

INSTRUCTION MANUAL

INSTALLATION, OPERATION AND MAINTENANCE

Gas-fired condensing
ceantral heating boilers

COMBI BOILERS

ECOCONDENS SLIM

SYSTEM BOILERS

ECOCONDENS SLIM



DEAR CUSTOMER

Congratulations on having chosen **termet** product.

We offer you modern, economical and environmentally friendly product, meeting particularly high requirements of European Standards. Please read this instruction manual carefully as the knowledge of service rules and manufacturer's recommendations are the conditions of reliable, efficient and safe operation of the appliance.

Please keep this instruction manual for the whole operation life of the boiler.

We wish you satisfaction in using our product.

termet

IMPORTANT TIPS

- Read the instruction manual before you perform the installation and operation of the boiler.
- This instruction manual is an integral equipment of the boiler. It should be kept through the whole operation life of the boiler and carefully read. It contains all the information and warnings for safety during installation, use and maintenance to be followed.
- The boiler is complicated appliance as it contains numerous precise mechanisms.
- Reliable operation of the boiler depends mainly on appropriate performance of systems that boiler cooperates with such as:
 - gas system,
 - flue gas-air system,
 - central heating system,
 - domestic hot water system.
- Flue gas - air installation for C type boilers should be made of separately approved and introduced on the market gas - air system. Adapters connecting the boiler with a pipe system must have a measuring points. Flue gas – air system must meet the specifications set out in section 3.8 of this manual.
- Flue gas - air system must be tight. Leaks on the connections of flue gas pipes can result in flooding of the boiler by condensate. Manufacturer is not liable for damage and malfunction of the boiler arising out from above mentioned reason.
- **Installation of the boiler should be performed only by a qualified person¹⁾. Make sure that the installer has confirmed in writing the tightness of the gas installation had been checked after connecting the boiler to the system.**
- Boiler may be installed and operated only in a room where all building works have been completed. It is not allowed to install and operate the boiler in a room where building works are still in progress.
- The cleanliness of air in a room where the boiler will be installed must meet the same requirements as for rooms designer for people.
- There should be installed appropriate filters on a central heating system and gas system. Filters are not included in a basic boiler equipment.
- An example of connecting a boiler to these systems is presented on fig. 3.5.1.
- All defects caused by lack of filters on central heating or gas supply will not be repaired under guarantee.
- Central heating system must be thoroughly cleaned and rinsed, the procedure is described on p.3.5.2.
- To avoid malicious calcification process of flue gas - water heat exchanger and also for reduce a risk of other items damage, there should be:
 - the proper water preparation in C.H. circuit according to p.3.5.2, Proper water parameters in C.H. system allows for long term operation maintaining its high efficiency, what leads to lower costs of gas consumption,
 - proper tightness of central heating system ensured by avoiding frequent refilling it with water,
- Complaints caused by gas-water heat exchanger calcification will not be repaired under guarantee.
- The initial start-up of the boiler as well as its repairs, adjustments and maintenance works must be performed only by AUTHORISED SERVICE COMPANY.
- The boiler must be operated only by an adult.
- Do not do any repairs and modifications by yourself.
- Do not cover any ventilation grilles.
- Do not keep in the vicinity of the boiler any containers with flammable, aggressive and corrosive liquids and other similar substances.
- Any failures that are result of operation discordant to recommendations included in this instruction manual cannot be subject to warranty claims.
- Manufacturer is not responsible for any failures being the result of faults during the process of installation and inobservance the regulations and instructions given by the manufacturer.
- Complying with recommendations given in this instruction manual ensures a long, reliable and safe operation of the boiler.

When you smell gas:

- do not use any electrical switches that could cause any spark,
- open the door and windows,
- shut down the main gas valve,
- contact your gas supplier.

In case of any failure you should:

- disconnect the boiler from a power source,
- shut down the gas supply valve,
- cut off a water supply and drain a water from the boiler and whole central heating system as well (when there is any risk of freezing of the system),
- drain the water from the system in any case of leakage that could cause a flood ,
- contact the nearest **AUTHORISED SERVICE COMPANY** or the producer.

¹⁾ 'Qualified person', means the one that has all required technical qualifications in an area of doing all the works necessary to connect appliances to the gas mains, central heating system and flue gas duct, accordingly to local regulations.

WARNING!

**Operational instruction during the start-up of the condensing boilers.
The instruction should be used after every draining water in the boiler
i.e. during the renovation of C.H. installation or repair of the boiler.**

Read carefully the instruction manual before filling the boiler with water

1. Fill the heating circuit with water and vent the radiators before start.
2. **Close the gas cut-off valve!**
3. **Open valves which cut-off the boiler from C.H. circuit.**
4. Remove the front cover of the boiler by unscrewing the relevant fixing screws (fig. 1).
5. Remove the front cover of the combustion chamber (fig. 2).
6. Loosen the stopper on the automatic air-vent of the pump. In order to protect the pressure transducer from water, point the outlet of stopper to the right (fig. 3).
7. Fill the boiler with water by using the filling valve (in case of system boilers – the filling valve is mounted on C.H. installation, in case of combi boilers – the filling valve is on the boiler's equipment – see p.3.5). Open the filling valve slowly to protect the boiler's and the C.H. installation's components against the results of a hydraulic shock.
8. Turn on the device. The venting procedure will start, which is indicated by the symbol "AP" on controller's display and lasts for 2 minutes. The venting procedure requires water pressure above 0.5 bar, therefore during this procedure, check it with the electronic manometer which is displayed on the controller screen and top up the water pressure in boiler, it is best to maintain the pressure within the range of 1.0-1.5 bar
9. Set the operating mode on WINTER according to the boiler instruction. If to the boiler controller has been connected the room thermostat than increase the desired temperature; the boiler should start operating in C.H. mode.
10. Because the gas valve outside the boiler is closed, the boiler will stop operate (E01 error code – a lack of gas). It allow for continuous pump operation and for removal of the air flowing in with water from the installation and for continuous water flow through the heat exchanger. Leave the boiler in this state for 2-3 min.
11. Delete E01 code by "reset" button and set the boiler controller on pressure reading mode (in version without an analogue manometer). During the first days of boiler operating it is recommended to set the water pressure in C.H. circuit on 1,8-2,0 bar. It will facilitate the work of the air-vent on the boiler pump and on the components of C.H. circuit. **
12. **Unscrew the gas valve** and delete E01 code again.
13. Set the desired operating parameters of the boiler according to the instruction manual. ***
14. Check the water pressure in C.H. circuit and if it's necessary fill the pressure up to the right level.

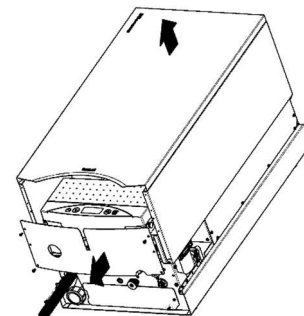


Fig. 1

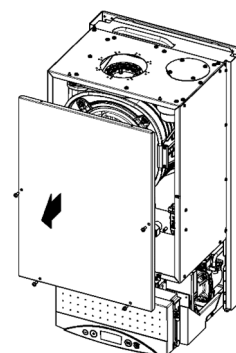


Fig. 2

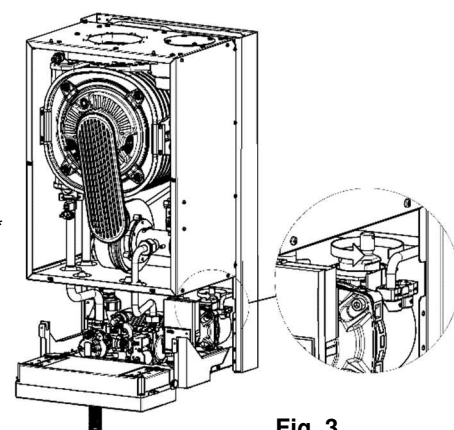


Fig. 3

* Depending on the size of C.H. circuit time of filling the boiler with water can be different. It is recommended to earlier fill the C.H. installation with water.

** In home C.H. circuits the nominal operating pressure should be set on 1,2-1,6 bar.

*** Note! The boiler is factory set on operating in the radiator heating. In case of the floor heating, the boiler control system shall be adapted to other operating parameters. This action is performed by Authorized Service Company.

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1. INTRODUCTION

Bifunctional condensing gas boiler is designed for supplying central heating systems and for heating domestic water.

There are described below mentioned types of ECOCONDENS SLIM boilers, bifunctional designed for supplying a central heating systems and for heating domestic water in instantaneous water-water heat exchanger:

type ECOCONDENS SLIM

and ECOCONDENS SLIM boilers, one function designed for supplying a central heating system and heating domestic water in separately connected water tank. Adaptation of the following types of boilers to work with the tank needs to be made by **AUTHORISED SERVICE COMPANY**.

type ECOCONDENS SLIM

ECOCONDENS SLIM boilers take the air for combustion process from outside the room (in which combustion circuit is sealed) with respect to the residential area of the building in which it is installed - type of installation: C₁₃, C₃₃, C₄₃, C₆₃, or take the air for combustion process from the room that meets appropriate conditions (required by law) - type of installation: B₂₃. Further information regarding the type – according section 3.8 and PN-EN 483:2007.

2. BOILER DESCRIPTION

2.1. Technical specification

2.1.1. Technical features

- Electronic fluent flame modulation for central heating system and domestic hot water;
- Electronic ignition with ionization flame control;
- Adjustable boiler power;
- Regulation of heating water and domestic water temperature;
- Function of soft ignition;
- Inlet gas pressure stabilisation;
- Adopted to cooperate with closed circuit in central heating system;

2.2. Design and technical specifications of the boiler

2.2.1. Main units of the boiler

Descriptions for fig. 2.2.1.1 + 2.2.1.3

- | | |
|---|--|
| 5. Fan | 18. NTC sensor of heating water |
| 7. Pump | 19. Heating water pressure transducer |
| 8. Gas unit | 20. Air vent |
| 9. Flame control / ignition electrode | 21. Plate water-water heat exchanger |
| 11. Burner | 22. Filling valve of installation |
| 12. 3-way valve | 25. Safety valve - 3 bar, |
| 13. Flue gas-water heat exchanger | 26. Domestic water flow sensor |
| 15. Temperature limiter as a protection against exceeding the upper limit water temperature | 27. NTC sensor of domestic water temperature |
| 16. Thermal fuse of flue gas | 28. NTC temperature sensor of heating water - return |
| 17. Expansion vessel | 29. Siphon |
| | 30. Mixing unit |
| | 33. Drain valve |

