BAXI

NUVOLA 3 COMFORT

GB

High performance gas-fired wall-mounted boiler

operating and installation instructions

CE 0051

Dear Customer,
We are confident your new boiler will meet all your requirements.
All **BAXI** products have been designed to give you what you are looking for: good performance combined with simple and rational use.
Please do not put away this booklet without reading it first as it contains some useful information which will help you to operate your boiler correctly and efficiently.

Do not leave any packaging (plastic bags, polystyrene, etc.) within the reach of children as they are a potential source of danger

BAXI S.p.A. declares that these models of boiler bear the CE mark in compliance with the basic requirements of the following Directives:
- Gas Directive 90/396/EEC
- Efficiency Directive 92/42/EEC
- Electromagnetic Compatibility Directive 2004/108/EEC
- Low Voltage Directive 2006/95/EC

CE

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INSTRUCTIONS FOR USERS

INSTRUCTIONS FOR FITTERS

CSQ

BAXI S.p.A., a leading European manufacturer of hi-tech boilers and heating systems, has developed CSQ-certified quality management (ISO 9001), environmental (ISO 14001) and health and safety (OHSAS 18001) systems. This means that BAXI S.p.A. includes among its objectives the safeguard of the environment, the reliability and quality of its products, and the health and safety of its employees.
Through its organisation, the company is constantly committed to implementing and improving these aspects in favour of customer satisfaction.

ISO 9001 - ISO 14001 - OHSAS 18001 Qualità Ambiente Sicurezza

1. INSTRUCTIONS PRIOR TO INSTALLATION

This boiler has been designed to heat water to a temperature lower than boiling point at atmospheric pressure. It must be connected to a central heating system and to a domestic hot water supply system according to its performance and power output.
Before having the boiler installed by a qualified service engineer, make sure the following operations are performed:

a) Make sure that the boiler is adjusted to use the type of gas delivered by the gas supply. To do this, check the markings on the packaging and the rating plate on the appliance.

b) Make sure that the flue terminal draft is appropriate, that the terminal is not obstructed and that no exhaust gases from other appliances are expelled through the same flue duct, unless the latter has been specially designed to collect exhaust gas from more than one appliance, in compliance with current laws and regulations.

c) Make sure that, if the boiler is connected to existing flue ducts, these have been thoroughly cleaned as residual products of combustion may detach from the walls during operation and obstruct the flow of fumes.

d) To ensure correct operation and maintain the warranty, observe the following precautions:

1. DHW circuit:

1.1. If the water is harder than 20 °F (1 °F = 10 mg calcium carbonate per litre of water), install a polyphosphate dispenser or an equivalent treatment system, compliant with current regulations.

1.2. Thoroughly flush the system after installation of the appliance and before use.

2. Heating circuit

2.1. new system
Before proceeding with installation of the boiler, the system must be cleaned and flushed to eliminate residual thread-cutting swarf, solder and any solvents, using suitable proprietary products. To avoid damaging metal, plastic and rubber parts, only use neutral cleaners, i.e. non-acid and non alkaline. Recommended cleaning products are: SENTINEL X300 or X400 and FERNOX Regenerator for heating circuits. Use these products in strict compliance with the manufacturers' instructions.

2.2. existing plant:
Before installing the boiler, drain the system and clean it to remove sludge and contaminants, using suitable proprietary products as described in section 2.1. To avoid damaging metal, plastic and rubber parts, use only neutral cleaners, i.e. non-acid and non-alkaline such as SENTINEL X100 and FERNOX Protector for heating circuits. Use these products in strict compliance with the manufacturers' instructions. Remember that the presence of foreign bodies in the heating system can adversely affect boiler operation (e.g. overheating and excessive noise of the heat exchanger).

Failure to observe the above will render the guarantee null and void.

2. INSTRUCTIONS PRIOR TO COMMISSIONING

Initial lighting of the boiler must be carried out by an authorised Service Engineer who must first ensure that:

a) the rated data correspond to the supply (electricity, water and gas) data;
b) the installation complies with current laws and regulations;
c) the appliance is correctly connected to the power supply and earthed.

The names of the authorised Service Centres are indicated in the attached sheet.
Failure to observe the above will render the guarantee null and void.
Prior to commissioning, remove the protective plastic coating from the boiler. Do not use any tools or abrasive detergents to do this as you may damage the painted surfaces.

The instructions shall state the substance of the following:
This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.

