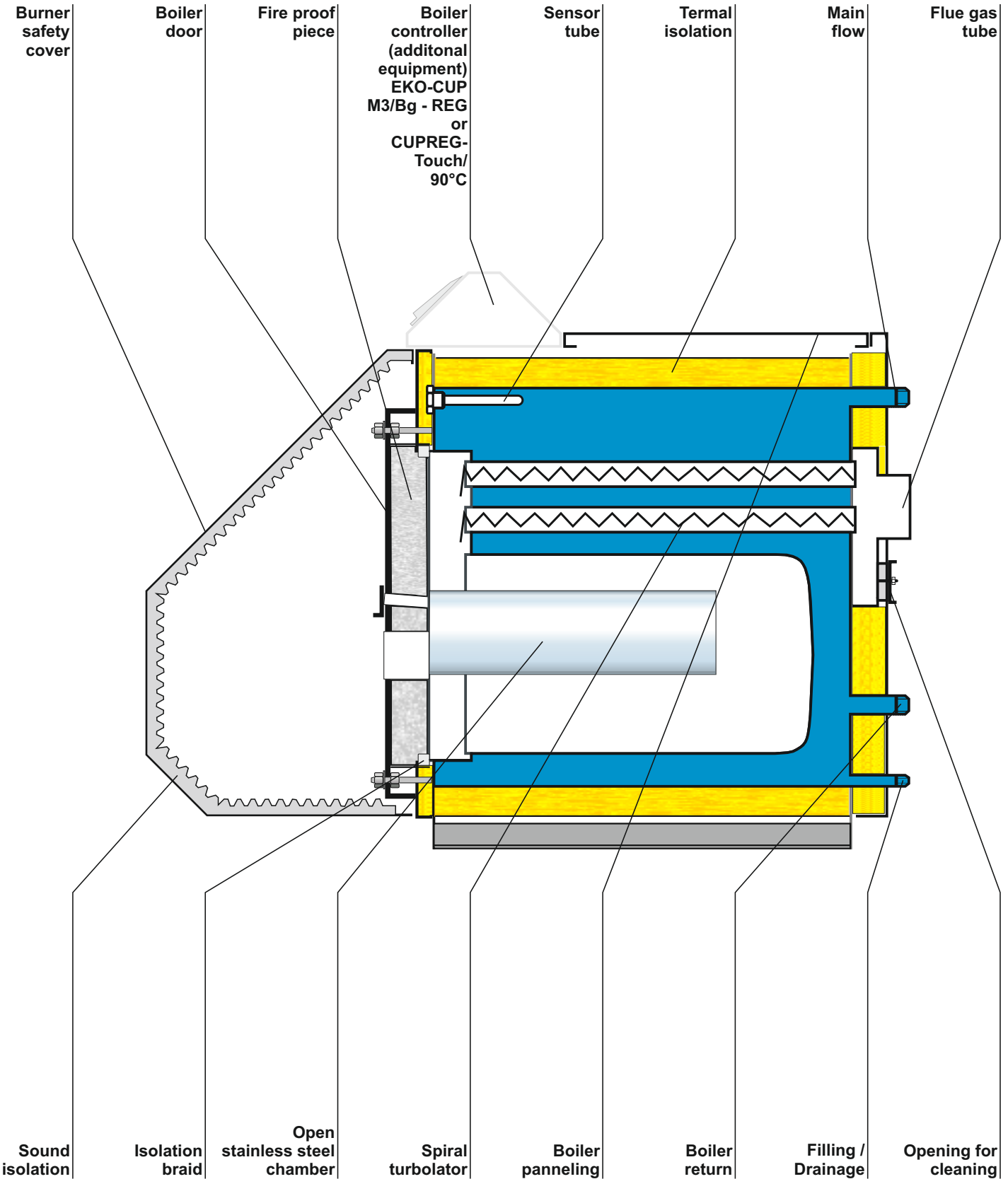


Keep the boiler room door closed.

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

If above mentioned issues are not solved, the boiler cannot be put into operation.

BOILER EKO-CUP M3 COMPONENT PARTS



1.0. IN GENERAL

The boiler **EKO-CUP M3** is intended for firing with light heating oil and gas. The boiler has a modern construction, small dimensions and design regarding to the projected capacity. The boiler is made out of controlled materials of high quality, welded with the most modern technology and additionally equipped and fulfills all special requirements for the connection to the central heating instalation.

1.1. BOILER DESCRIPTION

The boiler **EKO-CUP M3** is a triple flue gas passage steel boiler composed of a stainless steel combustion chamber part, a central combustion chamber with tubes for turbulators. Triple flue gas system with verified turbulator technology as the stainless steel combustion chamber part enables a complete combustion and the reduction of harmful components in the flue gas to a minimum. Stainless steel turbulators in the tube chamber enable longer retaining of flue gases and a better transmission of thermal energy to the boiler water. Beyond mentioned turbulators serve for a possible fine regulation of the exit temperature of flue gases, which minimum exhaust temperature is 160 °C at the boiler temperature of 70 °C. By this condensation is prevented and boiler operation life is extended.

