



IVY G6.3 ECO 24 - 28 - 32



INSTALLATION, COMMISSIONING, USE AND MAINTENANCE MANUAL

ITALIAN DESIGN



IVY G6.3 ECO 24/28/32 KW MR/MN
MONOTHERMAL BOILER MANUAL
VERS. 00/2023 - 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 Rapaccioni*



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

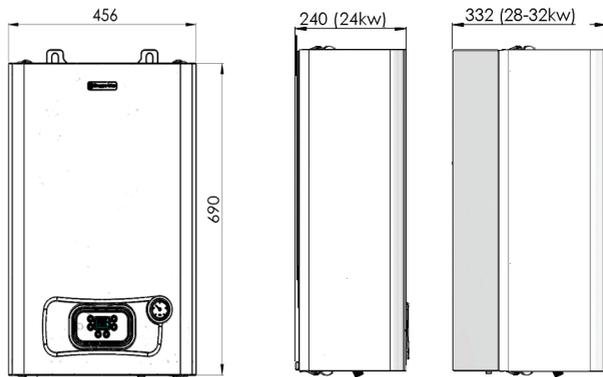


Important communications, signaling of modes and operations which could compromise the correct operation of the boiler and endanger people.

DESCRIPTION OF THE BOILER

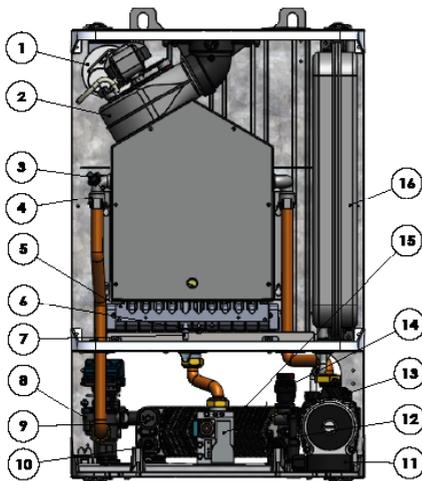
The Eco range of boilers represents the best appliances available for domestic central heating and hot water production. Their essential but extremely modern and elegant lines, compact size, solidity, performance, reliability and safety place Eco boilers in the category of appliances which are indispensable in every home. In creating the Eco range of boilers we chose to design a system which could satisfy a wide range of needs, able to adapt itself to any situation and thus enlarging its field of application. Models ranging from 24 to 32 kW power output are indeed available. The flexibility of the Eco range of boilers is also increased by the possibility to configure the management program of the microprocessor fitted to the system. This allows to pass from a reduced number of functions and configurations which make using the device easy, immediate and effective to a complete configuration with many specific options enabled as well as the possibility to interface with external control and regulation devices.

Pict. 1



COMPONENTS

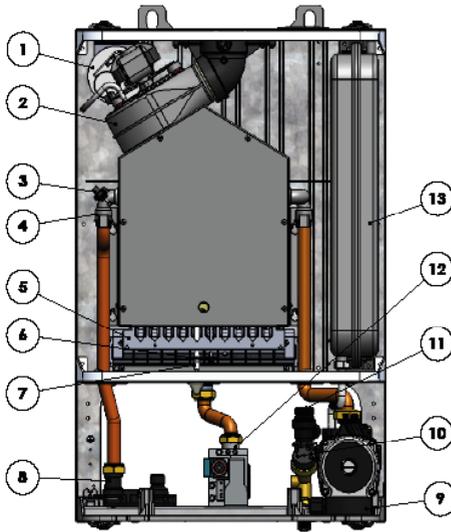
Pict. 2



IVY G6.3 ECO (with rapid heat exchanger)

- 1) COMBUSTION GAS PRESSURE SWITCH
- 2) FUME EXTRACTOR
- 3) DOUBLE HEATING SENSOR
- 4) PRIMARY HEAT EXCHANGER
- 5) BURNER
- 6) EARTH ELECTRODE
- 7) IGNITION MONOELECTRODE
- 8) THREE WAY GROUP
- 9) PRESSURE SENSOR
- 10) IMMERSION DHW SENSOR
- 11) CIRCULATOR UNIT
- 12) DHW PRIORITY VALVE
- 13) GAS VALVE
- 14) SAFETY VALVE
- 15) SECONDARY HEAT EXCHANGER
- 16) EXPANSION TANK

Pic. 3



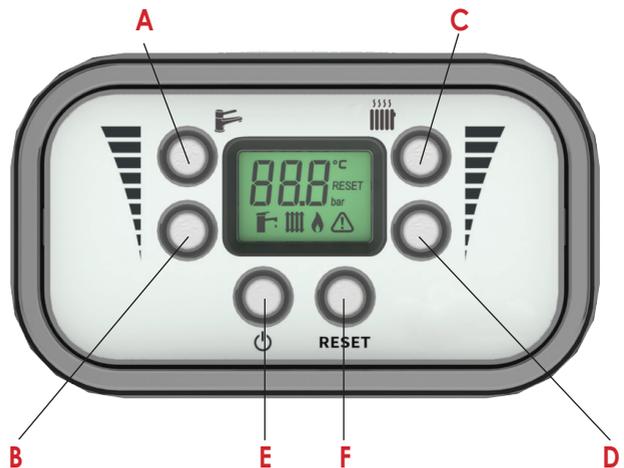
IVY G6.3 ECO (Heat only)

- 1) COMBUSTION GAS PRESSURE SWITCH
- 2) FUME EXTRACTOR
- 3) DOUBLE HEATING SENSOR
- 4) PRIMARY HEAT EXCHANGER
- 5) BURNER
- 6) EARTH ELECTRODE
- 7) IGNITION MONOELECTRODE
- 8) HEATING ONLY GROUP
- 9) CIRCULATOR UNIT
- 10) WATER PRESSURE SWITCH
- 11) SAFETY VALVE
- 12) GAS VALVE
- 13) EXPANSION TANK

INTERFACE DESCRIPTION

Pict. 4

- A. DHW TEMPERATURE INCREASE
- B. DHW TEMPERATURE DECREASE
- C. CH TEMPERATURE INCREASE
- D. CH TEMPERATURE DECREASE
- E. FUNCTION SELECTION
- F. RESET BUTTON



TURNING THE BOILER ON

Turn on the boiler's electrical supply by the switch, which must be installed on the power supply line to the boiler. The LCD display (will turn on immediately, showing all the available symbols for 5 seconds, and the program version installed in the microprocessor for further 5 seconds; the unit goes into stand-by and the display shows the word "OFF".

By pushing the "E" button, the boiler goes into "ON" mode; the display shows CH circuit temperature and the "TAP" symbol, thus indicating the summer mode (Pict. 5).

The boiler has now been started and ready to operate.

TURNING THE BOILER OFF

Pushing several times the "E" button until the word "OFF" is displayed.

Pict. 5



WARNING: In this mode the boiler is inactive but its electricity supply is still connected!

SEASON SELECTION

The boiler has three operating modes, which depend on the active functions, in response to the external temperature or the user requirements:

The **SUMMER** mode can be set, during which all the CH functions are deactivated and the domestic hot water production mode only is maintained: this mode is selected by pushing "E" button and then the "TAP" symbol (Pict.6) is displayed; when the unit is in stand-by, the CH circuit temperature is shown on the display (Pict. 5); during an intake of DHW water, the DHW temperature is shown together with the flashing "TAP" symbol and with the "FLAME" symbol of the ignited burner.

The **WINTER** mode is activated by pushing "E" button and then the "TAP" and "RADIATOR" symbols (Pict.7) are displayed. In this mode, the unit satisfies both DHW requests, and CH requests. When the unit is in stand-by, the CH circuit temperature is shown on the display; during an intake of DHW water, the DHW temperature is shown together with the flashing "TAP" symbol and with the "FLAME" symbol of the ignited burner; while in DHW mode, the display shows the CH temperature value, the "FLAME" symbol of the ignited burner and the "RADIATOR" mode flashing symbol (Pict.7).

The **HEAT ONLY** mode is activated by pushing "E" button and then the "RADIATOR" symbol is displayed (Pict. 8). In this mode, the unit will fulfill CH requests only.

Pict. 6



SUMMER EXAMPLE

Pict. 7



WINTER EXAMPLE

Pict. 8



HEAT ONLY

TEMPERATURE SETTING

It is possible to regulate the temperature of the domestic hot water supplied as well as that for the central heating. Once the desired temperature is set, during the requests the set temperature value is reached, if possible, and maintained at the set value.

In order to set the supplied DHW temperature, push "A" button to increase the value and "B" button to decrease it; the display shows the corresponding value and the flashing symbol of DHW mode ("TAP"); the set value and the mode symbol are displayed for 5 seconds, then the previous visualization mode is restored and the value is memorized. The minimum DHW temperature which can be set is 30°C, the maximum one is 60°C.

In order to set the supplied CH temperature, push "C" button to increase the value and "D" button to decrease it; the display shows

the corresponding value and the flashing symbol of CH mode ("RADIATOR"); the set value and the mode symbol are displayed for 5 seconds, then the previous visualization mode is restored and the value is memorized. The range of temperature goes from 50 to 80°C for high temperature systems and goes from 27 to 55°C for low temperature systems.



