



A brand by G20 ENGINEERING

THEA 65 MN

Kondens

Wall-mounted condensing boiler



Kondens

INSTALLATION, COMMISSIONING, USE AND MAINTENANCE MANUAL

ITALIAN DESIGN



THEA 65 MN KONDENS MANUAL
02/2019 VERSION - REV.4

TABLE OF CONTENTS


General requirements	2	-Connection to the electrical system	20
-General information	2	-Combustion gas evacuation system	21
-Description of the boiler	3	-Air intake and combustion gas evacuation system: important information	21
-Components	3	Adjustment and maintenance	22
-Interface description	4	-General maintenance operations	22
-Main menu	5	-Component replacement	23
-Page 2-Operation	6	-Cleaning the Mixer filter	24
-Page 2-Operation-Season select	7	-Power adjustment	26
-Page 2-Operation-Temperature regulation	7	-Testing the gas supply dynamic pressure	27
-Information menu	8	-Heating power adjustment	28
-Operation with room thermostat	9	-Analysis - Checking and regulating combustion	29
-Operation with external sensor	9	-Changing gas type	30
-Operation with Opentherm timer thermostat	9	-Accessing the configuration menu	31
-Operation with storage tank	10	-Installer menu	32
-Faults	12	-Thermostat installation	34
-Fault codes table	13	-Installation of external temp. sensor	35
Installation	14	-External temp. sensor conf.	35
-Operational diagram	14	-Auto-learning function	36
-Cascade installation diagram	14	-Configuring the climate curve	37
-Wiring diagram	15	-High-temp systems (SP50°-80°)	37
-Installation	16	-Low temp systems (SP28°-57°)	37
-Fastening the boiler to the wall	17	-Timer thermostat installation	37
-Layout of connections	17	-Special functions	38
-Plumbing in the boiler	18	-Technical Data	39
-Connecting the condensate line	18		
-Connection to the mains gas supply	19		

GENERAL REQUIREMENTS

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

G20 Engineering 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 THEA boilers are in compliance with European Directives and with European Delegates regulations.

Chief Executive *Marco Rapaccioli*



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 information, indications of methods and operations which could compromise correct operation of the boiler and create a hazard.

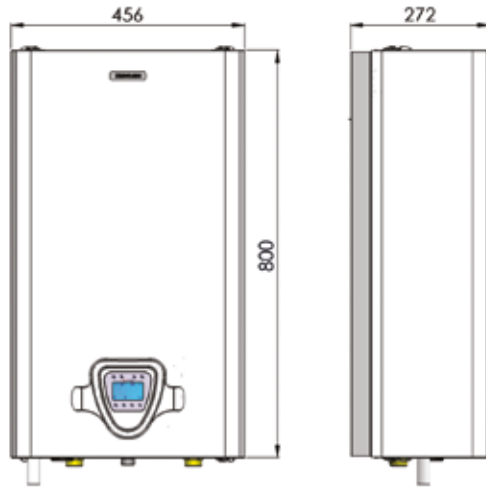
DESCRIPTION OF THE BOILER

The Thea range of wall-hung boilers is completed by the flagship model: Thea 65 MN Kondens. A perfect, powerful, reliable and ecological boiler, it is fitted with a high-efficiency condensing heat-exchanger and is completely made in Italy. The boiler includes a PCB with microprocessor to manage the system in such a way as to

always provide maximum efficiency and minimum waste.

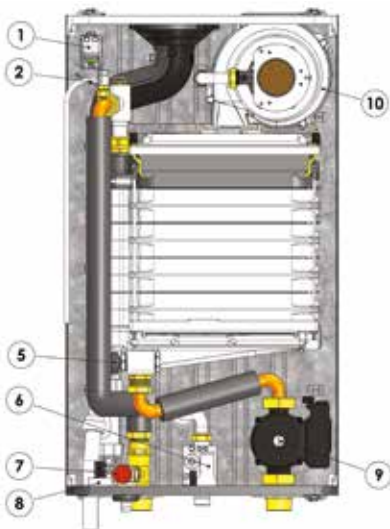
The highest quality components complete a system which is essential whenever the highest levels of domestic comfort and a clean, elegant and livable environment are required.

Pict. 1



COMPONENTS

Pict. 2



THEA 65 MN Kondens

- 1) IGNITER
- 2) DOUBLE HEATING/SAFETY SENSOR
- 3) -
- 4) HEAT EXCHANGER
- 5) PRESSURE TRANSMITTER
- 6) GAS VALVE
- 7) SAFETY VALVE
- 8) PRESSURE GAUGE
- 9) CIRCULATOR UNIT
- 10) FAN

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. 3



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. 4.1)

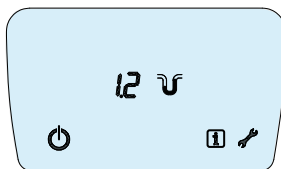
In this mode the device is powered on but all functions regarding the supply of domestic hot water or central heating are inactive. In this mode the central heating system pressure is displayed (in boilers with pressure transmitter) and the MAIN MENU can be entered by pressing button 1; to go back to the starting page (STAND-BY) press button 1 again (Pict. 4.2)

By pressing button 4, the **INFORMATION MENU** is accessed; to go back to the starting page, press button 4 again (Pict. 4.3)

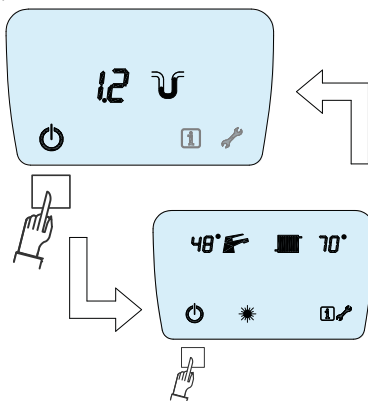
Consult the relevant chapters for menu exploring and menu functions: “FUNCTION”, “INSTALLER MENU”.

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.**

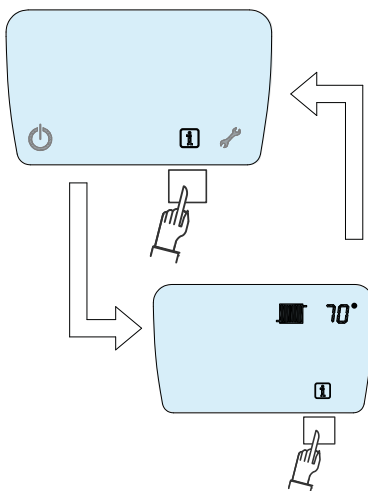
Pict. 4.1



Pict. 4.2



Pict. 4.3

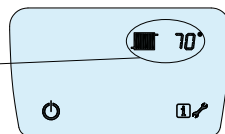


In standby/off mode the boiler is inactive but its electricity supply is still connected!

“OPERATION” MAIN MENU

The OPERATION page is the main page which is always displayed during the normal operation of the boiler. *Pict. 5.1*

CH Temperature



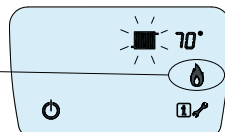
In this page, the following symbols are always displayed:

Central-heating only boilers

- The temperature of hot water in the CH circuit; *Pict. 5.2*
- The INFORMATION menu access symbol;
- The INSTALLER menu access symbol;
- The stand-by/off menu access symbol (Pict. 5.1).