2.0. DELIVERY STATUS

The boiler **EKO-CUP M3** is delivered together with outer boiler panelling made of plastificated sheet metal and thermal isolation of appropriate density mineral wool that reduces heat loss by convection and radiation.

OBLIGATORY ADDITIONAL EQUIPMENT (IT MUST BE ADDITIONALLY ORDERED):

-Basic boiler controller EKO-CUP M3/Bg - REG

or

-Basic boiler controller CUPREG-Touch

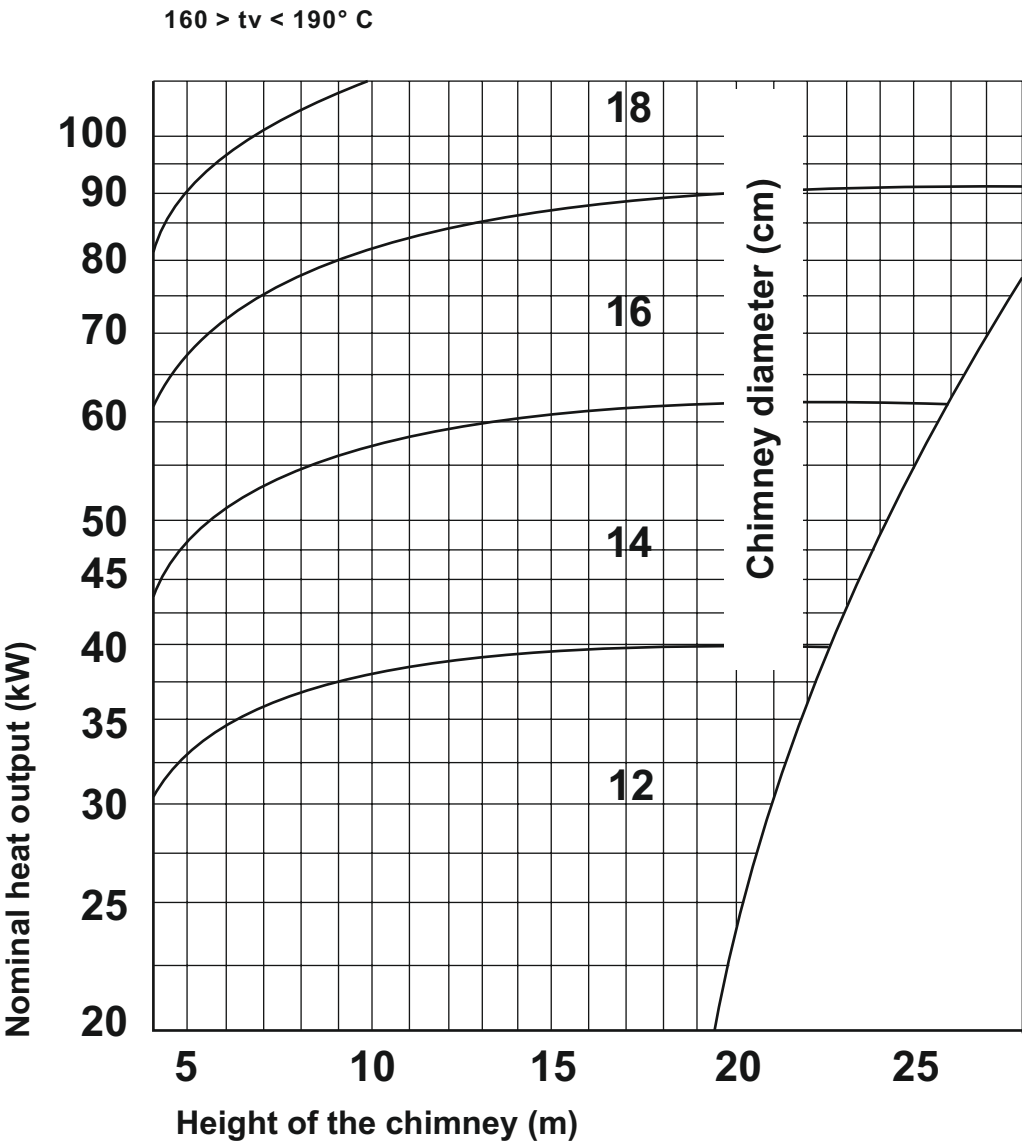
2.1. MOUNTING AND COMMISSIONING

Mounting and commissioning must be done by a qualified person, who takes the responsibility for correct boiler operation. Before the boiler is connected to the heating system, the boiler must be cleaned of possible dirt layers. These actions prevent boiler overheating, noise in the heating system, disturbances in the pump and the mixing valve. The connection has to be done by separable connection fittings - holenders (never by welding), with or without a mixing valve on a open or closed heating system. In a closed heating system, operation overpressure of 2,5 bar is allowed and it is obligatory to build in a safety valve. The boiler must be positioned to enable supervision during boiler operation, cleaning and maintenance.