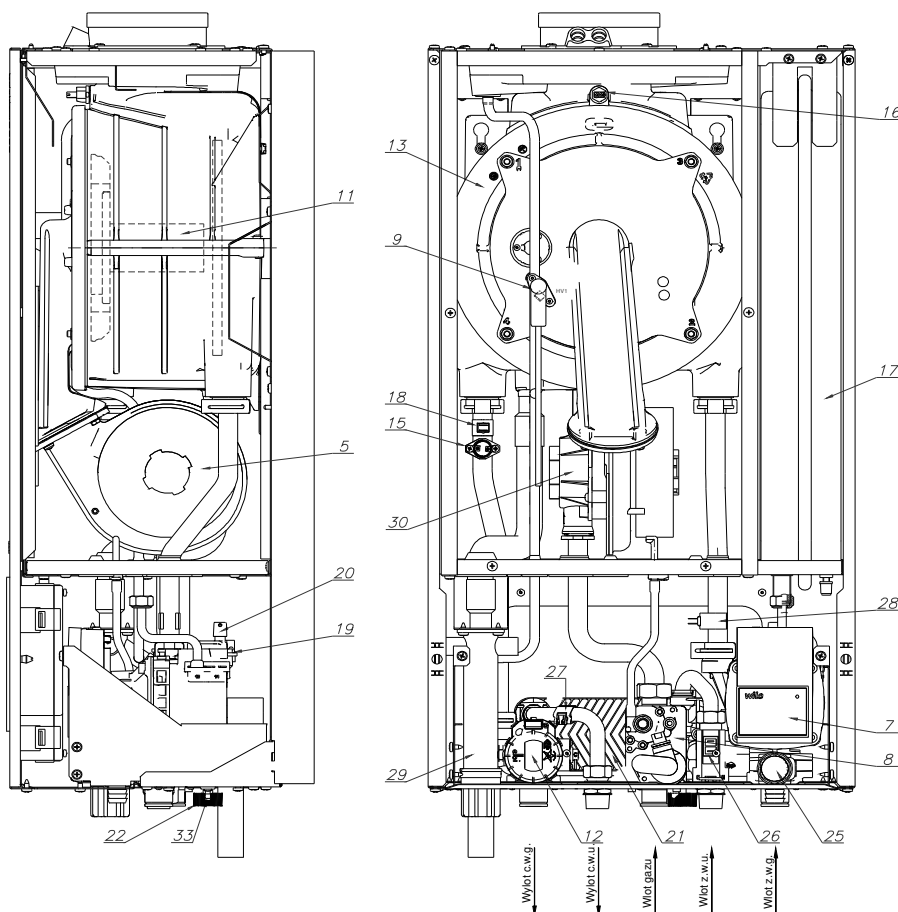


Fig.2.2.1.1. Elements in combi boiler ECOCONDENS SLIM

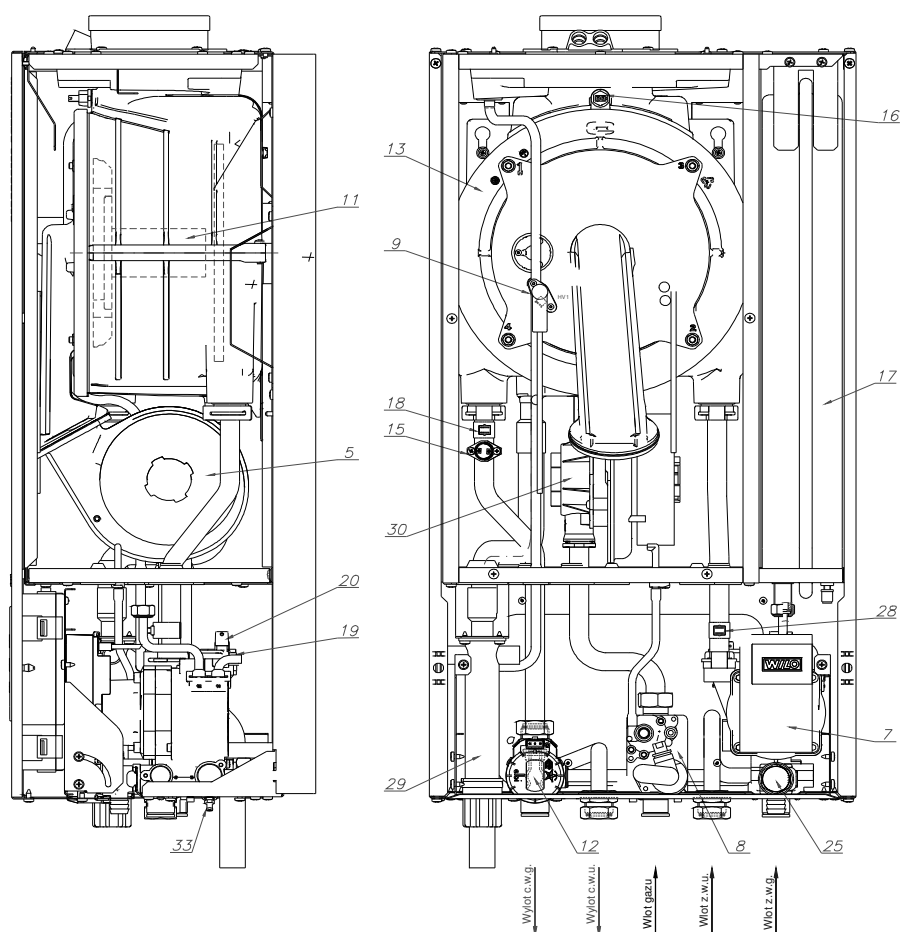
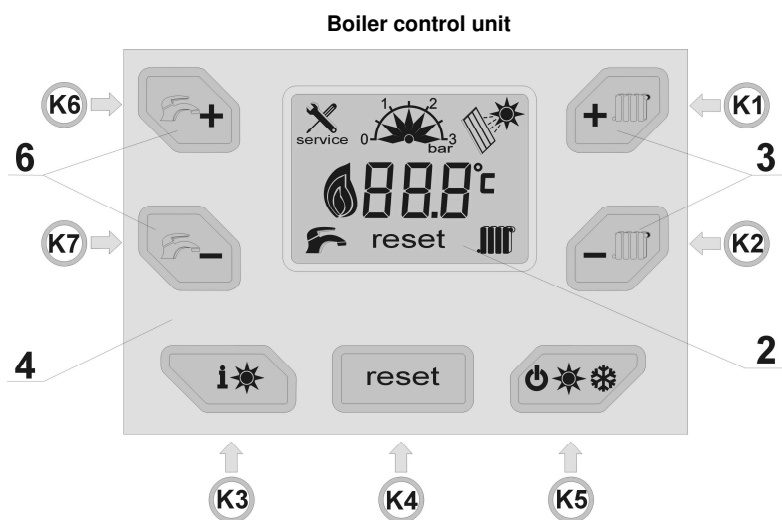


Fig.2.2.1.2. Elements in system boiler ECOCONDENS SLIM



3. Temperature selector of heating water
4. Control panel

2. Heating water, domestic water and static pressure temperature display with error codes diagnostic
6. Temperature selector of domestic hot water

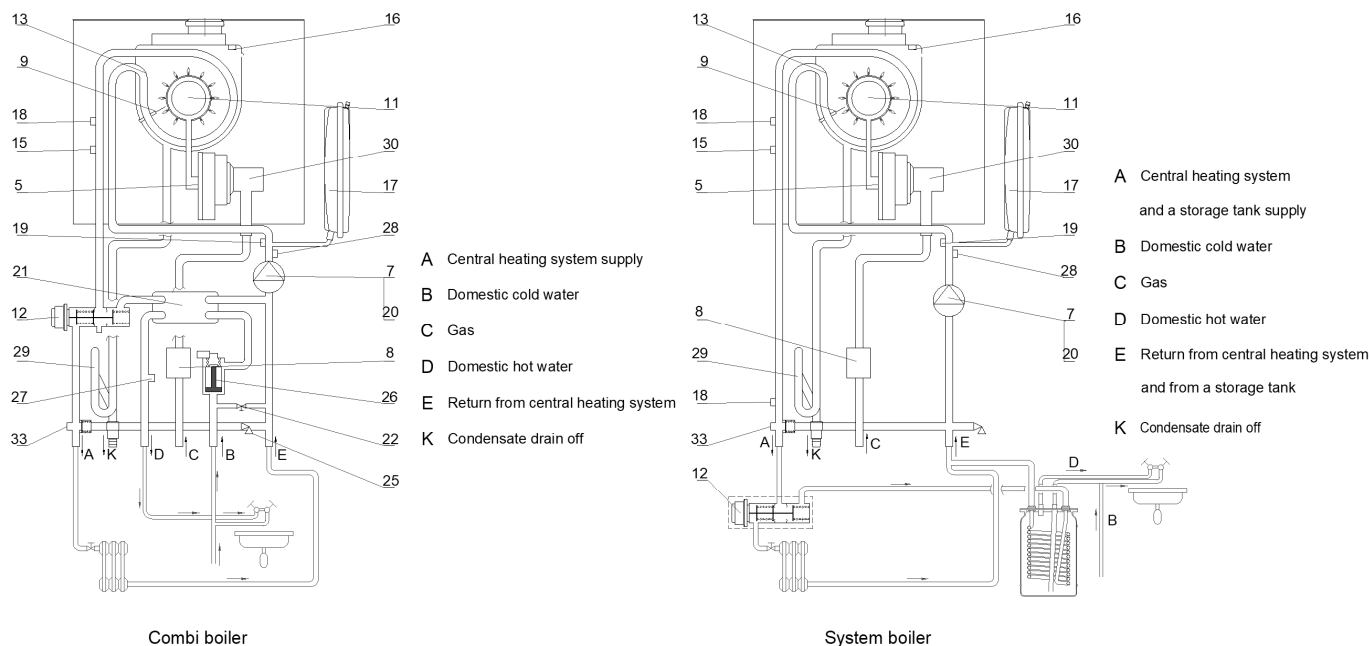


Fig.2.2.1.3. Schematic diagram of the operation of the boiler

2.2.2. Technical data

Parameter	Unit	SYSTEM BOILER ECOCONDENS SLIM	COMBI BOILER ECOCONDENS SLIM
		-20	-20
		Size	
Energetic parameters			
Central heating circuit			
Boiler thermal power at 80/60°C (modulated)	kW	2.7 ÷ 20.0	2.7 ÷ 20.0
Boiler thermal power at 50/30°C (modulated)	kW	3.0 ÷ 22.0	3.0 ÷ 22.0
Heat load	kW	2.8 ÷ 20.4	2.8 ÷ 20.4
The efficiency of the boiler at nominal load and average boiler water temperature 70°C	%	97.6	97.6
The efficiency of the boiler at partial load and return water temperature 30°C	%	107.9	107.9
Modulation range	%	13-100	13-100
Seasonal space heating energy efficiency η_s	%	91	91
Seasonal space heating energy efficiency class		A	
Useful heat output :			
- at rated heat output P_4	kW	20.0	20.0
- at 30% of rated heat output P_1	kW	6.0	6.0
Sprawność użytkowa:			
- η_4	%	88,0	88,0
- η_1	%	97,0	97,0
Nominal kinetic pressure in front of the boiler for gas: 2E-G20, 2H-G20; 2Lw-G27; 2Ls-G 2.350 3B/P-G30, 3P-G31	Pa (mbar)	2000 (20); 2500 (25); 2000 (20); 1300 (13); 2800 ÷ 3000 (28 ÷ 30); 3000 (30); 3700 (37); 5000 (50)	
Maximum water pressure	MPa (bar)	0,3 (3)	
Max temperature (central heating)	°C	95	
Standard adjustable temperature	°C	20 ÷ 80	
Reduced adjustable temperature	kPa (bar)	70 (0,7)	
Domestic hot water circuit			
Nominal heat output of the boiler at temp. 80/60°C	kW	-----	2.7 ÷ 25
Nominal heat load	kW	-----	2.8 ÷ 25.6
The efficiency of the boiler at nominal load and average boiler water temperature of 70°C	%	-----	97.6
Water heating energy efficiency class			A
Load profile			L
Water pressure	MPa (bar)	-----	0,01 (0,1) ÷ 0.6(6)
Min water flow	l/min	-----	2.0
Max water flow (flow limiter)	dm³/min	-----	-----
Range of water temperature regulation	°C	30 - 60	
Flow of domestic water for $\Delta t=30K$	dm³/min		12
Environmental protection			
Emission level of NO _x	mg/kWh	21	21
Emission of NO _x (natural gas)	class	5	
Condensate pH coefficient		natural gas - 5	
Sound power level L _{WA}	dB	48	48
Hydraulic parameters			
Expansion vessel capacity	dm³	6	
Water pressure in expansion vessel	MPa (bar)	0.08±0.02 (0.8±0.2)	

Electric parameters			
Type and supply voltage	V	~ 230 ±10%/ 50Hz	
Degree of protection		IP44	
Power consumption (max.)	W	110	
Standby mode power consumption P _{SB}	kW	0,005	
Electricity consumption :			
- at full load e _{lmax}	kW	0,05	0,05
- at part load e _{lmin}	kW	0,02	0,02
Maximum nominal current value of output terminals	A	2	
Type of flame sensor		ionization	
The parameters of flue gas			
Characteristics of the fan		see section 4.4 of this manual	
Flue gas mass flow at full load	kg/h	34.7	34.7
Flue gas mass flow at partial load	kg/h	5.2	5.2
The minimum flue gas temperature at minimum thermal power	°C	44	44
The maximum flue gas temperature at maximum thermal power	°C	61	61
Time parameters			
Time of central heating pump rundown	minutes	3	
Time preventing the anti-cyclical startup of the boiler (Anti-cycling time)	minutes	1	
Time of domestic hot water pump rundown	minutes	1	
Protection against pump and valve blocking	h / sec	the pump turns on for 60 seconds every 24 hours, three way valve turns on for 10 seconds every 24 hours	
Mounting dimensions			
Connection to the chimney duct (see section 3.8. and table 7.1.)	mm	Koncentryczne Φ80/Φ125, Koncentryczne Φ60/Φ100 lub 2 pojedyncze Φ80 x Φ80	
Connection of heating water (CH) and gas	inch	G3/4	
Connection of domestic water	inch	G3/4	G1/2
Dimensions	mm	777x400x250	
Boiler weight	kg	31,5	32,5

The manufacturer reserves the right to make changes in the construction of the boiler, which are not mentioned herein and have no influence on the technical and functional characteristics of the product.

2.3. Protection equipment

- Protection against outflow of gas
- Protection against explosive switch on of the gas
- Protection against exceeding the max temperature in the heating water system
- Protection against exceeding the upper limit of heating water temperature
- Protection against water pressure increase (1-st degree)- electronic
- Protection against water pressure increase (2-nd degree)- mechanical
- Protection against drop of water pressure
- Protection against water overheating
- Anti freezing protection of the boiler
- Protection against the pump blockade
- Monitoring of the correct operation of the fan. Fan failure is detected if the current fan speed is different from that expected by the driver of the boiler.
- Protection against exceeding the upper limit temperature of flue gas

Errors which do not require manual reset will cause return of the boiler to the normal operation after automatic disappearance of failure - see section 5.3.3 - boiler diagnostics.

Please note:

In case of noticing repeated emergency boiler shut-down by any of the protection it is necessary to contact an Authorized Service Company in order to check the reason of boiler switching off and to repair it.

It is forbidden to make any unauthorized modifications in the protection system.

2.4. Operation description

2.4.1. Way of heating the water for central heating system

The boiler switches on if the heating water temperature is lower than the temperature set by buttons K1 and K2 (section 5.2.) and the room thermostat gives the signal to heat. Then the following conditions occur simultaneously:

- power supply of the three-way valve (item 12, towards the central heating installation),
- power supply of the pump (item 7),
- power supply of the fan (item 5),
- followed by a sequence of ignition and the fan speed is set to ignition value (P02),
- after noticing presents of flame, fan speed is decreased to minimal value and maintained at this level for the time set by parameter (P29),
- then the controller starts the fan speed regulation taking into account a value of the central heating slope - parameter (P30). If the heating water temperature exceeds 95°C, the burner is turned off until the hot water temperature drops below 81°C.

The system of continuous flame modulation uses the PI control algorithm to minimize the difference between the temperature read by the NTC sensor (item 18) and the value of the set temperature of central heating.

The boiler switches off when the room temperature control unit is signaling reaching the desired temperature in the room or when the heating water temperature exceeds the set point by the hysteresis value of central heating.

After turning off the boiler pump is running during the pump overrun - parameter (27). Simultaneously the time of break in operation is metered - parameter (P26).

Restart of the boiler will be done automatically under the following conditions simultaneously:

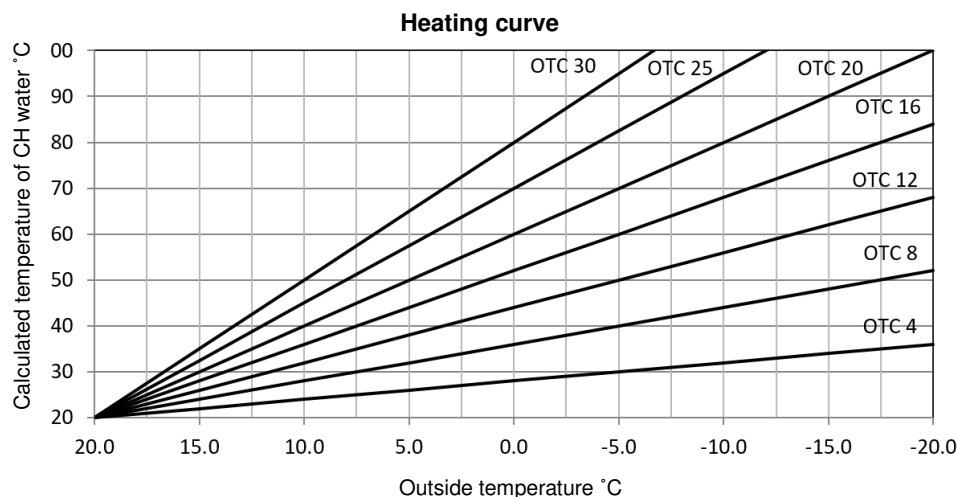
- heating water temperature is lower than the set temperature,
- break time in the central heating operation has elapsed [P26],
- room temperature control unit provides the signal "heat".

The list of driver parameters according to table 4.4.

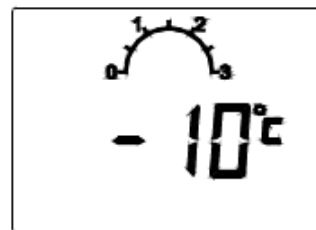
2.4.2. Temperature regulation dependent on external temperature

After connecting to the boiler the outdoor temperature sensor and changing parameter (P33) to the value different than 0, the boiler will adjust the setting based on the external temperature measurement. The temperature setting in the central heating circuit is calculated on the basis of the heating curve set by parameter (P33) and the outside temperature. It is not possible to set the central heating supply temperature manually using buttons K1 and K2. The maximum heating water temperature is defined by the parameter (P23).