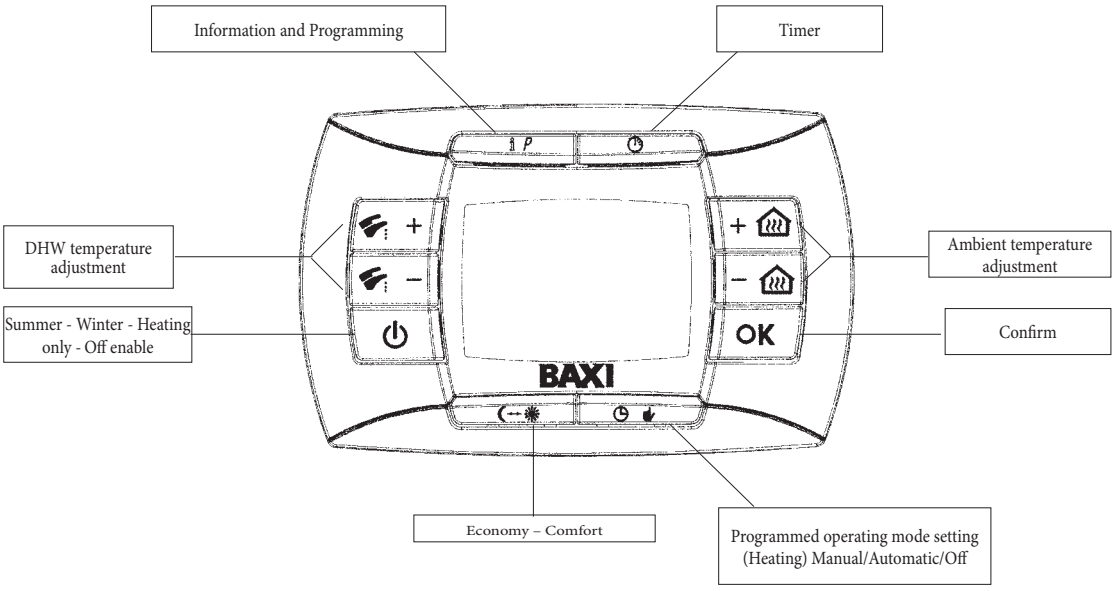
3. COMMISSIONING THE BOILER

To light the boiler correctly, proceed as follows:

1) power the boiler
2) open the gas tap;
3) press button ⏻ on the climate controller (figure 1) to set the boiler operating mode (see section 3.2.).

NOTE: *if the SUMMER (🚿), mode is set, the boiler will only light during a DHW demand.*

- To adjust OH and DHW temperatures, press the +/- buttons as described in <u>section 3.3.</u>



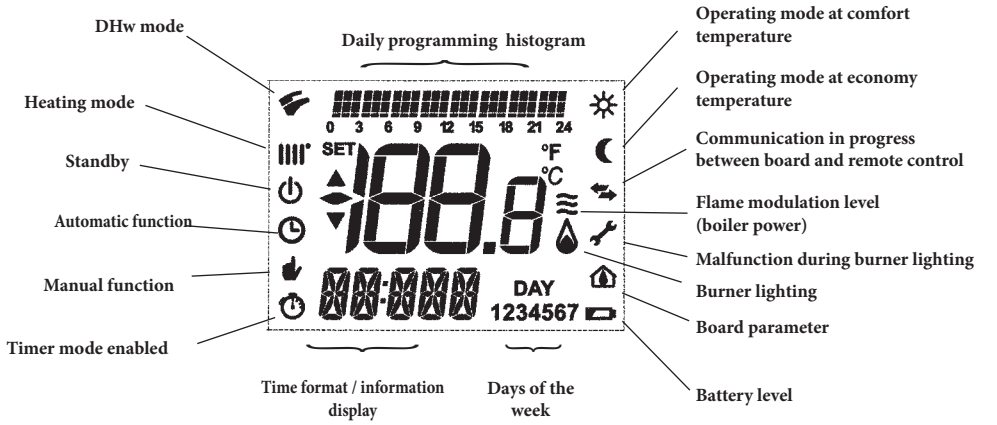


Figure 1

3.1 MEANING OF THE SYMBOL

4 different boiler modulation levels are shown on the climate controller display during boiler operation, as indicated in figure 2.

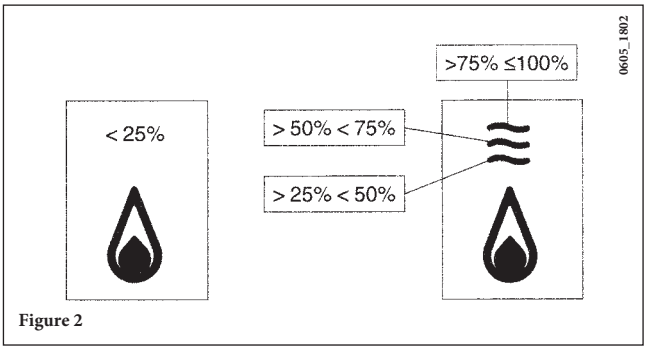


Figure 2

3.2 DESCRIPTION OF BUTTON (SUMMER - WINTER - HEATING ONLY - OFF)

Press this button to set the following boiler operating modes:

- **SUMMER**
- **WINTER**
- **HEATING ONLY**
- **OFF**

In **SUMMER** mode, the display shows . The boiler satisfies requests for DHW only while central heating is NOT enabled (ambient frost protection function active).

In **WINTER** mode, the display shows The boiler satisfies requests for both DHW and central heating (ambient frost protection function active).

In **HEATING ONLY** mode, the display shows The boiler satisfies requests for central heating only (ambient frost protection function active).

In **OFF** mode, the display shows neither of the above two symbols ( ) ( ) In this mode only the ambient frost protection function is enabled, any other request for DHW or heating is not satisfied.

3.3 DESCRIPTION OF BUTTON (AUTOMATIC-MANUAL-OFF)

Press this button to set one of the following heating functions:
AUTOMATIC-MANUAL-OFF as described below.