When the burner is operating the flame signal is displayed, with the radiator symbol flashing (Pict. 5.2). 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. 5.3).

Burner on

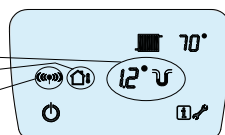


Pict. 5.3

System pressure

External temperature sensor

OT thermostat remote control



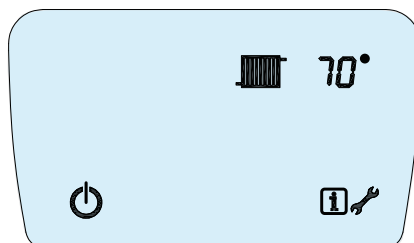
PAGE 2-OPERATION-SEASON SELECTION

The boiler has two operating modes, which *Pict. 6*

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

Central-heating only boilers

The season selection option is not available in central heating only boilers. The device can therefore be either in stand-by (*Pict. 4.1*) or operational, ready to supply the only service which it has been manufactured for (*Pict.6*).





TEMPERATURE ADJUSTMENT

Central-heating only boilers

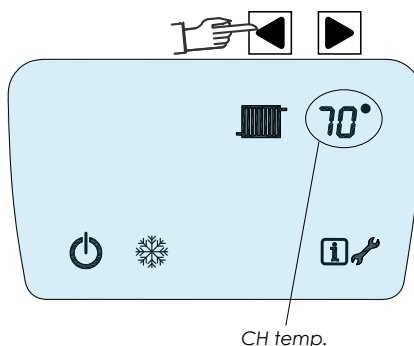
Only the temperature value for the single option which can be viewed on the display can be adjusted in central heating only boilers.

Pict. 7

Central heating temperature setting in the CH circuit

Push one of the two buttons located above the RADIATOR symbol (7-8); the set and displayed CH water temperature value starts flashing, then push  (8) button to increase and  (7) button to decrease. Every button pressure means 1°C increase/decrease.

Once reached the desired value, do not press 7-8 buttons anymore; the new water temperature value flashes for 5 seconds and it is automatically memorized and displayed. The temperature values which can be set depend on the type of system which the boiler is connected to. For serving high temperature heating systems, the temperature range is: min 50°C - max 80°C; for serving low temperature heating systems, the temperature range is: min 27°C - max 55°C.



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



MAIN MENU: 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.

Activating the INFORMATION MENU:

To access the menu pages, push button 4. It is possible to access the INFORMATION MENU both when the boiler is in standby/off and in operation.

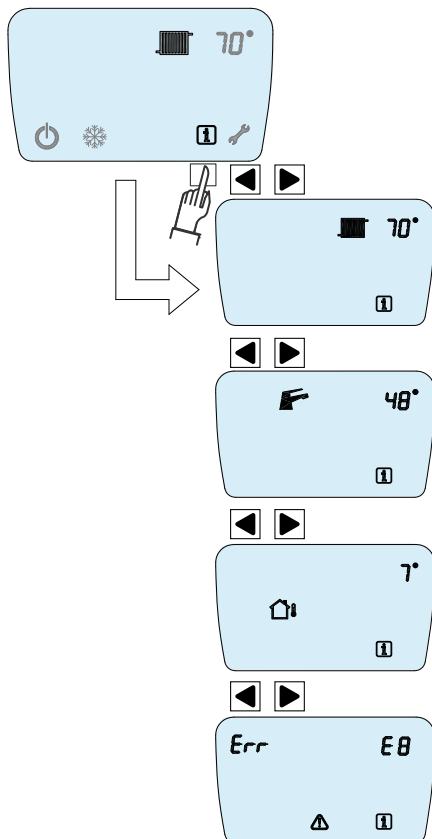
Selecting the menu pages

In order to display all the parameter values of INFORMATION MENU, after activating the first page which immediately shows the value of CH water temperature, push  6 button in order to scroll the pages forwards and  5 button in order to scroll them backwards.

The pages which can be displayed are:

1. Central heating temperature set
2. Domestic hot water temperature set

Pict. 8



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

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 optimised for a specific climatic area or season.



It is possible, in any case, to customise the central heating circuit temperature using the MULTIFUNCTION KNOB; increasing or decreasing the central heating circuit temperature adapts it (temperature offset) based on 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 OPENTHERM TIMER THERMOSTAT

For optimum and even more economical management of the domestic premises it is possible to use the ECOCHRONO programmable timer thermostat. ECOCHRONO 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. ECOCHRONO 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 FROM YOUR AREA AUTHORISED INSTALLER.

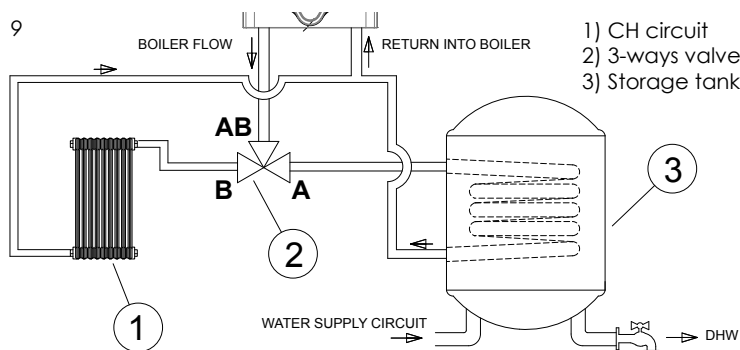
OPERATION WITH STORAGE TANK

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.

Pict. 9



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:

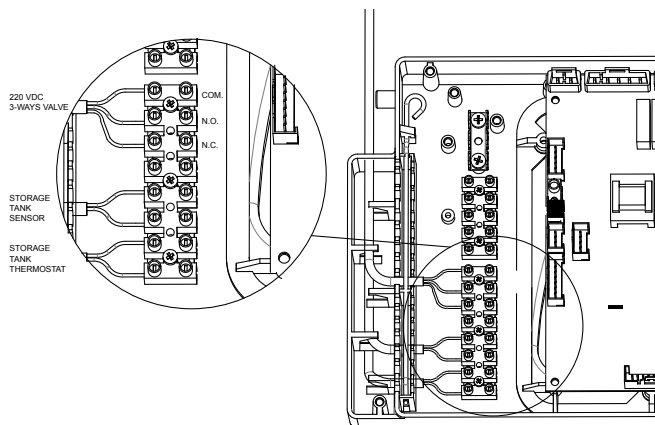
- 1_ the "common" line cable;
- 2_ the "Open" line cable
- 3_ the "Closed" line cable

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.



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:

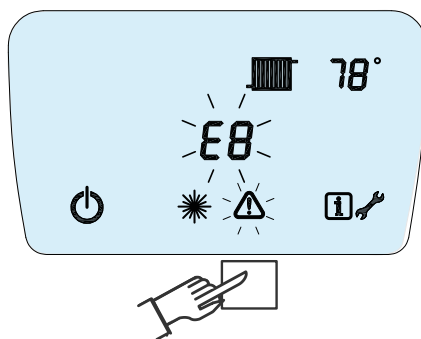
- The primary circuit temperature during the preparation for the storage tank;
- The temperature difference between set point (set sensor) and the temperature detected by the DHW (only NTC sensor mode) for the burner ignition and switch off (isteresis).

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. 11). Faults are displayed on any screen of the main menu.