The slope of the curve can be changed in the range from 0 to 30. The set of heating curves is shown on the diagram below.



After pressing the K3 button twice, it is possible to see the value measured by the outdoor temperature sensor. If the sensor is not connected, "----" will be displayed. The values are displayed for 5 seconds. Example of the displayed values:



2.4.3. Method of D.H.W. heating in combi boilers

Combi boiler heats the water in a instantaneous way. Water temperature is set using the buttons K6 and K7 in the range from 35°C to 65°C. The water temperature at the outlet depends on water temperature at the inlet.

In this mode the water heating demand occurs when the flow sensor turns on at the value above 2,0 l/min (ends at a flow < 1,5 l/min.)

Then follows the sequence:

- switching the power of the three way valve (item 12) in direction of the water-water heat exchanger, supply for the pump (item 7),
- the temperature of domestic hot water NTC sensor is read (item 27) and is compared with the set value. If it is less than the domestic hot water setting a sequence of ignition follows,
- after detection of flame and finish of starting sequence the controller starts regulation of fan speed according to the temperature set. If the heating water temperature exceeds 90°C the burner is turned off until the hot water temperature drops below 81°C

Continuous flame modulation system uses PID control algorithm to minimize the difference between the value of temperature reading by the NTC sensor, and the domestic hot water setpoint. If during the heating of domestic water its temperature exceeds the setting by the hysteresis value of DHW then burner is turned off until the water temperature drops to the setpoint.

Central heating hot water flows through the water-water heat exchanger segments and heats the water. The heated water is directed to the point of its collection.

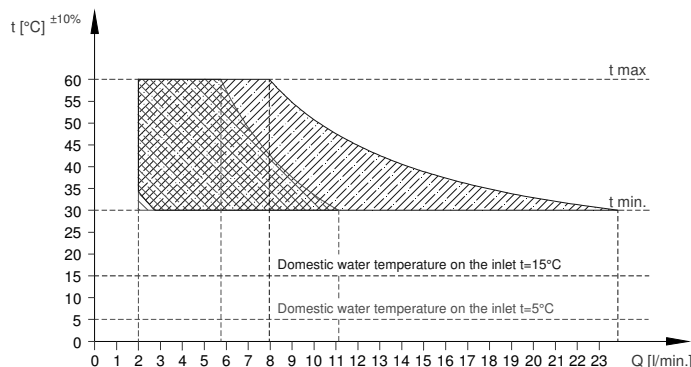


Fig. 2.4.3.1. Diagram of domestic water temperature at the boiler outlet at thermal power of 25kW depending on the water flow rate.

2.4.4. The way of heating the water in system boilers cooperating with domestic water tank.

The boiler may cooperate with domestic water tank type termet-120, termet-140. These water tanks are offered by termet company. Adjustment and display of domestic water temperature are done on the controller of the boiler. Boilers are factory designed for cooperation with domestic hot water tank.

The process of heating the domestic water is as follows:

When the water temperature sensor finds the temperature lower than set on the control panel with buttons K6 and K7, then the process of pumping the water to the central heating system will be stopped and the heating water temperature will be controlled in an optimal way by the driver of the boiler.

Heating the domestic water with cooperation of boiler and domestic hot water tank is as follows:

- water temperature sensor in the tank indicates the water temperature drop below the set temperature by the hysteresis value (default: 3°C), eg due to opening of inlet tap valve;
- boiler's controller makes the three-way valve to draw the heating water to a short circuit while giving a signal to the spark generator and gas valve;
- heating water flows through the coil of tank (short circuit);
- controller of the boiler controls the heating water temperature in an optimal way so as not to exceed a permissible value. If the heating water temperature exceeds 90°C, the burner is turned off until the hot water temperature drops below 85°C;
- after achieving the set water temperature in the tank increased by the hysteresis value (default: 4°C), boiler's controller gets distorted the three-way valve for long circuit and at fulfillment of the following conditions the heating water is pumped into the central heating system:
 - heating water temperature is lower than the set temperature
 - room thermostat gives a signal "heat".

Hot water temperature at the point of consumption may differ from the set value, and therefore it is advisable to install a mixing valve for domestic hot water systems.

Note: To eradicate legionella bacteria in the tray, the boiler is turned on every 168h to work with the tank and heats water to 60°C.

3. BOILER INSTALLATION

The boiler must be installed by an authorized service company accordingly with local regulations. After the boiler installation check the tightness of all connections of gas, water and flue gas system.

Service company is responsible for the proper installation of the boiler.

Installation of the boiler must be made so as not to cause any tension of the installation that may cause increased volume of work.

After exploitation of the boiler, disassembled product transfer to a specialized unit for utilization.

3.1. Requirements of boiler installation

3.1.1. The regulations on the water installation, gas and the flue gas system

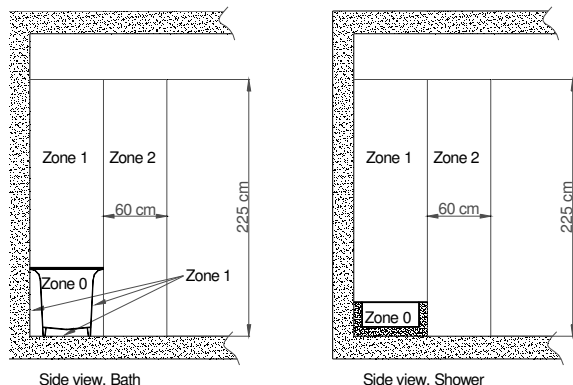
Water, gas and flue gas systems must meet local regulations as well as use of the gas, ventilation and flue gas installation.

Before installing the boiler the consent from the District Department of Gas, Chimney sweep company and Building administration must be obtained.

Gas appliances supplied with liquefied gas must not be installed in room with a floor below ground level.

If you use liquefied gas 3B/P it is recommended that the temperature in a room where a gas cylinder will be operated is not less than 15°C.

3.1.2. Regulations related to the room



Requirements for premises where gas appliances are installed shall be in accordance with local regulations. The room where appliance is to be installed should ensure the air supply and venting system necessary for gas combustion in accordance with local regulations. The location of ventilation should not cause the water freezing. The temperature in the room where the boiler is installed should be higher than 6°C.

The room should be protected against freezing, free from dust and aggressive gases. It is forbidden to install the device in a laundry rooms, drying rooms and in varnish, cleaners, solvents and sprays storages.

Boiler with a thermal capacity above 30 kW should be installed in a technical room. Place of installing a boiler in a room equipped with bath or shower with a pool and the way of connecting it to the electrical system - in accordance with the requirements of **HD 60364-7-701**. The boiler covered by this instruction has a degree of electrical protection provided by the housing IP44. Boiler equipped with power cord with a plug can be installed in zone 2 or further - must not be installed in zone 1.

In zone 1 can be installed only if it is permanently connected to a power source in accordance with **HD 60364-7-701**.

Fig. 3.1.2.1. The dimensions of zones in areas containing a bath or shower with swimming pool

3.1.3. Requirements for electrical installation

The boiler has been designed for operation with single-phase alternating current with rated voltage of 230 V / 50 Hz.

The main socket from which boiler is powered must meet the requirements of European Standard PN-IEC-60364-6-61:2000

The boiler has been designed as a Class I device and must be connected to an electrical outlet with ground terminal in accordance with **PN-IEC 60364-4-41**.

The boiler has a degree of electrical protection provided by the housing-IP44.

In case the boiler is permanently connected to the power supply the electrical installation should be equipped with means of disconnecting the boiler from the power source. If the boiler is permanently connected to the power source, it should be executed by junction box. The junction box must be equipped with protection degree appropriate for the defined assembly zone. If the boiler is connected through the junction box, electric system must be equipped with measures which can disconnect the boiler from the power source. In order to connect the boiler to the junction box, it is recommended to:

- cut the power cord to a suitable length for connection to the box
- pull off cable insulation
- connect wire ends using soldering or tighten cable-end sleeve with appropriate diameter

This prepared cables connect according to the following diagram.

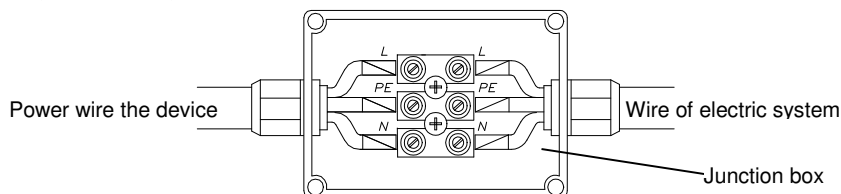


Fig 3.1.3.1 Wire colors: L – brown; N – blue; PE – yellow-green

3.2. Preliminary check activities

Before proceeding with the boiler installation:

- check whether the boiler is factory designed for the type of gas supplied from the gas system. The type of gas which the boiler is adjusted to is specified on the rating plate on the cover of the boiler;
- check whether the water system and radiators have been rinsed with water in order to remove rust, fillings scale, sand and other dusts that could disturb the proper operation of the boiler (for example increase the water flow resistance in central heating system) or to pollute the heat exchanger,
- whether the mains voltage has a value of 230V and that the socket has an efficient safety contact (complies with **PN-IEC-60 364-6-61: 2000**).

3.3. Mounting the boiler on the wall

Hang the boiler on hooks fastened durably in the wall using a beam placed in upper part of the boiler. The boiler shall be so located as to permit the eventual repair without any need to dismantling from the installation.

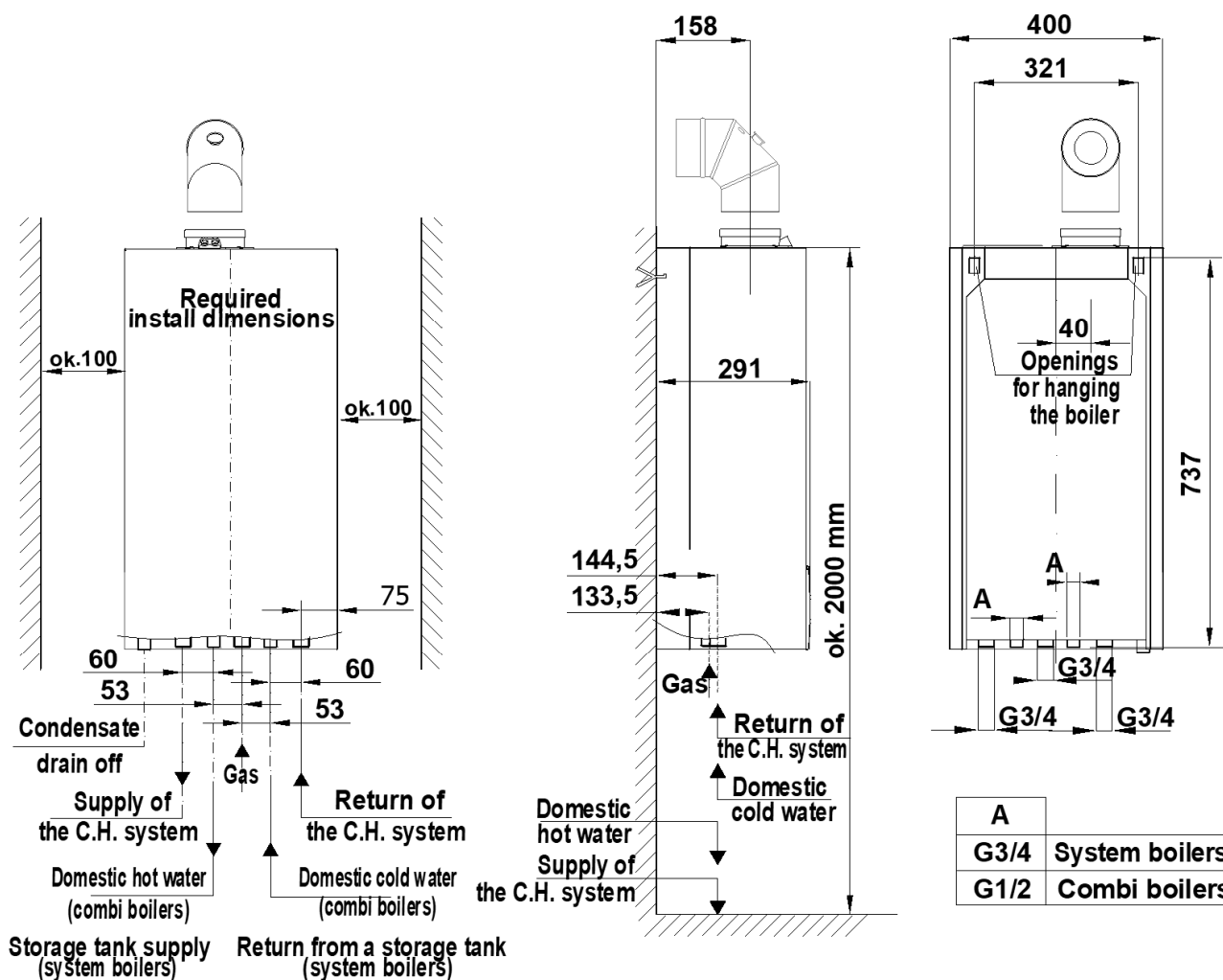


Fig. 3.3.1 Installation dimensions of ECOCONDENS SLIM

3.4. Connection to the gas installation

Connect a gas supply pipe directly to the connector of the boiler gas unit by means of standard connector subassembly **0696.00.00.00** (on boiler's equipment) .

It is necessary to install a gas filter on the gas supply pipe. This filter is not included in the standard boiler equipment. The gas filter is necessary for a proper operation of a gas unit and a burner.

Install a cut-off valve on the gas pipe in an accessible place.

3.5. Connection of the boiler to a water system of central heating

- Power connector and connector of return of the central heating boiler should be screwed to the installation. Location of the connectors is shown on the figure 3.3.1
- **Install a water filter on a water return from central heating system (in front of the connection with the pump). The filter is not included in standard boiler equipment.**
- The central heating system should be thoroughly rinsed out before the boiler is connected.
- In the central heating system it is permitted to use as a heat carrier any antifreeze fluids which can be used in central heating systems
- The cut-off valves needs to be installed between the boiler and central heating system so that the boiler could be dismantled without draining the system
- Do not install any thermostatic valves on radiators in the room where the thermostat is installed. The temperature controller takes the control over the function of temperature and it cooperates with the boiler
- Do not install a thermostatic valve on at least one of radiators of the central heating system
- It is recommended to lead out a water from a safety valve 0,3 MPa (3 bar) (item 25) to a floor drain by a tube or hose otherwise during the safety valve activation there is a risk of flooding a room what is excluded of producer's liability.

Selection of expansion vessel

Boilers described in this instruction manual are adjusted to be connected to a central heating system with the maximum capacity of 105 liters. The assembly to installation with larger capacity is acceptable after applying an additional expansion vessel. A proper expansion vessel should be selected by the designer of central heating system. Installation of expansion vessel should be made by an installation contractor in accordance with applicable regulations.