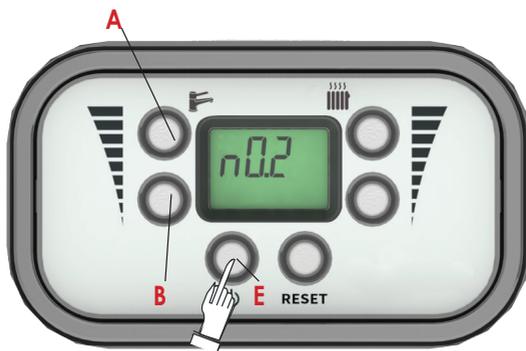
ASK YOUR AREA INSTALLER FOR INFORMATION ON THE TYPE OF SYSTEM CONNECTED AND RESPECTIVE ADJUSTMENTS

INTERFACE DESCRIPTION

By accessing the "Information Menu" pages, it is possible to consult the information that is shown on the display without any possibility of modifying the functional parameters. To access the "Information Menu" press the "E"

key. The successful access will be confirmed by the display of the menu page alternating with the relative value. To scroll the pages use the "A" and "B" keys

Pict. 9



Code	Information menu contents
n02	DHW temperature
n03	Return sensor temperature (if present)
n05	External sensor temperature (if present)
n21	Last fault code
n22	Second to last fault code
n26	CH temperature

OPERATING BY ROOM THERMOSTAT

In compliance with current standards in terms of energy saving, the device must be connected to a room thermostat for optimal temperature adjustment and maintenance in domestic environments.



ASK YOUR AREA INSTALLER FOR INFORMATION ABOUT INSTALLATION AND FUNCTIONING OF 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 TO YOUR AUTHORISED AREA INSTALLER.

OPERATION WITH OPENTHERM TIMER THERMOSTAT

For optimum and even more economical management of the domestic premises it is possible to use the ECO CRONO programmable timer thermostat. ECO CRONO 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.

ECO CRONO can also be used to schedule daily and weekly room temperatures and manage reduced demand periods (holidays, anti-frost and maintenance modes).



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

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 "E" error 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.

To manually reset the system following a fault condition, press "F" button (Pict.4).

If the operation is successful the boiler will return to normal operation; if not, the error code causing the malfunction will be displayed and technical support will be needed.

Pict. 10



IF A FAULT IS NOT SOLVED AFTER 2 MANUAL RESET ATTEMPTS, THE AUTHORISED AFTER SALES SERVICE MUST BE CONTACTED.



FAULT CODES TABLE (ALL MODELS)

Code	Possible cause	Behaviour	Possible actions
E1	Ignition failed	Boiler locked	Check gas presence Check gas line pressure Check ignition/detection electrodes Check electronic cable Check igniter
E2/E7	Air pressure switch failure	Boiler locked	Check flue draught / flue pipes Check fan
E3	Heating system temperature sensor fault	Boiler locked	Replace CH sensor
E4	Domestic hot water system temperature sensor fault	DHW supplied in provisional mode Heating functions normally	Replace CH sensor
E5	Gas regulation valve fault	Boiler locked	Check wire connection to modulator Replace gas valve
E6	High temperature detected by heating system sensor	Device in stand-by Normal DHW supply	Wait for automatic unlocking
E8	Central heating system pressure too low	Boiler locked	Check pressure to CH system
E9	Central heating system water temperature too high	Boiler locked	Reset the boiler Consult technical support
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
E15	Fault in the exhaust system	Attempt to restore safety conditions in progress	Check of chimney / flue gas line draft Check of fan functioning
E23*	Fault on external temperature sensor	Resumption of operation without external sensor	Check position of external probe Check communication line Replace external sensor
E28*	Water cylinder / water heater probe failure	Boiler locked	Replace probe
E88	Communication error Open Therm	Boiler locked	Check of boiler /Open Therm connection
E99	Parameter configuration error	Boiler locked	Check and reconfigure the parameters

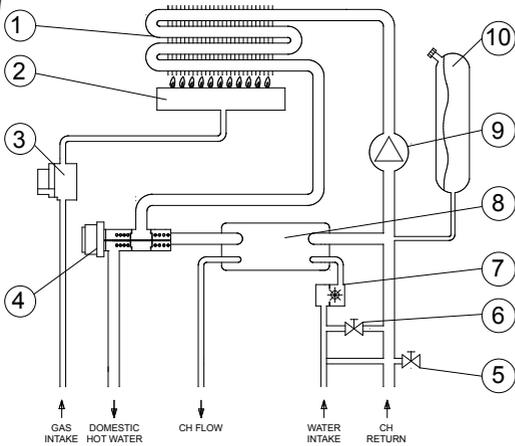
*Can be displayed only if the relative devices are installed



OPERATING DIAGRAM (MR)

COMBINATION: DOMESTIC HOT WATER + CENTRAL HEATING

Pic. 11

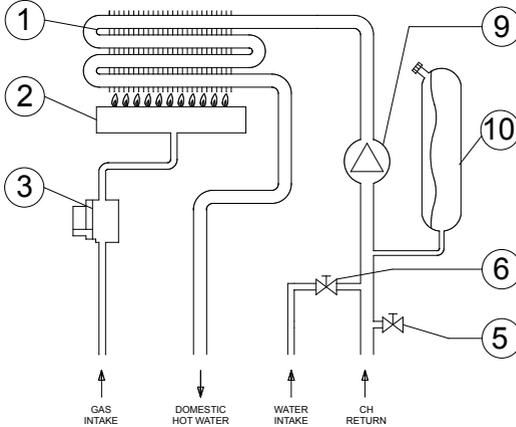


- 1) Primary heat exchanger
- 2) Burner
- 3) Gas valve
- 4) Three-way valve
- 5) Safety valve
- 6) Filling loop cock
- 7) Hot water priority turbine
- 8) Secondary heat exchanger
- 9) Circulator unit
- 10) Expansion tank

OPERATING DIAGRAM (MN)

CENTRAL HEATING ONLY

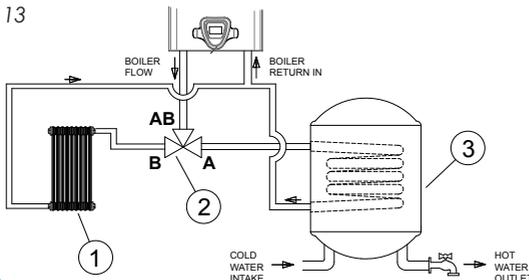
Pic. 12



- 1) Primary heat exchanger
- 2) Burner
- 3) Gas valve
- 5) Safety valve
- 6) Filling loop cock
- 9) Circulator unit
- 10) Expansion tank

DHW STORAGE TANK- THREE WAY VALVE OPERATIONAL DIAGRAM

Pic. 13

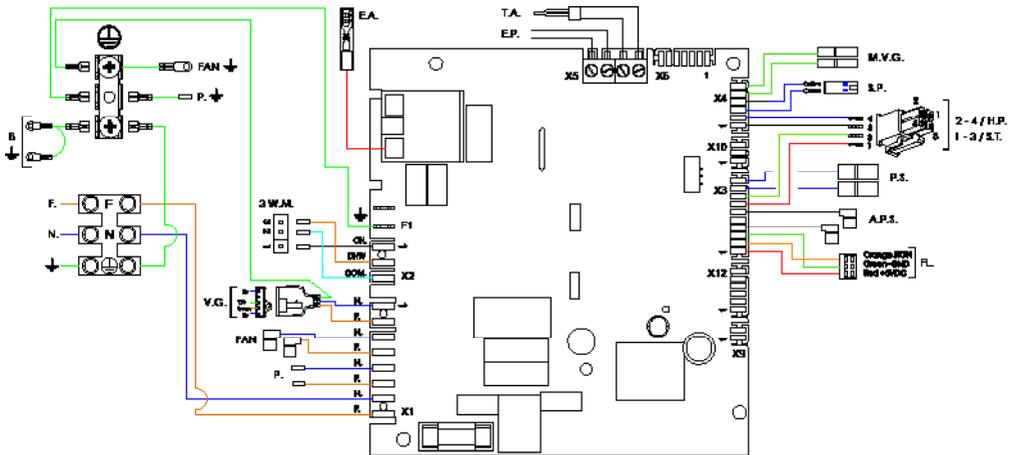


- 1) Central heating circuit
- 2) Three-way valve
- 3) DHW storage tank

ELECTRICAL WIRING DIAGRAM (MR)