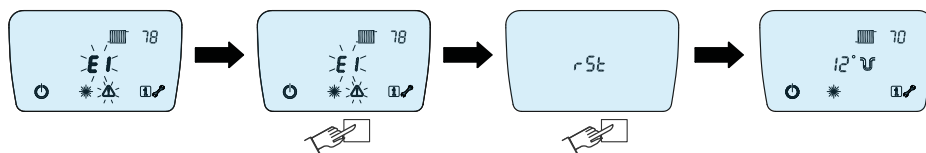
Conditions causing transitory faults are possible. Many of these are recognized and cause a temporary block which is automatically reset once the condition causing the fault has stopped. Some of these provide for the possibility to attempt to restore operation manually.



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. 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. 12



**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 CONDITIONS.**

FAULT CODES TABLE

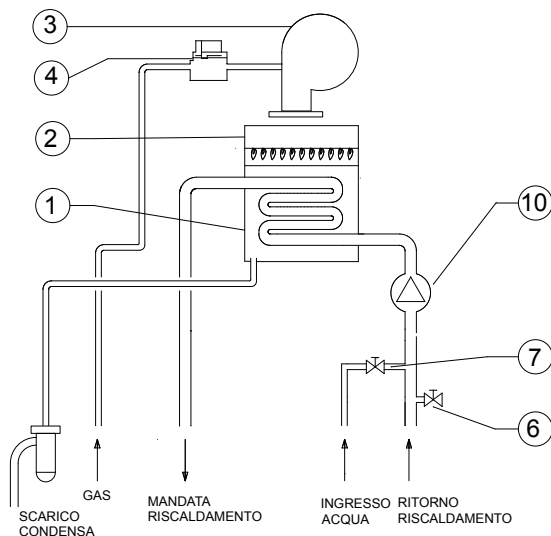
Code	Possible cause	Behaviour	Possible actions
E0*	No communication with ECOCHRONO timer thermostat	Operation in provisional mode	Check transmission line Replace ECOCHRONO
E1	Ignition failed	Boiler locked	Check gas presence Check gas line pressure Check ignition/detection electrodes Check electronic cable Check igniter
E3	CH temperature sensor fault	Boiler locked	Replace CH sensor
E4	DHW temperature sensor fault	DHW supplied in provisional mode Heating functions normally working	Replace DHW sensor
E5	Fan fault	Boiler locked	Check fan connections Replace fan
E6	High temperature detected by CH sensor	Boiler in stand-by Norma DHW supply	Wait for automatic unlocking Check system pressure
E8	Too low CH system pressure	Boiler locked	Check system pressure
E9	Too high CH system temperature	Boiler locked	Let the gas out of the system Check system pressure Check system flow Check combustion regulation
E10	Too high CH system pressure (>2,7 bar)	Boiler locked	Check circulating pump
E12	Remote control reset used-up	Boiler locked	Reset the system Power off the system
E13	EEPROM Error	Boiler locked	Reset the system Power off the system Replace electronic board
E14	Fan speed fault	Boiler locked	Check fan connections Replace fan
E16	Exhaust temperature sensor	Boiler locked	Check system purge Check system circulation Check circulating pump Check burner Check boiler regulation
E23*	Fault on external temperature sensor	The boiler starts again without external sensor	Check external sensor position Check communication line Replace external sensor
E24	Return probe fault	Boiler locked	Replace return probe
E25	Too low CH water temperature (danger of freezing)	Boiler locked	Wait for automatic unlocking
E26	Solenoid valve board failure	Boiler locked	Replace solenoid valve board
E28*	Storage tank probe failure	Boiler locked	Replace probe
E30	Parameter setting error	Boiler locked	Check and configure the parameters again
E33	DHW micro-storage tank sensor	Supply without storage tank	Replace micro-storage tank sensor
E77*	High storage tank temperature	Boiler locked	Check storage tank connections Check diverting valve Check storage tank probe
E40	High return probe temperature	Boiler locked	Check parameters
E77*	Storage tank overheating	Boiler locked	Check storage tank dimensions Check diverting valve Check storage tank probe

*can be displayed only if the relative devices are installed

OPERATING DIAGRAM

COMBINATION: DOMESTIC HOT WATER + CENTRAL HEATING

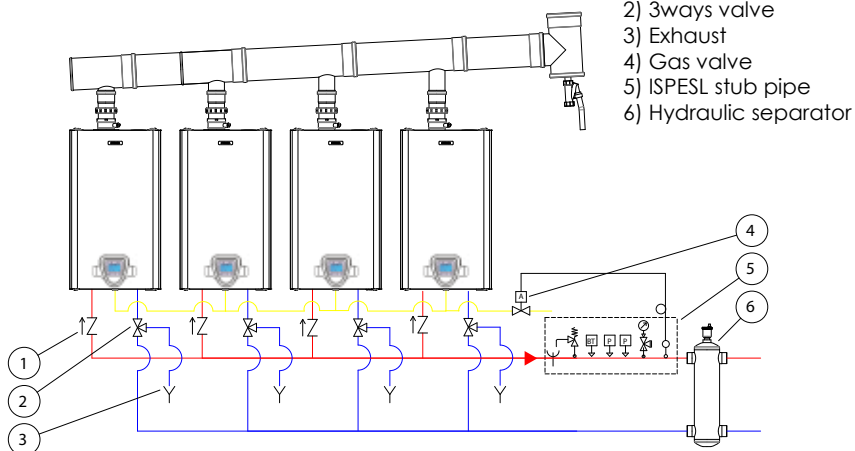
Pict. 13



- 1) Primary heat exchanger
- 2) Burner
- 3) Fan
- 4) Gas valve
- 6) Safety valve
- 7) Charge valve
- 10) Circulator unit
- 11) Expansion tank