Note: Before installing the boiler thoroughly flush the central heating system to free it from any solid impurities.

It is recommended that after first start up of the boiler and heating up of the installation drain the water from the system to remove residues of pastes metallurgical and precautionary measures of heaters. These activities would benefit for the operation of the device, its parameters and components life.

After the boiler installation it is necessary to:

- Fill the heating system with water;
- Vent the central heating installation and the boiler;
- Check whether connections of the boiler in the central heating system are tight.

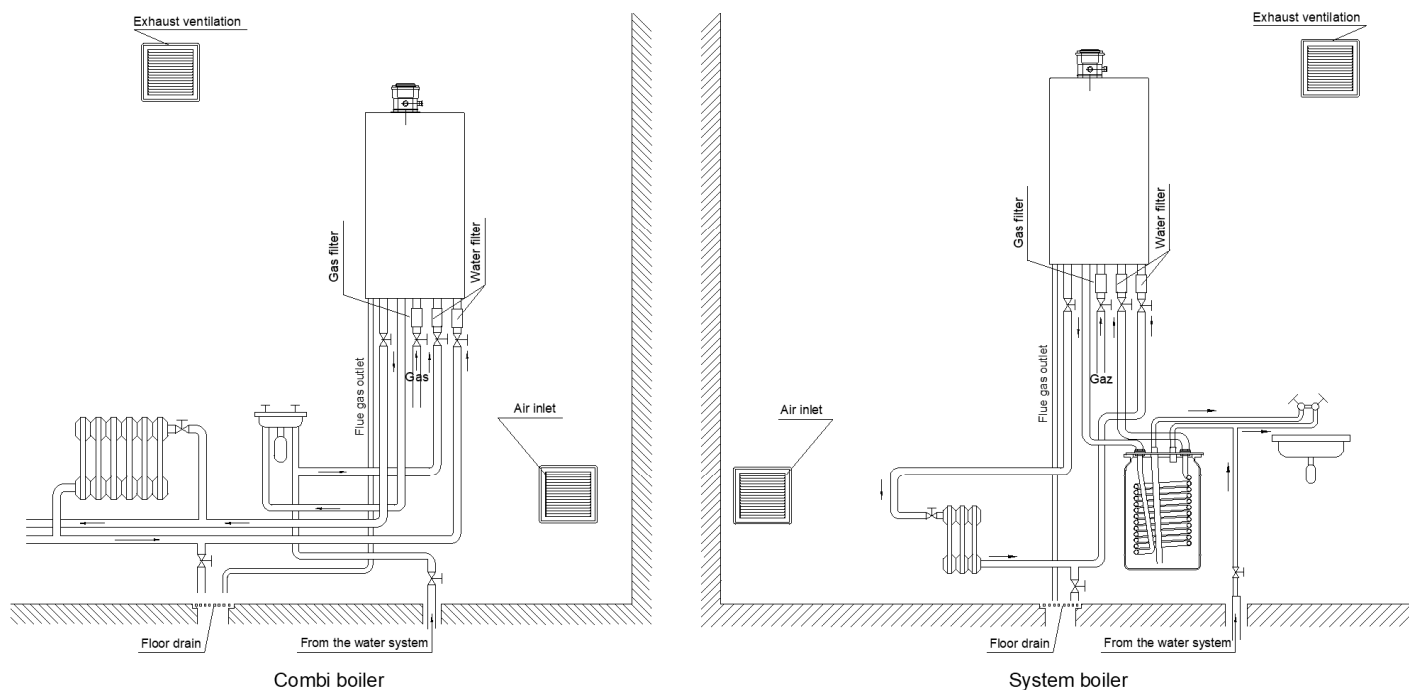


Fig. 3.5.1 Boilers installation requirements

3.5.1. System cleaning and water treatment for the central heating system filling.

Every component of central heating system is threatened by limestone deposits, corrosion and other dangerous processes. Boiler is the most expensive part of central heating system and it is necessary to protect its components like heat exchanger and other parts against harmful processes. Correct central heating circuit preparation for using relies on making two operations: cleaning the central heating system and treating the water that fills the system.

System cleaning

In new installation it is possible to find some remains of industrial process such as soldering and welding remains, flux, oil and grease residue among others. Older installations usually have products of corrosion in them. It is necessary to clean up the systems with a water to remove the remains before boiler is mounted. Afterwards, system should be cleaned with appropriate chemicals, for example Cleaner F3 from Fernox (for old and contaminated systems it is best to use Cleaner F5). After that it is necessary to rinse the installation with water.

Water treatment to fill the system

For filling the system, it is recommended to use water with parameters: pH 6,5- 8,5, hardness < 10 °n (~ 18°F). Do not use demineralised or distilled water. To ensure protection against rocks depositing, corrosion, it is recommended to use a special inhibitor, for example Fernox Protector F1. Heat transfer fluid HP-5 or antifreeze liquid can also be used, for example Fernox Alphi 11. If the water hardness is very high, the HP-5 effectively reduces the risk of heat exchanger calcification.

Low-temperature circuits

In the low-temperature area, it is recommended to treat the water by using heat transfer fluid HP-5 or Fernox AF10 biocide.

Filtration technique

Additionally, in order to ensure the quality of operation heating system, it is recommended to mount a modern filters, which works on the principle of the magnetic and cyclone effect, for example Fernox TF1 filter.

Notice:

- method and amount of use specific products for system cleaning and water treatment should be in accordance to the product manufacturer's instruction.
- above steps should be made by the authorized installer or service technician.

3.6. Connection of the boiler to a domestic hot water system

It is recommended to install cut-off valves on a domestic hot water system what will enable easier maintenance and service.

It is recommended to install a water filter on the connection with the domestic water supply. A filter is not included in the standard boiler equipment.

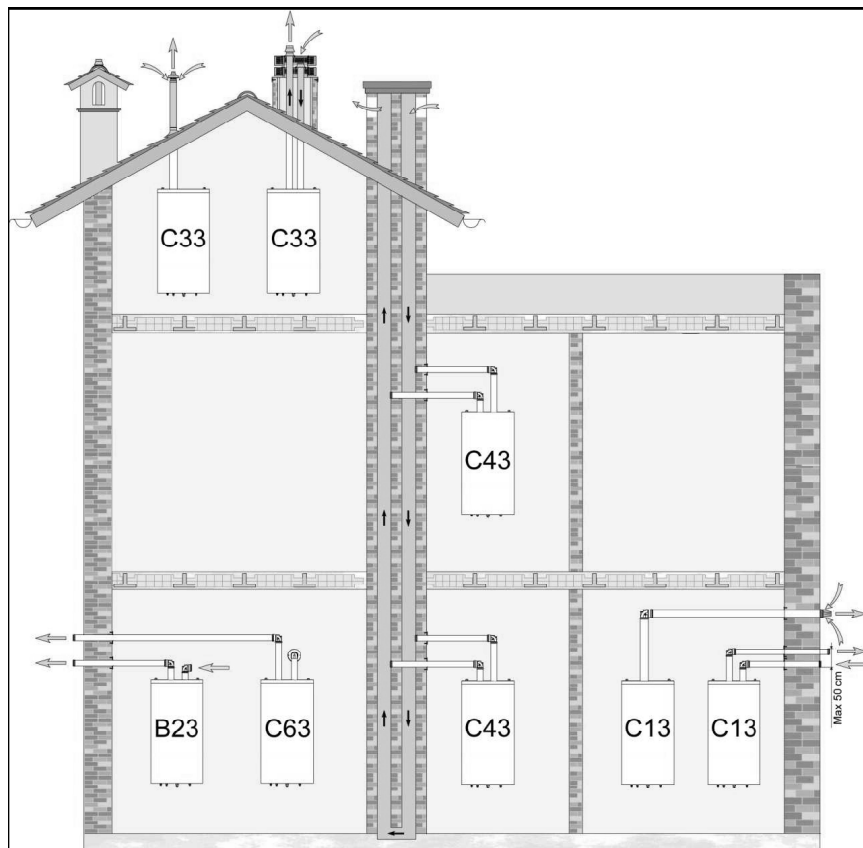
3.7. Condensate outlet

Condensate formed during the combustion process must be drained according the following conditions:

- Installation of condensate drain must be made of corrosion-resistant material.
- Connection of draining the condensate cannot be blocked.
- To facilitate to drain the condensate through the flue gas all horizontal flue pipes must be installed with a fall of 3° (52mm / m).

3.8. Flue gas outlet

Flue gas outlet from the boiler must be made in accordance with applicable regulations and this instruction manual and it needs to be agreed with the district chimney sweep service company.



ECOCONDENS SLIM boilers could be installed as B-type appliances (where air needed for combustion is taken from the room where boiler is installed) or as C-type appliances (where air needed for combustion is taken from outside). C-type appliances could be divided as follows:

- C13 – flue-gas system through the wall. Air for combustion is taken from the outside (for 20kW boilers)
- C33 – flue-gas outlet and air inlet through the roof
- C43 – flue-gas outlet connected to chimney. Air for combustion taken from outside of the building.
- C63 – flue-gas outlet through the wall to the outside of the building. Air for combustion taken from chimney shaft.
- B23 – air for combustion is taken from inside the room where boiler is installed. Flue-gas is taken outside through the chimney shaft.

Depending on local regulations some types of installations might not be allowed. Always consult your local regulations before making flue-gas system project.

Before turning on the boiler check if flue-gas system is made according to the project and air- and flue ducts lengths are shorter than maximum lengths showed in tables 3.8... Make sure flue-gas system is tight.

After turning on the boiler check if it operates correctly. Also check combustion parameters by checking concentration of CO₂ and/or O₂ in flue-gas.

Ways of connecting the boiler to the air-flue gas system → Fig. 3.8...

To ensure proper functioning of the device use the appropriate wire size (diameter, maximum length, resistance on the elbows), depending on the combustion system used. The dimensions of the wires should be adequately compatible as given in tables. Resistance of flue gas flow on each elbow depending on the bending angle and related reduction of the maximum wire length are given in section 3.8.5.

Each system should be installed with the windproof outlet protecting against external factors.

For condensing boilers ECOCONDENS SLIM 20/25 there are provided three types of flue gas-air systems: coaxial system $\Phi 80/\Phi 125$ and $\Phi 60/\Phi 100$ and separate system $2 \times \Phi 80$ by using air-flue gas separator TWIN type.

It is possible to apply air-flue gas pipe made from polypropylene or stainless steel.

The individual components of air-flue gas systems are given in table 7.1

NOTE:

The boiler is factory adjusted for the coaxial exhaust system $\Phi 60/100$ of the maximum pipe length 3m + elbow. Settings O₂ – 5%. To use the other systems and longer pipes it is required to adjust the boiler as specified in point 4.3.

For the use of $\Phi 80/\Phi 125$ coaxial air-flue gas ducts, to already mounted adapter $\Phi 60/100$ it must be installed a coaxial reduction $\Phi 60/\Phi 100 \times \Phi 80/\Phi 125$, or adapter $\Phi 60/100$ and reduction ring $\Phi 60/80$ must be replaced with $\Phi 80/\Phi 125$ adapter (insert the flue pipe $\Phi 80$ directly into the heat exchanger as far as possible.). The adapters connecting the boiler to the piping system must have measuring connections.

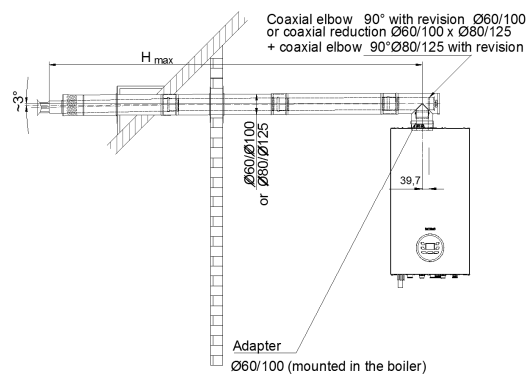
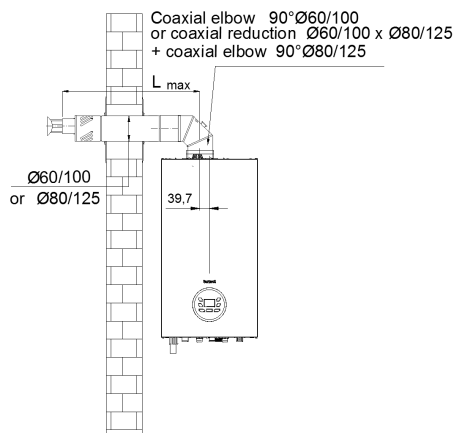
Inspection T-piece shall be applied when using air-flue gas pipe made from stainless steel.

Condensing boilers ECOCONDENS SLIM meet the requirements to use in multi-storey air-flue gas systems LAS.

3.8.1. Horizontal outlet of air- flue as system through the wall or on the roof

Table 3.8.1.1

Type of boiler	Coaxial system $\Phi 60/100$
ECOCONDENS SLIM	Maximum length of flue $L_{max}=15 \text{ m}$
	Coaxial system $\Phi 80/125$
ECOCONDENS SLIM	Maximum length of flue $L_{max}=25 \text{ m}$



3.8.2. Vertical outlet of air- flue gas system through the roof

Table 3.8.2.1.

L_{max} = H_{max} Ø60/100 or Ø80/125 with coaxial reduction Ø60/100 x Ø80/125 Coaxial adapter Ø60/100 (mounted in the boiler)	Type of boiler	Coaxial system Ø60/100
	ECOCONDENS SLIM	Maximum length of flue L _{max} =15 m
	Type of boiler	Coaxial system Ø80/125
	ECOCONDENS SLIM	Maximum length of flue L _{max} =25 m

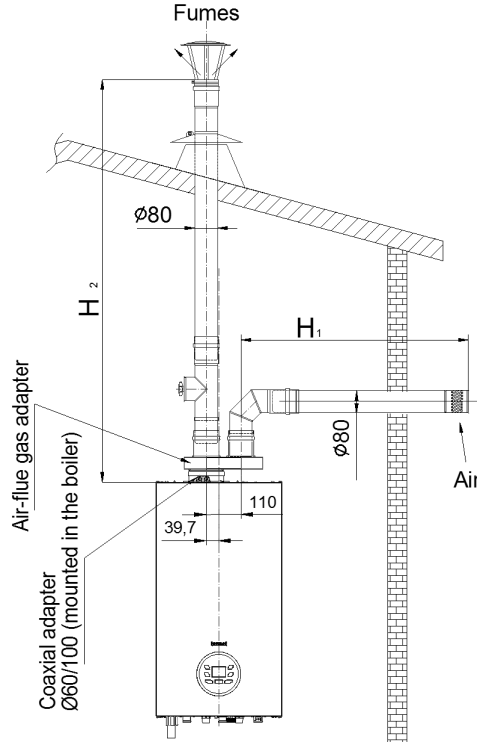
3.8.3. Connecting to a common chimney duct system, consisting of a duct for air inlet and flue gas outlet duct.

