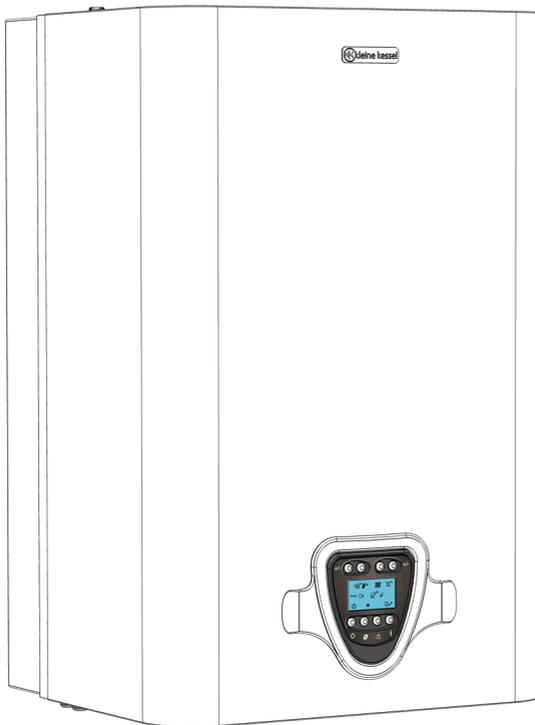




# CSP 45-70

WALL-MOUNTED CONDENSING BOILER



KONDENS

INSTALLATION, COMMISSIONING, USE AND MAINTENANCE MANUAL





**CSP 45-70 MANUAL**  
VERS. 01/2023 - REV.0

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## GENERAL REQUIREMENTS

### EC CONFORMITY DECLARATION (ACCORDING TO ISO/IEC 17050-1)

Kleine Kessel srl established in Loc. Campogrande, 13 - Carpaneto Piacentino whose processes of design, manufacturing and after-sales service are in compliance with requirements of UNI EN ISO 9001:2008 - DECLARES that boilers are in compliance with European Directives and with European Delegates regulations.

Chief Executive *Marco Rapaccioli*



CE CERTIFICATES ARE AVAILABLE ON OUR WEBSITE [www.produzionecaldaie.it](http://www.produzionecaldaie.it)

## GENERAL INFORMATION

This manual, supplied with every boiler, should be considered as an integral component as it contains instructions for the correct, safe and appropriate installation, use and maintenance of the system. The manual must always be kept by the user of the boiler and made available for the installation and/or maintenance technicians to consult. It must also accompany the boiler if it should be moved or otherwise transferred.

The manufacturer shall not be held responsible for any damage caused by failure to follow the instructions contained in this manual, nor:

If the boiler is used for purposes other than those for which it was built

If any part or circuit of the boiler is modified

If accessories or kits not approved by the manufacturer are installed

If ordinary and extraordinary maintenance is not performed by qualified personnel

If applicable technical and legal requirements have not been observed during installation and maintenance of the boiler.

### WARNING!

If the boiler should cease to function or not function correctly, deactivate it immediately by turning it off and then shutting off the gas supply. Do not attempt any repairs or direct work on the boiler.

Only personnel with the necessary qualifications and licenses must perform maintenance on the boiler. Any repairs must be performed using only original parts and accessories.

### SYMBOLS USED IN THE MANUAL



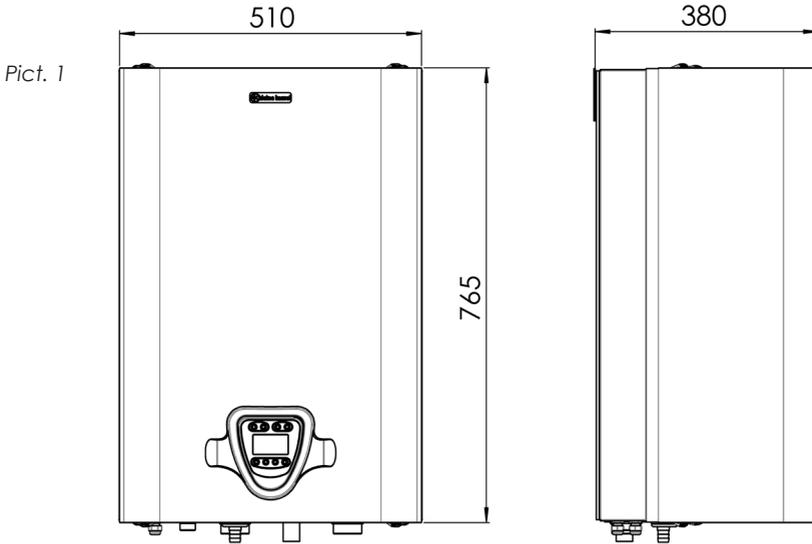
Advice, suggestion, note



Important communications, signaling of modes and operations which could compromise the correct operation of the boiler and endanger people.

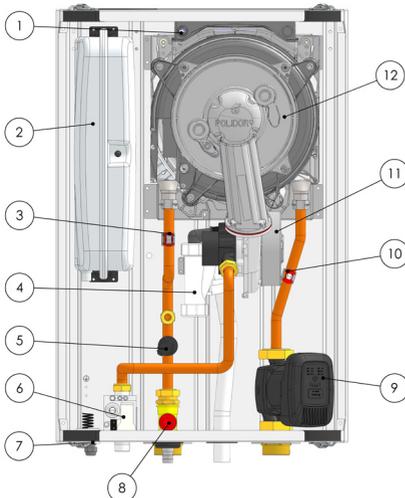
## DESCRIPTION OF THE BOILER

The CSP condensing boiler is a highly efficient gas appliance whose heat losses due to radiation, convection and downtime are extremely reduced. The emissions of harmful substances are considerably lower than the standards defined by current regulations.



## COMPONENTS

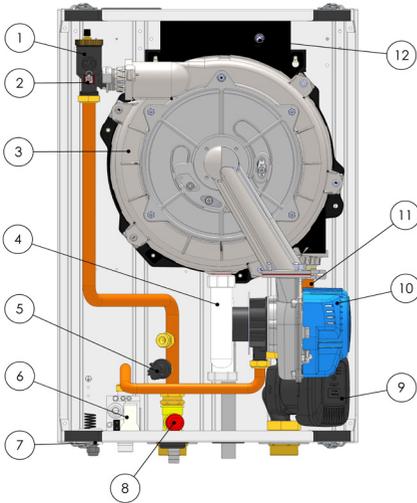
Pict. 2



### CSP 45

1. EXHAUST SAFETY SENSOR
2. 10 LITER EXPANSION TANK
3. HEATING PROBE AND SAFETY PROBE
4. CONDENSATE DRAIN SIPHON
5. PRESSURE TRANSMITTER
6. GAS VALVE
7. PRESSURE GAUGE
8. SAFETY VALVE
9. CIRCULATING PUMP
10. RETURN SENSOR
11. FAN
12. MAIN HEAT EXCHANGER

Pict. 3



### CSP 70

1. AUTOMATIC AIR VENT
2. HEATING PROBE AND SAFETY PROBE
3. MAIN HEAT EXCHANGER
4. CONDENSATE DRAIN SIPHON
5. PRESSURE TRANSMITTER
6. GAS VALVE
7. PRESSURE GAUGE
8. SAFETY VALVE
9. CIRCULATING PUMP
10. RETURN SENSOR
11. FAN
12. EXHAUST SAFETY SENSOR

## IGNITION

Turn on the boiler's electrical supply at the switch, which must be installed on the power supply line to the boiler. The LCD display (with blue backlight) will turn on immediately, showing the two-digit software version number loaded on the microprocessor for a few seconds, while an automatic check is performed on the conditions of the system and installed devices. When this stage has finished, if no faults are present, the last page of the MAIN MENU to be stored is displayed on the LCD (the one being displayed when the power was turned off).

Pict. 4



- 1: ON/OFF BUTTON
- 2: SUMMER/WINTER BUTTON
- 3: RESET BUTTON
- 4: INFORMATION/CONFIGURATION BUTTON
- 5: DHW TEMPERATURE DECREASE
- 6: DHW TEMPERATURE INCREASE
- 7: CH TEMPERATURE DECREASE
- 8: CH TEMPERATURE INCREASE

## INTERFACE DESCRIPTION

The interface allowing all operating parameters to be selected and modified as well as their relative values to be displayed is extremely simple. It is composed of a large backlit LCD which displays all symbols necessary for communicating the boiler's status in a simple and

immediate way, together with a series of buttons which are matched unequivocally to a specific function indicated on the display. Consult the relevant sections to get explanations on the symbols and the possible operating modes.

## “STAND-BY” MAIN MENU

When the boiler is turned on, two operating modes are possible. These ones constitute the MAIN MENU from which it is possible to set any operating mode required or view the boiler status at any time. The characteristics of the possible options for each of the MAIN MENU pages are given below:

### Page 1 - STAND-BY (Pict. 5.1)

In this mode the device is powered on but all functions regarding the supply of domestic hot water or central heating are inactive. In this mode the central heating system pressure is displayed (in boilers with pressure transmitter) and the MAIN MENU can be entered by pressing button 1; to go back to the starting page (STAND-BY) press button 1 again (Pict. 5.2)

By pressing button 4, the **INFORMATION MENU** is accessed; to go back to the starting page, press button 4 again (Pict. 5.3)

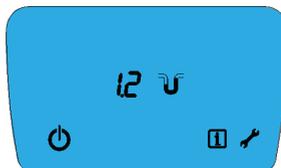
Consult the relevant chapters for menu exploring and menu functions: “FUNCTION”, “INSTALLER MENU”.

When in the STAND-BY mode, all fault indication modes remain active as do **the main maintenance functions for the diverter valve (when fitted) and the circulator unit together with the ANTI-FROST function.**

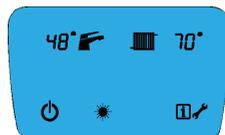
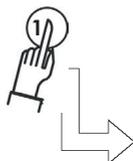
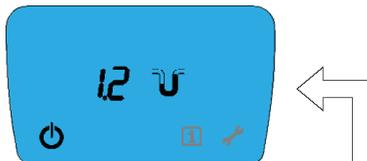


**In standby/off mode the boiler is inactive but its electricity supply is still connected!**

Pict. 5.1



Pict. 5.2



Pict. 5.3



## OPERATION MAIN MENU

The OPERATION page is the main page which is always displayed during the normal operation of the boiler.

In this page, the following symbols are always displayed:

### Central-heating only boilers

- The temperature of hot water in the CH circuit;
- The INFORMATION menu access symbol;
- The INSTALLER menu access symbol;
- The stand-by/off menu access symbol (Pict. 6.1).

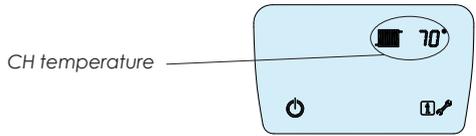
When the burner is operating the flame signal is displayed, with the radiator symbol flashing (Pict. 6.2). Based on whether devices such as the pressure sensor, external temperature sensor and OT timer thermostat are installed, the following are displayed respectively: the pressure of the central heating circuit with relative symbol and the OT timer thermostat present symbol. (Pict. 6.3).

### Boilers with domestic hot water production

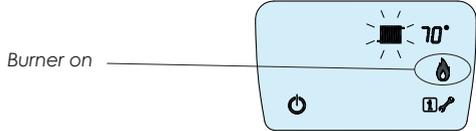
- The selected season.
- The DHW temperature set.
- The temperature of the water in the CH circuit.
- The INFORMATION menu access symbol.
- The INSTALLER menu access symbol.
- The standby/off menu access symbol. (Pict. 6.4)

When the burner is lit and running in order to produce domestic hot water, the tap symbol flashes and the temperature of the supplied domestic hot water is displayed. During heating of the central heating circuit water, the radiator symbol flashes alternatively to the C.H. temperature: in both cases, the flame symbol is always displayed (Pict. 6.3). Based on whether devices such as the pressure sensor, external temperature sensor and OT timer thermostat are installed, the following are displayed, respectively: the pressure of the central heating circuit with relative symbol, the external sensor present symbol and the OT timer thermostat present symbol. (Pict. 6.6).