COMBINATION: DOMESTIC HOT WATER + CENTRAL HEATING

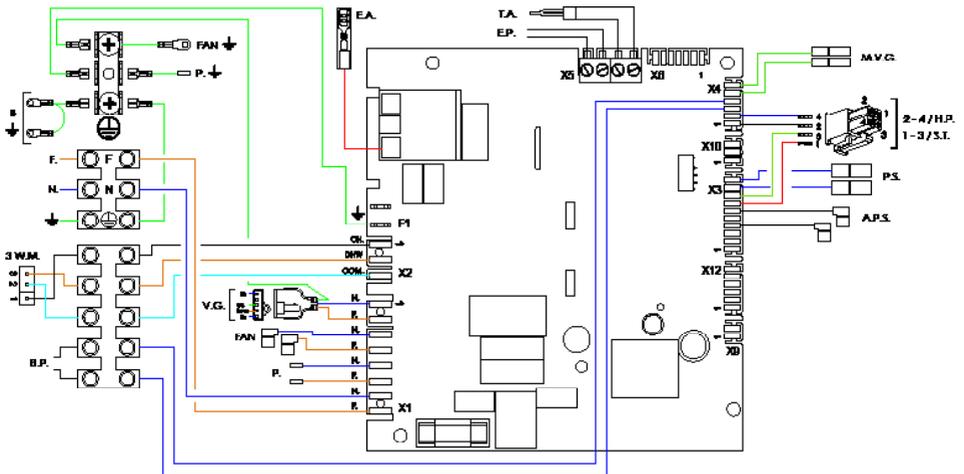
Pic. 14



ELECTRICAL WIRING DIAGRAM (MR)

CENTRAL HEATIN ONLY

Pic. 15

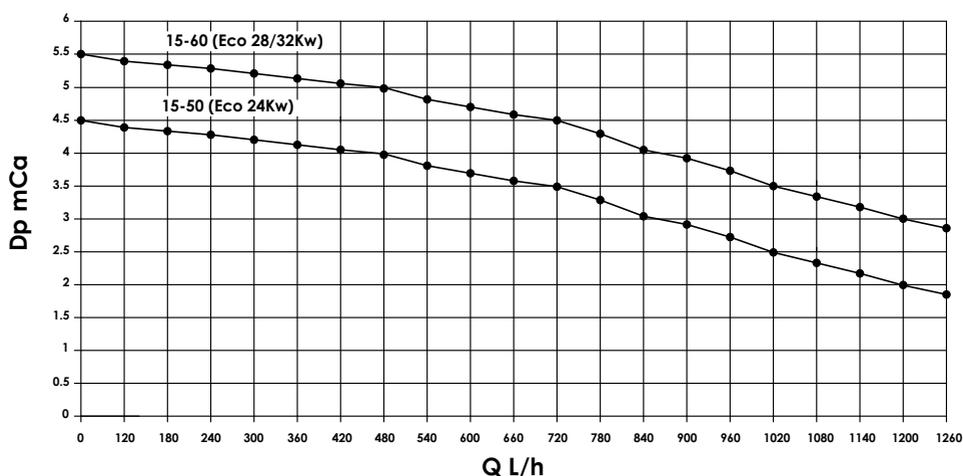


Wiring list

3.W.M.	3 Way valve	F.	Phase	N.	Neutral	S.T.	Safety thermostat
A.P.S.	Air pressure switch	FAN	Fan	P.	Pump	V.G.	Gas valve
B.	Earth boiler	FL	Flow switch	P.S.	Pressure Switch	B.P.	Boiler probe
E.A.	Ignition electrode	H.P.	CH sensor	S.P.	DHW sensor		
EP.	External probe	M.V.G.	Gas valve Modulator	T.A.	Boiler thermostat		

GRAPHS FOR THE HEAD AVAILABLE TO THE SYSTEM

Pic. 16



INSTALLATION

Use:

The boiler has been constructed according to 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 thermal 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.

Use of 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.

Avoid installing the boiler directly in commercial/industrial premises (e.g. hair salons, painting/carpentry workshops, cleaning companies etc.).

- The boiler must be installed in ventilated premises.

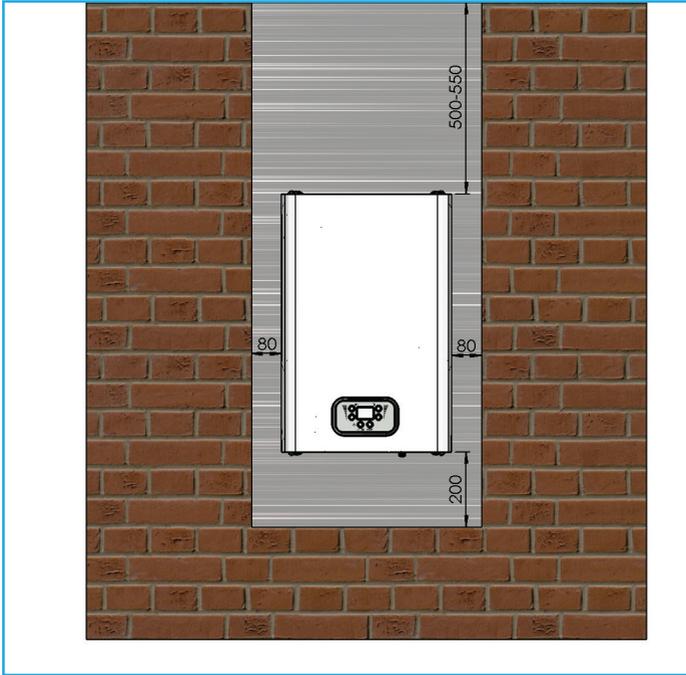
- Install the device respecting the minimum distances and spaces in Pict. 17 (also when installing inside an enclosure).

- Mount the boiler on a solid wall.

- Ensure that there are no depressions which could cause the boiler to stand out from the wall.

- Ensure you do not drill into tracked cables or piping when drilling.

Pic. 17



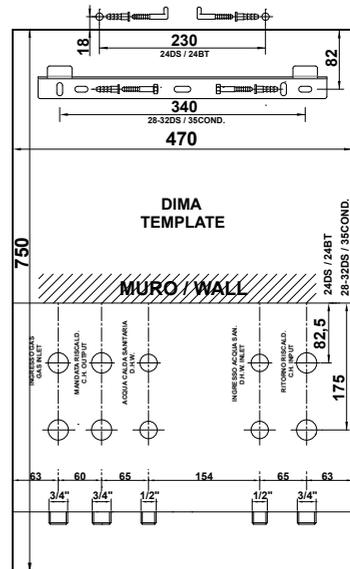
FASTENING THE BOILER TO THE WALL

Attach the cardboard template giving the connection and fastening schemes to the wall, paying attention to the boiler dimensions and necessary clearances. (Pic. 18)

- Use a suitable bit to drill the holes indicated by the two wall plug symbols on the template.
- Remove the template; insert the two wall plugs in the previously prepared holes, then hang the boiler, inserting the hooks of the plugs in the specific holes.



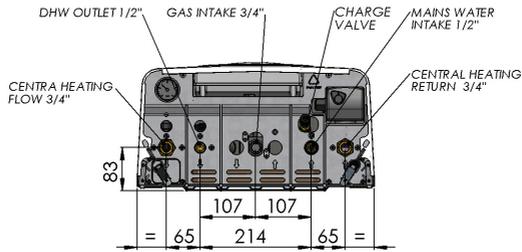
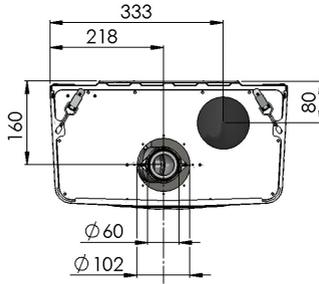
Fasten the template so that its axis coincides perfectly with that of the boiler



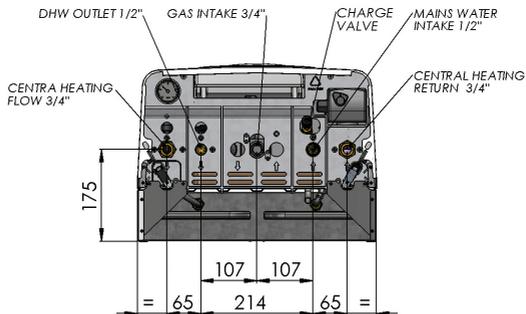
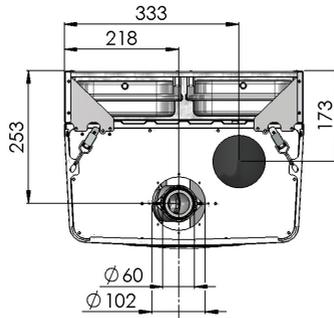
LAYOUT OF CONNECTIONS

Pic. 19

24 KW



28/32 KW



PLUMBING THE BOILER IN

Connect the water and central heating pipes to the boiler, respecting the positions and distances indicated (Pict. 17-18); 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.