3.0. CHIMNEY

Precisely calculated and performed chimney is a precondition for safe boiler operation and economic heating results. The chimney must be well thermal isolated, gas-impermeable and smooth. On the lower part of the chimney a cleaning door must be installed. A walled chimney must be three-layered with a middle mineral wool isolation layer. The thickness of the isolation should be at least 30 mm thick if the chimney is mounted inside the building and 50 mm thick if is mounted outside the building walls. The inner diameter of the chimney depends upon the actual chimney height and the boiler power output (Figure 1). The flue gas temperature on the chimney exit has to be at least 30°C higher than the condensation temperature of the combustion flue gases. Please confide the choice and montage of the chimney to a qualified person.

Figure 1: Gas or oil boilers with required draft and flue gas temperature at the boiler outlet



4.0. TECHNICAL INFORMATIONS

TYPE		EKO-CUP M3 - 18	EKO-CUP M3 - 25	EKO-CUP M3 - 35	EKO-CUP M3 - 50	EKO-CUP M3 - 65	EKO-CUP M3 - 80
Heat output	kW	18	25	35	50	65	80
Heat load	kW	19,2	26,5	37	53	69	84
Min. chimney underpressure	mbar	0,08	0,10	0,12	0,14	0,16	0,18
Flue gases temp. min/max	°C	160-210	160-210	160-210	160-210	160-210	160-210
Operating overpressure min/max	bar	0,8-2,4	0,8-2,4	0,8-2,4	0,8-2,4	0,8-2,4	0,8-2,4
Boiler temp. min/max	°C	55-90	55-90	55-90	55-90	55-90	55-90
Regulation thermostat	°C	0-90	0-90	0-90	0-90	0-90	0-90
Safety thermostat	°C	100(110)	100(110)	100(110)	100(110)	100(110)	100(110)
El. connector	V/Hz	230/50	230/50	230/50	230/50	230/50	230/50
Boiler efficiency min/max	%	92,1-93,8	92,1-93,8	92,1-93,8	92,1-93,8	92,1-93,8	92,1-93,8

5.0. OIL-GAS BURNER ADJUSTMENT

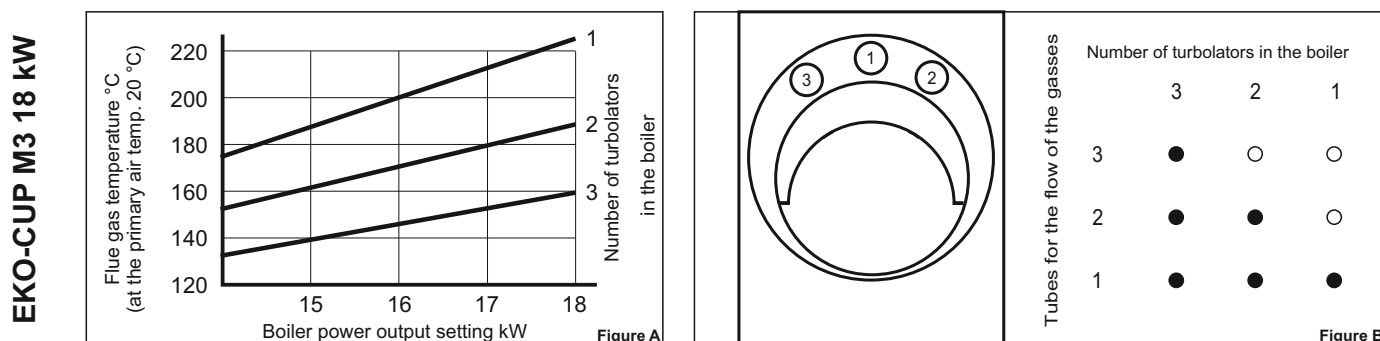
For regular boiler operation, it is necessary to adjust the burner correctly. These can be achieved by choosing the right nozzle size and oil pressure inside the oil burner, respectively by gas flow (gas consumption per hour) regarding to the boiler heat output.