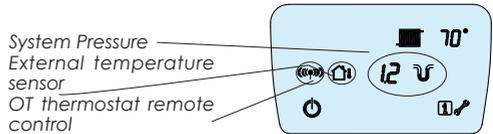
Pict. 6.1



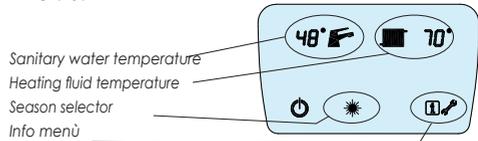
Pict. 6.2



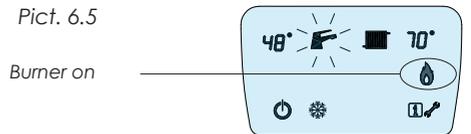
Pict. 6.3



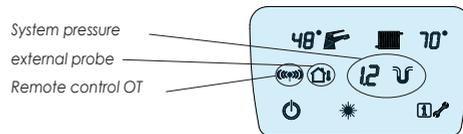
Pict. 6.4



Pict. 6.5



Pict. 6.6



## SEASON SELECTION

The boiler has two operating modes, which depend on the basic configuration, in response to the external temperature or the user requirements. These modes can be selected from the OPERATION page:

### Boilers with domestic hot water production

**SUMMER** mode deactivates all central heating functions, maintaining only domestic hot water production. When the boiler is in this mode the SUN symbol is displayed on the function page (Pict. 7.1).

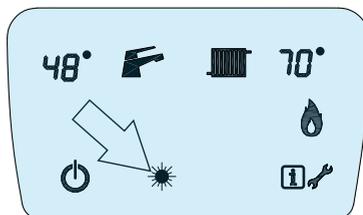
- **WINTER** mode, in which all central heating and domestic hot water production functions are active. When the boiler is in this mode the SNOWFLAKE symbol is displayed on the function page (Pict. 7.2).

- To select the desired mode, press button 2.

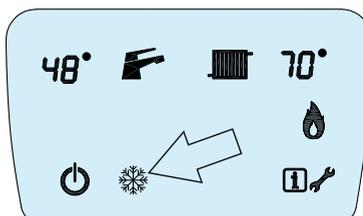
### Central-heating only boilers

The season selection option is not available in central heating only boilers. The device can therefore be in standby mode (Pict. 5.1) or else operational, ready to supply the only service which it has been manufactured for (Pict. 7.3).

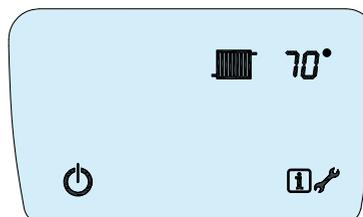
Pict.. 7.1



Pict.. 7.2



Pict.. 7.3



## TEMPERATURE REGULATION

### Boilers for domestic hot water production

It is possible to regulate the temperature of the domestic hot water supplied as well as that for the central heating. The set temperature will be reached, if possible, when supplying these services and maintained at the set value, allowing the user requests to be satisfied in both cases.

The temperature supplied for both modes is continuously displayed near the relative symbol when the functions are active: the radiator for the central heating and the tap for domestic

hot water.

When the boiler is in standby the DHW temperature displayed is the set value.

### Setting DHW temperature

Press one of the two buttons upon the tap symbol (5-6): the set and displayed temperature value starts flashing; then press the  button (6) to increase the temperature of DHW. Each time this button is pressed, an increase by 1°C is obtained. In order to decrease the DHW temperature, press the  button (5). Each

time this button is pressed, a decrease by 1°C is obtained.

Once the needed temperature value is set, do not press the (5-6) buttons anymore.

The new DHW temperature value will flash for 5 seconds, then it will be stored and displayed.

The minimum hot water temperature which can be set is 30°C, the maximum 60°C.

### Setting CH temperature

Press one of the two buttons upon the tap symbol (7-8): the set and displayed temperature value starts flashing; then press the (▶) button (8) to increase the temperature of CH. Each time this button is pressed, an increase by 1°C is obtained. In order to decrease the CH temperature, press the (◀) button (7). Each time this button is pressed, a decrease by 1°C is obtained.

Once the needed temperature value is set, do not press the (7-8) buttons anymore.

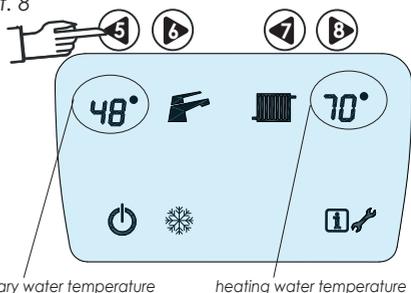
The new CH temperature value will flash for 5 seconds, then it will be stored and displayed.

The CH temperature values depend on the type of installation. For boilers used for high temperature systems, the temperature range is 50°C - 80°C, while for the ones used for low temperature systems, the temperature range is 27°C - 55°C.

### Setting heating temperature

If the "Summer" mode is active (the sun symbol is displayed), the device for modifying the CH temperature is disabled.

Pict. 8



In central heating only boilers, the temperature value for the single option which can be viewed on the display can be adjusted only. The central heating temperature setting is performed as previously described.

## INFORMATION MENU

Accessing the INFORMATION MENU allows various important parameters regarding the boiler adjustments and status to be viewed, allowing the state determining its operation to be known at any time. The displayed parameters cannot be modified.

To access the menu pages, press BUTTON 4. The menu can be accessed both when the boiler is in stand-by and when it is operating.

### Selecting the menu pages

In order to visualize the values of all the INFORMATION MENU parameters, after activating the initial page, press the (▶) button

(6) to scroll forward the pages and press the (◀) button (5) to scroll backward the pages.

The automatic exit from the menu happens after 60 seconds of device inactivity, or by pressing any button.

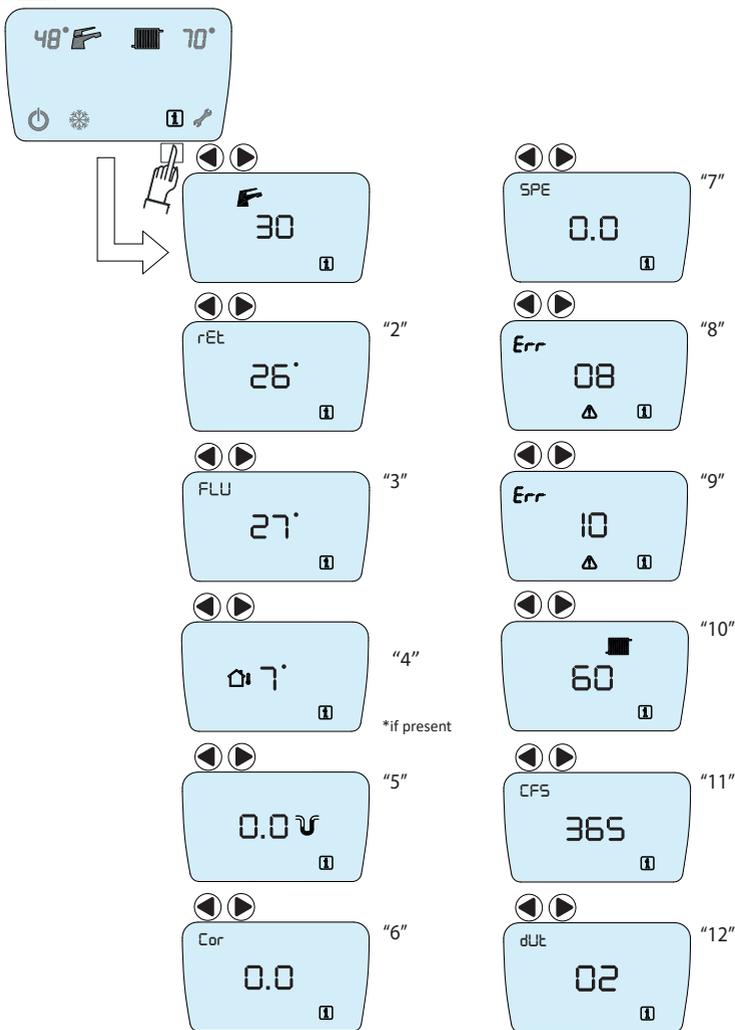
The display will return to last menu page active when the INFORMATION MENU was accessed.





**REQUEST INFORMATION ON CONNECTED DEVICES FROM AREA AUTHORISED INSTALLER**

Pict. 9



INFORMATION MENU LIST	
1	DHW temperature
2	Return sensor temperature
3	Flue gas probe temperature
4	External sensor temperature (if present)
5	CH circuit pressure
6	Ionization current
7	Fan speed
8	Last fault code
9	Second to last fault code
10	CH temperature
11	Days to ordinary maintenance expiration
12	Circulator Feedback

## OPERATION WITH ROOM THERMOSTAT

Energy savings regulations REQUIRE the boiler to be connected to a room thermostat in order to optimally regulate and maintain the temperature in domestic environments.



**ASK YOUR AREA INSTALLER FOR INFORMATION ON THE INSTALLATION AND OPERATION OF A ROOM THERMOSTAT.**

## OPERATION WITH EXTERNAL SENSOR

The boiler can be connected to an EXTERNAL sensor. In this mode, the system can regulate the central heating circuit temperature automatically based on the temperature measured by the suitably located sensor on the outside of the building.

Adjustments are made automatically to the central heating circuit temperature using a pre-loaded mathematical algorithm. Different “climate curves” can be selected by modifying the correct parameters, allowing the boiler to be optimized for a specific climatic area or season.



It is possible, in any case, to customize the central heating circuit temperature; by increasing or decreasing the central heating circuit temperature, the temperature itself (temperature offset) adapts to the selected climate curve.

**REQUEST INFORMATION ON INSTALLATION OF THE EXTERNAL SENSOR AND OPTIMAL REGULATION OF THE BOILER FROM YOUR AREA AUTHORISED INSTALLER.**

## OPERATION WITH OPEN-THERM TIMER THERMOSTAT

For optimum and even more economical management of the domestic premises it is possible to use the Easycontrol programmable timer thermostat. Easycontrol allows all main boiler functions to be managed remotely, allowing it to be fully managed from a different room to that where the boiler is installed. Easycontrol can also be used to schedule daily and weekly room temperatures and manage reduced demand periods (holidays, anti-frost and maintenance modes).

to connect the timer thermostat, and follow the already specified instructions in the “INSTALLATION OF ROOM THERMOSTAT”



chapter.  
Refer to the instructions for correct installation and use of the “Ecocrono” thermostat.  
To activate the O.T. communication it is necessary to select the corresponding parameter P13.

**REQUEST INFORMATION ON INSTALLATION OF THE EXTERNAL SENSOR AND OPTIMAL REGULATION OF THE BOILER FROM YOUR AREA AUTHORISED INSTALLER.**

## SPECIAL FUNCTIONS

### **Heating system Anti-frost function (all models)**

The anti-frost function is always active and prevents the heating system water from freezing.

If the heating circuit water temperature probe detects a too low water temperature, the circulating pump starts and the burner ignites at the minimum power.

The function remains active until the set temperature is reached, in order to prevent the heating system water from freezing.



**ALWAYS LEAVE THE BOILER POWERED ON AND THE SHUT-OFF VALVES OPEN, IF THE SYSTEM IS EXPECTED TO BE SUBJECT TO VERY COLD TEMPERATURES. THIS FUNCTION DOES NOT GRANT TO PREVENT THE HEATING SYSTEM FROM FREEZING, SINCE IT DEPENDS ON THE BOILER CONTINUOUS ELECTRIC POWER AND GAS SUPPLY.  
FOR INFORMATION ABOUT CONFIGURING THE BOILER TO PROTECT IT FROM FREEZING, ASK THE AUTHORIZED AREA INSTALLER.**

## DHW PRODUCTION OPERATION

All the CSP range of heat generators are equipped as standard with internal regulation for the management of the indirect domestic hot water preparation system, via the three-way valve and the storage probe (accessories) connected to various external storage tanks suitable for the specific comfort needs of the user (Annex system diagram: Diagram 1.2).

To this end, KLEINE KESSEL supplies as accessories:

- DHW storage tanks under the boiler or for installation near the heat generator.
- Three-way valve kit with 230V three-point actuator (without relay inside the actuator itself) and connector for electrical wiring.

- Immersion temperature sensor for storage NTC 10 K. The CSP heat generator is not suitable for combination with modulating or instantaneous domestic hot water preparation systems without accumulation. In the absence of the NTC 10 K immersion temperature sensor for DHW, a storage thermostat can be provided, taking care to parameterize it correctly [taking parameter A26 from 0 (default) = PROBETANK to 1 = TANK THERMOSTAT].

## ANTI-LEGIONELLA OPERATION

All the CSP range of heat generators are equipped as standard with internal regulation for protection against legionella.