- 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.**



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

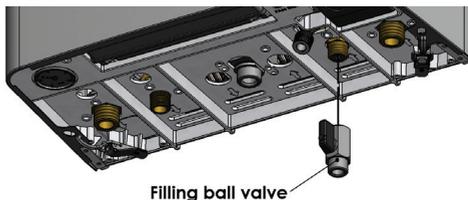


Connect the safety valve outlet so that its operation would not cause any damage to persons or property

- Use piping of not less than 1/2" diameter

CONNECTING FILLING COCK FOR CENTRAL HEATING ONLY BOILERS

In order to fill the system, it is sufficient to connect the supplied ball valve to the 1/2" DHW intake and connect this to a water pipe. *Pic. 20*



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 Pict. 21, 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

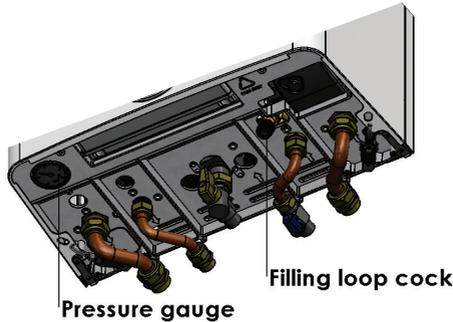
- Close the filling loop and then



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.

Pic. 21



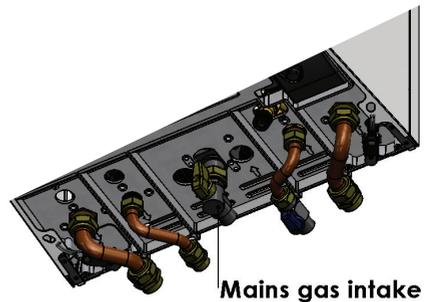
CONNECTION TO THE MAINS GAS SUPPLY

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.

Pic. 22

The gas supply must be connected to the boiler intake (Pict. 22), 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.



Do not use the gas supply pipework connections as earth points for electrical equipment.



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.

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-

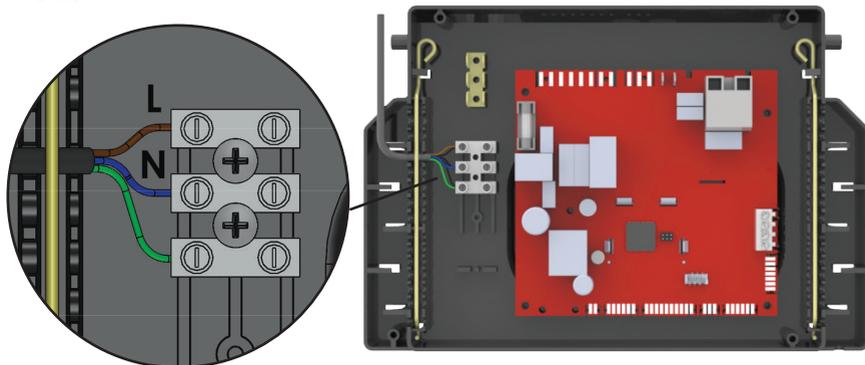
wired power-supply cable, it will be necessary to access the PCB compartment:

- 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. 23) 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.

Pic. 23



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



A qualified electrician should check the suitability of the protective earth system. The manufacturer is not responsible for any damage caused by the lack of a suitable system earth.



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.

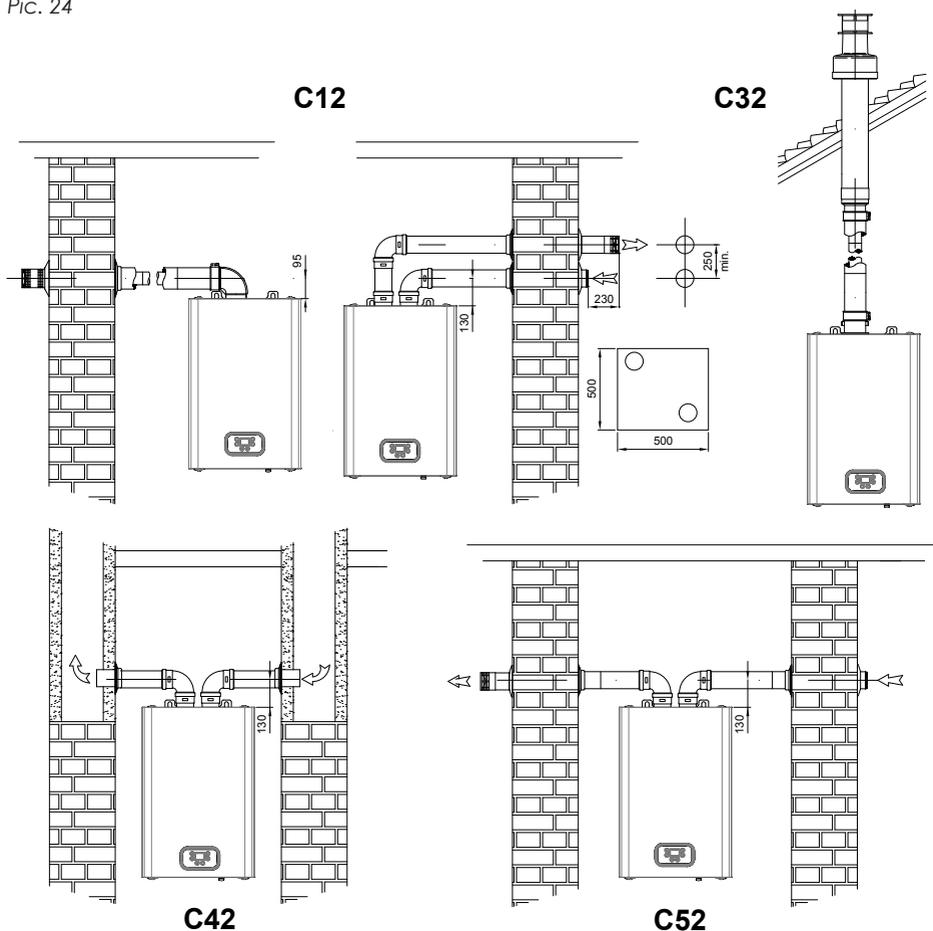
Before accessing the control panel internal components, make sure the boiler is turned off.

COMBUSTION GAS EVACUATION SYSTEM: COMPATIBLE APPLICATIONS

The boiler is a type C room-sealed fan-assisted device; the air intake and flue must be connected to a combustion gas evacuation/air intake system. The types of permissible air intake and combustion gas evacuation (flue) systems are listed on the technical data plate and summarised below:

- **C12** concentric wall flue. The pipes may also be split, but the outlets must be exposed to similar wind conditions.
- **C32** concentric vertical flue (with the same specifications as type C12)
- **C42** combustion gas evacuation and air intake in separate common flues, but which are exposed to similar wind conditions
- **C52** separate horizontal or vertical flues, in any case in areas exposed to different pressures
- **C62** combustion gas evacuation and air intake performed with pipes sold and certified separately.

Pic. 24



COMBUSTION GAS EVACUATION SYSTEM: INSTALLATION

The boiler, based on its UNI 7129 classification, can be connected to **COAXIAL** and **SPLIT** intake and flue evacuation systems.

The "coaxial" system is composed of a single pipe containing both the flue and intake pipes on the same axis. The system provides for all

components necessary for completing the line, including changes of direction, straight sections of various lengths, connections to the boiler and outside terminals as well as all necessary seals. Below is a list of compatible components with their relative characteristics:

60/100 mm DIAMETER COAXIAL SYSTEM

No.	Description	Pressure drop (Pa)	Equivalent length m
1	Terminal L.990	25	2.8
2	Extension L.1000 M-F	6	1
3	Vertical flanged coupling M	15	2.2
4	90° elbow M-F	7	1.3
5	45° elbow	6	1
6	Neoprene gasket d 128		
7	Intake gasket d 100		
8	Flue evacuation gasket d 60		

Pic. 25

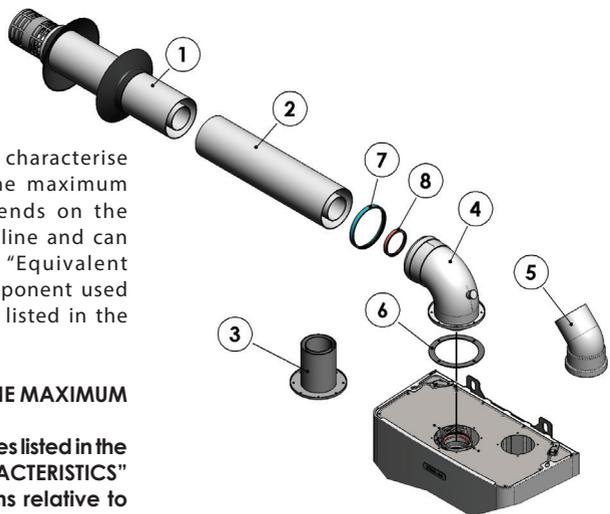
The large pressure drops which characterise this system limit its length. The maximum possible length therefore depends on the components used to create the line and can be determined by adding the "Equivalent lengths" for each individual component used (excluding the initial 90° elbow) listed in the "COAXIAL SYSTEM" table.

IT IS ESSENTIAL NOT TO EXCEED THE MAXIMUM PERMISSIBLE LENGTH!

Consult the maximum length values listed in the "FLUE SYSTEMS TECHNICAL CHARACTERISTICS" on page 23 for COAXIAL systems relative to the type of device installed.