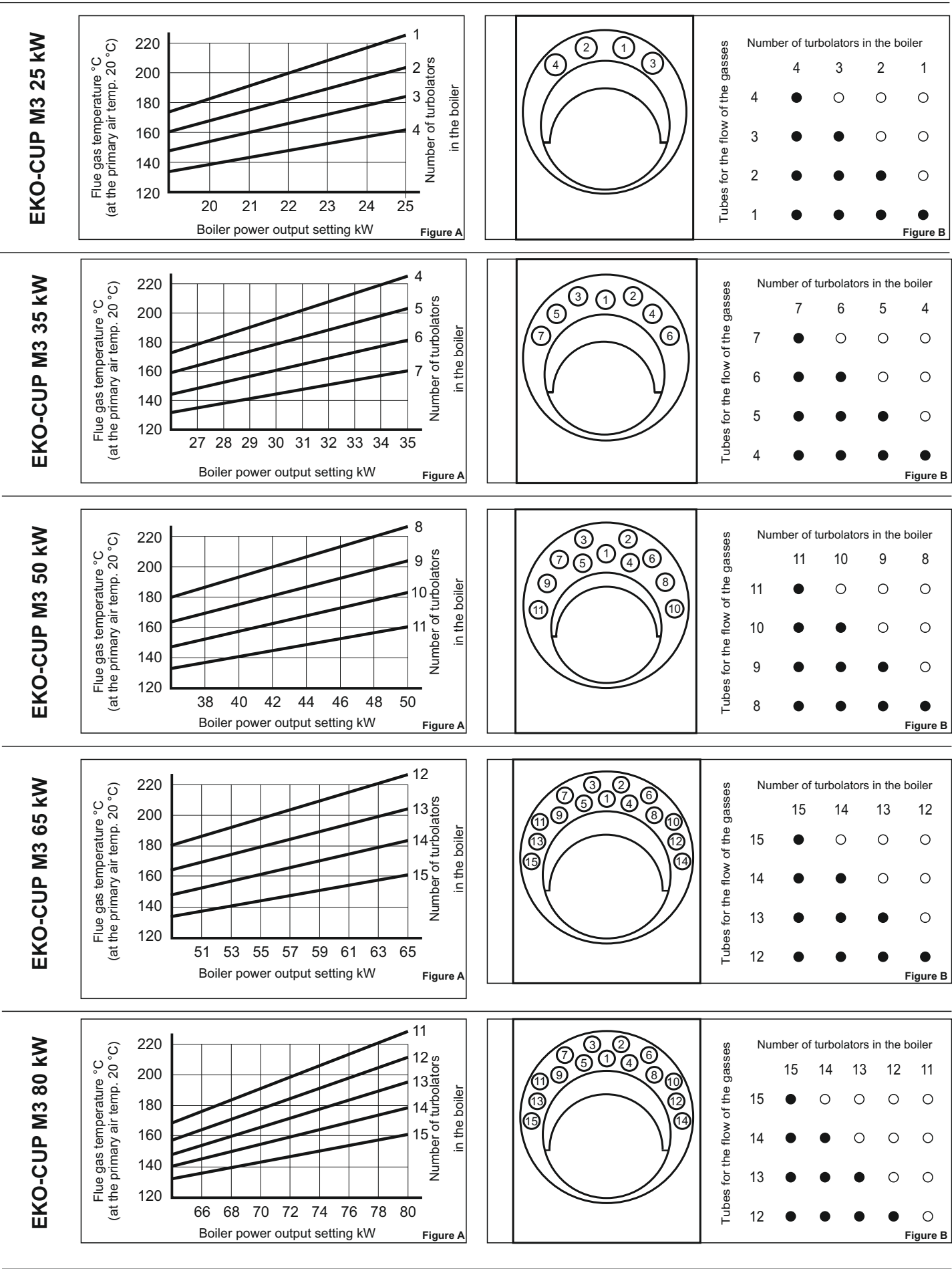
HEAT OUTPUT (kW)	GAS (m ³ /h)	OIL			CHIMNEY DEPRESSURE (mbar)	PERMITTED MIN. FLUE GAS TEMP. (°C)
		(kg/h)	nozzle (GPH)	pressure (bar)		
18	2,1	1,70	0,40	10	0,08	160
25	2,8	2,25	0,55	12	0,10	160
35	4,0	3,35	0,85	11	0,12	160
50	5,6	4,80	1,20	11	0,14	160
65	7,3	6,20	1,50	12	0,16	160
80	8,9	7,70	1,75	13	0,18	160

Above mentioned data are valid for extra-light heating oil according to the DIN 51603 T1 and T2, respectively natural gas.