AUTOMATIC (symbol displayed)

This function enables hourly boiler programming in the heating mode. Heat demand depends on the hourly programming setting (ambient temperature COMFORT "" or ambient temperature ECONOMY "" See section 3.6 for hourly programming settings.

MANUAL (symbol displayed)

This function disables hourly programming and the boiler works in the heating mode at the ambient temperature set by pressing +/- .

OFF (symbol displayed)

If the climate controller is set to "**Off**", the display shows the symbol and operation in the heating mode is disabled (the ambient anti-freeze function remains active).

3.4 AMBIENT TEMPERATURE AND DHW TEMPERATURE ADJUSTMENT

Adjust the ambient temperature ( ) and the DHW temperature ( ), buttons (figure 1).

The ignition of the burner is shown on the display with the symbol ( ) as described in section 3.1.

HEATING

While the boiler is operating in the heating mode, the display shows the symbol ( ) and the ambient temperature (°C) (see figure 1).

During manual ambient temperature adjustment, the display shows "**AMB**".

DOMESTIC HOT WATER

While the boiler is operating in the DHW mode, the display shows the symbol ( ) and the ambient temperature (°C) (see figure 1). During manual DHW temperature adjustment, the display shows the "**HW SP**".

NOTE: *If a storage boiler is connected, while the boiler is operating in the DHW mode, the display shows the symbol ( ) and the ambient temperature (°C)..*

3.4.1. Climate controller installed in the boiler

If the climate controller is installed in the boiler, press +/- to adjust the delivery temperature of the heating system water.
The temperature displayed is the ambient temperature.

3.5 PROGRAMMING (PROG)

DATE-TIME SETTINGS

Press **IP**: the display shows **PROG** (for a few seconds) and the hour starts flashing.

NOTE: *if no button is pressed, the function automatically stops after about 1 minute.*

- Press +/- to adjust the hours;
- Press OK;
- Press +/- to adjust the minutes;
- Press OK;
- Press +/- to set the day of the week "**Day**" (1…7 corresponding to Monday…Sunday);

Press **IP** to exit DATE-TIME settings.

3.6 HOURLY PROGRAMMING IN HEATING MODE

To enable hourly programming in the heating mode, press (the symbol appears on the climate controller display).
Hourly programming allows you to set the automatic boiler operation in the heating mode during determined time bands and determined days of the week.
Boiler settings can be made for ***single*** days or for ***groups*** of consecutive days.

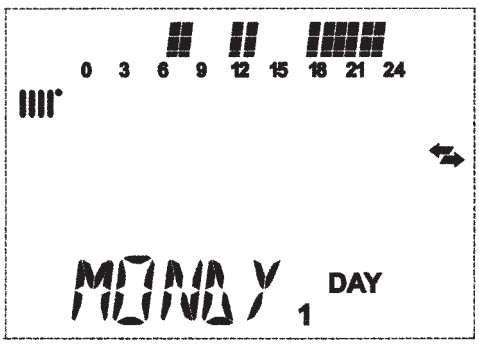
3.6.1. Single days

4 time bands are available every day (4 boiler switching on and switching off cycles in the heating mode, with times that can differ from day to day), as indicated in the following table:

			FACTORY SETTINGS							
			On 1	Of 1	On 2	Of 2	On 3	Of 3	On 4	Of 4
MONDY	**DAY 1**	(Monday)	06:00	08:00	11:00	13:00	17:00	23:00	24:00	24:00
TUEDY	**DAY 2**	(Tuesday)								
WEDDY	**DAY 3**	(Wednesday)								
THUDY	**DAY 4**	(Thursday)								
FRIDY	**DAY 5**	(Friday)								
SATDY	**DAY 6**	(Saturday)								
SUNDY	**DAY 7**	(Sunday)								

To set a single time band, proceed as follows:

1) press **IP** and then ;
2) select a day of the week (1 ... 7) by pressing +/- repeatedly;
3) press **OK**;
4) the display shows **on 1** and the four time digits start flashing, as shown in the following figure;
5) press +/- to set the boiler switching on time;
6) press **OK**;
7) the display shows **of 1** and the four time digits start flashing;
8) press +/- to set the boiler switching off time;
9) press **OK**;
10) repeat the operations from point 4 onwards to set the remaining three time bands;
11) press IP to exit the function.