Table 3.8.3.1.

Coaxial elbow 90° with revision Ø60/100 or coaxial reduction Ø60/100 x Ø80/125 + coaxial elbow 90° with revision Ø80/125 Ø60/100 or Ø80/125 H₁ H₂ Dimensions of the chimney duct min 140 min 140 Ø60 or appropriately Ø80 Ø60 or appropriately Ø80	Type of boiler	Coaxial system Ø60/100
	ECOCONDENS SLIM	Maximum length of flue L _{max} =15 m
	Type of boiler	Coaxial system Ø80/125
	ECOCONDENS SLIM	Maximum length of flue L _{max} =25 m

3.8.4. Flue gas air outlet and air inlet brought by two separate tubes

Tablica 3.8.4.1.

	Type of boiler	Separate system Ø80 x Ø80
	ECOCONDENS SLIM	Maximum length of flue H ₁ + H ₂
		L _{max} =25 + 25 = 50 m

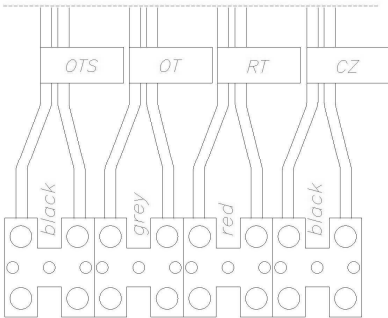
Note: The horizontal air tube should be mounted at an angle of ~ 3° (Figure 3.8.4.1) so that rain water that gets into the pipes would not flood the boiler and flowed outside the building.

3.8.5. Reduction of the maximum length of the air-flue gas system by changing the flow direction

Reduction of the max length of the air-flue gas system by changing the flow direction		
15°	45°	90°
0.25m	0.5m	1m

3.9. Connection of additional devices

Electrical terminals have been led out of the controller. To connect an additional device, connect the wire ends of this device to the correct terminals.



RT – room temperature controller; OT – OpenTherm device; OTS – outdoor temperature sensor; CZ – tank temperature sensor

Fig.3.9.1 Electrical terminals of controller

3.9.1. Connection of a room temperature control unit

3.9.2.1. Room regulator with contact.

The boiler has been designed to cooperate with a room temperature control unit which has got its own supply source and control contact free from potential. Connections must be made according to the instructions of regulator manufacturer. In order to connect the temperature thermostat to the boiler the appropriate length two-core wire is needed. It needs to be connected to terminals RT (→ Fig. 3.9.1) - previously separating the electrical bridge.

3.9.2.2. OpenTherm® remote control by Honeywell

The boiler is also adapted to connect the OpenTherm® remote control by Honeywell. In order to connect the OpenTherm® to the boiler the appropriate length two-core cable is needed. It needs to be connected to terminals OT (→ Fig. 3.9.1). For any technical information about the remote control OpenTherm® - see the instruction manual supplied by the manufacturer of remote control devices.

There are two basic remote control sets (see table 7.1):

- Round control package - serves as a room thermostat for one heating zone. Enables remote temperature setting, time programming and wireless communication with the boiler.
- EvoHome control package - allows for extended control of many independent heating zones along with time programming, has a convenient color touch screen and

allows for wireless communication with the boiler.

Honeywell's Total Connect Comfort application for smartphones is dedicated to the above-mentioned control packages. It is available for download in Google Play (for Android) and iTunes Apple (for iOS).

The above control packages are not included with the boiler.

More information is available on the manufacturer's website: <https://getconnected.honeywell.com/pl/>

3.10. Connecting the outdoor temperature sensor

To connect the outdoor temperature sensor use the two-core cable with 0,5mm² cross section and connect it to terminals OTS (→ Fig. 3.9.1). Connection must be made in accordance with the instructions provided by the sensor manufacturer. It is the best to place the outside temperature sensor on the north wall of the building and it should not be exposed to direct sunlight.

3.11. Connecting the hot water tank to the system boiler

Domestic hot water tank must be connected to the boiler in accordance with the Fig.3.5.1. Then connect the temperature sensor to the terminals in the control panel marked with CZ (remove the resistor first). The other end of the cable together with the sensor should be placed in the tank in the place of the domestic water temperature sensor. Check the value of parameter P00, for boilers cooperating with the tank it should be: 3.

3.12. Connecting ECOCONDENS SLIM in the cascade system

Boilers have the ability to cooperate in a cascade. Up to 4 boilers can be connected into one cascade, as shown on Fig. 3.12.1.

The cascade set included:

- Cascade manager Honeywell AX1203SQ
- Outdoor temperature sensor (equipment of the cascade manager AX1203SQ)
- Supply temperature sensor (equipment of the cascade manager AX1203SQ)
- Remote control OpenTherm Honeywell (see tab.7.1)
- From 2 to 4 boilers ECOCONDENS SLIM

Below listed designs should be made by people who have been authorized to do this:

- design of the flue gas outlet system and air inlet system
- gas system design
- hydraulic system design

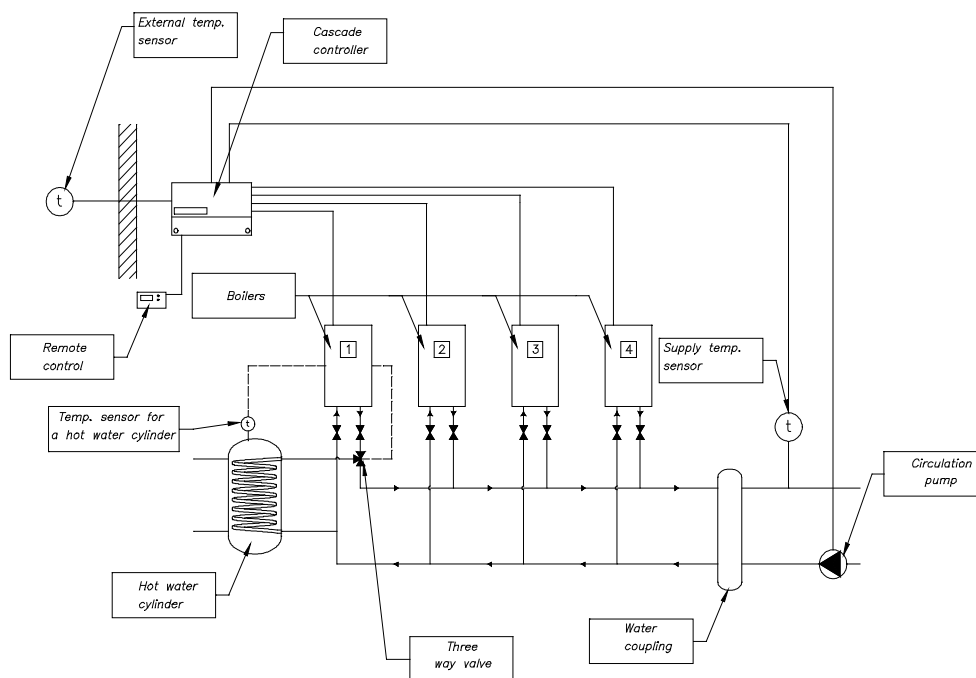


Fig.3.12.1

Control connection

Every boiler operating in a cascade system must be connected to the AX1203SQ cascade manager by means of a two-core control cable. The cable should be connected to the boiler by using OT terminals, see Fig. 3.9.1 to the corresponding terminals in the cascade manager according to the cascade manager's instructions.

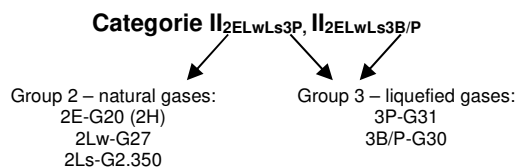
4. BOILER ADJUSTMENT AND PRELIMINARY SETTING

4.1. Introductory remarks

Purchased boiler is factory adjusted according parameters for the type of gas that is provided on the rating plate and in the documentation of the boiler. Only AUTHORIZED FACTORY SERVICE can do any and parameter settings of the boiler if there is any need to change the parameters or to adjust the boiler to another type of gas.

4.2. Adjusting the boiler to combust another type of gas

The boiler can be adjusted to combust another type of gas but only for this one which the boiler is certified for. The types of gases are given on the rating plate - in the index designation:



Example of completed label:

termet s.a.

Setting for the gas:	liquefied
Gas symbol:	3P
Gas pressure [mbar]:	37
Set the nominal heat load [kW]	

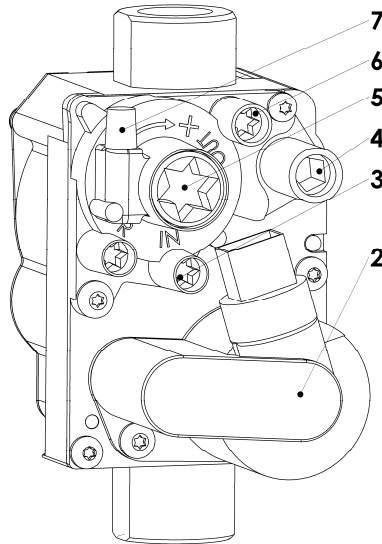
After adapting the boiler to combust another type of gas:

- Cross out on a rating plate the type of gas to which the boiler was adapted by the manufacturer,
- Write down the symbol of the gas, to which the boiler has been adjusted and the set heat load on the appropriate label that is attached bulk to the user manual. The entry must be written legibly and indelibly.
- Label filled in as above should be stuck on the cover near rating plate.

Adapting the boiler to combust another type of gas can be performed only by **QUALIFIED SERVICE COMPANY**. This operation is not included in the warranty repairs.

In order to perform above mentioned operations check if:

- the tightness of the gas system connections was checked after the boiler installation and it was confirmed with the signature and the stamp of the installer,
- the electrical installation was made in accordance with applicable regulations,
- the correctness of connections between the boiler and the chimney was checked and confirmed by a qualified chimney service.



2. Gas valve coils EV1-EV2,
3. Measuring point of inlet gas pressure (TORX T10),
4. A maximum pressure adjustment screw (HEX 4mm)
5. A minimum pressure adjustment screw (TORX T40),
6. Measuring point of outlet gas pressure (TORX T10),
7. Pressure feedback connector

Fig. 4.2.1 Gas valve

4.3. Boiler adjustment

The following regulations are only applicable if the gas unit is replaced. Each adjustment should be based on device data listed in table 4.3.2.1.

Test mode (Chimney sweeper)

To activate the test mode, press the K1+K2 buttons for approx. 5s.

Activation of the test mode is indicated by displaying SERVICE symbol on the boiler display. After starting the test mode, three-way valve is switched to central heating circuit, boiler operates without power modulation and fan speed is set to the value specified by parameter (P24).

Power adjustment can be made by changing fan speed in the range defined by parameters (P25 and P24). Changes can be made by pressing the K1 and K2 buttons with a value of 50 rpm, or by pressing the K7 buttons - to adjust the max power, and K6 - to adjust min. power. Display shows the set fan speed divided by 10; in addition, the power level is identified by flame symbol in three ranges: <30%; 30%-75%; >75%.

In the case of exceeding temp. 90°C on the NTC sensor, the burner will switch off. Restarting starts when the temperature drops to 85°C.

Function is active for a maximum of 15 minutes and has priority over DHW.

Exit from test mode is possible by pressing the K4 button.

4.3.1. Boiler adjustment according to gas flow rate (without using a flue gas analyzer)

Adjustment for 20kW boilers	
Minimum power adjustment	Maximum power adjustment
• Minimum power adjustment must only be made based on the measurement of flue gas composition p. 4.3.2.	• Check the set speed (parameter P24) and compare with table 4.3.2.1. • In test mode, set the maximum speed value with K7 button. • Check the gas flow rate on gas counter for compliance with table 4.3.3.2.1. If it is necessary to change the gas flow rate, turn the screw of item 4 (Fig. 4.2.1.). Clockwise rotation increases flow. Read the set flow rate on gas counter.

4.3.2. Boiler adjustment with a gas analyzer

Adjustment for 20kW boilers	
Minimum power adjustment	Maximum power adjustment
• Check the set speed (parameter P25) and compare with table 4.3.2.1. • In test mode, set the minimal speed value with K6 button. • Measure the gas inlet pressure at measuring point (item 3 Fig. 4.2.1.) after starting the boiler. Pressure values depending on the type of gas are specified in Table 4.3.2.1. • Connect the flue gas analyzer. • Remove the cap from the measuring point number 5 (Fig.4.2.1.) • Using the adjusting screw number 5 (Fig.4.2.1) set the gas flow to obtain the required composition of the flue gas listed in Table 4.3.2.1.	• Check the set speed (parameter P24) and compare with table 4.3.2.1. • In test mode, set the maximum speed value with K7 button. • Measure the gas inlet pressure at measuring point (item 3 Fig. 4.2.1.) after starting the boiler. Pressure values depending on the type of gas are specified in Table 4.3.2.1, • Connect the flue gas analyzer. • Using the adjusting screw number 5 (Fig.4.2.1) set the gas flow to obtain the required composition of the flue gas listed in Table 4.3.2.1. Clockwise rotation increases flow.

NOTE:

Check the settings for the max and min. gas flow.

If the adjustment is complete, close all measuring points, then check tightness and re-seal them.

The data specified for gases at normal conditions (15°C, pressure 1013 mbar), having regard to boiler efficiency -97.4.

Gas type 2H-G20, 2E-G20	Inlet pressure (mbar) 20 ÷ 25	Min power	Max power	
		ECOCONDENS SLIM	ECOCONDENS SLIM	
		20	20	
		P06=P25=120	P24= 630	P05= 785**
		The content of CO ₂ in the flue gas [%]	The content of CO ₂ in the flue gas [%]	
		10.0 ^{+0.2}	9.5 ^{+0.2}	
		Gas flow rate [l/min.]*	Gas flow rate [l/min]*	
		5.0	34.5	43.5
Gas type 2Lw-G27	Inlet pressure (mbar) 20	Min power	Max power	
		ECOCONDENS SLIM	ECOCONDENS SLIM	
		20	20	
		P06=P25=120	P24= 670	P05= 850**
		The content of CO ₂ in the flue gas [%]	The content of CO ₂ in the flue gas [%]	
		10.0 ^{+0.2}	9.5 ^{+0.2}	
		Gas flow rate [l/min.]*	Gas flow rate [l/min]*	
		6.0	43.0	54.0
Gas type 2Ls-G2.350	Inlet pressure (mbar) 13	Min power	Max power	
		ECOCONDENS SLIM	ECOCONDENS SLIM	
		20	20	
		P06=P25=120	P24= 650	P05= 800**
		The content of CO ₂ in the flue gas [%]	The content of CO ₂ in the flue gas [%]	
		10.0 ^{+0.2}	9.5 ^{+0.2}	
		Gas flow rate [l/min.]*	Gas flow rate [l/min]*	
		6.5	49.0	61.0
Gas type 3B/P-G30	Inlet pressure (mbar) 37	Min power	Max power	
		ECOCONDENS SLIM	ECOCONDENS SLIM	
		20	20	
		P06=P25=120	P24= 540	P05= 660**
		The content of CO ₂ in the flue gas [%]	The content of CO ₂ in the flue gas [%]	
		11.0 ^{+0.5}	11.0 ^{+0.5}	
		Gas flow rate [l/min.]*	Gas flow rate [l/min]*	
		2.3	10.0	12.5
Gas type 3P-G31	Inlet pressure (mbar) 37	Min power	Max power	
		ECOCONDENS SLIM	ECOCONDENS SLIM	
		20	20	
		P06=P25=120	P24= 580	P05= 720**
		The content of CO ₂ in the flue gas [%]	The content of CO ₂ in the flue gas [%]	
		11.0 ^{+0.5}	11.0 ^{+0.5}	
		Gas flow rate [l/min.]*	Gas flow rate [l/min]*	
		2.5	13.4	16.5

**If the system boiler is connected to domestic water tank, set the parameter P05 in accordance with power of tank's coil.