5.1. REGULATION OF FLUE GAS EXHAUST TEMPERATURE

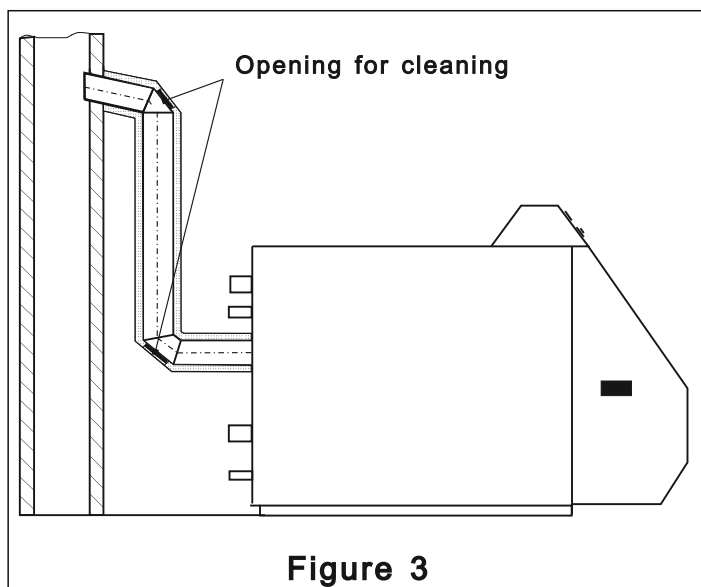
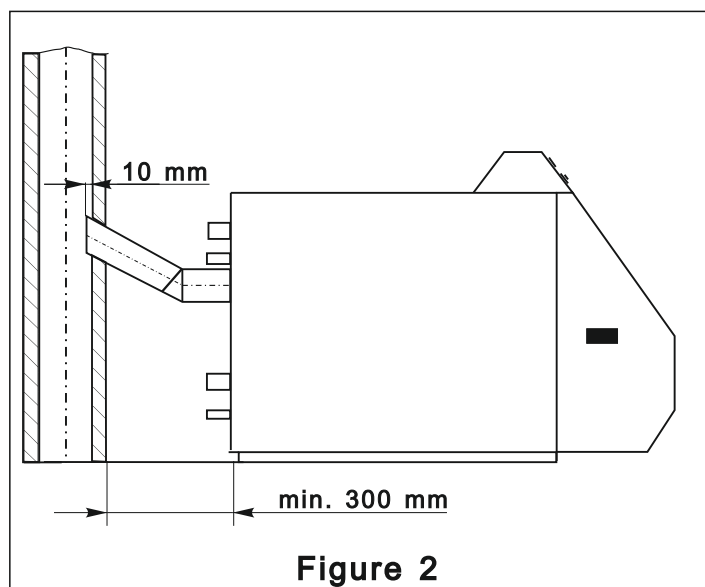
The diagram on the Figure A shows the dependence of the flue gas exhaust temperature on the thermal load and the number of turbolators in the boiler. Minimum flue gas exhaust temperature is 160°C and maximum 220°C. When the flue gas exhaust temperature is under 160°C, it leads to condensation in the boiler and chimney, therefore it is necessary to take out some turbolators. Stainless steel turbolators are taken out symmetrically as shown on diagram on the Figure B.





5.2. CONNECTION TO THE CHIMNEY

The required minimum distance between the boiler and chimney is 300 mm. The flue gas tube has to be mounted under an inclination between 30 - 40° (Figure 2). To prevent entering of condensing fluid from the chimney into the boiler, it is necessary and important to mount the flue gas tube 10 mm deeper into the chimney. A flue gas tube longer than 0,5 m should be thermal isolated with mineral wool, which is 30 -50 mm thick. For easier flue gas tube cleaning the tube itself must have an opening (Figure 3).



5.3. FRESH AIR OPENING

Every boiler room must have a correct calculated **opening for fresh air inlet** regarding to the boiler power output.