The "split" flue system is composed of one pipe for combustion gas evacuation connected to the fan outlet and one for the air intake connected to the hole on the roof of the sealed chamber. The system provides for all components necessary for completing the

line, including changes of direction, straight sections of various lengths, connections to the boiler and outside terminals as well as all necessary seals, for both pipes. Below is a list of compatible components with their relative characteristics.



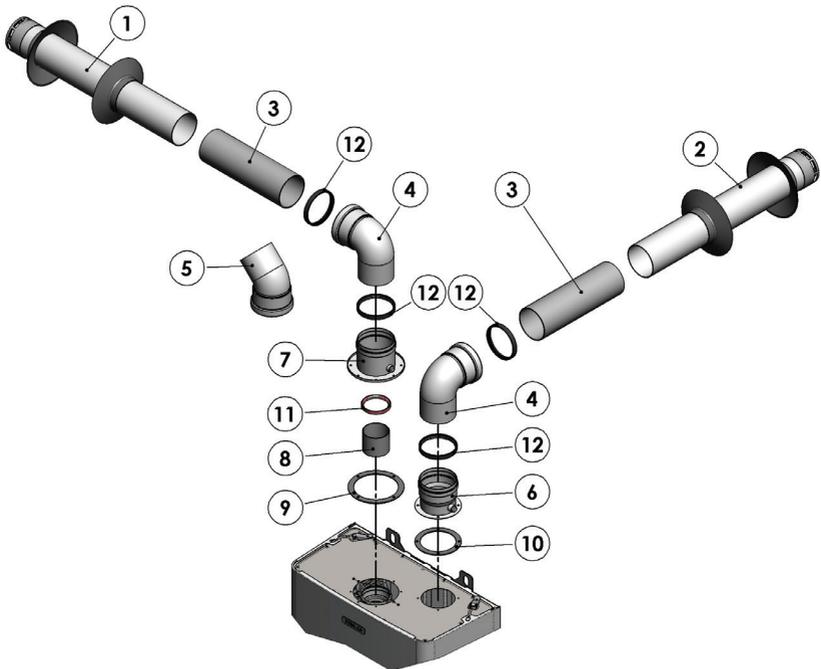
SPLIT SYSTEM 80 mm diameter:

No.	Description	Pressure drop (Pa)	Equivalent length m
1	Intake terminal L.950	15	0.8
2	Flue evacuation terminal L.990	3.5	1.5
3	Extension M-F L.1000	3	1
4	90° elbow M-F	14	3
5	45° elbow M-F	7	1.3
6	Intake adaptor d 80		
7	Flue evacuation adaptor d 80		
8	L50 d 60 flue evacuation connection		
9	Neoprene gasket d 128		
10	Neoprene gasket d 100		
11	Collar gasket d 60		
12	Gasket d 80		

The maximum possible length therefore depends on the components used to create the line and can be determined by adding the "Equivalent lengths" for each individual component for both the intake and evacuation lines listed in the "SPLIT SYSTEM" table.

IT IS ESSENTIAL NOT TO EXCEED THE MAXIMUM PERMISSIBLE PRESSURE DROP FOR THE DUCTS (air intake + flue evacuation)!
Consult the maximum PRESSURE DROP values listed in the "FLUE SYSTEMS TECHNICAL CHARACTERISTICS" for SPLIT systems relative to the power and type of device installed. (page 21)

Pic. 26



CHECKING THE EFFECTIVENESS OF THE COMBUSTION GAS EVACUATION SYSTEM

WARNING:

Check the installation of the air/exhaust system (for both types) by detecting the pressure of the fan exhaust fumes (signal to the pressure switch) and using a pressure switch differential of a suitable range 0 - 500 Pa.

The detected value shall not be less than shown in the table "EXHAUST TECHNICAL FEATURES SUMMARY", column "SIGNAL" for the exhaust system and for the examined power and type of device.

FLUE SYSTEMS TECHNICAL CHARACTERISTICS

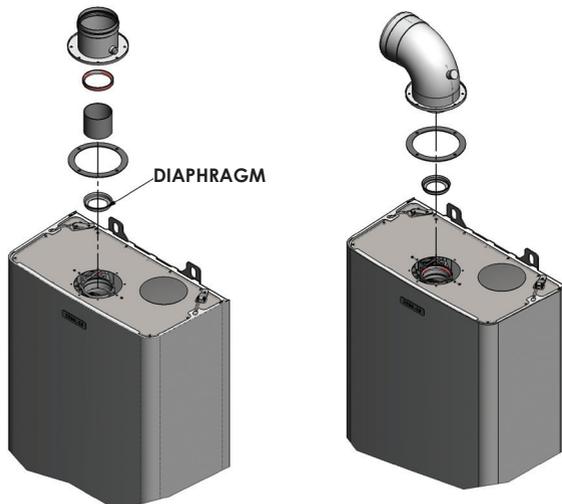
Model	Power	COAXIAL SYSTEM		SPLIT SYSTEM (intake + flue evacuation)	
		Max length	Signal	Max pressure drop (intake / flue evacuation)	Signal
Eco 24 MR/MN	24 kW	5 m	>80 Pascal	170 Pascal	>80 Pascal
Eco 28 MR/MN	28 kW	5 m	>92 Pascal	175 Pascal	>92 Pascal
Eco 32 MR/MN	32 kW	5 m	>110 Pascal	145 Pascal	>110 Pascal

COMBUSTION GAS EVACUATION CIRCUIT DIAPHRAGMS

In order to be able to adapt the air intake and combustion gas evacuation systems to the various installation requirements while keeping the functional characteristics of the device unchanged, in compliance with all applicable regulations regarding energy output efficiency, it is necessary to fit a diaphragm between the fan and flue duct for systems of minimum or intermediate length. The size of the diaphragm depends on the

type and length of the ducts which the boiler must be connected to, or in other words the pressure drop for the entire combustion gas evacuation and air intake system. The "DIAPHRAGMS" table below gives the dimensions of the diaphragms to be positioned at the fan outlet (Pict. 27) by type of duct and boiler.

Pict. 27



DIAPHRAGMS

COAXIAL SYSTEM		Diaphragm diameter		
BETWEEN	AND	Eco 24 MR	Eco 28 MR	Eco 32 MR
0.5 metri	1 metri	35 mm	37 mm	39 mm
>1 metri	2 metri	37 mm	39 mm	41 mm
>2 metri	3 metri	37 mm	39 mm	41 mm
>3 metri	4 metri	39 mm	41 mm	44 mm
>4 metri	5 metri	41 mm	44 mm	-

SPLIT SYSTEM diaphragm diameter					
Eco 24 MR		Eco 28 MR		Eco 32 MR	
>70 <100 Pascal	Ø 35 mm	>92 <110 Pascal	Ø 37 mm	>107 Pascal	Ø 35 mm
>100 <120 Pascal	Ø 37 mm	>110 <150 Pascal	Ø 39 mm	>107 <145 Pascal	Ø 44 mm
>120 <190 Pascal	Ø 39 mm	>150 <175 Pascal	-	≥145 Pascal	-
		-	-		



ALWAYS CONNECT A MINIMUM FLUE EVACUATION AND INTAKE SECTION FOR BOTH SYSTEMS OF AT LEAST 0.5 METRES (COAXIAL PIPE = 0.5m + 90° ELBOW; SPLIT 0.25 m FLUE EVACUATION + 0.25 m INTAKE + RESPECTIVE 90° ELBOWS)

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.

TAKE MEASURES TO AVOID THE FORMATION OF EXCESSIVE CONDENSATION. ENSURE THAT ANY CONDENSATION DOES NOT EVEN MINIMALLY AFFECT ANY INTERNAL PART OF THE BOILER.

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 exchangers and electrodes
- 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

The function is conceived to allow to place the device in maximum and minimum power functional conditions, during maintenance and adjustment operations.

The activation of the "SERVICE" function requires the complete installation of the appliance; before activating the function, check that all the conditions specified in the chapter "1st ignition" are satisfied.

Function activation:

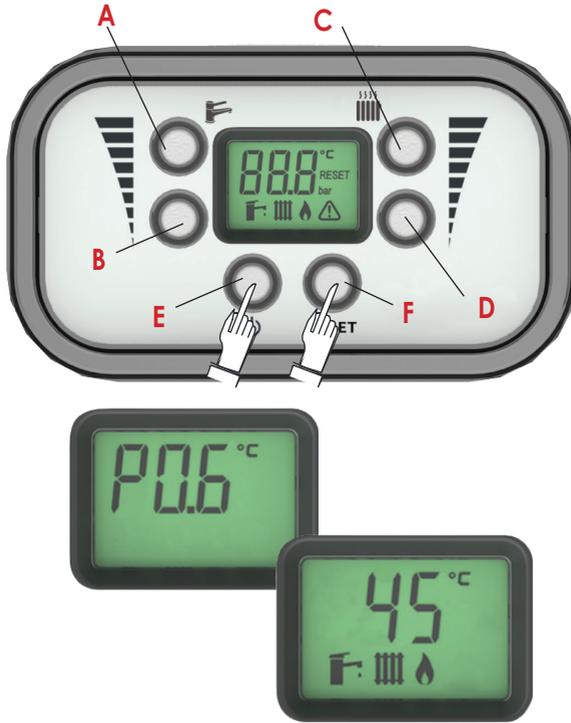
To activate the "SERVICE" function, press the "E" and "F" keys simultaneously for a minimum of 3 seconds (Pict.28).