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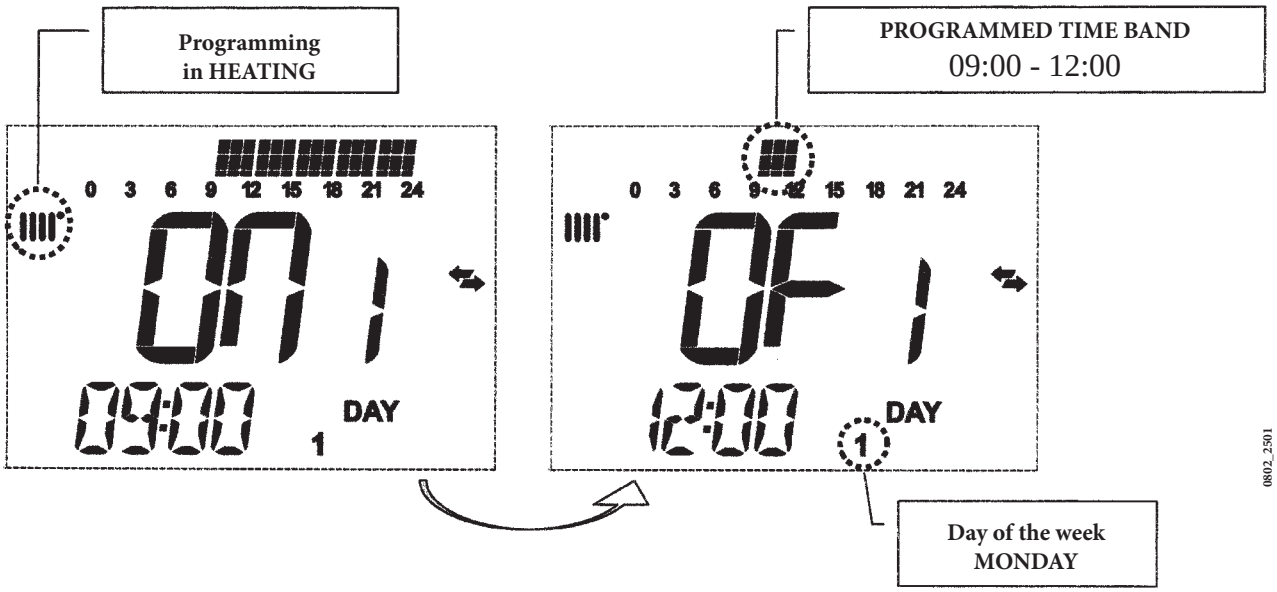

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NOTE: If switching on time **on ...** is set at the same time as switching off time **of ...** the time band is cancelled and the programme moves on to the next time band.
(e.g. **on1** = 09:00 - **of1** = 09:00 the programme "skips" time band 1 and continues to **on2**...).

3.6.2. Groups of days

This function allows you to programme 4 shared boiler switching on and switching cycles for several days or for the whole week (see summary below).

To set a single time band, proceed as follows:

1) Press **IP** and then ;
2) a GROUP of days by pressing +/- ;
3) Press **OK**;
4) repeat the operations from points 4 to 10 of section 3.6.1.

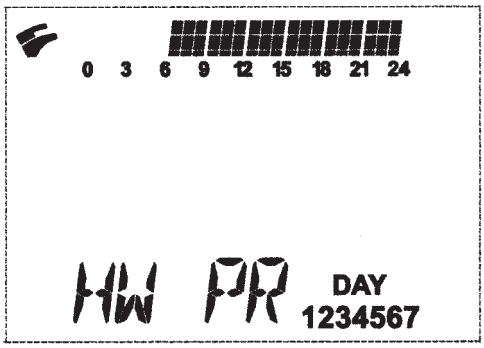
Summary of available groups of days

			FACTORY SETTINGS
"MO-FR"	**DAY 1 2 3 4 5**	*Monday to Friday*	*As per table in section 3.6.1.*
"SA-SU"	**DAY 6 7**	*Saturday and Sunday*	*07:00 – 23:00*
"MO-SA"	**DAY 1 2 3 4 5 6**	*Monday to Saturday*	*As per table in section 3.6.1.*
"MO-SU"	**DAY 1 2 3 4 5 6 7**	*Every day in the week*	*As per table in section 3.6.1.*

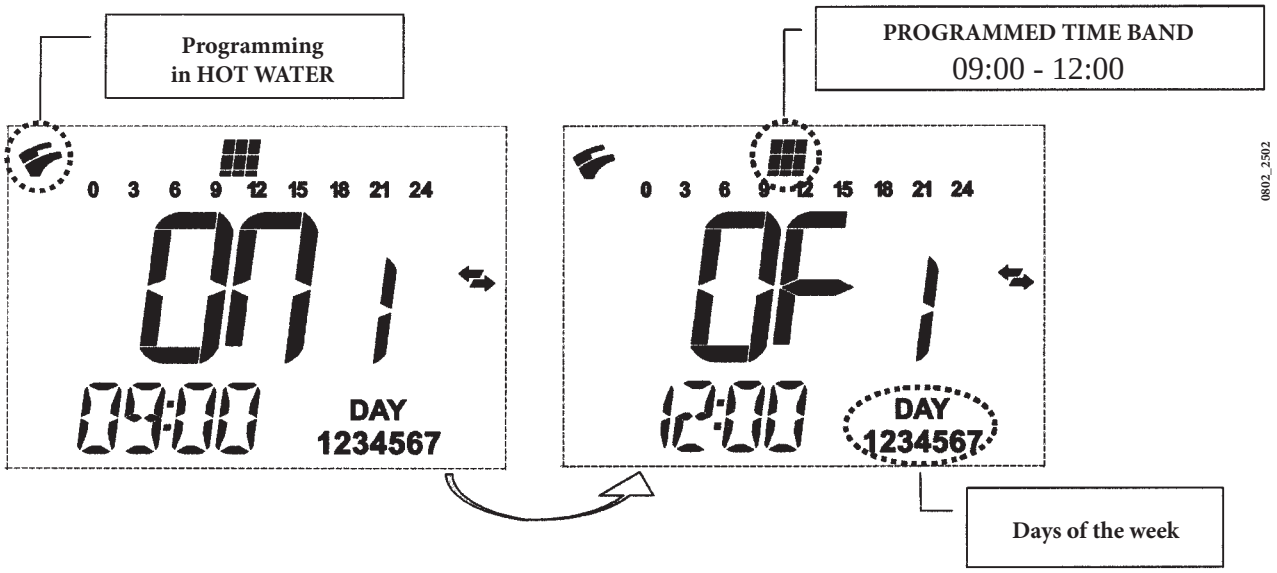
3.7 HOURLY PROGRAMMING DOMESTIC HOT WATER MODE

This function allows you to programme 4 boiler time bands in the DHW mode during the week (the programmed time bands are identical for every day of the week).