CASCADE INSTALLATION DIAGRAM

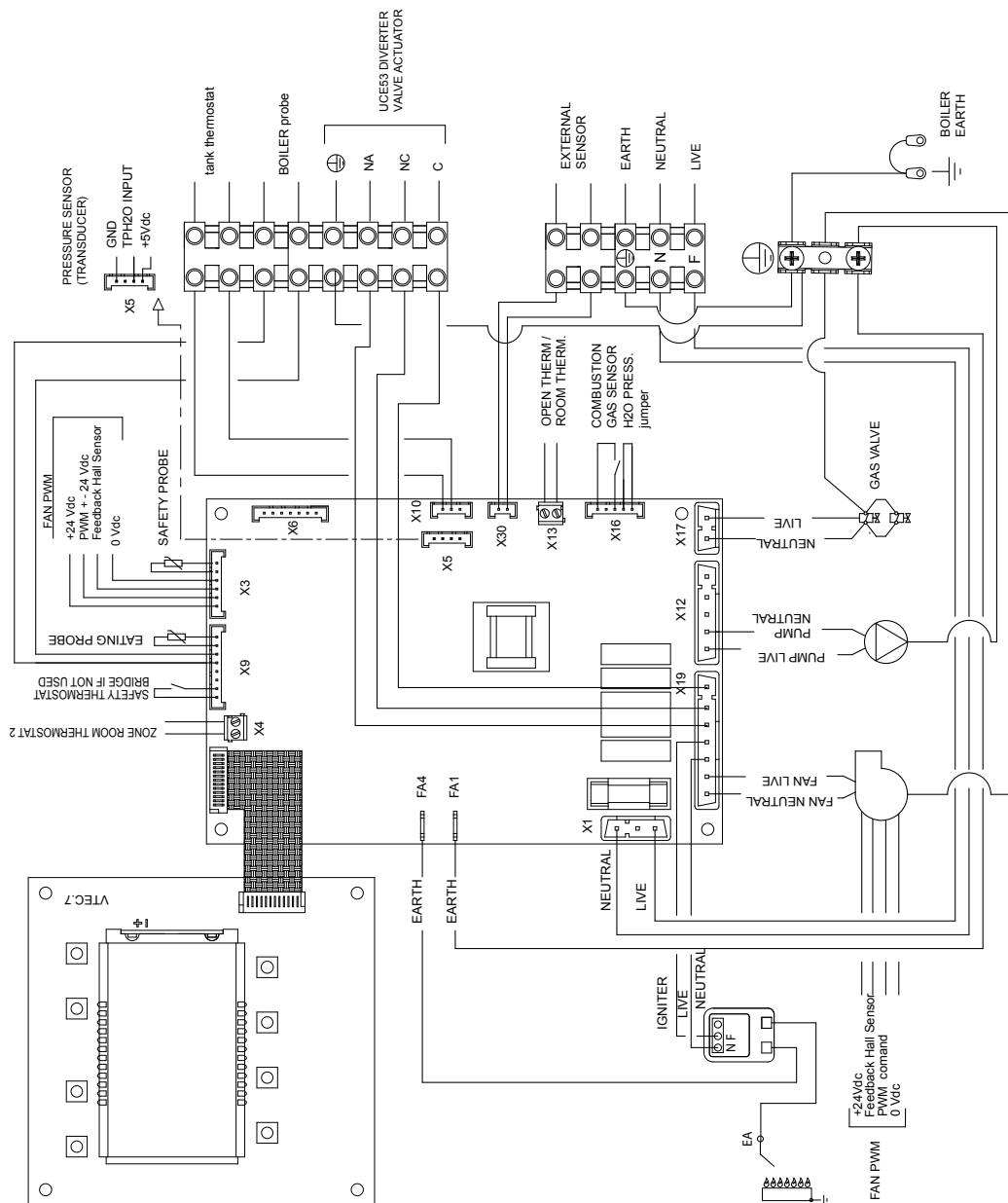
Pict. 14



- 1) Check valve
- 2) 3ways valve
- 3) Exhaust
- 4) Gas valve
- 5) ISPEL stub pipe
- 6) Hydraulic separator

ELECTRICAL WIRING DIAGRAM

Pict. 15



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.

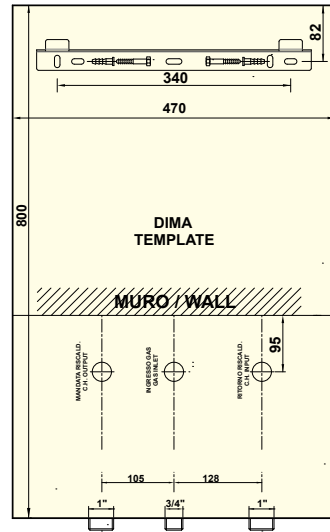
- Do not install the boiler in environments containing dust or strong vapours.

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.

FASTENING THE BOILER TO THE WALL

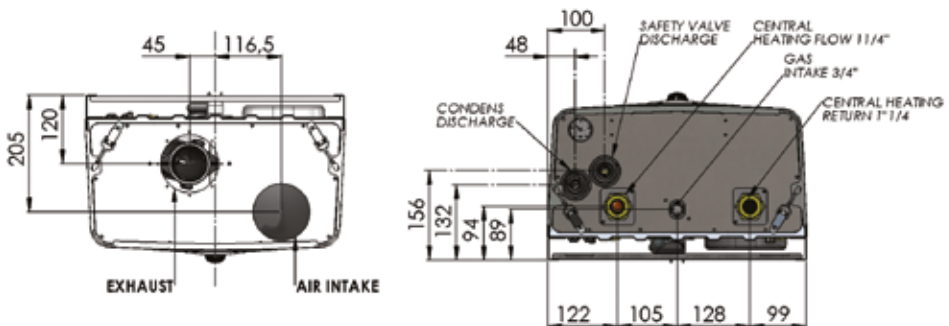
Hang the metal sheet template to the wall *Pict. 16* (Pict.16), paying attention to the boiler dimensions.

- 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. 17



PLUMBING THE BOILER IN

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



Before connecting the hydraulic pipes: 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 does 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

CONNECTING THE CONDENSATE LINE

It is compulsory to connect the Thea 65 MN Kondens boiler condense discharge to a condensate trap, in order to avoid the combustion products entering the environment it is installed in.

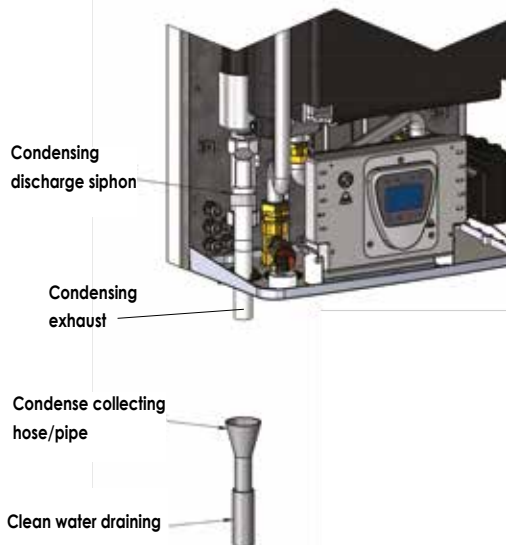
The boiler's connection to the condensate line must be inspectable and must drain into the household waste-water drainage system with a minimum fall specified by applicable regulations. There must be no points where standing water can form and no narrowing which could impede the flow.

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. 18 shows how to connect the trap to the household drainage system.

The installer shall be responsible for installing a condensate neutralisation system if necessary.

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

Pict. 18

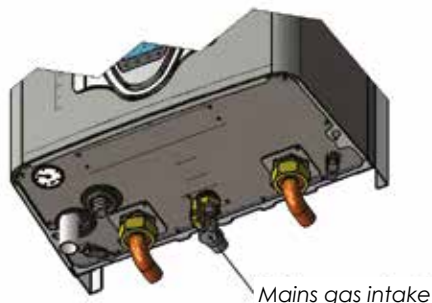


CONNECTION TO THE MAINS GAS SUPPLY

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. The gas supply must be connected to the boiler intake (Pict. 19), 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

Pict. 19



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.

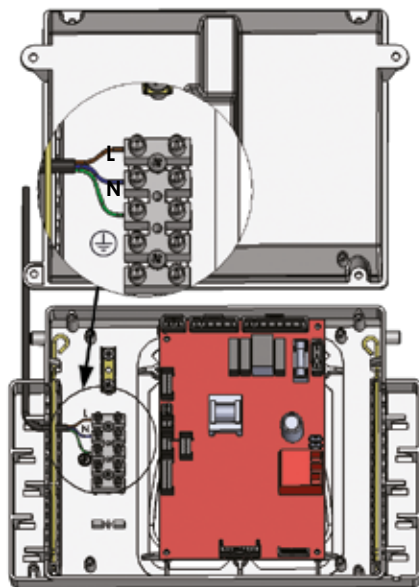
The device is fitted with a three-core electrical cable supplied without a plug. It must be connected to the mains with a dedicated connection via a dual-pole switch whose contacts have an opening of at least 3 mm. It is important to respect the correct polarity (LIVE: brown cable / NEUTRAL: blue cable / 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:

- Remove the bottom case cover by unscrewing the 4 screws; turn the instrument panel to the open position
- 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.