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

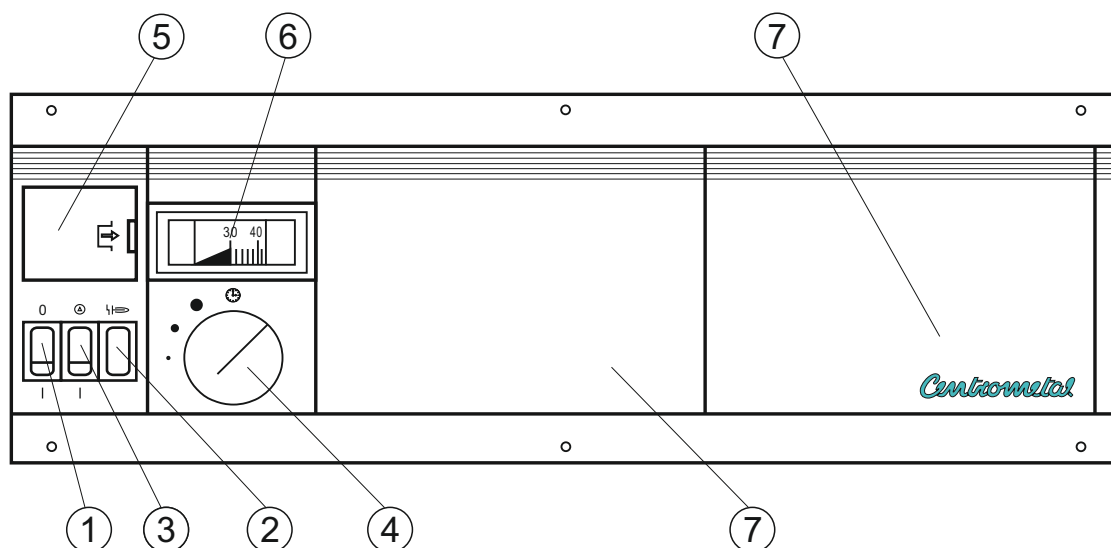
A - opening area in cm²

Q - boiler output in kW

The opening must be protected by a net or grid.

6.0. BASIC BOILER CONTROLLER (additional equipment)

6.1. BASIC BOILER CONTROLLER - EKO-CUP M3/Bg - REG (ADDITIONAL EQUIPMENT)



1. BURNER

Switch with a signal diode for turning the burner ON and OFF.

2. BURNER CONTROL SIGNAL LIGHT

If any disturbances occur during the boiler operation, this control signal light will light up.

3. CIRCULATION PUMP

The switch for turning the circulation pump ON and OFF.

4. REGULATION BOILER THERMOSTAT

Setting - changing boiler operation temperature (35 - 90°C) is achieved by turning the button (position 4).

5. SAFETY BOILER THERMOSTAT

It stops the burner operation if the boiler water temperature exceeds 98°C. In this way, a major breakdown is prevented. When the burner is put into the operation again, following steps must be taken:

- wait until the boiler temperature drops and reaches the value under 70°C
- take off the safety lid, position 5
- push the red button

If there are still frequent interruptions during the boiler operation, it is necessary to contact the qualified person to check it out.

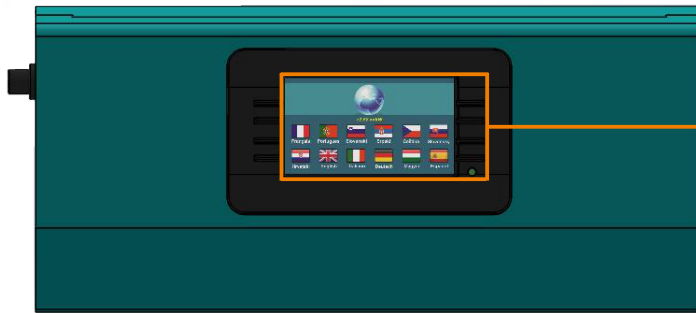
6. THERMOMETER

The thermometer indicates the boiler water temperature in °C.

7. POSITION FOR MOUNTING HEATING CONTROL UNITS

(additional equipment)

6.2. BASIC BOILER CONTROLLER (additional equipment): CUPREG-Touch



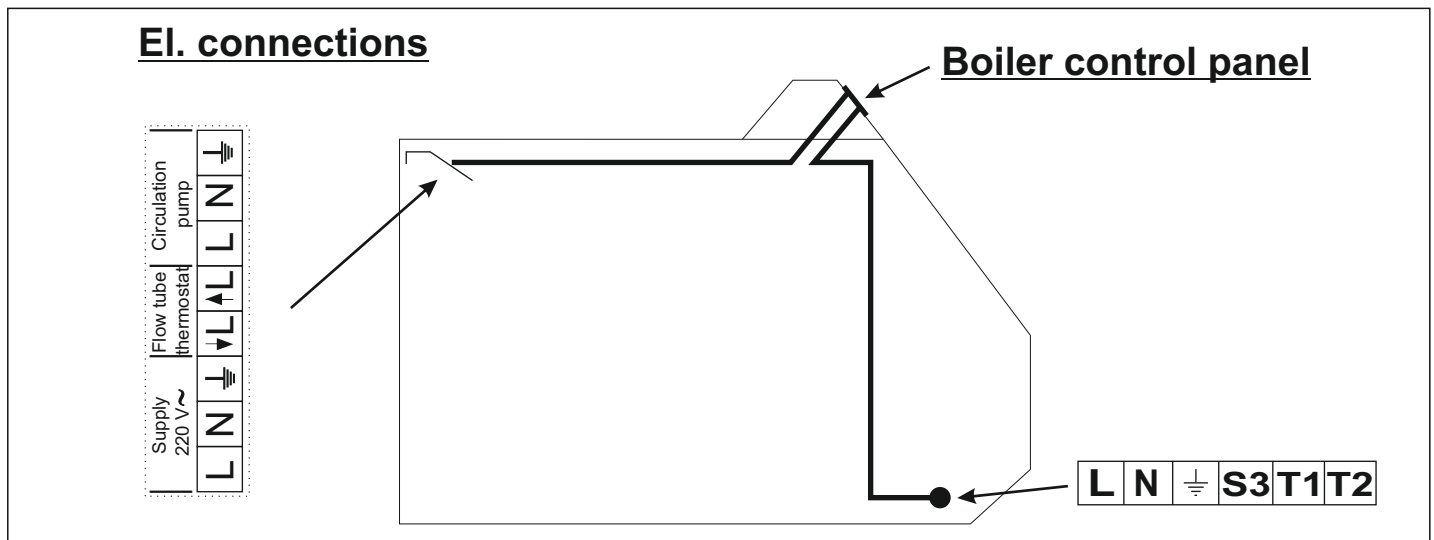
CUPREG-Touch
regulation (additional equipment)