The function is active only if the generator is configured for DHW storage (parameter A00 = 1) and if the storage sensor is wired and configured correctly (parameter A26 = 0).

it is possible to configure the anti-legionella function by intervening on the following parameters:

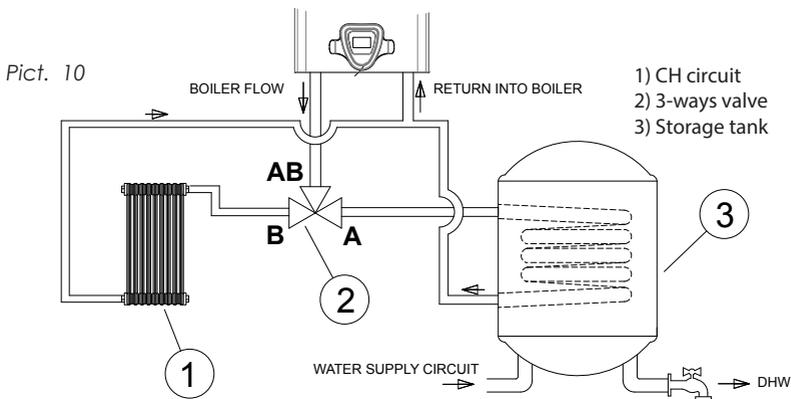
- Parameter A36, anti-legionella cycle activation frequency: freely configurable according to specific design requirements from 1 to 30 days, by default it is activated every 7 days.
- Parameter A37, DHW temperature during anti-legionella cycle: freely configurable according to specific design requirements from 60 to 85 °C, by default it is activated every 60 °C.
- Parameter A38, anti-legionella cycle maintenance time (minutes): freely configurable according to specific design requirements from 5 to 30 min., by default it is activated every 15 min.

## OPERATION WITH STORAGE TANK

The boiler can manage a DHW storage tank. All the functions which allow a quick installation and a precise and efficient control of systems for producing and supplying domestic hot water are available.

### HYDRAULIC CONNECTION TO DHW STORAGE TANK

In order to produce domestic hot water by a storage tank, it is necessary to connect the boiler primary circuit to the storage tank primary circuit. In order to control the DHW management and production and the heating function, it is necessary to introduce a 3-ways diverting valve in this hydraulic circuit, so that the DHW and CH functions are activated and used only when they are needed.



### 3-WAYS DIVERTING VALVE CONNECTION

The correct system operation depends on the correct diverting valve functioning. Therefore the correct functioning of the hydraulic connections must be carefully checked before powering the system on. The boiler is arranged for supplying the necessary power to activate the 3-ways diverting valve: AC230V

Inside the control panel a specific connector is there to connect:

- 1\_ the "common" line cable;
- 2\_ the "Open" line cable
- 3\_ the "Closed" line cable

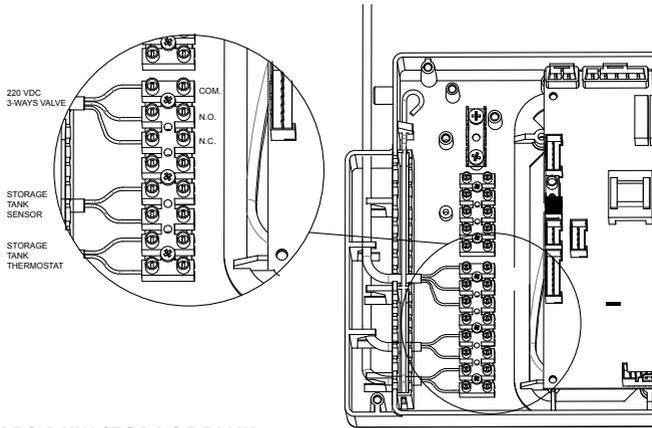
The "Open" and "Closed" modes determine the commutation from DHW (preparation of DHW storage tank) to CH. Their position depends on the type of diverting valve in use.

**THE CONNECTION FOR ACTIVATING THE DIVERTING VALVE ARE POWERED AT AC230V. MAKE SURE THE CONNECTIONS ARE CARRIED OUT WHEN THE BOILER IS POWERED OFF.**

**DIVERTING VALVES WITH ACTUATORS POWERED AT A DIFFERENT VOLTAGE FROM THE AVAILABLE ONE ARE NOT SUPPORTED.**



Pict. 11



## CONNECTION TO DHW STORAGE TANK

### DHW Storage with temperature control by NTC sensor

The boiler is arranged to be connected to a DHW storage tank supplied with a NTC sensor for a continuous DHW temperature control.

In order to connect the sensor, the terminal board inside the control panel must be accessed and the sensor cable terminals must be connected to the corresponding clips. NTC sensors are compatible with BETA ones = 3435-10K at 25°C.

### DHW Storage with temperature control by thermostat

The boiler is arranged to be connected to a DHW storage tank supplied with a thermostat for the DHW temperature setting and adjusting.

In order to connect the thermostat, the terminal board inside the control panel must be accessed and the thermostat cable terminals must be connected to the corresponding clips. The compatible thermostatic contact is at low tension (clean contact).

After the hydraulic and electrical connections have been effected, all the temperature control devices have to be connected.

In order to activate the DHW option with storage, the parameter A0=1 must be set from the installer menu. After the DHW option has been activated, the NTC sensor/thermostat has to be activated, by selecting respectively the parameter A18=0 (sensor) / A18=1 (thermostat) from the installer menu.

The boiler is ready to operate according to the available devices; in DHW mode, the display will show the  symbol and its set point temperatures (sensor) or the  symbol only (thermostat).

The request for DHW by storage tank has the priority towards the request for CH.

The presence of the NTC sensor for the DHW temperature control allows to select, by the multifunction knob, the desired DHW work temperature.

## ADJUSTMENT

While in DHW mode, by the A9 and A10 parameters from the installer menu it is possible to adjust:

- The primary circuit temperature during the preparation for the storage tank;
- The temperature difference between set point (set sensor) and the temperature detected by the DHW (only NTC sensor mode) for the burner ignition and switch off (isteresis).

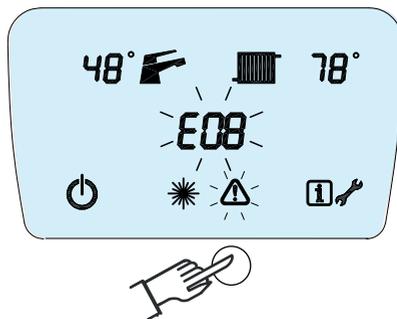
## FAULTS

All functions supported by the boiler are managed by a microprocessor-based system which, aside from allowing the system to run perfectly in order to maintain the greatest level of comfort possible, constantly monitors the functional parameters, ensuring they fall within the necessary safety interval by a wide margin, and therefore that all devices present are functioning perfectly.

Whenever the malfunction of any component or conditions which could compromise safe operation of the system are detected, the microprocessor system places the device into a limited operation mode or even completely prevents it from operating. The microprocessor system is able to detect and issue warnings for the main fault conditions to allow the system to be brought back to normal conditions as soon as possible. Fault warnings are given on the LCD display. The malfunction is detected and an intermittent warning displayed immediately, consisting of a number preceded by the error symbol E and by the relevant fault symbol (Pict. 10). Faults are displayed on any screen of the main menu.

Conditions causing transitory faults are possible. Many of these are recognized and cause a temporary block which is automatically reset once the condition causing the fault has stopped. Some of these provide for the possibility to attempt to restore operation manually.

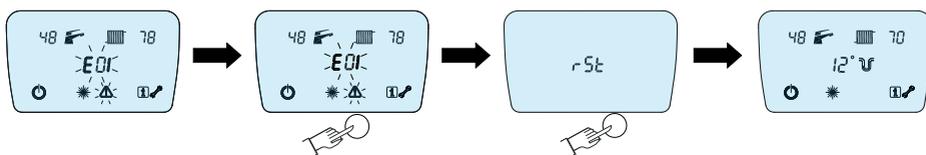
Pict. 12



### Manual error reset, recovery attempt

To manually reset the system following a fault condition, press the button 3: the RST symbol (reset) will be displayed on the LCD display. Press button 3 again (Pict. 13). The microprocessor will attempt to recover the system by resetting all the conditions presumed to have caused the fault. If the operation is successful the boiler will return to normal operation; if not, the error code causing the malfunction will be displayed again.

Pict. 13



**IF A FAULT IS NOT SOLVED AFTER 2 MANUAL RESET ATTEMPTS THEN THE AUTHORISED TECHNICAL ASSISTANCE CENTRE MUST BE CALLED.  
TAMPERING WITH ANY DEVICE MAY BE DANGEROUS AND ANNULS EVERY WARRANTY**

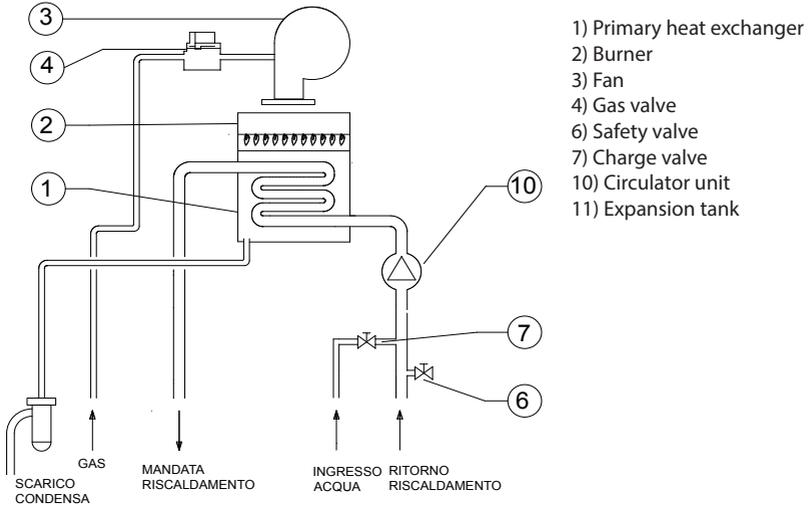
## FAULT CODES TABLE

Code	Possible cause	Behaviour	Possible actions
E01	Ignition failed	Boiler locked	Check gas presence Check gas line pressure Check ignition/detection electrodes Check electronic cable Check igniter
E03	Heating system temperature sensor fault	Boiler locked	Replace DHW sensor
E04	Domestic hot water system temperature sensor fault	DHW supplied in provisional mode Heating functions	Replace CH sensor
E06	High temperature detected by heating system sensor	Device in stand-by Normal DHW supply	Wait for automatic unlocking Check pressure to CH system
E08	Central heating system pressure too low	Boiler locked	Check pressure to CH system
E09	Over-temperature safety probe intervention	Boiler locked	Perform reset maneuver Contact technical support
E10	Central heating system pressure too HIGH (> 2.7 bar)	Boiler locked	Check pump functioning
E11	Pressure transmitter failure	Boiler locked	Check integrity of connection Replace pressure transmitter
E12	Remote control reset used-up	Boiler locked	Reset system Switch off power
E13	SYSTEM error	Boiler locked	Reset system Switch off power Replace electronic board
E17	Exhaust probe damaged or Exhaust overtemperature	Boiler locked	Reset the system or replace the probe
E23*	Fault on external temperature sensor	Resumption of operation without external sensor	Check position of external probe Check communication line Replace external sensor
E24	Return probe damaged	The boiler continues to operate with circulator always at maximum power	Replace the probe
E25	Central heating system temperature too low freezing risk	Boiler locked	If possible reset normal functioning conditions
E28*	Water cylinder / water heater probe failure	Boiler locked	Replace probe
E30	Fan fault feedback	Boiler locked	Check fan connections Replace fan
E31 - E33	Faulty safety probe	Boiler locked	Replace the probe
E60	Circulator PWM error	Circulator always at maximum power	Check wiring Replace the circulator
E61	Temporary circulator failure	The circulator works in emergency mode	Wait for normal conditions to be restored or replace the circulator
E62	Circulator failure	Boiler locked	Replace circulator
E75	Failure communication between electronic board and display board	Boiler locked	Reset system Switch off power Replace electronic board
E88	Failure OPEN THERM COMMUNICATION	Boiler locked	Check connection between boiler and Open Therm
E99	Parameter configuration error	Boiler locked	Check and reconfigure the parameters