Pict. 20



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.



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

Check that the electrical connection is sufficient to satisfy the boiler's maximum power consumption, indicated on the

COMBUSTION GAS EVACUATION SYSTEM: COMPATIBLE APPLICATIONS

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

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.

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.



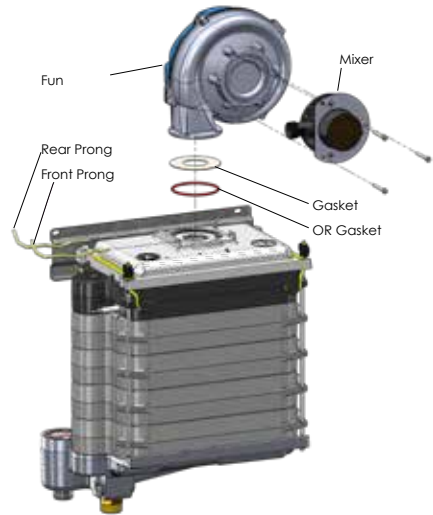
If any components of the boiler require replacement, original spare parts supplied by the manufacturer must be used. Use of other components could compromise correct operation of the device. The manufacturer declines any responsibility for consequences linked to the use of non-original spare parts. At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

COMPONENTS REPLACEMENT

FAN

1. In case it is necessary to replace the fan:
2. Disconnect the power supply
3. Close the gas
4. Loosen the nut of the gas supply fitting
5. Remove the power wires
6. Unhook the two holding pins of the fan from the burner plate by turning them of 90 °
7. Remove the front pin and remove the fan from its housing
8. Refit the fan by positioning it between the rear pin and the gasket, repeating the operations in reverse.

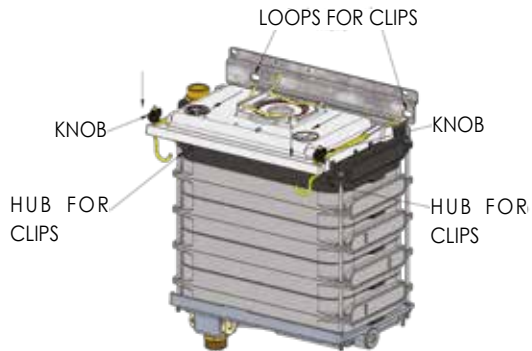
Fig. 21



BURNER

1. In case it is necessary to access to the burner:
2. Disconnect the power supply
3. Close the gas
4. Loosen the nut of the gas supply fitting
5. Remove the fan power wires and the gas valve power wires
6. Remove the fan as described in "FAN" section
7. Loosen the two knobs without unscrewing them completely and, by pressing them down, unhook the spring system from the coupling hubs
8. Remove the burner plate

Pict. 22



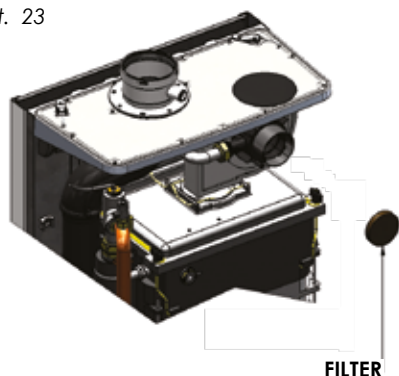
To refit the burner

1. Insert it in the hood seat, being careful to replace the gaskets in the correct way and checking for leaks.
2. Refit the hood so that it adheres perfectly to the body.
3. Insert the coupling system in the square holes on the back of the boiler, hook the remaining part in the special front seats and tighten both knobs again making sure that the hood abuts all the way down with the cast iron burner plate element.

CLEANING THE MIXER FILTER

The air intake filter positioned on the gas mixer must be cleaned at least once a year. Remove the filter from the mixer and clean it by a slight jet of compressed air.

Pict. 23



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 installer MENU and activate the relative modes from the dedicated page.

Refer to the procedures indicated in the relative chapter to access the INSTALLER MENU (Page 32)

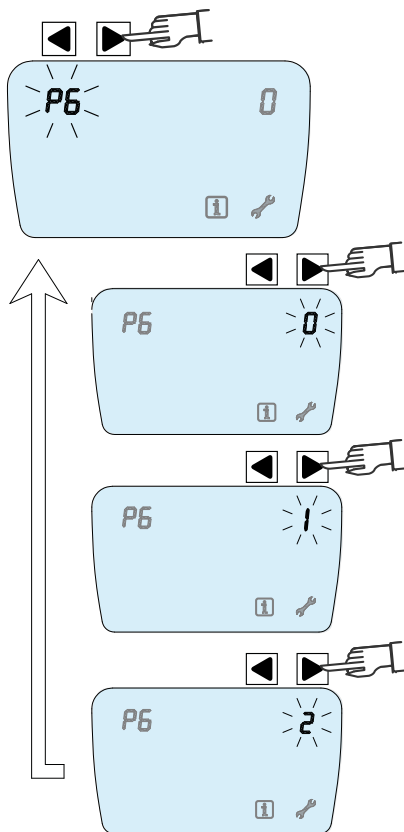
After accessing the INSTALLER MENU, select page "P6" by pressing buttons 5-6. Press one of the two buttons located above the number displayed next to the relevant page: the number will be flashing.

Push button "8" to increase the displayed value and button "7" to decrease it.

POSSIBLE VALUES FOR P6 PARAMETER
0 – DEFAULT (NORMAL FUNCTIONING)
1 – MINIMUM POWER
2 – MAXIMUM POWER

Pict. 24

During **SERVICE FUNCTION**, the diverting valve prepares the boiler to work in heating mode.



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 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 80°C the

function is suspended.

The boiler exits the function automatically after 15 minutes of operation each time the mode is set, or else when the relative page of the **INSTALLER MENU** is selected and the current value which returns the boiler to normal operation is assigned.

DATA PLATE

Pict. 25 - TECHNICAL DATA PLATE

Boiler type: A	0	CE
Serial number: B	Cat.: G	
Code: C	Type: H	
Country of destination: D	Date: I	
Manufacturer: E	PIN Code: J	
Gas: F	Nox class: K	
..... Natural gas G20	Flow	Pressure
..... G31	L/a (m ³ /h)	L/b (mbar)
C.H. Circuit	L/a (kg/h)	L/c (mbar)
		L/c (mbar)
Thermal power	M (kW min.)	M/a (kW max)
Useful load	N (kW min.)	N/a (kW max)
Useful load in condensing		O (kW max)
Pressure	P (bar)	Work temperature: Q(C°)
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°)
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 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

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. 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.