To set hourly programming in the DHW mode, proceed as follows:
1) press **IP** and then to access programming (heating and DHW);
2) select the DHW programme "**HW PR**" by pressing +/- repeatedly;
3) press **OK**:
4) set the time bands in which DHW is to be made available by repeating the operations from points 4 to 10 of section 3.6.1 (factory setting 06:00 - 23:00).



IMPORTANT: to enable weekly programming, the fitter must set the parameter "**HW PR**" = **2**, as described in section 20.1.



4. SPECIAL FUNCTIONS

4.1 ECONOMY - COMFORT

This function is used to set two different ambient temperature values:
Economy / Comfort.
For the sake of simplicity, make sure ECONOMY is at a lower temperature than COMFORT.

To set the required ambient temperature, press :

- "**ECONM**" indicates that ambient temperature is set to economy:
  the display shows the symbol ;
- "**COMFR**" indicates that the ambient temperature is set to comfort:
  the display shows the symbol ;

To temporarily change the ambient temperature, press +/- or see section 4.3. This function can be manual or auto- matic, as described below:

AUTOMATIC OPERATION (symbol on display)

The ambient temperature setting depends on the time band (section 3.6). The ambient temperature is set to COMFORT inside the time band while it is set to ECONOMY outside the time band.
Press to temporarily change ambient temperature (from COMFORT to ECONOMY and vice-versa) until the next set time band change.

MANUAL OPERATION (symbol on display)

Press and set the boiler to manual.
Press to change ambient temperature (from COMFORT to ECONOMY and vice-versa) until the next time the button is pressed.

4.2 SHOWER FUNCTION

The shower function optimises DHW control, for example, when someone is taking a shower.
The function delivers DHW at a lower than rated temperature.
To modify the maximum temperature of the shower function, proceed as described in section 4.3.

This function can be manually enabled as follows:

- Press one of the two buttons +/- ( ) and then to enable the function **SHOWR** appears on the display for a few seconds followed by **HW SS**);
- press **OK** while the delivery temperature and the symbol flashes on the display;
- the function lasts ***60 minutes*** (the symbol flashes during this time.
  At the end of this period, DHW temperature returns to that of the operating mode set before the function activated (the symbol not longer flashes on the display).

NOTE: to disable the function before the 60 minute period terminates, proceed as follows:

- press one of the two buttons +/- ( ) and then ;
- press **OK** the display visualises the message "**HW S^**".

4.3 CHANGE TEMPERATURE VALUES OF THE FUNCTIONS ASSOCIATED WITH THE BUTTON

To change the temperature value, proceed as follows:

- Press **IP** to enable the **PROG** function;
- press to scroll the functions to modify, as described in the following table:

Function	Display	Description of function
COMFR	The set temperature flashes (factory value = **20°C**)	Boiler in heating mode at rated temperature.
ECONM	The set temperature flashes (factory value = **18°C**)	Boiler in heating mode at reduced temperature
NOFRS	The set temperature flashes (factory value = **5°C**)	Boiler in heating mode at preset antifreeze ambient temperature
SHOWR	The set temperature flashes (factory value = **40°C**)	. Boiler in DHW mode at the preset temperature

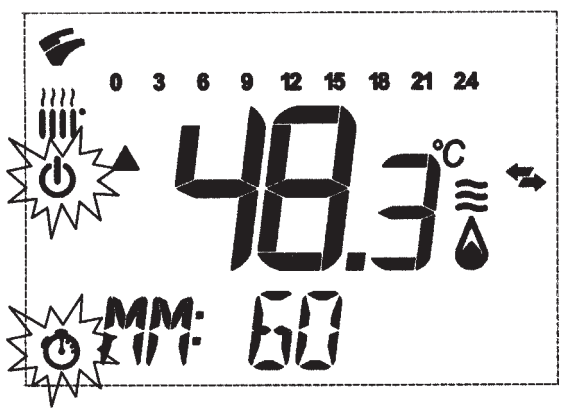
- To change the value of the selected function, press +/- ;
- To exit, press **IP**.

4.4 TIMER FUNCTIONS (BUTTON)

4.4.1 TIMED SHUTDOWN OFF (HOLIDAY PROGRAMME)

This function allows you to disable hourly programming (section 3.6) for a certain period of time. During this time, mini- mum ambient temperature is assured (factory setting 5°C). This setting may be modified as described in section 4.3 under "**NOFRS**".
To enable the function, proceed as follows:

- press and set the "**AUTO**" function (symbol);
- press **MM 60** appears on the display and the symbols flash.