## OPERATION DIAGRAM

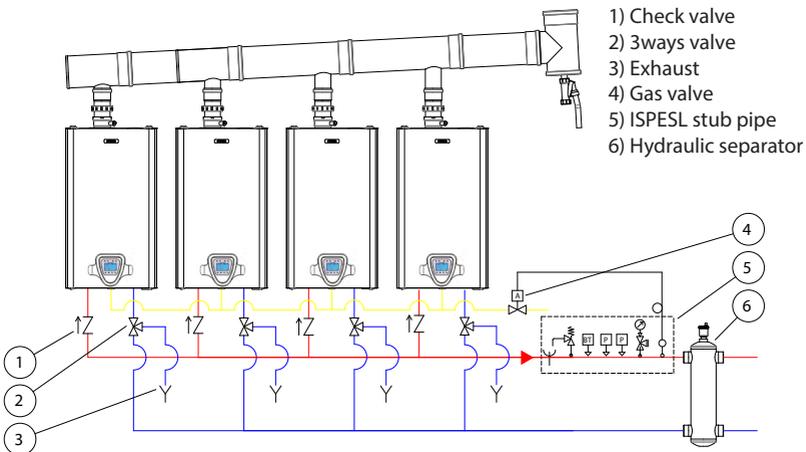
COMBINATION: DOMESTIC HOT WATER + CENTRAL HEATING

Pict. 14



## CASCADE INSTALLATION DIAGRAM

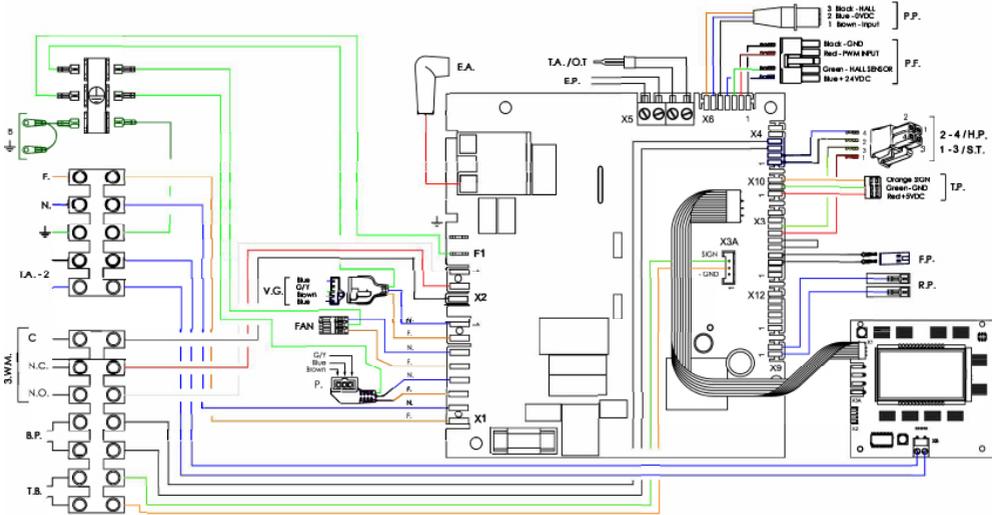
Pict. 15



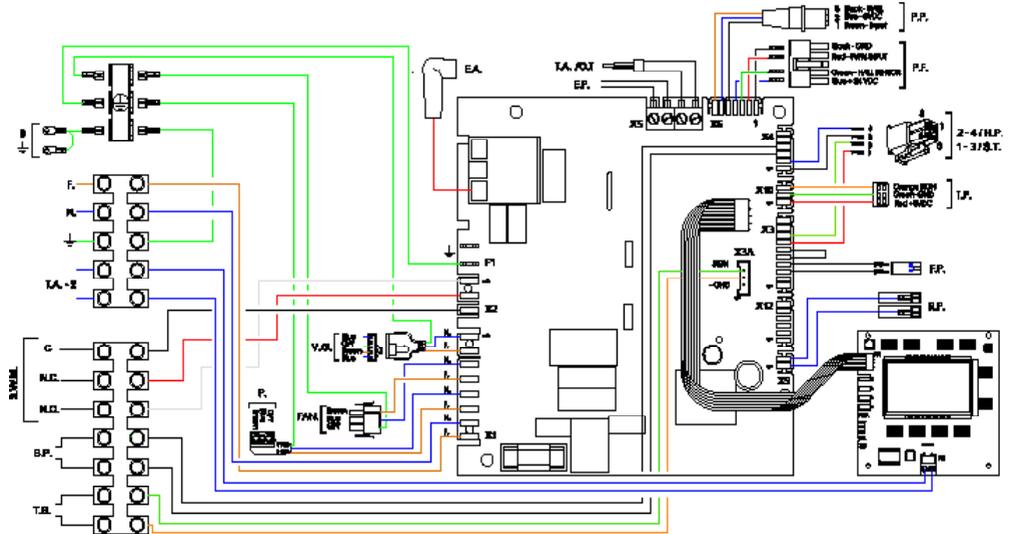
# ELECTRICAL WIRING DIAGRAM

CSP 45

Pict. 16



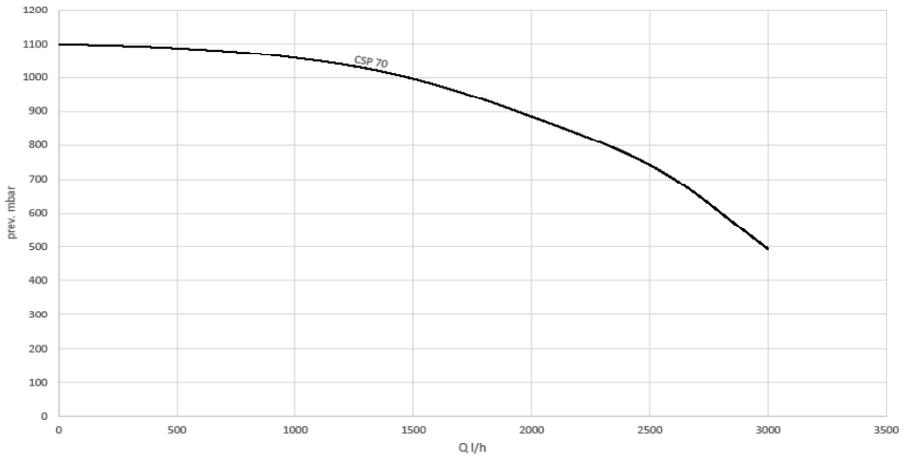
CSP 70



Connection list

3.W.M.	Three Way 230V	EP.	External probe	N.	Neutral	R.P.	Probe Return Heating	TP.	Transducer Pressure
B.	Earthing Boiler	F.	Fuse	N.O.	Normally Open	S.T.	Safety Thermostat	V.G.	Gas Valve
B.P.	Boiler Probe	FAN	Flue Aspirator	N.C.	Normally Closed	T.A./O.T.	Room Thermostat/Open Therm		
C.	Common	F.P.	Flue Sensors	P.	Circuit/zone 2	T.A. - 2	Room Thermostat Zone 2		
EA.	Ignition Electrode	HP.	Heating Probe	P.F.	PWM Fan	T.B.	Boiler Thermostat		

## GRAPHS FOR THE HEAD AVAILABLE TO THE SYSTEM



## INSTALLATION

### Use:

The boiler has been constructed according to the current technical standards and the most stringent safety rules. Despite this, improper use may endanger persons and property as well as damaging the boiler itself.

This boiler has been designed as a heat generator for closed-loop central heating systems and for the production of domestic hot water.

This boiler is only for heating water to a temperature below that of boiling point at atmospheric temperature.

Any use different from those outlined herein is to be considered improper. The manufacturer/ supplier declines any responsibility for damage or injury caused by improper use.

Using the boiler according to its design also means respecting the instructions given in the operation and maintenance manuals and observing the general inspection and maintenance conditions.

### General requirements

- Installation must only be performed by qualified

and licensed personnel. They also assume responsibility for correct installation, adjustment and commissioning. Adjustment, maintenance and repair of the boiler must only be performed by qualified and authorised personnel.

- Do not install the boiler in environments containing dust or strong vapours.

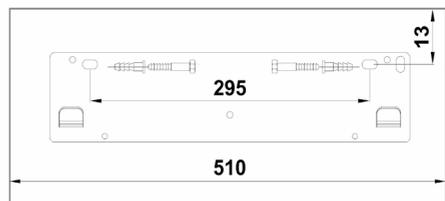
The presence of substances such as fluorine, chlorine, sulphur etc. (e.g. vapours from sprays, solvents or detergents, paints, adhesives or fuels) may cause the boiler's components or combustion gas evacuation system to corrode and become damaged.

*Pict. 17*

## FASTENING THE BOILER TO THE WALL

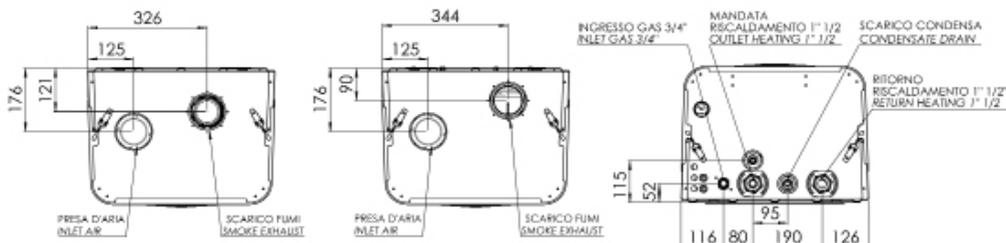
Hang the metal sheet template to the wall (Pict.17), paying attention to the boiler dimensions.

- Use a suitable bit to drill the holes indicated by the two wall plug symbols on the template.
- Insert two hooks into the holes and fasten the metal sheet template to the wall; then hang the boiler.



## LAYOUT OF CONNECTIONS

Pict. 18



## PLUMBING THE BOILER

Connect the water and central heating pipes to the boiler, respecting the positions and distances indicated (Pict. 18); take particular care when connecting pipes to ensure they are not placed under pressure in order to minimise the danger of future leaks. Use appropriate tools and procedures for tightening.



Flush thoroughly before connecting the pipes to ensure that any impurities present in the piping and radiators are completely removed.



Connect the safety valve outlet so that its operation would not cause any damage to persons or property

- Use piping of not less than 1/2" diameter
- Ensure that the line is always at atmospheric pressure by using suitable traps (do not connect pipes



directly to the valve outlet)

- Connect the safety valve outlet line to the household grey water drainage system
- Apply suitable protection to the drainage line – the water carried in it may be at high temperatures
- **THE MANUFACTURER ASSUMES NO RESPONSIBILITY FOR DAMAGE CAUSED TO PERSONS OR PROPERTY DUE TO OPERATION OF THE SAFETY VALVE DO NOT USE THE PLUMBING PIPEWORK CONNECTIONS AS EARTH POINTS FOR ELECTRICAL EQUIPMENT.**

## WARNING!!!

**PROTECT THE PRIMARY HEAT EXCHANGER BY THE USE OF THE CORROSION INHIBITOR FLUID EXCLUSIVELY SUPPLIED BY THE MANUFACTURER. OTHERWISE THE HEAT EXCHANGER WARRANTY SHALL DECAY.**

- Idraterm p.100 In 1% sol. For high temperature systems
- Idraterm p.140 In 1% sol. For low temperature systems

## FILLING THE SYSTEM

When all of the boiler connections have been plumbed in, it is possible to proceed to fill the central heating circuit. Perform the operation slowly to help all air bleed out of the system. When filling, check all the internal and external parts of the system to make sure they are perfectly tight.

- Open the bleed valves on the radiators.
- Gradually open the filling loop cock, ensuring that any automatic air bleed valves installed on the system are working correctly.
- Close the radiator bleed valves as soon as water starts to come out.
- Check on the boiler pressure gauge that a pressure of between 1.3 and 1.6 bar has been reached.
- Close the filling loop.



**Perform the filling and topping up of the system with the boiler completely off and all parts at ambient temperature.**

**Always close the filling loop cock once you have finished the operation.**

## CONNECTING THE CONDENSATE LINE

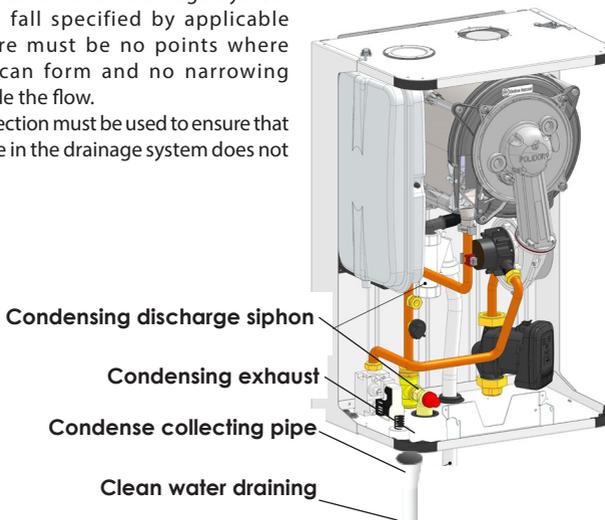
The CSP boiler is already fitted with a condensate trap to avoid the combustion products entering the environment it is installed in.