TESTING THE GAS SUPPLY DYNAMIC PRESSURE

- Remove the iron cover by loosening the 4 locking clips.
- Clear the access to the gas valve by turning the control panel in OPEN position.
- Loosen the locking 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. 26).
- 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 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

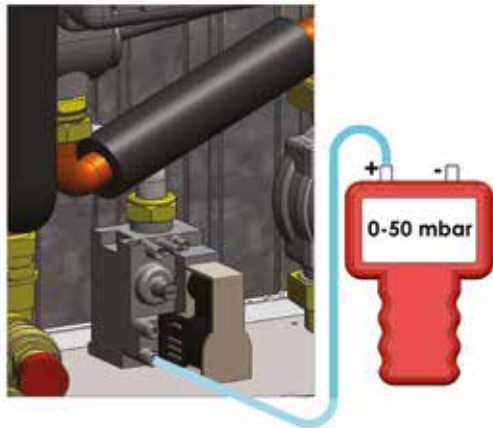


Whenever dynamic pressures above the specified maximum values should be found:

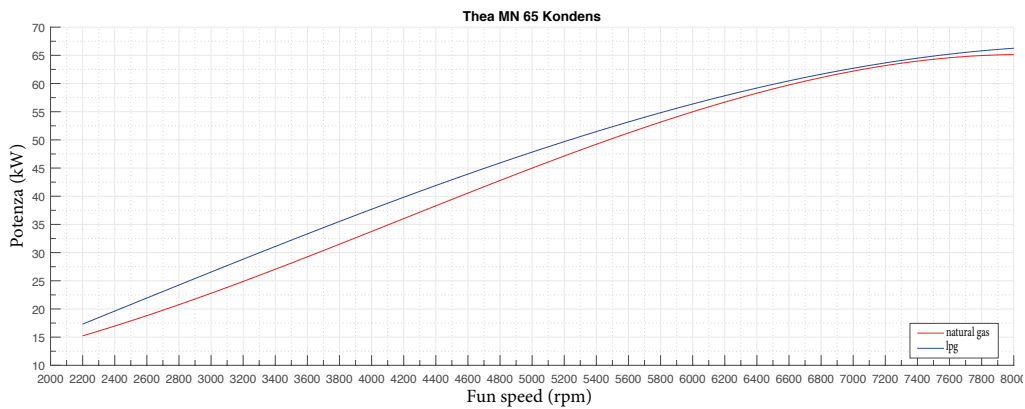
- *Install a suitable pressure reducer/regulator on the gas supply line before the boiler.*
- *Adjust the dynamic pressure of the gas via the regulator, if already present.*

DYNAMIC PRESSURE mbar (MAINS)					
G20 (NATURAL GAS)		G30 (BUTANE)		G31 (PROPANE)	
min	max	min	max	min	max
17	25	-	-	25	37

Pict. 26



HEATING POWER ADJUSTMENT



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.

to increase the CO₂ value, anticlockwise to decrease it.

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

MAXIMUM POWER:

- Use the SERVICE function to bring the boiler to maximum power.
- Insert the combustion analyser probe in the inspection outlet provided in the flue (pict. 27). After the boiler has been running for 2-3 minutes, run the analysis and check that the CO₂ measured by the analyser corresponds to the value indicated in the table for maximum power.
- If the CO₂ does not correspond, regulate with screw "N" (pict. 29) of the ratio adjuster until the specified CO₂ value is obtained. Turn clockwise to decrease the CO₂ value, anticlockwise to increase it.

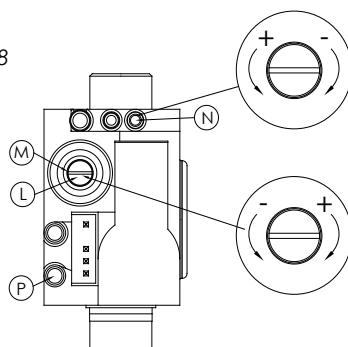
Pict. 27



MINIMUM POWER:

- Use the SERVICE 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 CO₂ measured by the analyser corresponds to the value indicated in the table for minimum power.
- If the CO₂ value does not correspond, regulate with screw "M" (pict. 28) of the ratio adjuster after removing the protective cover "L" until the specified CO₂ value is obtained. Turn clockwise

Pict. 28



CO₂ VALUES

	M.U.	G20 (NATURAL GAS)	G31 (LPG)
CO ₂ max power	%	8,9 + 0,1 - 0	10,2 + 0,1 - 0
CO ₂ min power	%	8,8 + 0,1 - 0	10,00 + 0,1 - 0
Minimum mains pressure	mbar	17	29
Maximum mains pressure	mbar	25	37



WARNING!

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**
- 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

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

Gas type	Parameter value
Natural gas	0
LPG	1

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 "INSTALLER MENU" (see page 32 for how to access this menu) and view the value of parameter "A1".
- Set the parameter according to the gas supply and the change performed, following the values given in the table below:

APPLIANCE CONVERTED : G31 TO GAS	Conversion performed on date ____/____/____ Signature of service: _____	SET ACCORDING TO: GPL G30 - G31
	Conversion performed on date ____/____/____ Signature of service: _____	SET ACCORDING TO: METANO G20
SET ACCORDING TO: METANO 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



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 27).

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:

- Regulate combustion as described on page 29, "Analysis - Checking and regulating combustion" chapter.

ACCESSING THE CONFIGURATION MENU

It is possible to view information or perform complete configuration of the boiler by accessing the different pages of the available menus:

- INFORMATION MENU
- INSTALLER MENU

The INFORMATION MENU is the only one which exclusively displays information on the state or presence of devices and does not allow any

modifications to the operational parameters; to access the pages of the information menu, proceed as described on page 8.

Accessing the INSTALLER 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.

From any page of the "MAIN MENU", push button "4" for at least 5 seconds. Access to the menu page is indicated by the symbol and page number flashing, while the value of the parameter referred to by that page is displayed normally. In this mode it is possible to scroll through the pages for all parameters and read the relative values, but without the possibility to make any changes. To modify the value of any parameter it is necessary to activate "Edit" mode by entering the correct security code which corresponds to the value of menu parameter P10. (Pict. 30) Selecting the menu/parameter modification page.

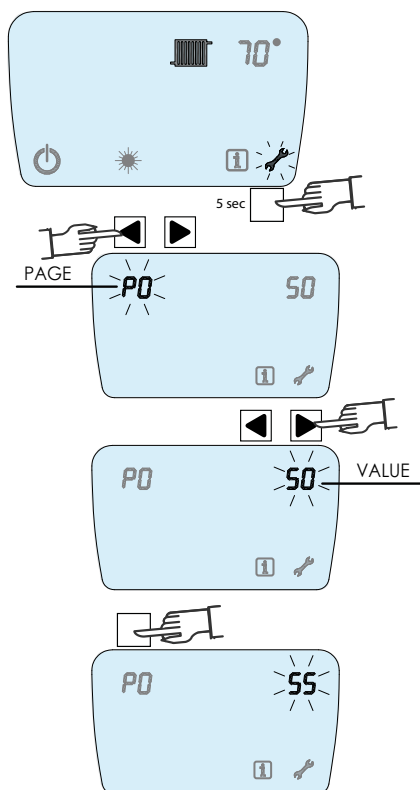
By pushing buttons "5" and "6" one can scroll through the available pages in menu.

Once the required page has been identified, in order to modify the associated parameter push buttons "7"-"8". The symbol and page number will be displayed normally while the value of the parameter flashes.