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In this example, the function lasts 60 minutes

Press +/- to adjust the duration of the function, the adjustment step is 10 minutes. Duration ranges from 10 minutes to a maximum of 45 days.
Press + after **90 minutes, HH 02** appears on the display:
In this case, the time is considered in hours. Duration ranges from 2 to 47 hour.
Press + after **47 hours, DD 02** appears on the display:
In this case, the time is considered in days. The duration ranges from 2 to 45 days (the adjustment step is 1 day).

• press **OK** to enable the function and exit the programming mode

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WARNING
after enabling this function, make sure not to press any other button. If one of the buttons on the climate controller is pressed, in fact, the manual function may be enabled flashes on the display) and the "Timed shutdown" function is interrupted. In this case, repeat the function enable procedure as described at the beginning of this section**.**

4.4.2 TIMED MANUAL MODE (PARTY)

This function is used to set a temporary ambient temperature. After this period, the operating mode returns to the previously set one. To enable the function, proceed as follows:

- press and set the "**MAN**" function (symbol ());
- press **MM 60** appears on the display and the symbols flash;
- the duration of the function is adjusted as described in section 4.4.1.
- to modify the ambient temperature, press OK ("**AMB**" appears on the display) and then +/- .

5. FILLING THE SYSTEM

IMPORTANT: Regularly check that the pressure displayed on the pressure gauge (Figure 3) is 0.7 - 1.5 bar, with the boiler cold. In case of overpressure, open the boiler drain tap. In case of insufficient temperature, open the boiler filling tap (figure 3).
Open the tap very slowly in order to vent the air.
During this operation the boiler must be "**OFF**" (press - figure 1).

NOTE: the boiler is equipped with a hydraulic pressure switch which blocks its operation in the event of lack of water.

In case pressure drops occur frequently, have the boiler checked by an authorised Service Engineer.

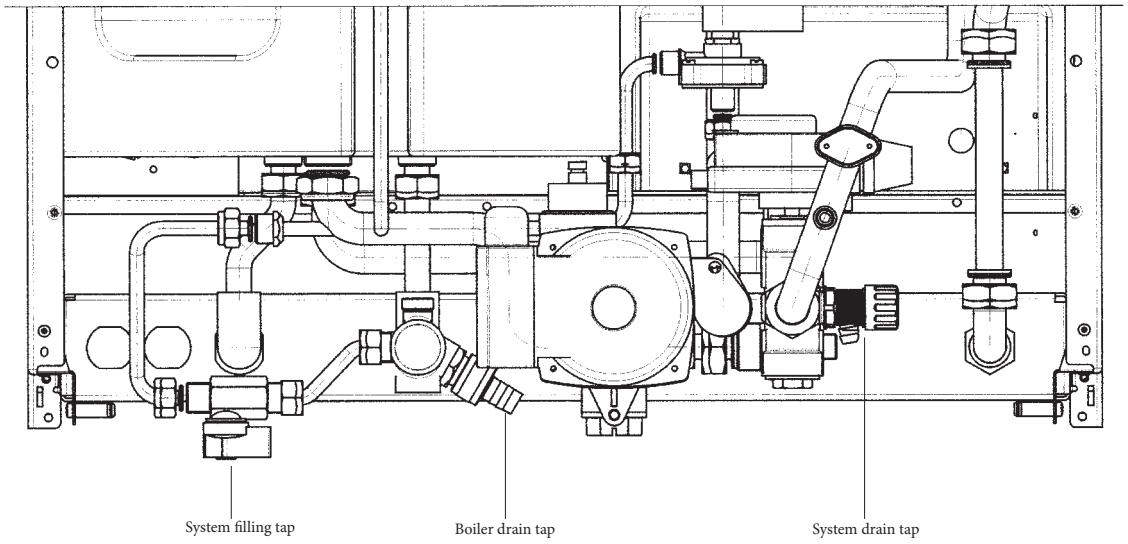


Figure 3

6. TURNING OFF THE BOILER

To switch off the boiler, disconnect the electric power supply. With the gas boiler in "**OFF**" mode (section 3.2), the electric circuits remain powered and the anti-freeze function is enabled (section 8).

7. GAS CONVERSION

The boilers can operate both on natural gas and **LPG**.
All gas conversions must be made by an authorised Service Engineer.

8. PROLONGED SHUTDOWN. FROST PROTECTION

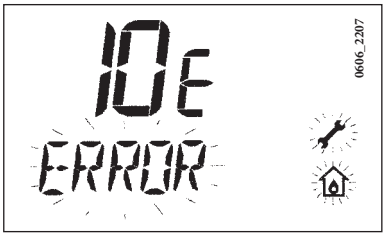
Do not drain the whole system as filling up with water again causes unnecessary and harmful scale to build up inside the boiler and the heating elements. If the boiler is not used during winter and is therefore exposed to the danger of frost, add some specific anti-freeze to the water in the system (e.g.: propylene glycol coupled with corrosion and scale inhibitors). The electronic boiler management system includes a "frost protection" function for the heating system which, when delivery temperature falls below 5°C, operates the burner until a delivery temperature of 30°C is reached.