NOTE:
In case of adapting the boiler to combust another type of gas, before starting up the boiler check the values of parameters P5, P6, P24, P25 in accordance with Table 4.3.2.1.
Change of parameter P01 without checking the parameters mentioned above may lead to boiler damage.

The installer mode allows you to program service parameters, read information from sensors, read historical data and delete history.

Parameters may only be configured by an AUTHORISED COMPANY SERVICE.

Category	No.	Description		Unit	Range		Default value *		Factory set value	
					Min	Max				
Boiler type	P00	DHW configuration	1 = Flow 2 = Flow + solar (nieobsługiwane) 3 = Tank 4 = Tank + solar (nieobsługiwane) 5 = Only CH	Number	1	5	1	3	1	3
System	P01	Gas type: 0 = natural gas / 1 = liquefied gas		Number	0	1	0	0	0	0
System	P02	Ignition fan speed (natural gas)		rpm x 50	20	180	80	80	50	50
		Ignition fan speed (liquefied gas)		rpm x 50	20	180	80	80	50	50
System	P03	Water filling: 0=OFF / 1=ON / 2=AUTO		Number	0	2	0	0	0	0
DHW	P04	Max. domestic water temperature setting		°C	30	65	65	65	60	60

DHW	P05	Max. fan speed (natural gas)	rpm x 50 (rpm x 10)	20	180	107 (530)	107 (530)	According to Table: 4.3.2.1	
		Max. fan speed (liquefied gas)	rpm x 50 (rpm x 10)	20	180	130 (650)	130 (650)		
DHW	P06	Min. fan speed (natural gas)	rpm x 50 (rpm x 10)	20	180	25 (125)	25 (125)		
		Min. fan speed (liquefied gas)	rpm x 50 (rpm x 10)	20	180	25 (125)	25 (125)		
DHW	P07	Pump rundown time	Minute	0	255	1	1	1	1
DHW	P08	Activation of anti-freeze function	°C	0	50	8	5	8	5
DHW	P09	Deactivation of anti-freeze function	°C	0	50	35	7	35	7
Tank: DHW	P10	Heat demand from: 0 = sensor / 1 = thermostat	Number	0	1	-	0	-	0
Tank: DHW	P11	Settings for anti-legionella function	°C	0	70	-	60	-	60
Tank: DHW	P12	Operation interval of anti-legionella function	Day	1	7	-	7	-	7
Tank: DHW	P13	Delta of supply temperature	°C	0	20	-	5	-	5
Tank: DHW	P14	Max. supply temperature	°C	0	90	-	85	-	85
CH	P23	Max. heating water temperature setting	°C	20	90	80	80	80	80
CH	P24	Max. fan speed (natural gas)	rpm x 50 (rpm x 10)	20	180	107 (530)	107 (530)	According to Table: 4.3.2.1	
		Max. fan speed (liquefied gas)	rpm x 50 (rpm x 10)	20	180	130 (650)	130 (650)		
CH	P25	Min. fan speed (natural gas)	rpm x 50 (rpm x 10)	20	180	25 (125)	25 (125)		
		Min. fan speed (liquefied gas)	rpm x 50 (rpm x 10)	20	180	25 (125)	25 (125)		
CH	P26	Central heating switch-off time	Minute	0	10	1	1	1	1
CH	P27	Pump rundown time	Minute	0	255	3	3	3	3
CH	P28	Pump operation: 1 = continuous / 0 = rundown	Number	0	1	0	0	0	0
CH	P29	Operation time with minimal power	Minute	0	5	1	1	1	1
CH	P30	Rate of temperature rise	°C/Min.	0	60	4	4	4	4
CH	P31	Switching on the anti-freeze function	°C	0	10	3	3	3	3
CH	P32	Switching off the anti-freeze function	°C	0	10	8	8	8	8
CH	P33	Selecting the heating curve	Number	0	30	0	0	0	0
CH	P34	Power supply temperature to switch off the pump rundown	°C	0	100	80	80	80	80
CH	P35	Power supply temperature to switch on the pump rundown	°C	0	100	85	85	85	85
System	P36	Configuration	Bit x: delete / set Bit 2: sensor / water pressure switch	Number	0	255	4	4	4
DHW	P37	Czujnik	0 – Fugas flow sensor 1 – Bitron flow sensor 2 – Kramer flow sensor 3 – Flow switch 4 – Honeywell flow sensor	Number	0	4	3	-	3

NOTE:

Parameters from P15 to P22 refer to functions that are not performed, therefore they are not included in the table.

The values of parameter P00 should not be set as 2 or 4 because the controller has not been adapted to operate with solar panel.

Units defining the fan speed parameters (P02, P05, P05, P06, P24, P25) differ depending on how they are programmed. If the parameters are programmed using a PC, these units are in accordance with the above table [rpm x 50]; if the parameters are programmed manually as described in section 4.4.1, units of these parameters are [rpm x 10].

*** If parameter P00 is changed, all parameters take their default values according to the above table. In this case, the boiler controller must be reconfigured.**

Starting the installer mode

In order to start the installer mode, press K4 button for approx. 10s, to switch it off - press K5 button for approx. 1s.

Switching between the installer mode functions is possible with the K6 and K7 buttons. To activate the selected function, press K4 button for approx. 1s.

Inscription on the display	Display status		Description
tS	flashing		Programming of service parameters
In	flashing		Information mode – preview of performance parameters
Hi	flashing		Error history
rES	flashing		Erasing error history

4.4.1. Service parameters mode

Programming of service parameters:

- Hold t K4 button for 10s. The inscription "tS" will appear.
- Press K4 button for 1s. The number of first parameter (P00) will be displayed.
- Use K6 and K7 buttons to select the desired parameter.
- Press K1 or K2 button to enter the selected parameter.
- Use buttons K1 and K2 to change the parameter value according to the table (see 5.6). The value will be automatically saved.
- Press K4 button to return to the parameter selection menu.
- Press K4 button again to return to the installer's main menu.
- Press K5 button to exit Installer Mode.

The controller will leave Installer Mode automatically after 2 minutes of inactivity.

4.4.2. Information mode

Reading the information parameters:

- Hold t K4 button for 10s. The inscription "tS" will appear.
- Press K7 button. The inscription "In" will appear.
- Press K4 button. The number of first information parameter (i00) will be displayed.

- Use K6 and K7 buttons to select the desired information parameter.
- Press K1 or K2 button to read the value of this parameter.
- Press K4 button to return to the parameter selection menu.
- Press K4 button again to return to the installer's main menu.
- Press K5 button to exit Installer Mode.

The controller will leave Installer Mode automatically after 2 minutes of inactivity.

The information mode can also be displayed by holding the K3 button for 10s from the main screen. The exit from the information mode occurs after pressing the K3 button.

Table 4.4.2.1. List of parameters in information mode

Parameter number	Description	Value
i00	Supply temperature sensor (°C)	00 ÷ 125
i01	Return temperature sensor (°C)	00 ÷ 125
i02	DHW temperature sensor (°C) – flow, tank, top of the tank	00 ÷ 125
i03	DHW temperature sensor (°C) – bottom of the tank	00 ÷ 125
i04	Temperature sensor of solar panel (°C)	00 ÷ 125
i05	Flue gas temperature sensor (°C)	00 ÷ 125
i06	Outdoor temperature sensor (°C)	2-digit value
i07	Present fan speed (rpm x 10)	
i08	DHW flow (l/min)	ON or OFF
i09	Present water pressure	
i10	Present ionization current (uA*10)	00 ÷ 99
i11	Software version	C_x.xx version

The "History" and "Reset" modes are described in chapter 5.3 Diagnostics.

4.5. Fan characteristics

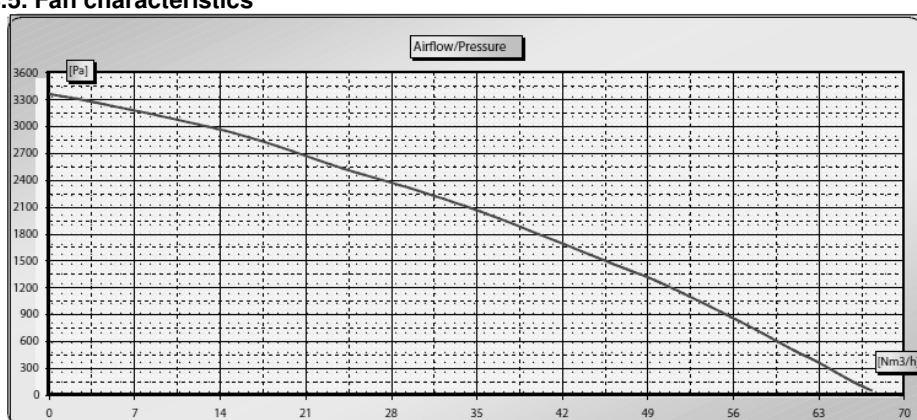


Fig.4.5.1. Characteristics of the fan - type NG40m

5. STARTUP AND OPERATION OF THE BOILER

5.1. Initial startup of the boiler

After installing the boiler, checking the accuracy and tightness of its connections and preparing for operation in accordance to this instruction manual and applicable regulations first commissioning and user training for boiler operation and safety devices may be done only by AUTHORISED SERVICE COMPANY.

5.2. Inclusion and operation

All boiler functions are performed by the boiler electronic control panel. Changing the operating mode and settings is done done by 6 buttons. Current state of the boiler is shown on the LCD display.

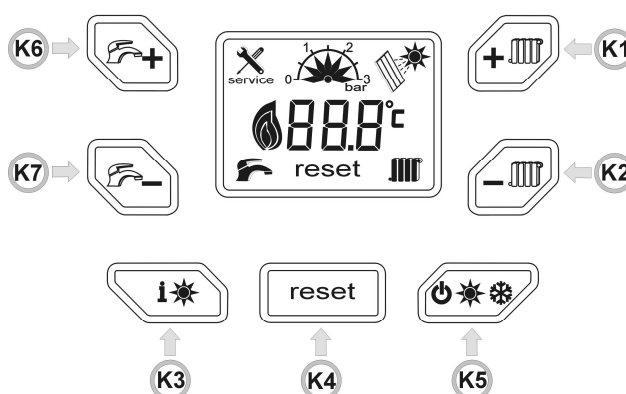


Fig. 5.2.1. Control panel

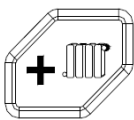
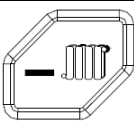
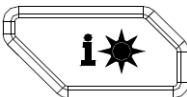
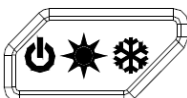
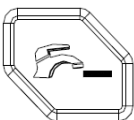
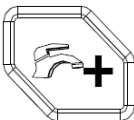
- Check the pump (→ item.6.1.6),
- Connect the boiler to the electrical mains,
- Open the gas valve and water valves,
- Wait until the boilers enters auto-diagnosis mode,
- Set the mode WINTER or SUMMER (→ item.5.3)

The turning on of the boiler in the heating season

- Set the desired temperature of the heating water using buttons K1-K2 in the range of 20°C to 80°C
- The spark generator will cause ignition of gas outflowing from the burner.
- Set the desired water temperature using buttons K6-K7 in the range of 30°C to 60°C. Remember! The priority is always to obtain domestic hot water during operation of the boiler

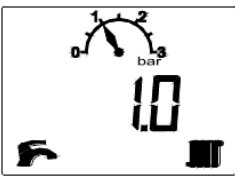
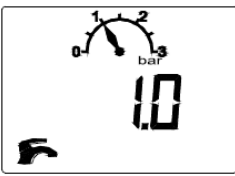
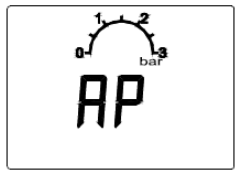
When the room temperature controller is connected, set desired room temperature on the controller.

5.2.1. Meaning of buttons on the control panel

Button number	Symbol	Name	Performed functions
K1		Setting of CH temperature (+)	- setting of heating water temperature (+) - in modes „tS“, „In“, „Hi“ change the value of parameters (+) - with K2 button - activating the test mode (chimney sweep) and changing the fan speed (+) in this mode
K2		Setting of CH temperature (-)	- setting of heating water temperature (-) - in modes „tS“, „In“, „Hi“ change the value of parameters (-) - with K1 button - activating the test mode (chimney sweep) and changing the fan speed (-) in this mode
K3		Selecting information mode	enterance to information mode
K4		Reset	- enterance to installer mode - in installer mode, activate or exit the relevant parameter mode, or complete exit from the installer mode - stopping the venting function - deleting the error codes and locks
K5		Selecting standby mode / CH / CH + DHW	- exit from installer mode (1 sec) - resetting history (5 sec)
K6		Setting of DHW temperature (-)	- setting of domestic water temperature (-) - moving through the installer mode menu and parameter numbers (-) - in test mode, setting the fan speed to minimum
K7		Setting of DHW temperature (+)	- setting of domestic water temperature (+) - moving through the installer mode menu and parameter numbers (+) - in test mode, setting the fan speed to maximum

5.3. Signalisation of operation states and diagnosis

5.3.1. Controller operating modes

Mode	Display	Changing the operating mode	Performed functions
STAND-BY		To turn on / turn off the controller press the K5 button	- active anti-freezing function: the boiler is switched on when the boiler water temp. drops below the value of P08 parameter and heats the water as long as the temperature reaches the value of P09 parameter, 3-way valve blocking protection (valve is switched on 15sec. every 48 hours), - heat demand is ignored
WINTER		Press the K5 button to enter WINTER mode	- CH and DHW heating, - anti-legionella function - active only for boilers with tanks
SUMMER		Press the K5 button to enter SUMMER mode	- DHW heating, - anti-legionella function - active only for boilers with tanks
VENTING		The function is always activated in the case of: - Disconnection and reconnection to the power source. - Restoration of the correct pressure in the CH system after errors F37 or F40 occur. - Manual E3 error deleting. You can stop the function by pressing K4.	During this operation, the heat demand is inactive and the fan operates at its highest speed for 120 seconds. The pump is switched on and off alternately for periods of 5 seconds. The 3-way valve is moved to the CH position for the first 30 seconds, then to DHW position for the next 30 seconds, again to CO for 30 seconds and again to DHW position for the last 30 seconds. In this way, all air bubbles are removed and the pump operation is protected.