7.0. CONNECTION TO THE ELECTRIC INSTALLATION

7.1. CONNECTION OF BASIC BOILER CONTROLLER EKO-CUP M3/Bg - REG TO THE ELECTRIC INSTALLATION

- see technical instructions delivered with the boiler controller - EKO-CUP M3/Bg - REG

During the installation of electrical installation, which must be done by a qualified person, it is necessary to take off the lid on the upper side of the boiler (behind the boiler controller) under which is placed the line clamp for the electric supply of the boiler controller.



7.2. CONNECTION OF BASIC BOILER CONTROLLER - CUPREG-Touch TO THE ELECTRIC INSTALLATION

- see technical instructions delivered with CUPREG-Touch

8.0. BOILER CONNECTION TO THE HEATING INSTALLATION

The heating installation must be performed according to technical valid norms. Before the boiler is connected to the heating installation, it is necessary to clean all tubes in the system from dirt layers on the tube inner surface. This actions prevents boiler overheating, noise in the heating system, disturbances on the circulation pump and mixing valve. Connection to the heating system must be performed with holenders with or without a mixing valve to open or closed heating system. In a closed system it is obligatory to build in a certificated safety valve with opening overpressure set on 2,5 bar. Security and expansions lines must not have any shut-off elements. Boiler water outlet from the safety valve is lead directly to the sewage. During the water filling into the heating system (boiler and radiators) it is necessary to open the mixing valve if it is inbuilt and air-vent the boiler and heating system.

9.0. BOILER CHECK AND STARTUP

Check if the boiler and the whole heating system is filled with water. Check if the flue gas tube is properly sealed and if the boiler is connected to the el. supply. Startup must be done by a qualified and authorized service technician.

9.1. INSTALLATION CHECK AFTER START UP

After startup please check:

- no occurrence of water leakage
- if the filling/drainage valve in the system is closed
- if the complete installation is air-vented
- if the boiler water temperature rises
- activate the safety valve and check if it works properly
- that during continuous boiler operation there is no visible chimney condensation

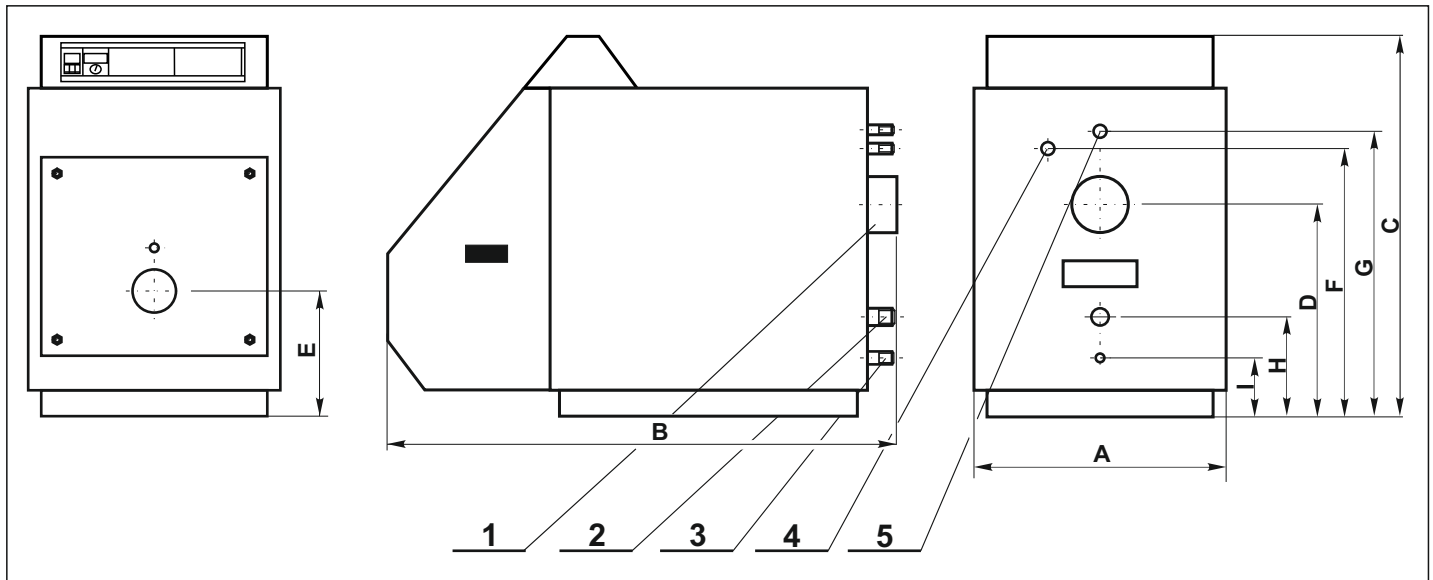
Please repeat the complete check after several days.