The frost protection function is enabled if:

* the boiler is electrically powered;
* the gas tap is open;
* the system is at the correct pressure;
* the boiler is not blocked.

9. TROUBLESHOOTING

The climate controller sends two types of signals: ***FAULT*** and ***BLOCK***.



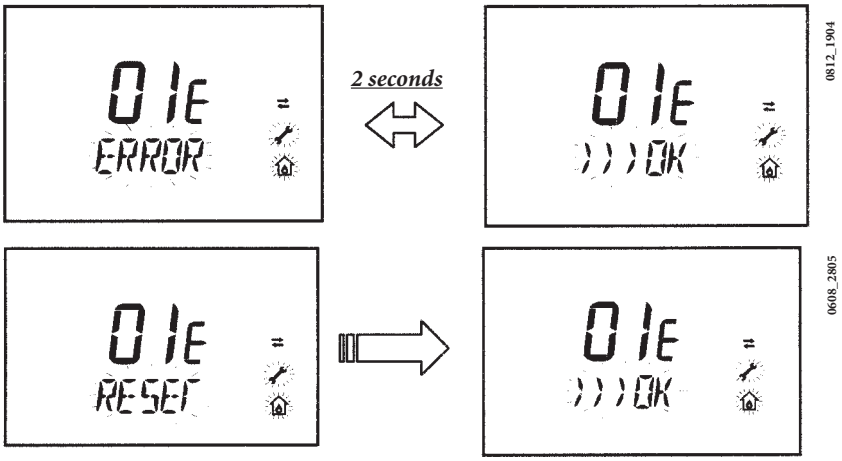
FAULT

In the presence of a fault the display shows the symbols and the flashing <**ERROR**> message.
The fault is identified with an error code followed by a letter and cannot be reset by the user. Call the authorised Service Centre.

BLOCK

In the presence of a block, the display shows the symbols the flashing letters >>>**OK** which flash alternately (about every 2 seconds) with the <**ERROR**> message. The block is identified by an error code followed by the letter **E**.

Press **OK** to reset the electronic board and restore operation.
The display shows the message <**RESET**> and then the message >>>**OK**.



Error code	Description of fault	Corrective action
01e	Failed ignition shutdown	Press **OK**. If this fault occurs repeatedly, call the authorised service centre.
02e	Safety thermostat tripped	Press **OK**. If this fault occurs repeatedly, call the authorised service centre.
03e	Flue thermostat/ flue pressure switch tripped	Call the Authorised Service Centre.
04e	Safety error for frequent losses of flame	Call the Authorised Service Centre.
05e	Delivery probe failure	Call the Authorised Service Centre.
06e	DHW sensor fault	Call the Authorised Service Centre.
11e	Tripping of safety thermostat for system at low temperature (if connected)	Call the Authorised Service Centre.
12e	Lack of consent from hydraulic differential pressure switch	Check that the pressure in the system is correct. See section 5. If this fault persists, call the Authorised Service Centre.
13e	Hydraulic differential pressure switch contact faulty	Check that the pressure in the system is correct. See section 5. If this fault persists, call the Authorised Service Centre.
25e	Safety intervention for no water circulation	Call the Authorised Service Centre.
31e	Communication error between electronic board and climate controller	Press **OK**. If this fault occurs repeatedly, call the authorised service centre.
35e	Parasite flame (flamer error)	Press **OK**. If this fault occurs repeatedly, call the authorised service centre.
80e-96e	Climate controller internal error	Call the Authorised Service Centre.
98e	Board internal error	Call the Authorised Service Centre.
99e	Board internal error	Call the Authorised Service Centre.

10. ROUTINE MAINTENANCE INSTRUCTIONS

To keep the boiler efficient and safe, have it checked by the authorised Service Centre at the end of every operating period. Careful servicing ensures economical operation of the system.
Do not clean the outer casing of the appliance with abrasive, aggressive and/or easily flammable cleaners (e.g.: petrol, alcohol, and so on). Always switch off the appliance before cleaning it (see section 6 “Switching off the boiler”).

11. GENERAL INFORMATION

The following notes and instructions are addressed to fitters to allow them to carry out trouble-free installation. Instructions for lighting and using the boiler are contained in the 'Instructions for Users' section.
Additionally, bear in mind the following:

- This boiler can be connected to any type of double- or single-pipe convector plate, radiator or thermoconvector. Design the system sections as usual, though, bearing in mind the available flow-head at the plate, as shown in section 26.
- Do not leave any packaging (plastic bags, polystyrene, etc.) within the reach of children as they are a potential source of danger.
- Initial lighting of the boiler must be carried out by an authorised Service Engineer, as indicated on the attached sheet.

Failure to observe the above will render the guarantee null and void.

12. INSTRUCTIONS PRIOR TO INSTALLATION

This boiler has been designed to heat water to a temperature lower than boiling point at atmospheric pressure. It must be connected to a central heating system and to a domestic hot water supply system according to its performance and power output.
Do the following before connecting the boiler:

a) Make sure that the boiler is adjusted to use the type of gas delivered by the gas supply. To do this, check the markings on the packaging and the rating plate on the appliance.

b) Make sure that the flue terminal draft is appropriate, that the terminal is not obstructed and that no exhaust gases from other appliances are expelled through the same flue duct, unless the latter has been specially designed to collect exhaust gas from more than one appliance, in compliance with current laws and regulations.

c) Make sure that, if the boiler is connected to existing flue ducts, these have been thoroughly cleaned as residual products of combustion may detach from the walls during operation and obstruct the flow of fumes.