5.3.2. Signalization of operation states

Symbol on the display	Signalization	Remarks
	BURNER IS OPERATING	Flame presence indication The symbol is divided into 3 parts which indicate: - first only (smallest): power below 30% - first and second: power above 30% but less than 75% - all: power more than 75%
	SOLAR MODE	The solar panel is connected and active (Function inactive for this boiler version)
	CH MODE	CH mode is active.
	DHW MODE	DHW mode is active.
	SERVICE FUNCTION SYGNALISATION OF EMERGENCY SITUATIONS	It appears during: • operations in test mode • boiler failures
reset	BOILER BLOKAGE	After removing the cause of the failure to restart the boiler operation, use the reset button.
	WATER PRESSURE IN THE SYSTEM	It indicates the current system water pressure in bar (step by every 0.5 bar).

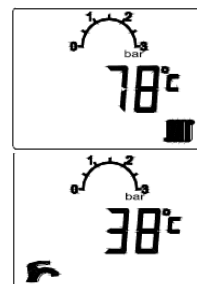
5.3.2.1. Settings

CH setting

It is possible to change the CH water temperature setting by pressing K1 button (increasing) and K2 button (decreasing). The setting range is between 20°C and P23 parameter (maximum heating water temperature setting). During setting, by using buttons K1 and K2, the temperature value is shown on the display and it can be changed in steps of 1°C.
After 5 seconds of inactivity, the display will return to its previous state.

DHW setting

It is possible to change the DHW temperature setting by pressing K7 button (increasing) and K6 button (decreasing). The setting range is between 30°C and P04 parameter (maximum domestic water temperature setting). During setting, by using buttons K7 and K6, the temperature value is shown on the display and it can be changed in steps of 1°C.
After 5 seconds of inactivity, the display will return to its previous state.



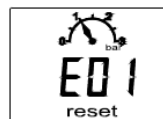
5.3.3. Diagnosis

When the boiler operation is incorrect, an error message appears on the boiler display. Errors requiring manual correction with the K4 button are signalled with the letter "E" and the error number, and when an error occurs which does not cause permanent locking of the boiler, the code:"F" and the error number is displayed.
If the boiler still becomes locked after the error has been already corrected, call the AUTHORISED COMPANY SERVICE.

If an error occurs, the pump performs following functions:

- rundown,
- anti-freeze protection,
- protection against locking the pump.

The exception are situations in which the error is related to the system pressure or pressure sensor errors.



5.3.3.1. Error codes with boiler blokage

In case of an error, a manual reset or intervention of the Authorized Company Service is necessary.

Error code	Error cause / Description	Way of error removing
E01	No flame on the burner: All (3) ignition tests were carried out. Boiler operation is stopped.	Manual or remote reset
E02	False flame: The flame appeared on the burner without prior request. Boiler operation is stopped.	Manual or remote reset
E03	Exceeding the supply or return temperature: Boiler operation is stopped.	Manual or remote reset
E05	No feedback signal from the fan: If the controller does not receive a feedback signal from the fan within 1 minute, an error message appears and boiler operation is stopped.	Manual or remote reset
E08	Flame circuit damage: A flame was detected outside the safety limits, posing a risk to the electronics of the boiler. Boiler operation is stopped.	Manual or remote reset
E09	Check valve error: Valve does not respond to controller requests.	Boiler is not equipped with valve. Error should not occur.
E07	The flue gas temperature has exceeded the permitted value: Boiler operation stops. Error can be reset provided that the flue gas temperature falls below limit value.	Manual or remote reset
E12	EEPROM blockage: EEPROM checking failed. Data in the EEPROM is damaged.	
E15	Error in the NTC sensor system. An internal check showed a malfunction.	Manual or remote reset
E16	NTC sensor error on CH supply.	Manual or remote reset
E17	NTC sensor error on CH return.	Manual or remote reset
E18	Error in the NTC sensor system. An internal check showed a malfunction.	Manual or remote reset
E21	ADC failure: The ADC test failed, which could mean a serious electronics error.	Manual or remote reset
E33	Error of CH return temperature sensor: Return temperature sensor out of range (short circuit or open circuit). Heat demand will be ignored. If 2 or more sensors are damaged, the controller will indicate the first sensor.	Manual or remote reset possible if temperature value returns to the nominal range.
E35	Error of CH supply temperature sensor: Supply temperature sensor out of range (short circuit or open circuit). Heat demand will be ignored. If 2 or more sensors are damaged, the controller will indicate the first sensor.	Manual or remote reset possible if temperature value returns to the nominal range.

5.3.3.2. Error codes without boiler blockage

After removing the cause of failure, the boiler automatically returns to normal operation. In case of necessary service intervention, the "service" symbol is displayed.

Error code	Error cause / Description	Way of error removing
F13	Remote reset blocked: All manual or remote reset attempts failed (5 attempts per hour)	Disconnect the boiler power supply.
F34	Mains voltage too low: Lock code will be displayed if the supply pressure drops below 170V AC. If the boiler is operating during this time, the burner will be switched off.	By itself, if voltage increases to the correct level.
F37	Water pressure too low: Water pressure in the system is too low or the water pressure sensor has been opened. Heat demand and pump operation are stopped. 3-way valve is set to the CH position.	Blockage is removed when the appropriate pressure is reached in the system or when sensor contacts are shorted.
F39	Outdoor temperature sensor out of range: The value indicated by sensor is out of range (from -40°C to +50°C) or a short circuit or open circuit has occurred. In the case of an open circuit, lock code will be displayed only in the case of an active heating curve (sensor will be disconnected but the heating mode will remain available).	By itself, if sensor value returns to the correct range.
F40	Too high pressure in CH circuit: Heat demand is ignored, pump operation is stopped.	Blockage is removed when the appropriate pressure is reached in the system
F41	Inactive. Only if an automatic water filling valve is used.	-
F42	Inactive. Only if an automatic water filling valve is used.	-
F43	Inactive. Only if an automatic water filling valve is used.	-
F47	Water pressure sensor is not connected: Heat demand is ignored, pump operation is stopped.	Check the connection of pressure sensor.
F52	Domestic water temperature sensor out of range: There is a short circuit, open circuit in sensor, or value measured by the sensor is out of range 5-125 ° C. Heat demand is ignored.	By itself, if sensor value returns to the nominal value.
F53	Flue gas temperature sensor out of range: There is a short circuit, open circuit in sensor, or value measured by the sensor is out of range 5-125 ° C. Heat demand is ignored.	By itself, if sensor value returns to the nominal value.
F81	Control of NTC sensors Heat demand may not be provided. Only pump is active.	

5.3.3.3 Errors history

Boiler controller saves in its memory 8 consecutive errors regardless of their type.

Procedure for reading back data:

- Hold the K4 button for 10 seconds. The inscription "tS" appears.
- Press the K7 button twice, the inscription "Hi" appears.
- Press the K4 button. Number of first parameter in history (H01) appears.

Kolejność zapisywania błędów od H01 (najstarszy) do H08 (najnowszy).

- Use the K6 and K7 buttons to select the desired parameter from the history.
- Press the K1 or K2 button to read the value of this parameter.
- Press the K4 button to return to the parameter selection menu.
- Press the K4 button again to return to the installer's main menu.
- Press the K5 button to exit the installer mode.

Controller will exit the installer mode automatically after 2 minutes of inactivity.

5.3.3.4. History deletion mode

Back data deletion procedure:

- Hold the K4 button for 10 seconds. The inscription "tS" appears.
- Press the K7 button three times, the inscription "rES" appears.
- Press and hold the K5 button for at least 5 seconds.

As confirmation of this operation, controller will automatically exit the installer mode.

5.4. Boiler shutdown / Standby mode

- Leave the boiler connected to power supply.
- Leave the gas valve and water valve of CH open.
- Set the mode on STAND BY (section 5.3)

If you decide to discontinue use of the boiler for a long time you should:

- Disconnect the boiler from electricity.
- Drain the water system of the boiler and also CH system – only if there is possibility of freezing.
- Close the water and gas valves.

NOTE: In a winter time (because of the risk of freezing water in the system) the disconnection the boiler from electrical system is forbidden (if there is still water in the water system of the boiler).

6. MAINTENANCE, INSPECTIONS, CHECKING OF THE OPERATION

6.1. Inspection and maintenance

The boiler should be regularly serviced and subjected to maintenance.

At least once a year it is recommended to perform a service and it should be reviewed before heating season.

All service and maintenance works should be performed by an Authorized Person. Only original parts should be used for boiler repairs.

At every service and maintenance works the tightness of the gas units and gas installation and correctness of the protective systems should be checked. The warranty does not cover above mentioned operations.

6.1.1. Maintenance of the combustion chamber, burner, ignition / ionization electrode.

The interior of the combustion chamber, burner surface and the pads should be checked by visual inspection:

- the contaminated burner and the interior of the combustion chamber may be cleaned with a brush made of plastic,
- visible on the surface of the burner gaps and deformations disqualify burner - replace the burner,
- clean the electrode with a plastic brush,
- deformed electrode should be replaced,
- check the condition of insulator of electrode,
- clean dirty insulator,
- insulator with visible damages should be replaced.

Note! Dirty burner and the interior of combustion chamber mean that the boiler regulation must be done.

In order to get into the combustion chamber, burner and electrode:

- close the gas valve,
- unscrew the front part of the combustion chamber,
- remove the wires from the end of the electrode,
- remove the cover fixing screw of flue gas-water heat exchanger,
- remove the cover of heat exchanger,
- assemble in reverse order.

Note: The tightening torque on cold door caps is 5 Nm (+1/0 Nm).

Pay attention not to damage the seals, check the tightness of connections.

6.1.2. Cleaning the condensate siphon

Condensate siphon should be inspected. If you need to purge:

- unscrew siphon,
- clean the siphon of any dirt,
- tighten the siphon.

Check the patency of the siphon (for example blow the tube which drains the condensate).

In case of difficulty in clearing the siphon it should be removed from the boiler and cleaned with the strong stream of water.

To avoid the possibility of leakage of flue gas through a siphon until the condensation of the condensate in it (flooding) there is a possibility of flooding the siphon by pouring a little water.

6.1.3. Pressure in the expansion vessel

The pressure in the expansion vessel

Check the pressure in the expansion vessel (→item 17) using pressure meter (for example automotive) connecting it to the fan on the vessel. Value shown in Table 2.2.2.

If there is any need to adjust the pressure in the expansion vessel using the pump (for example a car pump)

Note: When checking the pressure in the expansion vessel the central heating water pressure in the inside system of the boiler must be zero.

6.1.4. Maintenance of the flue water-water heat exchanger, item.21

The heat exchanger design provides turbulent water flow over the entire heat exchanger surface minimizing contamination of internal surfaces of the exchanger. But when there are favorable conditions for the formation of solid impurities they must be removed. To do this select one of the methods recommended by the manufacturers of heat exchangers such as Alfa Laval or SWEP.

6.1.5. Checking the temperature sensors (Table 6.1.5.1.)

- **NTC sensor of CH water, DHW. and central heating return**

- Remove the sleeves from the NTC sensors,
- Measure the sensor resistance

- **outdoor temperature sensor**

- Disconnect the sensor cable from the terminals under the flap of control panel
- Measure the sensor resistance

- **tank temperature sensor**

- Disconnect the sensor cable from the terminals under the flap of control panel
- Measure the sensor resistance

Temperature [°C]	NTC (DHW) and NTC (CH) sensor resistance, NTC tank sensor and temperature sensor resistance Sensor: $\beta=3977$
20	12.480 [Ω] $\pm 0.75\%$
30	8.060 [Ω] $\pm 0.75\%$
60	2.490 [Ω] $\pm 0.75\%$
80	1.210 [Ω] $\pm 0.75\%$

Table 6.1.5.1 Resistance of NTC sensor, outside temperature sensor and tank NTC sensor, depending on the temperature

6.1.6. Checking the water pump operation

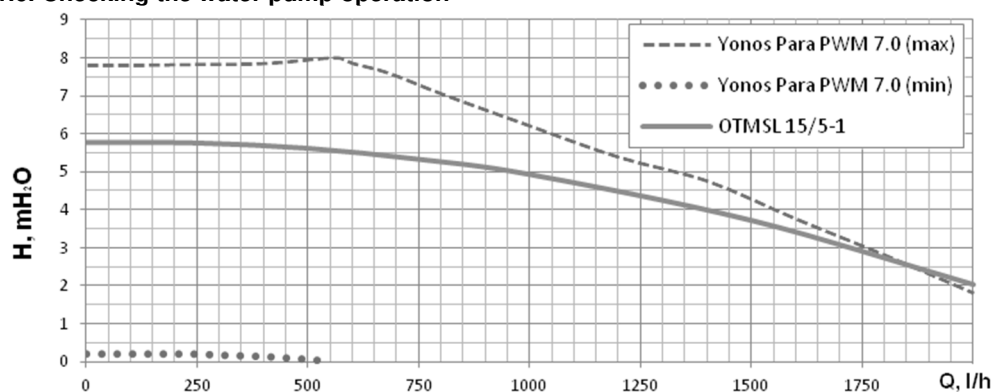
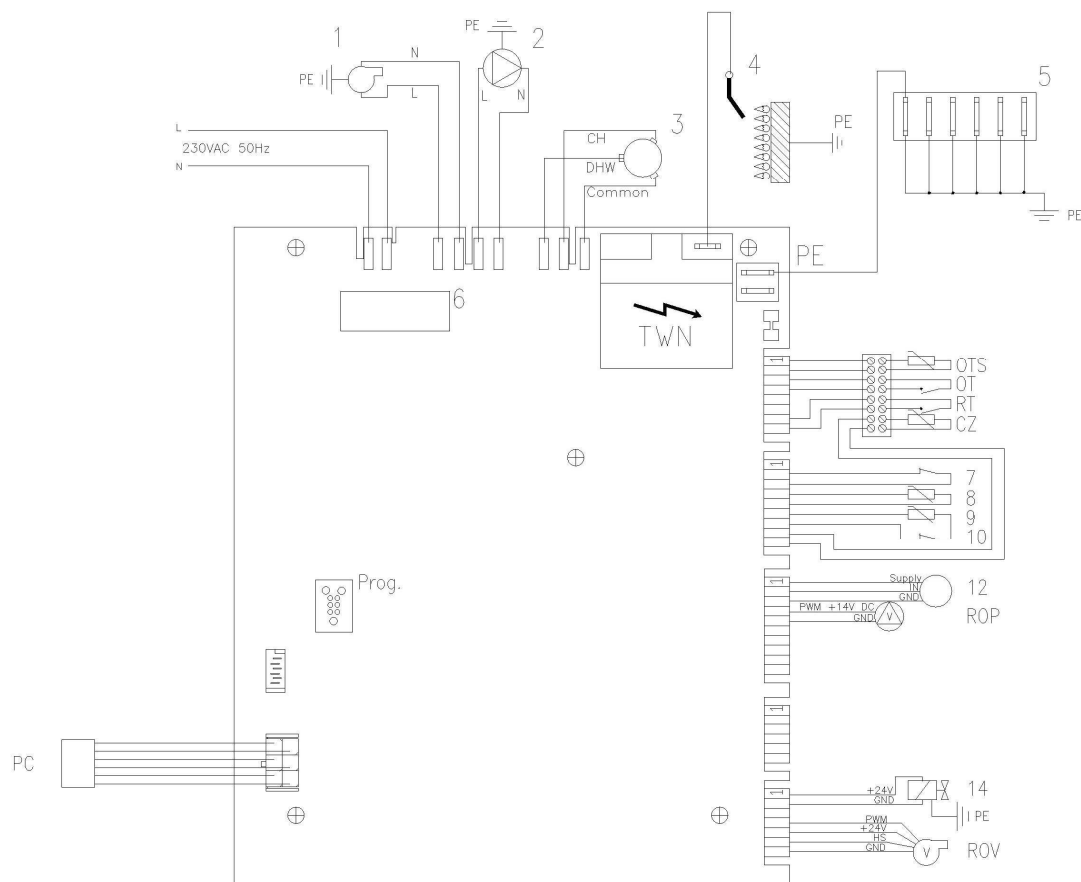


Fig. 6.1.6.1. Pump characteristic

6.2. Replacing a damaged control board in the control panel

If the control board need to be replaced follow the installation instructions attached to each board devoted as spare part.