The boiler's connection to the condensate line must be inspectable and must drain into the household waste-water drainage system with a minimum fall specified by applicable regulations. There must be no points where standing water can form and no narrowing which could impede the flow.

An open type connection must be used to ensure that any formation of ice in the drainage system does not

impede the condensate flow. Pict. 19 shows how to connect the trap to the household drainage system.

*Pict. 19*



**IMPORTANT:**



To avoid gas dispersion in the environment, fill the condensate drain siphon before commissioning the boiler



The installer will be responsible for providing a condensation neutralization system if necessary

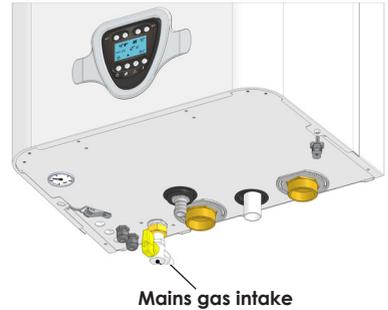


A check and possible cleaning of the siphon and the condensation drainage system is recommended at least once a year.

## CONNECTING TO THE MAINS GAS SUPPLY

Before connecting the boiler to the mains gas, check that it is designed to function with the available type of gas. Thoroughly flush all the gas pipes to remove any residues which could compromise correct operation of the boiler.

The gas supply must be connected to the boiler intake (Pict. 20), following all applicable regulations. Rigid metal piping or continuous-wall stainless-steel hose must be used and a shut-off valve must be connected before the boiler. Check that the flow rate from the line from the gas meter is sufficient to support the simultaneous use of all equipment connected to it. Check that there is no significant drop in pressure along the distribution line from the gas meter; pipes of sufficient diameter must therefore be used to satisfy this requirement.



Check that all connections are perfectly tight before opening the boiler's gas connection.



Check that all devices necessary for creating and limiting the maximum permissible pressure of the relative gas are installed in the system before opening the boiler's gas connection.

Do not use the gas supply



pipework connections as earth points for electrical equipment.

Always install a gas shut-off valve before the device. This must have a YELLOW valve handle and must be placed in a position which allows full access to it.

## CONNECTION TO THE MAINS ELECTRICAL SYSTEM

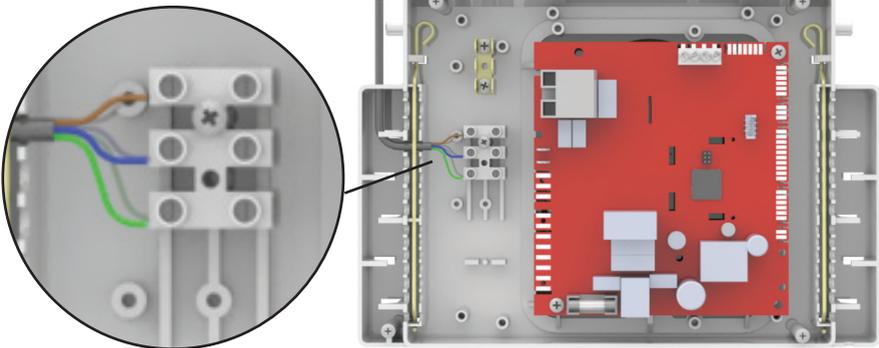
For safe installation of the boiler it must also be correctly connected to the mains electrical supply in accordance with all applicable regulations, and in particular it must be connected to a suitable protective earthing system.

The device is fitted with a three-core electrical cable supplied without a plug. It must be connected to the mains with a dedicated connection via a dual-pole switch whose contacts have an opening of at least 3 mm. It is important to respect the correct polarity (LIVE: brown cable / NEUTRAL: blue cable / EARTH: yellow-green cable) when wiring in the boiler. When installing or replacing the power-supply cable, the earth conductor must be left 2 cm longer than the others. If it is necessary to completely replace the pre-wired power-supply cable, it will be necessary to access the PCB compartment:

- Cut power to the boiler using the power switch installed before it.
- Remove the lower cover by removing the four screws; turn the instrument panel to the open position.
- Remove the rear case cover by unscrewing the 4 screws.
- Identify the terminals next to the PCB (Pict. 21) and disconnect the live, neutral and earth poles of the pre-wired cable; remove the cable.
- Connect the new cable in the same position
- Close the rear cover and screw it closed
- Return the panel to its operational position and reposition the lower protection.

**For connecting or replacing conductors, use H05VV -F, H05VVH2-F CEI EN 60228 or better rated cable.**

Pict. 21



A qualified electrician should check the suitability of the protective earthing system. The manufacturer is not responsible for any damage caused by the lack of a suitable earthing system. Check that the electrical connection is sufficient to satisfy the boiler's maximum power consumption, indicated on the boiler plate.



Extensions, adaptors or gang sockets must not be used when connecting the device to the mains electrical system.

Before accessing the internal components of the control panel, make sure that the boiler is turned off.



## COMBUSTION GAS EVACUATION SYSTEM: COMPATIBLE APPLICATIONS

The boiler is a type B23p fan-assisted device the evacuation system. flue must be connected to a combustion gas

## AIR INTAKE AND COMBUSTION GAS EVACUATION SYSTEM: IMPORTANT INFORMATION



**FOLLOW APPLICABLE LEGISLATION AND REGULATIONS TO THE LETTER.**

**INSTALL AIR INTAKE AND FLUE EVACUATION SYSTEMS CONFORMING TO THE SPECIFICATIONS GIVEN ON THE TECHNICAL DATA PLATE AND OBSERVE ANY LIMITATIONS ARISING FROM APPLICABLE LEGISLATION AND REGULATIONS TO THE LETTER.**

**ONLY USE APPROVED COMPONENTS FOR AIR INTAKE AND COMBUSTION GAS EVACUATION SYSTEMS WHICH ARE OF THE CORRECT DIMENSIONS AND PURPOSELY DESIGNED AND MANUFACTURED FOR THE PURPOSE.**

**FOLLOW INSTALLATION INSTRUCTIONS TO THE LETTER.**

**INSULATE ANY FLUE SECTIONS WHICH WILL BE EXPOSED TO LOW TEMPERATURES.**

**WHENEVER NECESSARY, PLACE APPROPRIATE CONDENSATE TRAPS ON THE FLUE EVACUATION LINE:**

**Ensure the following before commissioning the boiler:**

- **THAT THE FLUE EVACUATION AND AIR INTAKE LINES ARE PERFECTLY SEALED.**
- **THAT THEY ARE CORRECTLY POSITIONED AND FASTENED.**
- **THAT THERE ARE NO MECHANICAL, THERMAL OR CHEMICAL STRESSES ON THE LINES WHICH COULD EVEN MOMENTARILY COMPROMISE THEIR INTEGRITY.**

**INSTALL SYSTEMS TO ABSORB ANY THERMAL EXPANSION WHEN THE SECTIONS OF FLUE DUCTING ARE LONGER THAN THE MINIMUM SPECIFIED LENGTHS.**

## All maintenance operations MUST BE PERFORMED BY QUALIFIED PERSONNEL.

These operations must also be performed in full compliance with all applicable legislation and regulations. The boiler should

be inspected by a qualified technician at the end of every heating season (winter) and whenever else it is considered necessary in order to keep it in optimum operating condition.

## PRELIMINARY MAINTENANCE OPERATIONS

- Declaration of conformity check.
- Check the log book.
- Check that the Instruction Manual is present.
- Visual check of the installation (in conformity with applicable regulations).
- Visual check of the flue system.
- Check that combustion gases are being properly evacuated.

## GENERAL MAINTENANCE OPERATIONS

- Clean any deposits on the heat-exchanger fins.
- Remove any oxidation on the burner.
- Check that the boiler ignites, turns off and functions correctly.
- Visual check for leaks in gas and water pipes and unions.
- Check that the safety devices are operational.
- Check that the boiler's control and regulation devices are functioning correctly.
- Check that the combustion gas evacuation device and/or duct is in good condition and operating correctly.
- Perform a visual check that the safety valve outlet is not blocked.
- Check hydraulic system static pressure.



If any components of the boiler require replacement, original spare parts supplied by the manufacturer must be used. Use of other components could compromise correct operation of the device. The manufacturer declines any responsibility for consequences linked to the use of non-original spare parts.

At the end of the maintenance procedure a report must be prepared and left with the owner. This must contain the findings of the inspection, any work performed and any recommendations.

## SERVICE FUNCTION

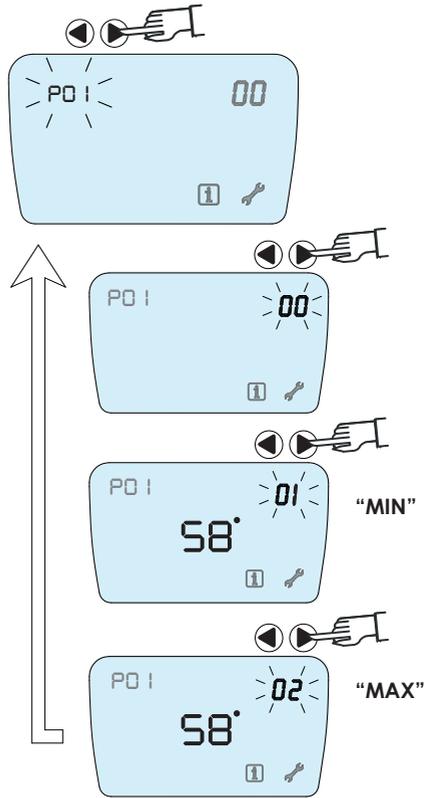
This function allows the boiler to be run at minimum and maximum power conditions during maintenance and adjustment operations, independently of the room thermostat signals.

**The boiler installation must be completed before activating the "SERVICE" function. Before activating this function check that all conditions specified in the "Commissioning" chapter have been satisfied.**

**Activating the function:**

To activate the function it is necessary to access the MENU and activate the relative modes from the dedicated page. Refer to the

**procedures indicated in the relative chapter (page 32) to access the configuration MENU.** Enter the "PARAMETER MENU" and select page "P01" by using the button 6. Press one of the two buttons upon the digits displayed next to the relevant page. The value will begin to flash. Press button 8 to increase the displayed value and button 7 to decrease it.



**ENSURE THAT:**

**THE CENTRAL HEATING SYSTEM IS CHARGED AND PRESSURISED ANY SHUT-OFF VALVES FITTED TO THE CH FLOW AND RETURN AND ON THE GAS LINE ARE OPEN AND THAT THE GAS SUPPLY IS AVAILABLE ANY CONTROL VALVES ARE TURNED TOWARDS THE SYSTEM THE SPECIFICATIONS FOR CORRECT INSTALLATION AND COMMISSIONING OF THE BOILER HAVE BEEN OBSERVED.**

If the function remains activated for long periods of time an increase in pressure may occur in correspondence with the system's terminals.

All safety measures are active when in SERVICE mode, in particular those for the control of the maximum temperature in

the central heating circuit via the flow temperature sensor; on reaching 90°C the function is suspended.

The boiler exits the function automatically after 20 minutes of operation, or selected the current value which returns the boiler to normal operation is assigned.