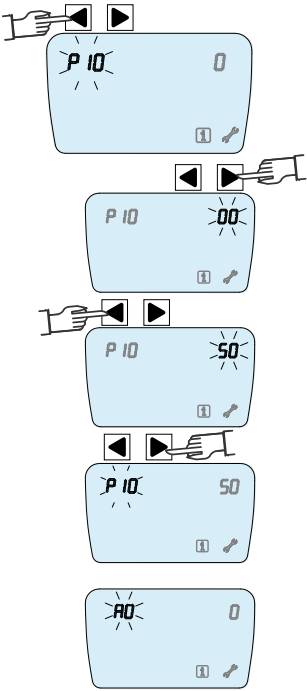
Modifying the parameter associated with a page: Once the required parameter has been displayed, select it by pushing button "5". After memorizing it, the menu page selection is displayed again.

The system will automatically exit the INSTALLER MENU after 30 seconds and return to normal display mode. It may also exit it by pushing one of the following buttons: "1" - "2" - "3" - "4".

Pict. 30



Pict. 31



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

INSTALLER MENU

Page	Description	Min	Max	Default
P0	Burner ignition power % with NG supply	0	99	0
P1	Burner ignition power % with LPG supply	0	99	15
P2	Burner maximum power %	0	99	99
P3	"Post circulation" time sec	0	99	60
P4	"Post ventilation" time sec	0	99	10
P5	Anti frequent ignition parameter min	0	255	3
P6	Service function	0 = deactivated 1= minimum power 2= maximum power		
P7	High temperature climate curve parameter	-20	10	0
P8	Low temperature climate curve parameter	-20	10	0
P9	Type of system pressure measurement device	0= none 1= 0.5-2.5 V 300-TRP100B transducer 2= 0.5-3.5 V 300-TRP100A transducer 3= pressure switch 4= flow switch		2
P10	ALL PARAMETER MODIFICATION ENABLE CODE	0-99		

Page	Description	Min	Max	Default
A0	Boiler type setting	0 = combination with plate heat exchanger 1 = combination with DHW storage tank 2 = central heating only 3 = combination with DHW micro storage tank 4 = combination with DHW storage tank with dual pump		2
A1	Gas type setting	0 Natural gas	1 LPG	0
A2	System type	1 High temperature	2 Low temperature	1
A4	Minimum fan RPM with NG (RPM/100) (if A1 = 0)	10	40	25
A5	Minimum fan RPM with LPG (RPM/100) (if A1 = 1)	10	40	24
A6	Maximum fan RPM with NG (RPM/100) (if A1 = 0)	Val A4	70	82
A7	Maximum fan RPM with LPG (RPM/100) (if A1=1)	Val A5	70	80
A13	Primary low flow rate protection	0 = absent	1 = present	0
A14	Heating ramp-up time (min)	0	99	3
A16	Diverter valve setting (230 V)	0 = absent	1 = present	0
B0-B11		PARAMETERS WHICH CANNOT BE MODIFIED!		
A21	Select TA or OT	0 = TA	1 = OT	0
A22	Enabling dual flow probe	0 = Deactivate	1 = Activate	1
A99	Exit menu			

INSTALLATION OF ROOM THERMOSTAT:

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 device is set up for connection to a thermostat **WHICH CLOSES AN UNPOWERED CONTACT WHEN THE MEASURED TEMPERATURE IS LESS THAN THAT SET (CONTACT CLOSED = REQUEST).**

Refer to the instructions supplied by the thermostat manufacturer for its installation.

To connect the room thermostat to the boiler it is possible to use the supplied two-core cable labelled "TA". Whenever necessary, replace the "TA" cable and connect it directly to the slot present in the PCB case as follows:

- Remove the lower cover by removing the four screws; turn the instrument panel to the 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.

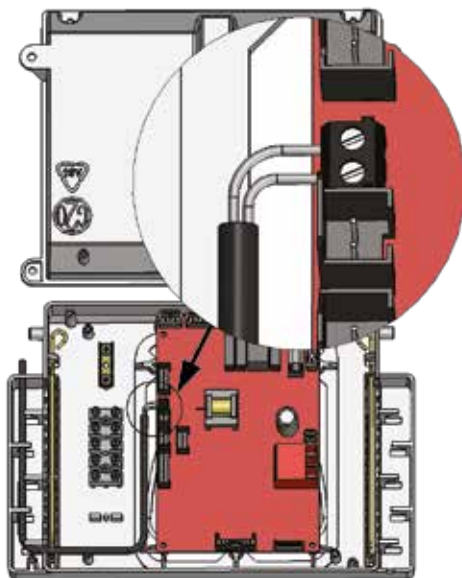
- Connect the wires from the thermostat cable to their respective slots (Pict. 32).

- 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 display visible).

Pict. 32



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_B 3445 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

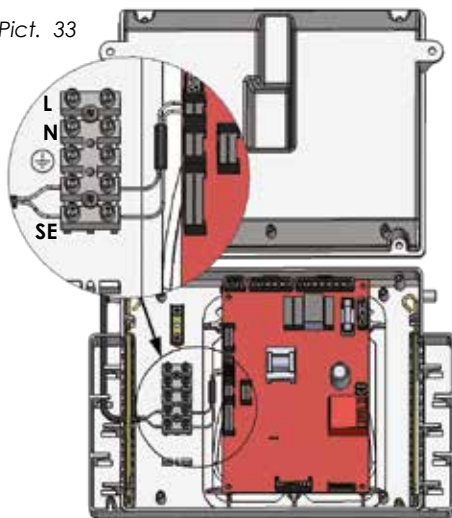
Wire the cable from the sensor to the correct slot in the terminal block inside the PCB panel:



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

- Remove the lower panel by unscrewing the four screws
- 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. 33)
- 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

Pict. 33



EXTERNAL TEMPERATURE SENSOR CONFIGURATION

The boiler must be configured with the operational mode which uses the external sensor. The operation is performed when connecting the boiler to the mains electricity supply. During initialisation of the functions it is

necessary to activate the "AUTO-LEARNING" mode, which updates and activates the functionality of all the devices connected to the boiler at that moment.

CONFIGURING THE CLIMATE CURVE AMONG THE AVAILABLE ONES

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 P7 - P8 of the INSTALLER menu.

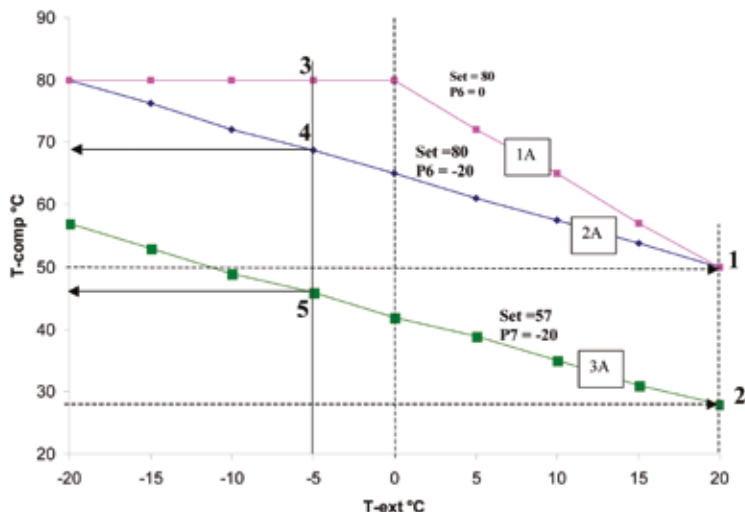
HIGH-TEMPERATURE SYSTEMS (SP 50°-80°)

The value set (from -20 to +10) for the parameter P7 in the "INSTALLER" menu refers to the characteristics of the possible climate curves which have common origins in the TOffset - TExt (offset system temp - external temp) graph positioned at the co-ordinates TExt = 20° TOffset = 50° C (fixed point); all curves which can be generated using the parameter P7 settings concern the regulation of devices configured to run with high central heating circuit temperatures (min set 50°C max set 80° C). The value of the parameter P7 (on the TExt axis), together with the central heating temperature set (on the TOffset axis) equals the co-ordinate of the furthest point of the climate curve starting from the set point and reaching the end point thus defined. For all external temperature values measured by the sensor within the interval defined by the climate curve, the set point for the central heating circuit (X axis) is taken from the intersect value with the TExt (Y axis) value. For external temperature values not included in that interval, the max value set with the adjustment knob (A) is always considered the set point.