9.2. OPERATION AND MAINTENANCE

During boiler-heating system take over please check the complete heating system together with the service technician. The service technician must inform you about the general heating system and about its supervision. Beyond this you must be informed about the vital parts of the heating system and their function. After several days of operation please air-vent the heating system once more and fill it with water if necessary. At least once a year (before heating season) it is necessary that authorized service technician check the burner, so the boiler and the heating system will be safe and economic. In case of operation disturbances, please contact only the **authorized service technician**.

10.0. CLEANING

It is necessary to clean the boiler at least once a year. Before cleaning switch off the main switch on the boiler control panel, thus prevent a possible burner start. Open the boiler door, pull out turbolators, clean boiler tubes and the combustion chamber with the brush. The chimney and the end part of the turbolator tubes can be cleaned through the opening on the back of the boiler. After cleaning return turbolators.



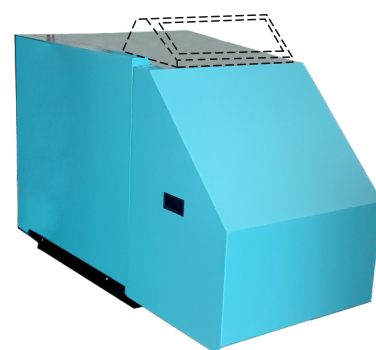
11.0. TECHNICAL DATA

TYPE		EKO-CUP M3 18	EKO-CUP M3 25	EKO-CUP M3 35	EKO-CUP M3 50	EKO-CUP M3 65	EKO-CUP M3 80
Power output	kW	18	25	35	50	65	80
Dimensions of the combustion chamber	diameter	mm	240	240	275	310	440
	length	mm	440	540	540	540	690
Resistance of the combustion chamber	80% power output	mbar	0,17	0,18	0,20	0,27	0,35
	100% power output	mbar	0,20	0,21	0,25	0,32	0,40
Boiler flue exhaust diameter	mm	130	130	130	150	160	160
Fuel type		oil/gas	oil/gas	oil/gas	oil/gas	oil/gas	oil/gas
Boiler mass	kg	105	117	147	168	206	235
Water amount in boiler	l	48	54	80	85	105	130
Burner opening	mm	100	100	100	100	110	110
Max. operating pressure	bar	2,5	2,5	2,5	2,5	2,5	2,5
Test pressure	bar	5,5	5,5	5,5	5,5	5,5	5,5
Operation temperature	°C	55-90	55-90	55-90	55-90	55-90	55-90
Mineral wool thermo isolation layer	mm	40	40	40	40	40	40
Useful boiler efficiency	%	93,8	93,8	93,8	93,8	93,8	93,8

11.1. DIMENSIONS

TYPE		EKO-CUP M3 18	EKO-CUP M3 25	EKO-CUP M3 35	EKO-CUP M3 50	EKO-CUP M3 65	EKO-CUP M3 80
A Boiler width	mm	505	505	582	632	692	692
B Boiler length	mm	1090	1190	1190	1190	1190	1340
C Boiler height	mm	805	805	885	910	1005	1005
D Boiler flue exhaust	mm	440	440	490	515	580	580
E Burner opening	mm	265	265	300	300	330	330
F Safety line	mm	540	540	620	645	710	710
G Main flow	mm	595	595	660	700	760	760
H Boiler return	mm	215	215	230	250	250	250
I Filling / drainage	mm	140	140	140	140	140	140
1 Boiler flue exhaust	mm	130	130	130	150	160	160
2 Boiler return	R"	1"	1"	5/4"	5/4"	6/4"	6/4"
3 Filling / drainage	R"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
4 Safety line	R"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
5 Main flow	R"	1"	1"	5/4"	5/4"	6/4"	6/4"

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Company assumes no responsibility for possible inaccuracies in this book originated typographical errors or rewriting, all figures and diagrams are principal and it is necessary to adjust each actual situation on the field, in any case the company reserves the right to enter their own products such modifications as considered necessary.

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