Upon release, the Installer Menu can be accessed, confirmed by the value P00 on the display. Scroll through the pages using the "A" key up to page P06. Use the "C" and "D" keys to change the value.

During "SERVICE" mode, the diverter valve sets the appliance to operate in heating mode.

P06	0 = disabled	1 = minimum power	2 = maximum power
-----	--------------	-------------------	-------------------

Pic. 28



MAKE SURE 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;
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.

The boiler exits the function automatically after 15 minutes of operation, or bringing back parameter P06 to 0.

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 80°C the function is suspended.

DATA PLATE

TECHNICAL DATA PLATE

		CE	0
Type:	A	Cat.:	G
Serial number	B	Type:	H
Code:	C	Date:	I
Country of destination:	D	PIN Code:	J
Manufacturer:	E	Class NOx	K
Gas:	F		
		Flow	Pressure
..... Natural gas G20	L/a (m ³ /h)	L/b (mbar)	
..... LPG G31	L/a (kg/h)	L/b (mbar)	
C.H. Circuit			
		MIN.	MAX.
Thermal load: 60/80°	M kW (min.)	M/a (kW max)	
Thermal power: 60/80°	N kW (min.)	N/a (kW max)	
Thermal power: 30/50°	O kW (min.)	O/a (kW max)	
Work Pressure:	P (bar)	Work Temperature:	Q (C°)

This heat generator can be adjusted according to the power required by the installation at p. 28 of the enclosed user B
Power curves are available depending on the number of fan rotations.

D.H.W. Circuit:			
Thermal load:	R (kW min.)	R/a (kW max)	
Specific flow Δt25:	S (l/min.)		
Work Pressure:	T (bar)	Work Temperature:	U (C°)

D.H.W. ErP η _{wh} :	V (%)	C.H. ErP η _{wh} :	V/a (%)
IP protection rate:	W	Electric power:	X (W)
Work Temperature:	Y (C°)	Power supply:	Z

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 pressure
M= Thermal load min 60/80
M/a= Thermal load max 60/80
N= Thermal power min 60/80
N/a= Thermal power max 60/80
O= Thermal power min 30/50
O/a= Thermal power max 30/50
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
V= Seasonal energy efficiency ratio of water heating
V/a= Seasonal energy efficiency ratio of room heating
W= IP protection rate
X= Gas consumption
Y= Operating temperature
Z= Power supply

POWER ADJUSTMENT

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. 26) are respected. Also check that the condensate collection system is perfectly tight. 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.

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 at the burner while running the boiler at various levels.

GAS PRESSURE CHECK:

- 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
- Remove the gas regulation valve screws protection cap by applying leverage near the mark (Pict. 29)
- 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)
- Loosen the screw holding the pressure outlet after 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.30)
- Turn on the gas supply by opening the shut-off valve located on the meter and open the gas cock before the boiler.

Fig. 29

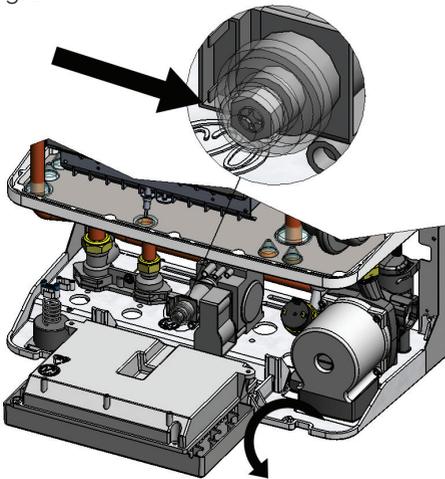
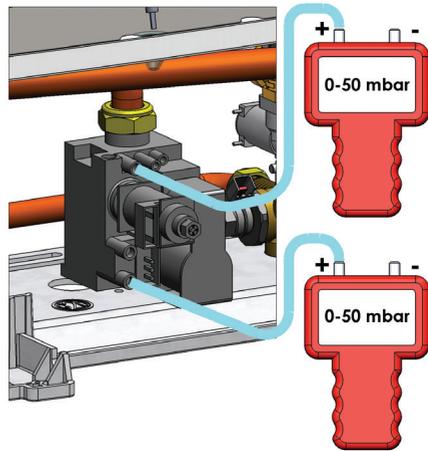


Fig. 30

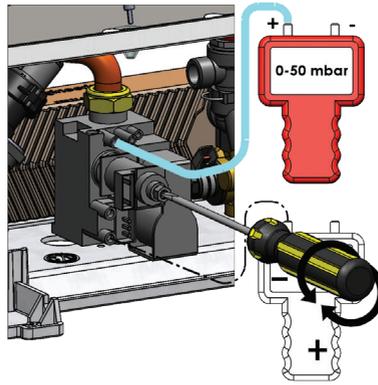


CHECKING THE PRESSURE AT THE BURNER

- Check that all preliminary indications and checks specified have been carried out.
- Activate the SERVICE function and run the boiler at minimum power.
- Measure the pressure of the gas after the regulator using the micromanometer connected to the relative outlet. Check that

the measured value is the same as that listed in the "min" column of the "Burner pressure" table on page 27 for the boiler and gas type used. If the measured value does not correspond to the table, adjust the central adjustment screw on the gas valve until it does, turning it **CLOCKWISE** to increase the pressure and **ANTICLOCKWISE** to reduce it.

Pic. 31



TESTING THE GAS SUPPLY DYNAMIC PRESSURE:

- Use the SERVICE function to bring the boiler to maximum power.
- Measure the gas pressure before the regulator (dynamic mains supply pressure).

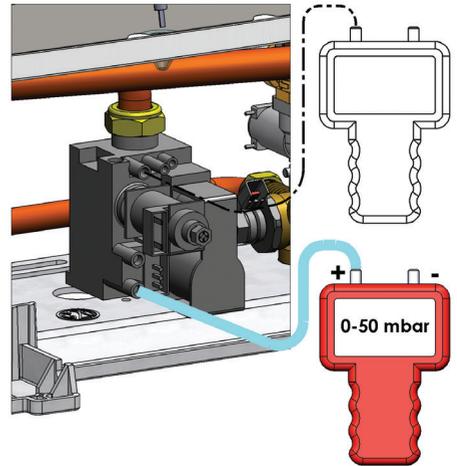
Check that the value measured with the manometer falls within the max-min interval given in the "Dynamic mains supply pressure" table for the specific type of gas.



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. 32



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

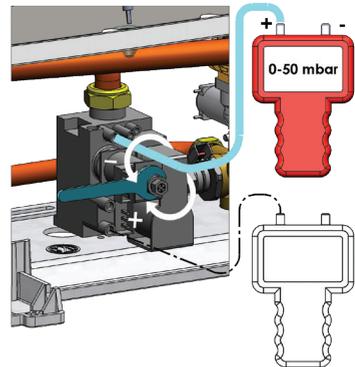
CHECKING PRESSURE AT THE BURNER AT MAXIMUM POWER

- Ensure that the SERVICE function is active and configured for maximum power. Measure the gas pressure after the regulator by connecting the micromanometer to the relative pressure outlet. Check that the measured value is the same as that listed in the "max" column of the "Burner pressure" table for the specific type of gas.
- If the measured value does not correspond to the table, adjust the external adjustment screw on the gas valve until it does, turning it CLOCKWISE to increase the pressure and ANTICLOCKWISE to reduce it.**
- Repeat the measurements of the maximum and minimum pressure at the burner twice.



THE BOILER'S OPERATION AND SAFETY ARE NOT GUARANTEED IN ANY MANNER IF IT IS SUPPLIED WITH GAS AT PRESSURES MEASURED BEFORE AND AFTER THE GAS REGULATION VALVE WHICH DO NOT CORRESPOND TO THE SPECIFIED VALUES.

Pict. 33



DYNAMIC PRESSURE mbar (MAINS)				
G20 (NATURAL GAS)		G31 (PROPANE)		
	min	max	min	max
Eco 24 MR	1,4	12,5	5,2	37
Eco 28 MR	1,2	13,0	4,8	37
Eco 32 MR	1,2	11,6	4,7	37

After finishing the gas supply pressure tests:

- Disable the SERVICE function
 - Place the device in stand-by (off)
 - Disconnect the micromanometer connected before the gas regulator. **TIGHTEN THE PRESSURE OUTLET SCREW UNTIL IT SEALS**
 - Disconnect the micromanometer connected after 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

CHANGING GAS TYPE (ALL MODELS)

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 and resulting adjustments necessary.