Parameters of components for boilers ECOCONDENS SLIM 20				
Item on the scheme	Name		Parameters	Supply voltage from the controller
5	Fan	NG40m	Power: 75 W (max)	230V AC
2	Yonos Para PWM pump		Power: 45W	230V AC
14	Gas unit PX42		Valve coil resistance: 114,5Ω, Moc 5W	24V DC
9	NTC sensor of CH water temperature		10K@25°C β=3977	SELV
12	Pressure transducer of heating water		The output voltage: 0,5 V do 2,5 V (0 bar - 4 bar)	5V DC
13	Domestic water flow sensor		pin	SELV
11	NTC sensor of DHW water temperature		10K@25°C β=3977	SELV
8	NTC sensor of CH water temperature -return		10K@25°C β=3977	SELV
OTS	NTC sensor of outdoor temperature		10K@25°C β=3977	SELV
10	Temperature limiter 95°C		pin	SELV
7	Thermal fuse		pin	SELV
3	3-way valve			230V AC

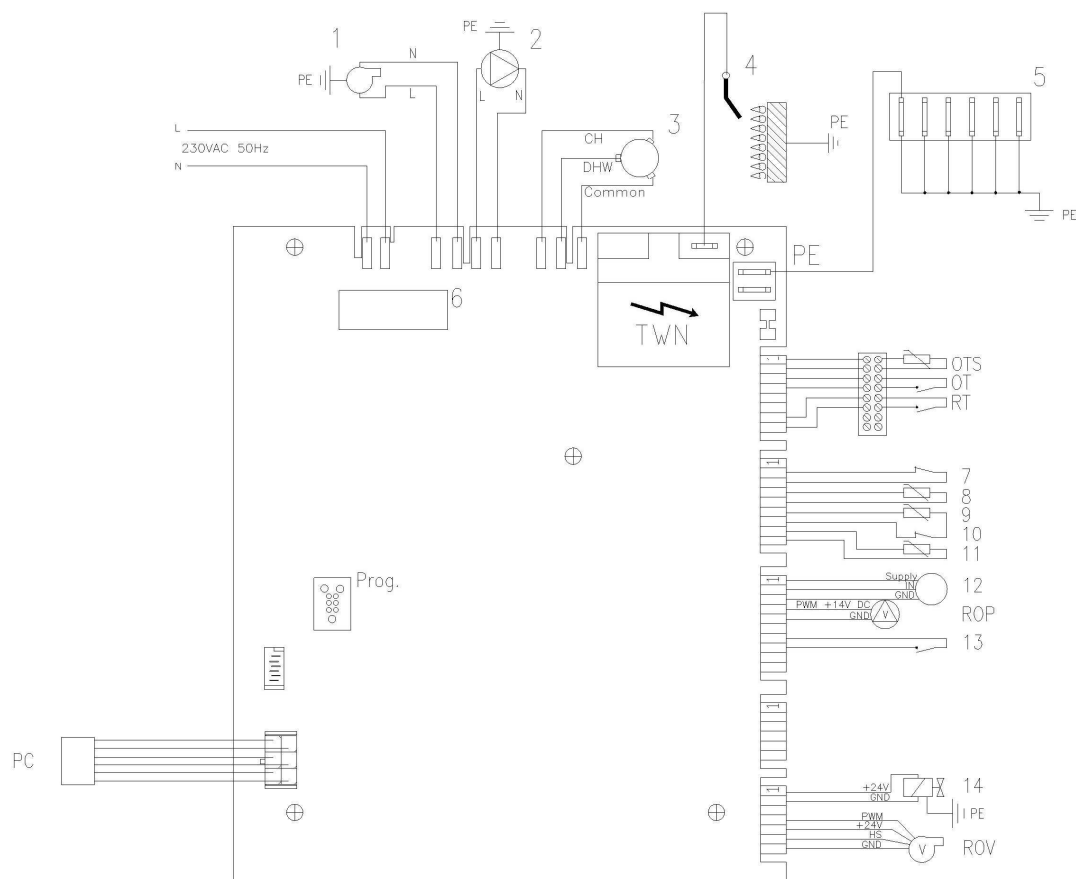


System boiler

OTMSL 15/5-1	Yonos Para PWM 7.0
ECOCONDENS SLIM	ECOCONDENS SLIM with PWM pump

The check should be done at the first start the boiler and when the following events occur:

- the pump is not working after turning on (does not raise the pressure in the C.H. system)
- start the pump impeller by hand (not applicable to PWM pumps).



Combi boiler

No	Description	No	Description	No	Description
1	Fan - supply	9	NTC sensor of heating water temperature (supply)	OTS	Outdoor temperature sensor
2	Pump - supply	10	Temperature limiter of heating water	PC	PC service connector
3	3-way valve	11	NTC sensor of DHW temperature	PE	Grounding connector
4	Flame control / ignition electrode	12	Pressure sensor of heating water	Prog	Connector for microprocessor programming
5	PE connector space	13	Flow sensor	RT	Room temperature regulator
6	Fuse	14	Gas valve	ROP	Pump speed regulator
7	Fumes temperature limiter	CZ	Tank sensor	ROV	Fan speed regulator
8	NTC sensor of heating water temperature (return)	OT	OpenTherm device	TWN	Spark generator

6.3. The maintenance operations to be performed by the user

User should:

- clean the water filter periodically, preferably before the heating season (should be replaced when used),
- clean the domestic water filter also in case of finding decreasing flow,
- refill the central heating system with the water,
- deaerate the central heating system and the boiler,
- periodically clean the boiler cover with the water with detergent (avoid cleaners that cause scratches).

7. BOILER EQUIPMENT

In table 7.1 there is placed a list of parts required for installation of the boiler, its proper operation and for enhancement the comfort of usage of the product. The following items are available for purchase together with the boiler or are supplied with the boiler.

Table 7.1

No.	Name	Drawing number Type Code	INDEX	Quantity	Refers to the boiler	Remarks
1	2	3		4	5	6
1.	Hook for wood 8 x 70			2	ECOCONDENS SLIM	In boiler equipment. Put in the package of the boiler
2.	Sparing sleeve			2		
3.	Adhesive spacer EPDM	1780.00.00.49		4		
4.	Subassembly of gas connector	0696.00.00.00		1		
5.	Tank NTC sensor	0960.00.10.00		1	ECOCONDENS SLIM (system boilers)	
PURCHASE RECOMMENDED TO IMPROVE COMFORT OF THE BOILER USAGE						
6.	Room temperature regulator: Any contact or - OpenTherm remote control menu PL, GB, DE type CR11011	WKZ0624.00.00.00		1	ECOCONDENS SLIM	Not included in boiler equipment

7.	Outdoor temperature sensor	WKC 0564.00.00.00 or WKC 0566.00.00.00 or WKC 0567.00.00.00		1		
8.	Honeywell's Round control package	WST9647.00.00.00/PL		1	ECOCONDENS SLIM	Not included in boiler equipment
9.	Honeywell's EvoHome control package	WST9648.00.00.00/PL		1		
PURCHASE NECESSARY TO ENSURE THE PROPER OPERATION OF THE BOILER						
10.	Gas filter			1	ECOCONDENS SLIM	Not included in boiler equipment
11.	Heating water filter			1		
12.	Domestic water filter			1		
PURCHASE NECESSARY IN CASE OF BOILER CONNECTION IN THE CASCADE SYSTEM						
13.	AX1203SQ cascade manager	WKM 0623000000		1	ECOCONDENS SLIM	Not included in boiler equipment
14.	OpenTherm remote control			1 per cascade		

PURCHASE NECESSARY TO ENSURE THE PROPER OPERATION OF THE FLUE GAS-AIR SYSTEM OF THE BOILER (PP system)						
No.	Name	Drawing number Type Code	INDEX	Quantity	Refers to the boiler:	Remarks
Flue gas-air system – coaxial Ø80/125 (Fig. 3.8.1.1.)						
1	Coaxial reduction Ø60/100 x Ø80/125		T9000016700	1	ECOCONDENS SLIM	Not included in boiler equipment
	Coaxial elbow Ø80/125 90°		T9000015000	1		
	Elements of the system (according to the installation design)					
Flue gas-air system – coaxial Ø60/100 (Fig. 3.8.1.1.)						
2	Coaxial elbow Ø60/100 90°		T9000014900	1	ECOCONDENS SLIM	Not included in boiler equipment
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø80/125 (Fig. 3.8.1.1.)						
3	Coaxial elbow Ø80/125 90° with revision		T9000015400	1	ECOCONDENS SLIM	Not included in boiler equipment
	Coaxial reduction Ø60/100 x Ø80/125		T9000016700	1		
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø60/100 (Fig. 3.8.1.1.)						
4	Coaxial elbow Ø60/100 90° with revision		T9000015300	1	ECOCONDENS SLIM	Not included in boiler equipment
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø80/125 (Fig. 3.8.2.1.)						
5	Coaxial reduction Ø60/100 x Ø80/125		T9000016700	1	ECOCONDENS SLIM	Not included in boiler equipment
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø60/100 (Fig. 3.8.2.1.)						
	Elements of the system (according to the installation design)					
Flue gas-air system – coaxial Ø80/125 (Fig. 3.8.3.1.)						
7	Coaxial reduction Ø60/100 x Ø80/125		T9000016700	1	ECOCONDENS SLIM	Not included in boiler equipment
	Coaxial elbow Ø80/125 90° with revision		T9000015400	1		
	Coaxial elbow Ø80/125 90°		T9000017400	1		
	Support bracket for elbows 90°		T9000017900	1		
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø60/100 (Fig. 3.8.3.1.)						
8	Coaxial elbow Ø60/100 90°		T9000014900	2	ECOCONDENS SLIM	Not included in boiler equipment
	Support bracket for elbows 90° Ø60		T9000017910	1		
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system with – separate pipes Ø80 x Ø80 (Fig. 3.8.4.1)						
9	Air-flue gas adapter type TWIN		T9000000276	1	ECOCONDENS SLIM	Not included in boiler equipment
	Elements of the system (according to the installation design)			1 set		

PURCHASE NECESSARY TO ENSURE THE PROPER OPERATION OF THE FLUE GAS-AIR SYSTEM OF THE BOILER (steel system)						
No.	Name	Drawing number Type Code	INDEX	Quantity	Refers to the boiler:	Remarks
Flue gas-air system – coaxial Ø80/125 (Fig. 3.8.1.1.)						
1	Coaxial reduction Ø60/100 x Ø80/125		T90000016700	1	ECOCONDENS SLIM	Not included in boiler equipment
	Coaxial elbow Ø80/125 90°		T90000001200	1		
	Elements of the system (according to the installation design)					
Flue gas-air system – coaxial Ø60/100 (Fig. 3.8.1.1.)						
2	Coaxial elbow Ø60/100 90°		T90000001100	1	ECOCONDENS SLIM	Not included in boiler equipment
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø80/125 (Fig. 3.8.1.1.)						
3	Coaxial T-piece Ø80/125 90° with revision		T90000001400	1	ECOCONDENS SLIM	Not included in boiler equipment
	Coaxial reduction Ø60/100 x Ø80/125		T90000016700	1		
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø60/100 (Fig. 3.8.1.1.)						
4	Coaxial T-piece Ø60/100 90° with revision		T90000001300	1	ECOCONDENS SLIM	Not included in boiler equipment
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø80/125 (Fig. 3.8.2.1.)						
5	Coaxial reduction Ø60/100 x Ø80/125		T90000016700	1	ECOCONDENS SLIM	Not included in boiler equipment
	Coaxial inspection T-piece		T90000007300	1		
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø60/100 (Fig. 3.8.2.1.)						
6	Coaxial inspection T-piece		T90000007200	1		
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø80/125 (Fig. 3.8.3.1.)						
7	Coaxial reduction Ø60/100 x Ø80/125		T90000016700	1	ECOCONDENS SLIM	Not included in boiler equipment
	Coaxial T-piece Ø80/125 90° with revision		T90000001400	1		
	Coaxial elbow Ø80/125 90° with support bracket		T90000001000	1		
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system – coaxial Ø60/100 (Fig. 3.8.3.1.)						
8	Coaxial T-piece Ø60/100 90° with revision		T90000001300	1	ECOCONDENS SLIM	Not included in boiler equipment
	Coaxial elbow Ø60/100 90° with support bracket		T90000000900	1		
	Elements of the system (according to the installation design)			1 set		
Flue gas-air system with – separate pipes Ø80 x Ø80 (Fig. 3.8.4.1)						
9	Air-flue gas adapter type TWIN		T90000000276	1	ECOCONDENS SLIM	Not included in boiler equipment
	Elements of the system Ø80 (according to the installation design)			1 set		

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