## DATA PLATE

Pict. 23 - TECHNICAL DATA PLATE

<p>Boiler type: <b>A</b>                  Serial number: <b>B</b>                  Code: <b>C</b>                  Country of destination: <b>D</b>                  Manufacturer: <b>E</b>                  Gas: <b>F</b></p>	<p style="text-align: center;">0 <b>CE</b></p> <p>Cat.: <b>G</b>                  Type: <b>H</b>                  Date: <b>I</b>                  PIN Code: <b>J</b>                  Nox class: <b>K</b></p>	<p>0= Supervisory body                  A= Type of boiler                  B= Boiler model                  C= Serial Number                  D= Code                  E= Country of destination                  F= Manufacturer                  G= Category                  H= Approved types of exhaust exchange configuration                  I= Date of production                  J= P.I.N. product identification number                  K= NOx Class                  L= Set by gas type                  L/a= Load                  L/b= Supply nominal pressure                  L/c= Pressure min/max                  M= Thermal load min                  M/a= Thermal load max                  N= Useful load min                  N/a= Useful load max                  O= Useful load in condensing                  P= C.H. work pressure                  Q= C.H. work temperature                  R= D.H.W thermal load if different from M min.                  R/a= D.H.W thermal load if different from M/a max                  S= A.C.S. specific flow rate according to EN625-EN13203-1                  T= D.H.W work pressure                  U= D.H.W work temperature                  W= IP protection rate                  X= Gas consumption                  Y= Operating temperature                  Z= Power supply</p>
<p>..... Natural gas G20                  ..... G31                  C.H. Circuit</p>	<p style="text-align: center;">Flow                  L/a (m<sup>3</sup>/h)                  L/a (kg/h)</p> <p style="text-align: center;">Pressure                  L/b (mbar)                  L/b (mbar)</p>	<p style="text-align: center;">Pressure min/max                  L/c (mbar)                  L/c (mbar)</p>
<p>Thermal power                  Useful load                  Useful load in condensing                  Pressure</p>	<p style="text-align: center;">M (kW min.)                  N (kW min.)                  P (bar)</p>	<p style="text-align: center;">M/a (kW max)                  N/a (kW max)                  O (kW max)                  Work temperature: Q(C°)</p>
<p>D.H.W. Circuit                  Thermal load:                  Specific flow Δt25:                  Work Pressure:</p>	<p style="text-align: center;">R (kW min.)                  S (l/min.)                  T (bar)</p>	<p style="text-align: center;">R/a (kW max)                  Work Temperature: U(C°)</p>
<p>IP protection rate: <b>W</b>                  Work Temperature: <b>Y(C°)</b></p>	<p style="text-align: center;">Electric power: <b>X(W)</b>                  Power supply: <b>Z</b></p>	

## POWER ADJUSTMENT

When supplied, the boiler is already set up to function optimally with a specific type of gas, which can be identified by consulting the technical data plate present on the rear of the instrument panel.

**It is in any case ALWAYS necessary to check the following before running the device:**

### Commissioning

- That the device has been correctly located and installed in a location satisfying all the manufacturer's requirements as well as any applicable legislation and regulations.
- That the boiler is correctly plumbed in.
- That the central heating circuit is filled with water at a suitable pressure.
- That the central heating circuit and all the boiler's hydraulic connections are perfectly tight.
- That the boiler is connected to the mains electrical supply according to the electrical code and any other applicable regulations.
- That the boiler is connected to the combustion gas evacuation system in accordance with all applicable legislation and regulations and that the manufacturer's specifications and compatible methods listed on the technical data plate (Pict. 23) are respected. **Failure to carry out these checks may make the boiler's operation extremely dangerous to**

**the health of people and animals.**

- That the gas supplied by the mains network connected to the boiler corresponds to that indicated on the data plate and for which the boiler is set up.

**Running the boiler on gas which is incompatible with the specifications on the boiler data plate can prove extremely dangerous to people and property as well as causing irreparable damage to the device itself.**

- That the entire gas distribution line both inside and outside the building, as well as inside the device, where applicable, is tested for tightness.

**- That the gas line meets all applicable legislation and regulations, in particular: That a gas shut-off valve is installed immediately before the device. This must have a YELLOW valve handle and must be placed in a position which allows full access to it.**

Commissioning / periodically:

- Check that the above specifications have been maintained and that the boiler is in perfect working order
- Check the dynamic pressure of the mains gas supply.
- Check the gas pressure in the burner at different outputs.

## TESTING THE GAS SUPPLY DYNAMIC PRESSURE:

- Remove the iron cover by loosening the 4 fastening clips.
- Free up access to the gas valve by rotating the instrument panel to the open position (Pict. 24).
- Loosen the screw holding the pressure outlet upstream of the regulator and connect it with silicone tubing to the + input of a differential manometer with an appropriate range (at least 0 - 50 mbar), leaving the second input free if present – (Pict. 24).
- Turn on the gas supply by opening the shut-off valve located on the meter and open the gas cock before the boiler.
- Use the FLUE CLEANING function to bring the boiler to maximum power.
- Measure the gas pressure before the regulator (dynamic mains supply pressure). - Check that the value measured with the manometer falls within the max-min interval given in the “Dynamic mains supply pressure” table for the specific type of gas.



**Whenever dynamic pressures below the specified minimum levels should be found:**

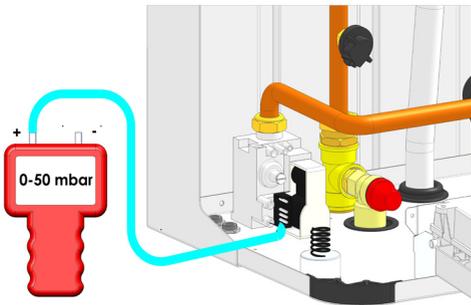
- Check that there are no kinks, blocks or other impediments to the normal gas flow in the gas supply line to the boiler.
- Check that the diameter of piping used for the gas supply line is sufficient and constant along the whole length.
- Check that there are no elements in the supply line which could lead to excessive pressure drops, e.g. too many bends, changes of direction, excessively long or countersloping sections etc.
- Consult the gas company on the specified minimum supply pressure values.

Pict. 24



**Whenever dynamic pressures above the specified maximum values should be found:**

- Install a suitable pressure reducer/regulator on the gas supply line before the boiler.
- Adjust the dynamic pressure of the gas via the regulator, if already present.



DYNAMIC PRESSURE mbar (MAINS)			
G20 (NATURAL GAS)		G31 (PROPANE)	
min	max	min	max
17	25	25	37

## ANALYSIS - CHECKING AND REGULATING COMBUSTION

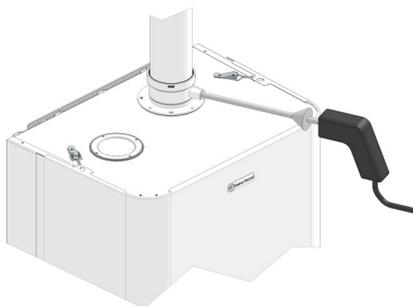
The boiler comes already calibrated and tested for the requested type of gas, however it is advisable to check that the type of gas supplied in the mains and the supply pressure are correct. If this should not be the case, follow the procedures described in this section.

For a correct regulation could be necessary to repeat twice the regulation of the maximum one and the minimum one)

### MAXIMUM POWER:

- Use the FLUE CLEANING function to bring the boiler to maximum power.
- Insert the combustion analyser probe in the inspection outlet provided in the flue (Pict. 25). After the boiler has been running for 2-3 minutes, run the analysis and check that the CO<sub>2</sub> measured by the analyser corresponds to the value indicated in the table for maximum power.
- If the CO<sub>2</sub> does not correspond, regulate with screw "N" (Pict. 25) of the ratio adjuster until the specified CO<sub>2</sub> value is obtained. Turn clockwise to decrease the CO<sub>2</sub> value, anticlockwise to increase it.

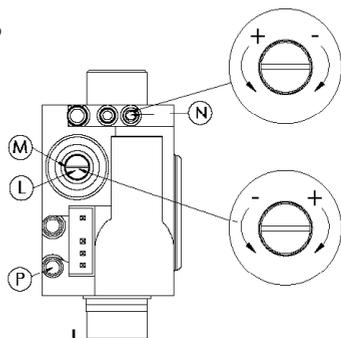
Pict. 25



### MINIMUM POWER:

- Use the FLUE CLEANING function to bring the boiler to minimum power.
- Wait a few seconds for the ignition phase to complete and the boiler to bring itself to minimum power.
- After the boiler has been running for 2-3 minutes, run the analysis and check that the CO<sub>2</sub> measured by the analyser corresponds to the value indicated in the table for maximum power.
- If the CO<sub>2</sub> value does not correspond, regulate with screw "M" (Pict. 26) of the ratio adjuster after removing the protective cover "L" until the specified CO<sub>2</sub> value is obtained. Turn clockwise to increase the CO<sub>2</sub> value, anticlockwise to decrease it.

Pict. 26



It may be necessary to repeat the maximum and minimum adjustment twice to obtain correct regulation.

CO2 VALUES		G20 METHANE		G31 LPG	
	UdM	CSP 45 kW	CSP 70 kW	CSP 45 kW	CSP 70 kW
CO2 power max	%	8,9 + 0,1 - 0	9,1 + 0,1 - 0	10,4 + 0,1 - 0	10,3 + 0,1 - 0
CO2 power min	%	8,7 + 0,1 - 0	9,0 + 0,1 - 0	10,2 + 0,1 - 0	9,9 + 0,1 - 0
Minimum network pressure	mbar	17	17	25	25
Maximum network pressure	mbar	25	25	45	45



### WARNING!

After finishing the gas supply pressure tests:

- Disable the FLUE CLEANING function.
- Place the device in stand-by (off).
- Disconnect the micromanometer connected before the gas regulator.

### TIGHTEN THE PRESSURE OUTLET SCREW UNTIL IT SEALS.

- Press the gas valve regulation screws cover closed.
- Return the instrument panel to its operating position, fastening if necessary.
- Refit the lower cover, fastening it with the screws.
- The SERVICE function may be activated by setting the season selector in winter mode.

## CHANGING GAS TYPE

When necessary, it is possible to modify the boiler to run on types of gas which are supported but which the boiler was not set up for in the factory. This modification concerns in particular

the change from NG (natural gas) to LPG (butane / propane) and vice versa. In order to perform this change the boiler's basic configuration must be modified to that necessary to support the supplied type of gas.



### CONVERSIONS MUST ALWAYS BE PERFORMED BY QUALIFIED PERSONNEL

Proceed as follows to change the system:

#### CHANGING FROM NATURAL GAS (NG) TO LPG

- CONFIGURING THE SOFTWARE
- REGULATING COMBUSTION
- APPLY LABEL B1 ON THE GAS VALVE AFTER REMOVING THE OLD LABEL

#### CHANGING FROM LPG TO NG

- CONFIGURING THE SOFTWARE
- REGULATING COMBUSTION
- APPLY LABEL B2 ON THE GAS VALVE AFTER REMOVING THE OLD LABEL

#### CONFIGURING THE SOFTWARE FOR A CHANGE IN GAS TYPE:

- To adapt the supply driver of the gas regulation valve modulator it is necessary to enter the "CONFIGURATION MENU" (see page 30 for how to access this menu) and view the value of parameter "A01".
- Set the parameter according to the gas supply and the change performed, following the values given in the table below:

Adjust the values of parameter A13 / A14 as per table B

Value	Gas	Parameters
A01	Methane	0
	LPG	1
A13	Methane	18
A14	LPG	28
A13	Methane	19
A14	LPG	20

CSP 45

CSP 70

Table B  
Pict. 27

<p><b>APPLIANCE CONVERTED : G31 TO GAS</b></p>	<p>Conversion performed on date: ___/___/___</p> <p>Signature of service: _____</p>	<p>SET ACCORDING TO: GPL G30 - G31</p>
<p><b>APPLIANCE CONVERTED : G20 TO GAS</b></p>	<p>Conversion performed on date: ___/___/___</p> <p>Signature of service: _____</p>	<p>SET ACCORDING TO: METANO G20</p>
<p>SET ACCORDING TO: METANO G20</p>	<p>To be returned to G20 Engineering with a copy of the warranty certificate and/or Appendix G of 1st commissioning</p> <p>Converted to <input type="checkbox"/> G20 <input type="checkbox"/> GPL on ___/___/___</p> <p>Signature of service: _____</p>	<p>SET ACCORDING TO: GPL G30 - G31</p>



**BEFORE COMMISSIONING THE NEWLY CONFIGURED BOILER IT IS NECESSARY TO CHECK THE GAS SUPPLY PRESSURE BEFORE THE BOILER AND MEASURE AND ADJUST THE GAS PRESSURE AT THE BURNER. REFER TO THE PRESSURE VALUES AND PROCEDURES GIVEN FOR EACH SPECIFIC GAS IN THE "TESTING THE GAS SUPPLY DYNAMIC PRESSURE:" CHAPTER (Page 28).**

Complete the change by attaching the label A1/A2 indicating the change to the new type of gas for which the boiler has now been configured, near the technical data plate located on the rear instrument panel cover.

#### REGULATING COMBUSTION:

Carry out the combustion adjustment as described on page 28, chapter "Analysis-verification of combustion regulation". If necessary, check and adjust the ignition speed by changing the parameter "A15" for LPG or "A16" for NG

## ACCESSING THE CONFIGURATION MENU

It is possible to view information or per for complete configuration of the boiler by accessing the pages of CONFIGURATION MENU. Accessing the CONFIGURATION MENU, aside from displaying information on the state or presence of most of the devices, also allows the configuration parameters to be altered, therefore substantially influencing the device's operation.