In order to perform this change the boiler's basic configuration must be modified to that necessary to support the supplied type of gas. The first step is to change the burner injectors, which must be adapted to the type of gas used in order to maintain the correct gas flow rate and allow the boiler to operate within its rated power range.

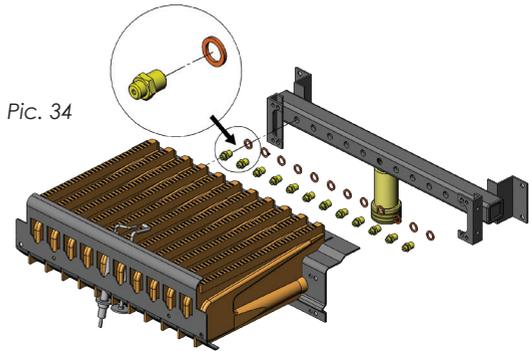


CONVERSIONS MUST ALWAYS BE PERFORMED BY QUALIFIED PERSONNEL

It is necessary to access the burner in order to change the nozzles:

- Completely disconnect the boiler from the electrical supply
- Close the shut-off valve on the boiler gas supply
- Remove the cover of the sealed chamber by unhooking the upper and lower fastenings
- Disconnect the cable of the ignition electrode located in front of the burner trays
- Remove the front cover of the combustion chamber, if necessary
- Remove the burner trays pack by unscrewing the 4 screws for positioning it and fastening it to the gas manifold (Pict. 34)
- Remove any air deflectors and conveyors in the vicinity of the gas manifold, then use a suitable box spanner to unscrew all the injectors
- Check that the type of injectors available corresponds to those specified in the table by model and gas type
- Position the new injectors with their copper washers (Pict. 34)
- Tighten all the injectors into place

- Replace the burner tray pack, fastening it to the manifold with the 4 front screws, together with any previously removed deflectors and conveyors
- Replace and close the combustion chamber cover
- Reconnect the ignition electrode cable located in the front
- Replace and close the sealed chamber cover
- Apply label B1/B2 on the gas valve after removing the old label



Pic. 34

Boiler	No. injectors	Injector type	
		Natural gas	LPG
Eco 24 MR	11	NP Ø 1.3 mm	NP Ø 0.78 mm
Eco 28 MR	13	NP Ø 1.3 mm	NP Ø 0.77 mm
Eco 32 MR	15	NP Ø 1.3 mm	NP Ø 0.77 mm

CONFIGURING THE SOFTWARE FOR A CHANGE IN GAS TYPE

Once all the gas injectors are replaced, one must check and, in case, update the program residing in the microprocessor, so that the program can adapt optimally the supply to the gas modulator coils.

modify the parameter according to the gas distributed and for which the transformation was carried out, using the values shown in the table:

Once all the gas injectors have been replaced, the microprocessor-based program must be checked and updated if necessary so that it can optimally adapt the power supply to the gas modulator coils.

Gas type	Parameter value A01
Natural gas	0
LPG	1

To adapt (maybe "adjust"?) the modulator valve power driver of the gas regulation valve, access the "CONFIGURATION MENU" and display the value of parameter "A01";

ONLY BY SUPPLYING THE GAS MODULATOR IN AN APPROPRIATE WAY, IT IS POSSIBLE TO OBTAIN AND ENSURE A SAFE, PROPER AND COMPLYING FUNCTIONING.

Pic. 35



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

THE USE OF INJECTORS DIFFERENT THAN THOSE SPECIFIED CAN ENDANGER PERSONS AND PROPERTY. CHECK THAT THE BURNER TRAY PACK AND ALL OTHER PREVIOUSLY REMOVED COMPONENTS ARE CORRECTLY POSITIONED BEFORE CONNECTING THE GAS SUPPLY AND STARTING THE BOILER.

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 "GAS PRESSURE CHECK" CHAPTER (PAGE 28)

COMPLETE THE CHANGE BY ATTACHING THE LABEL A1 OR A2 INDICATING THE CHANGE TO THE NEW TYPE OF GAS FOR WHICH THE BOILER HAS NOW BEEN CONFIGURED, SUPPLIED WITH THE GAS CHANGE KIT, NEAR THE TECHNICAL DATA PLATE LOCATED ON THE REAR INSTRUMENT PANEL COVER.

ACCESSING THE CONFIGURATION MENU

It is possible to view the information or to perform the complete configuration of the boiler by accessing the different pages of the INSTALLER/CONFIGURATION MENU. Accessing the 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.



THE ACCESS TO THE INSTALLER/CONFIGURATION MENU IS EXCLUSIVELY RESERVED FOR TECHNICIANS WITH THE NECESSARY QUALIFICATIONS AND LICENSES. THE 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 the menu pages:

Press the "E" and "F" buttons simultaneously for more than 5 seconds; the letter "P" and the number "00" will appear on the display on release (Pict.36)

Selecting a page within the menu:

The information in the menus is organized by pages corresponding to a code that uniquely identifies a parameter and the corresponding value. To select a menu page: enter according to the procedure described in the desired menu; as soon as this mode is activated, the first code of the present parameter is automatically displayed. To scroll the pages use the "A" buttons.

Changing the parameter setting:

The value of a certain parameter can be changed after selecting it, by pressing the "C" key to increase and / or "D" to decrease.

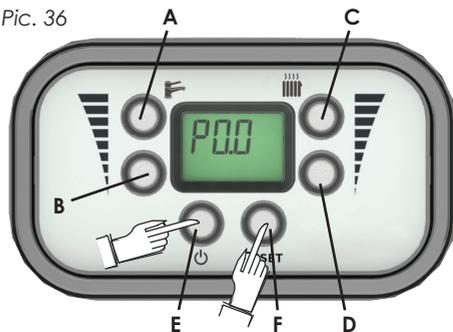
To store the value press the "B" key.

To exit without saving, press the "E" key or wait for the automatic return to the main menu.

Accessing the installer menu via password:

Access the configuration menu by pressing the "E" and "F" keys simultaneously, and "P00" will appear on release. Pressing the "B" button the word "Cod" will appear and

Pic. 36



then "---"; enter the first value by pressing the "C" button; confirm by pressing the "B" button; enter the second and third values in sequence. Once the "198" code has been entered in full, confirm using the "B" button. At this point the access to all the "Axx" parameters is effected.

INSTALLER MENU

Page	Description	Min	Max	Default
P00	Burner ignition power % with NATURAL GAS supply	0	99	25
P01	Burner ignition power % with LPG supply	0	99	50
P02	Burner maximum power %	0	99	99
P03	"Post circulation" time sec	0	99	60
P04	"Post ventilation" time sec	0	99	10
P05	Anti frequent ignition parameter min	0	255	3
P06	SERVICE FUNCTION	0= deactivated 1= minimum power 2= maximum power		0
COD	ALL PARAMETER MODIFICATION ENABLE CODE	0-99 198 INSTAL. 275 OEM		
P07	Activation external probe	0 = deactivated 1= activated		0
P08	"K"climate curve parameter	10	30	10
P09	Type of system pressure measurement device	0 = none - 1= transducer 0,5-2,5 V (B type) 2 = transducer 0,5-3,5 V (A type) - 3 = pressure switch 4= flow switch		3

Page	Description	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		0
A01	Gas type setting	0 Natural gas	1 LPG	0
A02	System type	1 High temperature	2 Low temperature	1
A03	Plate heat exchanger preheating	0 = not enabled	1 = enabled	0
A04	Min current			20
A05	Min current			30
A06	Max current			120
A07	Max current			165
A08	The value added to the D.H.W. set point, corresponds to the primary circuit water temperature to release D.M.W. in the event of sanitary water sensor failure.	50	80	10
A09	Storage tank regulation setpoint. °C			80
A10	Delta T ON burner °C	-10	10	-3
A11	Delta T OFF burner °C	-10	10	3
A12	DHW input	0= flow switch	1 = tipe A	1
A14	Max CH power time sec.	0	99	5
A16	Deviant setting (230V)	0 = deactivated	1 = activated	1
A17	Control type DHW (if A00=0)	0 = DHW probe	1 = CH probe	0

A21	Selection T.A. or O.T.	0 = T.A.	1 = O.T.	0
A23	Pump type	0 = ON/OFF	1 = PWM	0
A24	PWM pump managing during CH if A23=1 29=OFF	30-100 fixed %	101=auto	101
A25	Delta T during CH (if A32=1)	10	35	10
A26	Delta T during DHW (if A23=1)	10	35	25
A27	PWM pump refresh time during CH	10	200	50
A28	PWM pump refresh time during DHW	10	200	100
A29	PWM pump management during DHW if A23=1 29=OFF	30-100 fixed %	101=AUTO	101
A30	Min PWM pump speed CH if A23=1	20	100	60
A31	Min PWM pump speed DHW if A23=1	20	100	20
A32	Max temperature offset during AUTO if A23=1	0	50	10
A33	Antilegionella frequency day	0	30	7
A34	Antilegionella temperature °C	65	85	65
A35	Antilegionella temperature time	0 min	30 min	15
A36	OFFSET temperature DHW burner ignition	-10	10	0
A37	OFFSET temperature DHW burner ignition switching off	-10	10	4
A38	Post circ. time in DHW sec.	0	99	60
A39	CH modulation during DHW=0	0 = disabled	1 = enabled	0
A40	Minimum draw function	0 = deactivated	1 = activated	1
A41	DHW deactivation demand sec.	0	20	0
A42	CH deactivation demand sec.	0	60	0
A43	ON °C	-10	10	-5
A44	OFF °C	-10	10	5
A45	Deaeration program	0 = deactivated	1 = activated	1
A46	Offset DHW Preheating	0	10	5
A47	Gas heater type	0	3	0
A49	Pump run during DHW request	0 = enabled	1 = disabled	1
A50	Antilegionella function	0 = enabled	1 = disabled	0
A99	Exit menu			

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 Open-Therm.