LOW-TEMPERATURE SYSTEMS (SP 28°-57°)

For boilers configured to operate with central heating circuit temperatures between 28 - 57 C° (low temperature), the set-up procedure for the climate curves is identical to the one described above. The only variations which must be taken into consideration are: the point of origin on the graphs for all climate curves (fixed point), positioned at TExt 20° TOffset 28°; the end-point co-ordinate of the climate curve is obtained using the set-point value set with the knob (A) and the value of parameter P8 in the "INSTALLER" menu.

Consult the example climate curve configuration graph given on page 37.



Climate set curve example:

point 1 = high temperature configuration climate curves fixed point (origin) (TOffset=50 TExt= 20)

point 2 = low temperature configuration climate curves fixed point (origin) (TOffset=28 TExt= 20)

curve 1 A obtained with a set-point set with the upper knob (A) of 80 °C and parameter P7 in the CONFIGURATION menu set to 0

curve 2 A obtained with a set-point set with the upper knob (A) of 80 °C and parameter P7 in the CONFIGURATION menu set to -20

curve 3 A obtained with a set-point set with the upper knob (A) of 57 °C and parameter P8 in

the CONFIGURATION menu set to -20

Setting curve 1 A at the temperature measured by the external sensor of -5°C will result in the central heating circuit temperature automatically being set to 80°C (point 3)

Setting curve 2 A in the same conditions will lead to the central heating circuit temperature being set to 68°C (point 4)

Setting curve 3 A in the same conditions will lead to the central heating circuit temperature being set to 47°C (point 5)

INSTALLATION OF "ECOCHRONO" OPEN-THERM TIMER THERMOSTAT

For optimum and even more economical management of the domestic premises it is possible to use the ECOCHRONO programmable timer thermostat. ECOCHRONO 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. ECOCHRONO can also be used to schedule daily and weekly room temperatures and manage reduced demand periods (holidays,

anti-frost and maintenance modes).

Use the cable labelled "TA" supplied with the boiler (the same as for the room thermostat) to connect the timer thermostat.

Refer to the instructions for correct installation and use of the "ECOCHRONO" thermostat.

To activate the O.T. communication it is necessary to activate the corresponding parameter (refer to timer thermostat instruction manual).



COMPLETELY DISCONNECT THE DEVICE FROM THE ELECTRICITY SUPPLY BEFORE PERFORMING ANY OPERATION. USE CERTIFIED OPEN-THERM COMPATIBLE DEVICES.

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 $< 6^{\circ}\text{C}$, 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 8°C , the function is deactivated by turning off the burner and restoring the previous conditions. When an external sensor is fitted, the function is activated when the temperature measured by the sensor on the CH flow circuit is $< 6^{\circ}\text{C}$ and the temperature measured by the external sensor is $< 2^{\circ}\text{C}$. The function is deactivated when the temperature measured by the sensor on the CH flow circuit reaches 8°C .



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 and must not have faults 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.

	U.M.	Thea 65 MN Kondens
Category		
Type		B23 C13 C33 C43 C53 C83
Nominal load	kW	61,0
Minimum nominal load	kW	14
Maximum load (80°/60°)	kW	58,87
Minimum load (80°/60°)	kW	13,67
Maximum load in condensing (50°/30°)	kW	64,2
Minimum load in condensing (50°/30°)	kW	15,1
Max. Efficiency (80°/60°)	%	96,5
Min. Efficiency (80°/60°)	%	97,65
Max. Efficiency in condensing (50°/30°)	%	106
Efficiency at Partial Nominal Load (50°/30°)	%	106,8
Max. Exhaust Temperature (Room Temp. 20°)	°C	64,8
Mass Flow Rate	g/s	27,6
Min. Mass Flow Rate	g/s	6,78
Heat loss from chimney when burner off	%	0,15
Heat loss from chimney when burner on (Max. power)	%	3
Heat loss from chimney when burner on (Min. power)	%	1,75
Heat loss from boiler surface area (Max. power)	%	0,5
Heat loss from boiler surface area (Min. power)	%	0,6
Nox Class		6
Max. available pressure (Exhaust+Suction 0,5m Ø 80mm separate pipes)	Pa	220
DHW nominal load	KW	/
Min. DHW nominal load	KW	/
CH Min/Max Operating Pressure	bar	0,8/3
Power Supply	Volt -Hz	230-50
Maximum Absorbed Electric Power	W	270
IP Rating	IP	X4D
Expansion Vessel		/
Expansion Vessel Pre-charge	bar	/
Max. DHW Pressure	bar	/
Min. DHW Pressure	bar	/
DHW Flow Rate at Δt 35°C	l/min	/
DHW Min. Flow Rate	l/min	/
DHW Flow Limiter	l/min	/

FUEL		Thea 65 MN Kondens
Gas Consumption at Nominal Load	G20 m/h 3	6,81
	G31 k/gh	4,56
Gas Consumption at Minimum Load	G20 m/h 3	1,61
	G31 k/gh	1,12

TECHNICAL PARAMETERS ACCORDING TO ERP (812/2013)			
			Thea 65 MN Kondens
Energy Season Efficiency Class for Room Heating	-	-	A
Nominal Load	P _{nomiale}	kW	61
Energy Season Efficiency for Room Heating	η_s	%	92
HEAT LOAD			
At Nominal Load and High Temperature	P ₄	kW	58,87
At 30% Nominal Load and Low Temperature	P ₁	kW	19,7
EFFICIENCY			
At Nominal Load and High Temperature	η_4	%	86,9
At 30% Nominal Load and Low Temperature	η_1	%	96,2
AUXILIARY POWER CONSUMPTION			
Full load	e _{lmax}	kW	0,16
Partial load	e _{lmin}	kW	0,04833
Stand-by	PSB	kW	0,002
OTHER PARAMETERS			
Heat Loss in Stand-by mode	P _{stby}	kW	0,09
Power Consumption of pilot flame	Q _{HE}	GJ	184
Annual Power Consumption	LWA	dB	52
Inner Sound Power Level	NOx	mg/kWh	49
FOR COMBI BOILERS:			
Declared Load Profile	-	-	/
Hot Water Power Efficiency	Q _{elec}	kWh	/
Annual Power Consumption	AEC	kWh	/
Annual Gas Consumption	η_{vh}	%	/
Daily Power Consumption	Q _{fuel}	kWh	/
Daily Gas Consumption	AFC	GJ	/
Contact: G20 ENGINEERING Loc. Campogrande 13, 29013 CARPANETO PIACENTINO (Pc), Italy - tel. +39 0523 850513 www.aircontrol-pc.com - www.g20engineering.com			



MADE IN ITALY



A brand by G20 ENGINEERING

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