**ACCESS TO THE "CONFIGURATION MENU" IS EXCLUSIVELY RESERVED FOR TECHNICIANS WITH THE NECESSARY QUALIFICATIONS AND LICENSES ARBITRARY MODIFICATION OF ANY PARAMETER CAN CAUSE MALFUNCTIONING OF AND DAMAGE TO THE BOILER, AS WELL AS CREATING A DANGEROUS SITUATION FOR PERSONS AND PROPERTY.**

### Accessing menu pages:

Press button "4" for more than 5 seconds; "P" letter and "00" number will be displayed on the left, on the right the relevant value (Pic. 28).

### Selecting a page from menu:

Information of the menu are arranged into pages corresponding to a code that identifies a parameter and its relevant value. To select a page scroll pages by pressing buttons "5"- "6".

### Modify parameters setting:

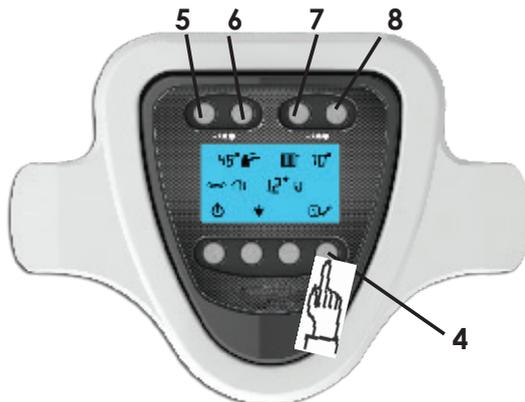
After selection of a parameter, modifying its value by pressing button "8" to increase and "7" to decrease. To store the value press button "6".

To exit without saving set the required value, press button "6" to return to page modification and press button "8" or wait for the automatically return to main menu.

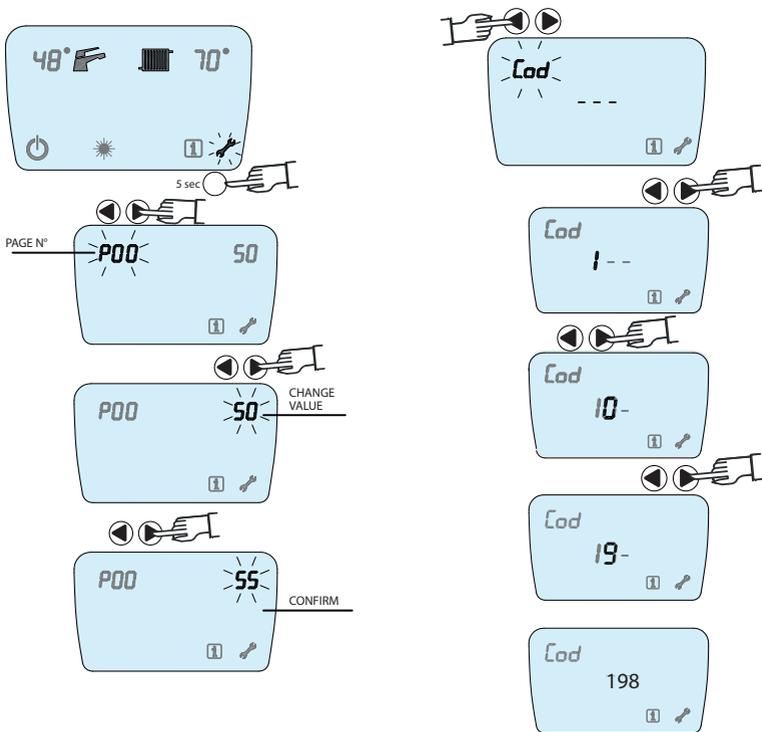
### Accessing installer menu by password:

Press button "4" for more than 5 seconds, "00" will appear. By pressing button "5" the word "Cod" will appear and then "---", enter the first value pressing buttons "7" and "8", confirm pressing button "6", then enter in sequence second and third value. Once the code "198" is entered, confirm by pressing button "6". At this point the access to all parameters "Axx" is achieved.

Pict. 28



Pict. 29



THE DESCRIPTIONS AND VALUES GIVEN IN THE TABLE BELOW ARE ONLY TO BE USED WHEN IT IS NECESSARY TO CHECK THE CONFIGURATION. MODIFICATION OF THE PARAMETERS CAN CAUSE THE BOILER TO MALFUNCTION AND BE DAMAGED OR DESTROYED.

## CONFIGURATION MENU

Pag	Description	Min	Max	Default
P0	ALL PARAMETER MODIFICATION ENABLE CODE	0-99		198 INSTAL.
P1	SERVICE FUNCTION	0 = deactivated 1 = minimum power 2 = maximum power		0
P2	RESET SERVICE	1 = boiler power day/hour timer reset		
P3	Deaeration program	0 = deactivated	1 = enabled	1
P4	Ramp CH (minutes)	0	10	2
P5	Anti frequent ignition parameter min	0	255	3
P6	Plate heat exchanger preheating	0 = not enabled	1 = enabled	0
P7	DHW preheating offset (minutes)	0	10	3
P8	Minimum water flow	0 = not enabled	1 = enabled	1
P9	Delay time for activation of DHW request (seconds)	0	10	0
P10	Anti-water hammer function in diverter valve switching	0 = not enabled	1 = enabled	1
P11	Activation external probe	0 = deactivated	1 = activated	0
P12	"K"climate curve parameter	10	30	10
P13	Selection T.A. or O.T.	0 = T.A.	1 = O.T.	0
P14	Anti-legionella function activation	0 = deactivated	1 = activated	1
P15	Loading / unloading function	0 = deactivated	1 = activated	1

Pagina	Descrizione	Min	Max	Default
A00	Boiler type setting	0 = combination with plate heat exchanger 1 = combination with DHW storage tank 2 = central heating only 3 = combination with bithermal primary heat exchanger 4 = Water Heater		2
A01	Gas type setting	0 Natural gas	1 LPG	0
A11	Modulating circulating pump	0 = deactivated	1 = activated	1
A12	System type	1 = High temperature	2 = Low temperature	1
A13	Burner ignition power % with NATURAL GAS supply	0	99	18 Per CSP 45 19 Per CSP 70
A14	Burner ignition power % with LPG supply	0	99	28 Per CSP 45 20 Per CSP 70
A15	Burner maximum power % with LPG	0	99	99 Per CSP 45 99 Per CSP 70
A16	Burner maximum power % with natural gas supply	0	99	99 Per CSP 45 99 Per CSP 70
A17	"Post circulation" time sec in CH	0	99	60
A18	Post circ. time in DHW sec.	0	99	60
A19	"Post ventilation" time sec	0	99	10

Pag	Descrizione	Min	Max	Default
A20	"Post ventilation" time sec in DHW	0	99	10
A21	$\Delta$ burner ignition in CH mode ° C	-10	+10	-5
A22	$\Delta$ burner shutdown in CH mode ° C	-10	+10	+5
A23	$\Delta$ burner ignition in DHW mode ° C	-10	+10	0
A24	$\Delta$ burner shutdown in DHW mode ° C	-10	+10	+4
A25	$\Delta T$ prim in DHW emergency ° C	0	+30	10
A26	Water tank temperature detection	0 = ntc probe	1 = thermostat	0
A27	Water tank preparing temperature ° C	+50	+80	80
A28	$\Delta$ water tank ignition preparing temperature ° C	-10	+10	-5
A29	$\Delta$ water tank shutdown preparing temperature ° C	-10	+10	0
A30	System maximum pressure (bar)	20	40	25
A31	System minimum pressure (bar)	5	11	5
A32	$\Delta t$ CH modulating circulator ° C	5	35	20
A33	Circulator minimum PWM in CH mode % RPM	20	60	50
A34	Circulator maximum PWM in CH mode % RPM	65	100	100
A35	Feedback on circulator PWM	0 (not enabled)	1 (enabled)	0
A36	Anti-legionella days frequency	1	30	7
A37	Anti-legionella temperature ° C	60	85	60
A38	Anti-legionella temperature holding time (minutes)	5	30	15
A39	230V diverter valve setting	0 = enabled zone 2° thermostat	1 = enabled in DHW	0

## INSTALLATION OF ROOM THERMOSTAT/OPEN-THERM

It is recommended, and in many cases mandatory, to connect the boiler to a device which monitors and regulates the temperature in the areas served by the boiler itself. The purpose of this device is to create the maximum comfort and maximum energy savings possible.

The main heating area can be managed both by a thermostat, and by a remote control electronic device called OT.

The appliance is supplied in TA Thermostatic Control configuration; **in order to activate Open-Therm control, it is necessary to connect the OT timer thermostat and enable it by accessing to CONFIGURATION MENU (see page 30) modifying parameter P13 from 0 to 1.**

For the correct installation of Room Thermostat or Open-Therm, refer to the instructions supplied by the thermostat manufacturer.

To connect the Room Thermostat or Open-Therm to the boiler it is possible to use the supplied two-core cable labelled "TA".

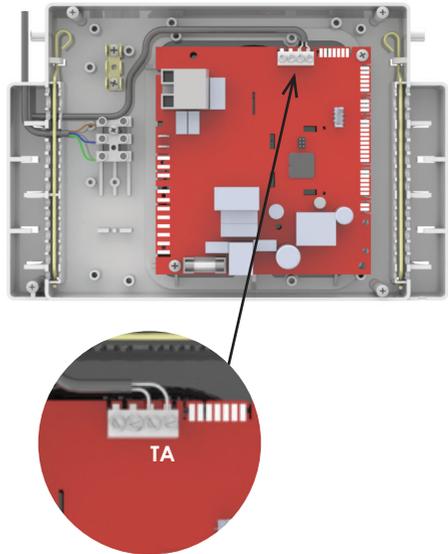
The connection to the boiler PBC is the same both for the Thermostat control and for the Open-Therm (see wire scheme at page 13, Connection x6).

Whenever necessary, replace the "TA" cable and connect it directly to the slot present in the PCB case as follows:

- Power the boiler off
- Remove the boiler iron cover by unscrewing the 4 fastening clips
- Rotate the instrument panel in "Open" position
- Remove the rear instrument panel cover by unscrewing the 4 screws
- Identify the two-pole terminal board located on the left-hand side of the PCB.

- Disconnect any cable which may be present by loosening the terminal screws and remove it completely
- Connect the wires from the thermostat cable to their respective slots (Pict. 30)
- Run the cable and hold it in position with the cable grip at the edge of the case
- Position the cable, running it under the cable gripping tabs on the side of the case
- Close the case cover with the 4 screws, paying attention that all the cables running out of the case are correctly positioned
- Return the electrical panel to the operational position (with the visible display)

Pict. 30



**COMPLETELY DISCONNECT THE DEVICE FROM THE ELECTRICITY SUPPLY BEFORE PERFORMING ANY OPERATION. USE THERMOSTATS COMPATIBLE WITH THE BOILER.**

## INSTALLATION OF EXTERNAL TEMPERATURE SENSOR

### Type and positioning:

Use an NTC 10K\_  $\beta$  3435 pre-wired sensor with protective cover.

Position the sensor outside the area to be heated facing NORTH/NORTH WEST, or in any case in a position with minimal exposure to direct sunlight and air currents (corridors, crawl spaces etc.). Fasten the sensor to a wooden or masonry structure which is thermally insulating, avoiding fixing it directly in contact

with metal structures and surfaces (guttering, arches, frames etc.). Avoid the sensor being even partially immersed in water, ideally ensuring it does not come into direct contact with ice formations, either. Where possible, install the sensor in an area protected (e.g. under roof overhang) or partially protected from bad weather, ensuring it is at least 3 - 4 m from the ground. The pre-wired sensor can be installed for all boilers.



**DO NOT USE SENSORS DIFFERENT FROM THOSE SPECIFIED, AS THIS COULD RESULT IN MALFUNCTIONING OF, DAMAGE TO AND EVEN DESTRUCTION OF THE BOILER.**

### Wiring:

Connect the sensor with insulated, dual-core cable with sheath of 5 – 6 mm diameter and conductor diameter of between 1 and 1.5

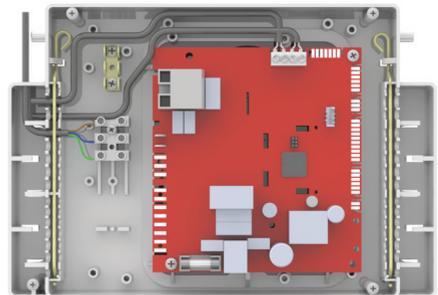
mm; the maximum recommended length is 40 - 50 m

Wire the cable from the sensor to the correct slot in the terminal block inside the PCB panel:



**COMPLETELY CUT THE POWER SUPPLY TO THE BOILER BY TURNING IT OFF AT ITS DEDICATED SWITCH**

- Remove the iron cover by loosening the 4 fastening clips *Pict. 31*
- Rotate the instrument panel to the open position
- Remove the rear instrument panel cover by unscrewing the 4 screws
- Identify the terminals next to the PCB
- Connect the wires of the sensor cable to their respective slots (Pict. 31).
- Run the cable and hold it in position with the cable grip at the edge of the case
- Position the cable, running it under the cable gripping tabs on the side of the case
- Close the case cover with the 4 screws, paying attention that all the cables running out of the case are correctly positioned
- Return the electrical panel to the operational position



## OUTDOOR TEMPERATURE SENSOR CONFIGURATION

Accessing the configuration menu (see page 30) : enter the password to enable parameter modification and change parameter "P11" from 0 to 1.