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 INSTALLER MENU (see page 34) modifying parameter A21 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 OpenTherm to the boiler it is possible to use the supplied two-core cable labelled "TA".

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

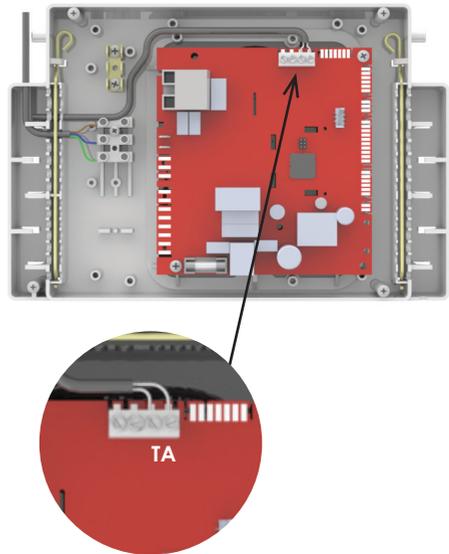
Whenever necessary, replace the "TA" cable and connect it directly to the slot present in the PCB case as follows:

- 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 (Pic. 41)

- 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)

Pic. 41



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_β 3977 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.

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

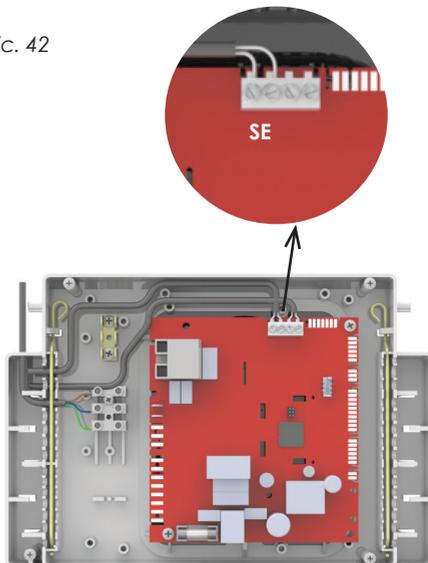
40 - 50 m

Wire the cable from the sensor to the correct slot (x5) 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 *Pic. 42*
- 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 (x5) (*Pic. 42*).
- 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)



EXTERNAL TEMPERATURE SENSOR CONFIGURATION

Access to installer menu (see page 32), enter password of authorization to modify parameters and modify parameter "P07" from 0 to 1.

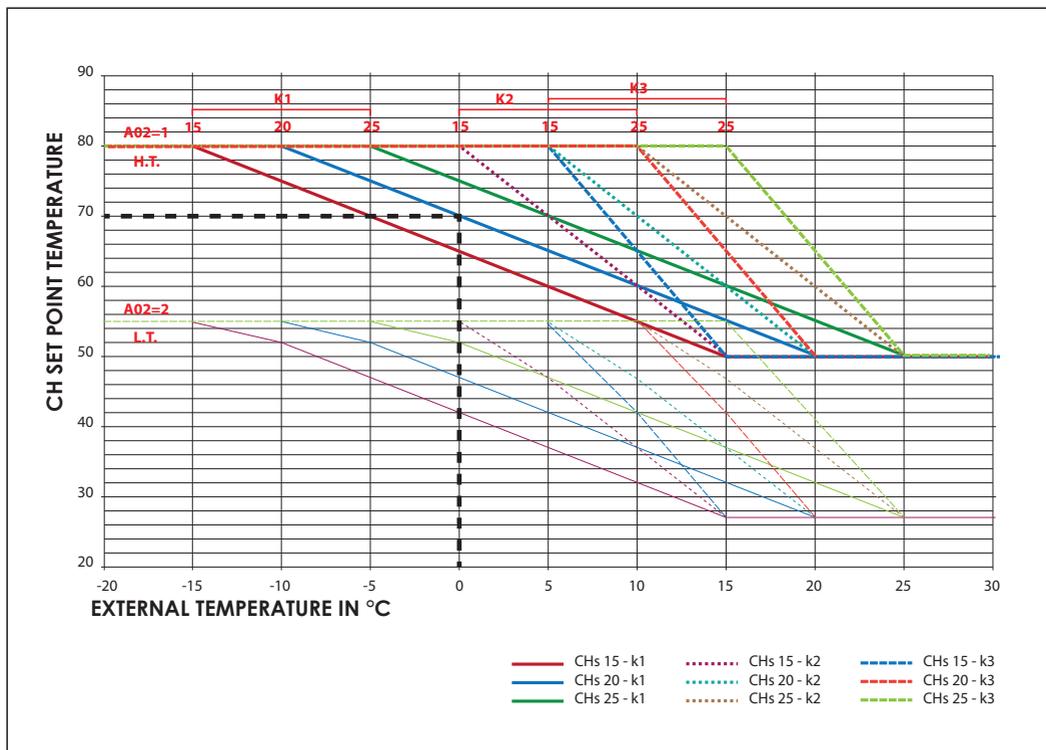
CONFIGURING THE CLIMATE CURVE FROM THOSE AVAILABLE:

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 P8. 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 P8 is indicated in the graph (Pic.43)

Pic. 43



Example:

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

- Set P8 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°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° temperature and deactivates 10° .



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 "INSTALLER" 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 "A45" PARAMETER

TECHNICAL DATA	U.M.	Eco 24 MR/MN	Eco 28 MR/MN	Eco 32 MR/MN
Category		II2H3P	II2H3P	II2H3P
PIN		CE-1299CS0116	CE-1299CS0116	CE-1299CS0116
NOx Class		3	3	3
Type		B22p-C12-C32-C42 -C52-C62	B22p-C12-C32-C42 -C52-C62	B22p-C12-C32-C42 -C52-C62
Gas used		G20 G31	G20 G31	G20 G31
Heat input max.	kW	26,0	30,0	33
Heat input min.	kW	9,0	10,0	11,2
Heat output max.	kW	24,92	27,92	31
Heat output min.	kW	8,8	9,63	9,51
Efficiency	%	92,7	92,9	93,2
Efficiency at 30% P	%	91,0	90,9	90,6
Exhaust gas T. (G20 20mbar) 20 °C	°C	128,0	129	146
Fuel consumption	G20 m ³ /h	2,6	3,2	3,57
	G31 kg/h	1,95	2,3	2,5
HEATING				
CH water temperature adjustment range	°C	27-80	27-80	27-80
Expansion tank	l	6,0	6+6	6+6
Expansion tank pressure	bar	1,0	1,0	1,0
Min/Max operating pressure	bar	0,8 - 3,0	0,8 - 3,0	0,8 - 3,0
Max Circulator head	mwc	5,0	6,0	6,5
DOMESTIC HOT WATER				
Continuous draw ΔT 25°C	l/min	13,5	14,5	16,6
Max DHW pressure	bar	10,0	10,0	10,0
Min DHW pressure	bar	0,5	0,5	0,5
Min/max DHW temp adjustment	°C	30-60	30-60	30-60
ELECTRICAL CHARACTERISTICS				
Voltage/Frequency	V/Hz	230/50	230/50	230/50
Power	W	152	152	155
IP rating	IP	X4D	X4D	X4D
DIMENSIONS AND CONNECTIONS				
Width	mm	456	456	456
Height	mm	690	690	690
Depth	mm	240	332	332
Weight	kg	35	37	38
Flow/Return	in	3/4	3/4	3/4
DHW in/out	in	1/2	1/2	1/2
Gas supply	in	3/4	3/4	3/4
Concentric (coaxial) intake/exhaust gas pipe diameter	mm	60-100	60-100	60-100
Min-max concentric pipe length	m	0,5-5 + curva	-	0,5-5 + curva
Split (separate) intake/flue pipe diameter	mm	80/80	80/80	80/80
Max pressure drop with separate pipes (intake + flue evacuation)	mbar	1,7	1,75	1,45
MAIN GAS OPERATING PRESSURE				
G20 max.	mbar	12,5	13	11,6
G20 min.	mbar	1,4	1,2	1,2
G31 max.	mbar	37	37	37
G31 min.	mbar	5,2	4,8	4,7
Ø G20 nozzles	mm	1,3	1,3	1,3
Ø G31 nozzles	mm	0,78	0,77	0,77



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