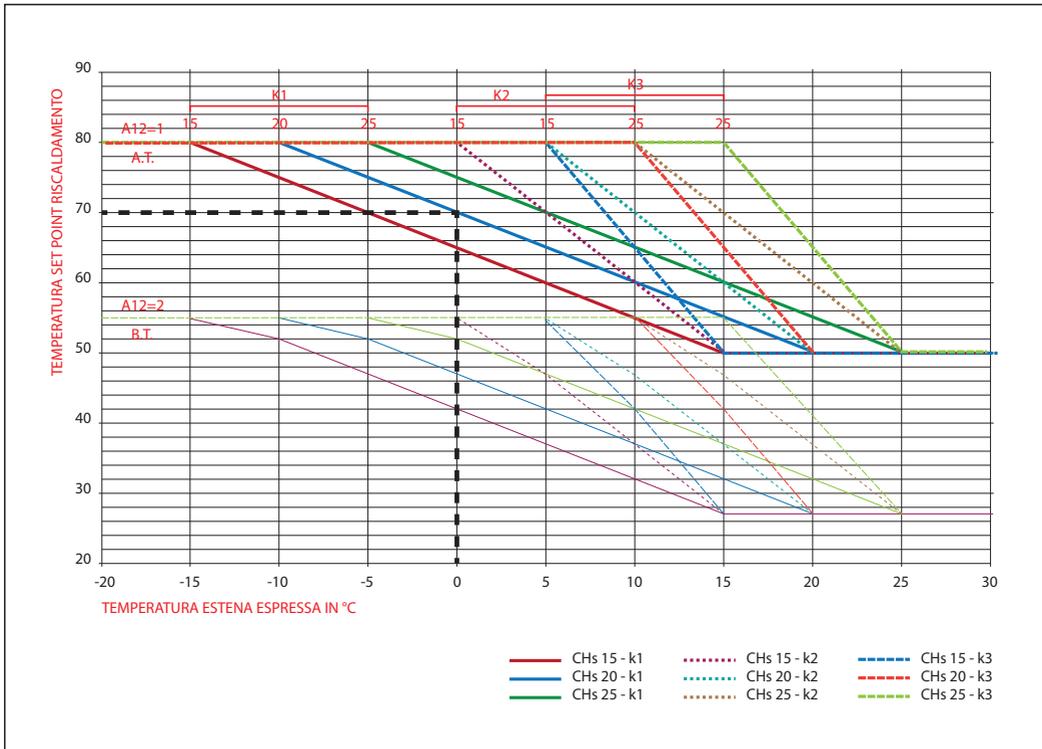
## CONFIGURING THE CLIMATE CURVE FROM THOSE AVAILABLE

Operation in external sensor mode makes the boiler heat the water in the central heating circuit to a temperature which depends on the temperature measured by the external sensor, in other words the temperature outside the heated building. Running in external sensor mode automates the boiler's response to climatic variations, allowing a high level of home comfort to be maintained while making significant savings in gas consumption.

It is possible to adapt the boiler's response based on the climatic conditions present by configuring the slope of the climate curve via the corresponding parameter on page P12. It's also possible by pressing buttons "C" and "D" (these lose the function of increasing and decreasing CH temperature) to make a further improvement of climate curve variable from 15 to 25.

The configuration of parameter P12 is indicated in the graph (Pic.32)

Pic. 32



Example:

With an external temperature of 0°C a CH flow temperature of 70°C is needed, it's necessary to:

- Set P12 parameter value to 10 (K1)
- Adjust by pressing "C" and "D" buttons the value to 20

## SPECIAL FUNCTIONS

### ANTI-FROST:

This function is always active, whatever mode the boiler is in.

In order to allow this function to fulfil its purpose, the device must be:

- Turned on
- Connected to the mains gas supply
- The shut-off valves on the central heating circuit must be open
- The shut-off valve on the gas supply line must be open
- No fault conditions must be present

If the temperature measured by the sensor on the central heating flow circuit is  $< 4^{\circ}\text{C}$ , circulation is activated, the diverter valve (when present) switched to the CH circuit and the burner lit at minimum power.

When the temperature measured by the sensor reaches  $35^{\circ}\text{C}$ , the function is deactivated by turning off the burner and restoring the previous conditions.

Also for DHW circuit, the antifrost function activates at  $4^{\circ}$  temperature and deactivates  $10^{\circ}$ .



**THIS FUNCTION DOES NOT GUARANTEE COMPLETE AND CERTAIN PROTECTION OF THE SYSTEM FROM TOTAL OR PARTIAL FREEZING!**



**WHEN CONSIDERED NECESSARY, AND WHEN THE SYSTEM IS CERTAIN TO BE EXPOSED TO LOW TEMPERATURES, IT IS POSSIBLE TO ADD ANTIFREEZE TO THE CENTRAL HEATING CIRCUIT.**



**ONLY USE ANTIFREEZE WHICH IS COMPATIBLE WITH THE CENTRAL HEATING SYSTEM DEVICES AND EQUIPMENT. CAREFULLY FOLLOW THE INSTRUCTIONS FOR USE.**

### CIRCULATOR DEVICE/DIVERTER VALVE ANTI-LOCK FUNCTION:

The function is active when the boiler is in "SUMMER" or "STANDBY / OFF" modes

In order to allow this function to fulfil its purpose, the device must be:

- Turned on
- The shut-off valves on the central heating circuit must be open
- No fault conditions must be present

The function is activated if there are no requests to the boiler in the previous 24 hours.

The function stops the devices from locking up, which is possible after long periods of inactivity, by switching the diverter valve (when present) to the central heating circuit and running the circulator device for a predetermined time (35 sec).

### ANTI FREQUENT IGNITION FUNCTION:

This function is active when the boiler is in heating mode (season selector A on winter) and parameter P5 in the "CONFIGURATION" menu is enabled. The function does not allow unnecessarily frequent ignitions to satisfy heating requests when the system water temperature is near that set by the selector.

The parameter P5 is set to 0 when the function is not enabled and can have a value up to 255 indicating the wait time in minutes between one ignition and the next.

## THERMOSTAT POST CIRCULATION/VENTILATION FUNCTION

### **In winter mode:**

In order to prevent an overheat stress, in case at the end of a CH request the heat exchanger temperature is too high, a heat disposal function by circulator pump ignition is activated.

This function remains active until the temperature values of heat exchanger decrease. This function is displayed by E06 flashing.

### **In summer mode:**

In order to prevent an overheat stress, in case at the end of a DHW intake the heat exchanger temperature is too high, a heat disposal function by circulator pump and fan ignition is activated.

This function remains active until the temperature values of heat exchanger decrease. This function is displayed by E06 flashing.

## DEAERATION FUNCTION

Following each ignition consequent to a power disconnection, boiler starts automatically the circulator pump; this activates ignition cycles in CH and in DHW to remove residual air in the CH circuit.

**THIS FUNCTION MAY BE DISABLED BY "P3" PARAMETER**

## TECHNICAL DATA SHEET

TECHNICAL DATA	U.M.	CSP 45	CSP 70
		I12H3P	I12H3P
Device category			
Appliance classification		B23 C13 C33 C43 C53 C83	B23 C13 C33 C43 C53 C83
Nominal thermal flow	[ kW ]	46,89	71,02
Minimum thermal flow	[ kW ]	8,58	14,06
Nominal thermal power (80°/60°)	[ kW ]	45,57	68,92
Minimum thermal power (80°/60°)	[ kW ]	8,35	13,69
Maximum condensing power (50°/30°)	[ kW ]	48,4	75,9
Minimum condensing power (50°/30°)	[ kW ]	9,0	14,5
Useful efficiency at nominal heat output (80°/60°)	[ % ]	97,2	97,1
Useful efficiency at min thermal power (80°/60°)	[ % ]	97,5	97,4
Useful efficiency at maximum condensing power (50°/30°)	[ % ]	105	105
Partial load efficiency (50°/30°)	[ % ]	106,2	106,6
Smoke temperature (Tf-Tamb ) maximum*	[ °C ]	72,5	73,1
Smoke mass flow at the nominal heat input	[ gr/s ]	21,9	33,3
Fume mass flow rate at minimum thermal flow rate	[ gr/s ]	4,08	6,58
Leaks in the fireplace with the burner off	[ % ]	0,12	2,37
Chimney leak with burner on at the nominal heat input	[ % ]	2,12	1,64
Chimney leak with burner lit at minimum heat input	[ % ]	1,63	0,15
Shell loss at nominal heat input	[ % ]	0,7	0,58
Shell loss at minimum heat input	[ % ]	1,05	1,01
NOx class		5	5
Max discharge+intake residual head (separate tubes 0.5 Ø 80 mm)	[ Pa ]	138,5	240
Nominal heat input for domestic hot water	[ kW ]	/	/
Min/max heat input for domestic hot water	[ bar ]	0,8/3	0,8/3
Power supply	[ Volt -Hz ]	230-50	230-50
Maximum absorbed electric power	[ W ]	220	220
Electrical protection degree	[ IP ]	X4D	X4D
Expansion vessel	[ lt ]	10	/
Expansion tank	[ bar ]	/	/
Maximum sanitary pressure	[ bar ]	/	/
Minimum sanitary pressure	[ bar ]	/	/
Specific flow rate of hot water with $\Delta t$ 35°C	[ l/min ]	/	/
Minimum domestic water flow	[ l/min ]	/	/
Flow limiter	[ l/min ]	/	/

(\* )G20 fuel room temperature= 20 °C

FUEL		CSP 45	CSP 70
		Gas flow rate at nominal thermal flow rate	G20 m <sup>3</sup> /h
	G31 kg/h	3,37	5,5
Gas flow at minimum thermal flow	G20 m <sup>3</sup> /h	0,85	1,4
	G31 kg/h	0,6	1,06

TECHNICAL PARAMETERS OF THE ERP REGULATION (812/2013)				CSP 45	CSP 70
Seasonal space heating energy efficiency class	-	-	A		
Nominal useful heat output	P <sub>nominal</sub>	[ kW ]	45	70	
Seasonal space heating energy efficiency	$\eta_5$	%	92	93	
USEFUL THERMAL POWER					
At rated heat output and high temperature regime	P4	[ kW ]	45,57	68,92	
At 30% of nominal heat output and low temperature regime	P1	[ kW ]	14,3	22,5	
EFFICIENCY					
At rated heat output and high temperature regime	$\eta_4$	[ % ]	87,5	87,4	
At 30% of rated heat output and low temperature regime	$\eta_1$	[ % ]	95,7	96,0	
AUXILIARY ELECTRICITY CONSUMPTION					
Fully loaded	el <sub>max</sub>	[ kW ]	0,0865	0,1292	
Partial load	el <sub>min</sub>	[ kW ]	0,018	0,0219	
In standby mode	PSB	[ kW ]	0,0039	0,0031	
OTHER PARAMETERS					
Thermal losses in standby mode	P <sub>stby</sub>	[ kW ]	0,07	0,11	
Annual energy consumption	Q <sub>HE</sub>	[ GJ ]	142	221	
Sound power level	LWA	[ dB ]	/	/	
Emissions of nitrogen oxides	NO <sub>x</sub>	[ mg/kWh ]	58	42	
FOR COMBI HEATERS:					
Declared load profile	-	-	/	/	
Daily electricity consumption	Q <sub>elec</sub>	[ kWh ]	/	/	
Annual electricity consumption	AEC	[ kWh ]	/	/	
Energy efficiency of water heating	$\eta_{vh}$	[ % ]	/	/	
Daily fuel consumption	Q <sub>fuel</sub>	[ kWh ]	/	/	
Annual fuel consumption	AFC	[ GJ ]	/	/	





**KLEINE KESSEL**

Operational headquarters: Loc. Campogrande 13, 29013 CARPANETO PIACENTINO(PC), Italy  
phone +39 0523 850513 - [info@kleinekessel.com](mailto:info@kleinekessel.com) - [www.produzionecaldaie.com](http://www.produzionecaldaie.com)