To ensure correct operation and maintain the warranty, observe the following precautions:

1. DHW circuit:

1.1. If the water is harder than 20 °F (1 °F = 10 mg calcium carbonate per litre of water), install a polyphosphate dispenser or an equivalent treatment system, compliant with current regulations.

1.2. Thoroughly flush the system after installation of the appliance and before use.

2. Heating circuit

2.1. new system

Before proceeding with installation of the boiler, the system must be cleaned and flushed to eliminate residual thread-cutting swarf, solder and any solvents, using suitable proprietary products. To avoid damaging metal, plastic and rubber parts, only use neutral cleaners, i.e. non-acid and non alkaline. Recommended cleaning products are: SENTINEL X300 or X400 and FERNOX Regenerator for heating circuits. Use these products in strict compliance with the manufacturers' instructions.

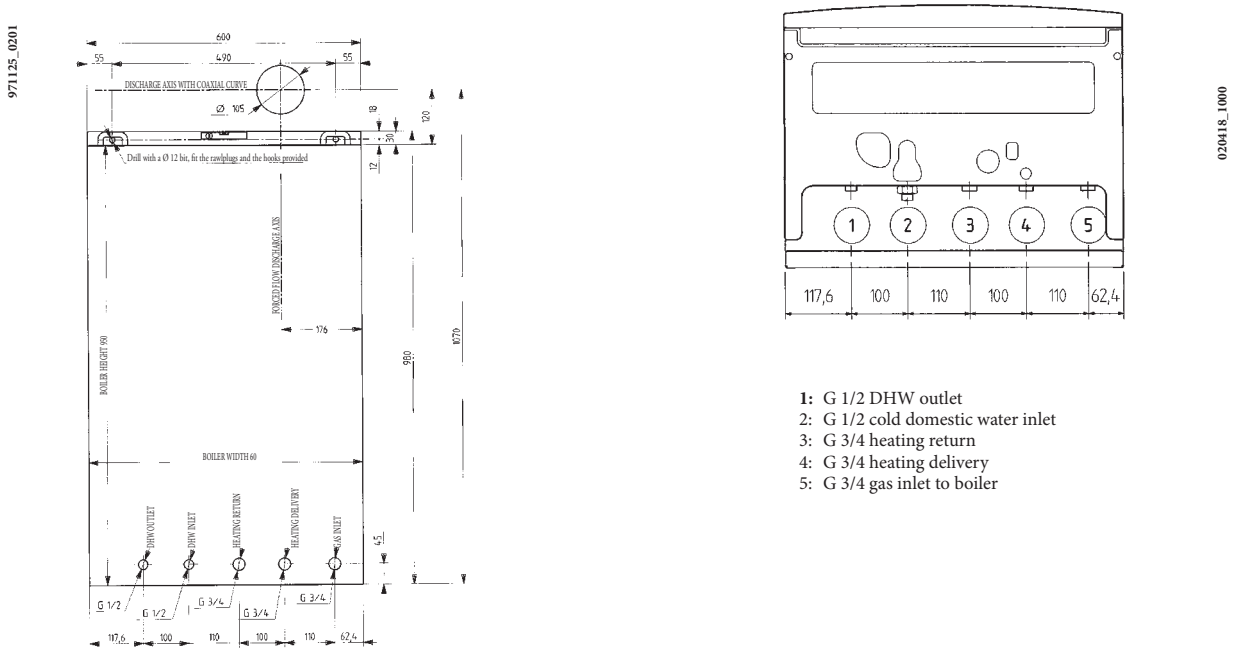
2.2. existing plant:

Before installing the boiler, drain the system and clean it to remove sludge and contaminants, using suitable proprietary products as described in section 2.1. To avoid damaging metal, plastic and rubber parts, use only neutral cleaners, i.e. non-acid and non-alkaline such as SENTINEL X100 and FERNOX Protector for heating circuits. Use these products in strict compliance with the manufacturers' instructions. Remember that the presence of foreign bodies in the heating system can adversely affect boiler operation (e.g. overheating and excessive noise of the heat exchanger).

Failure to observe the above will render the guarantee null and void.

13. INSTALLING THE BOILER

After deciding the exact location of the boiler, fix the template to the wall.
Connect the system to the gas and water inlets present on the lower bar of the template. Fit two G3/4 taps (delivery and return) on the central heating circuit; these taps make it possible to carry out important operations on the system without draining it completely. If you are either installing the boiler on an existing system or replacing one, as well as the above, fit a settling tank under the boiler on the system return line in order to collect any deposits and scale circulating in the system after flushing. After fixing the boiler to the template, connect the flue and air ducts, supplied as accessories, as described in the following sections.
If installing the boiler with natural draught models **240 i - 280 i** make the connection to the flue using a metal pipe which, over time, will resist normal mechanical stress, heat and the action of the combustion products and any condensate they form.



1: G 1/2 DHW outlet
2: G 1/2 cold domestic water inlet
3: G 3/4 heating return
4: G 3/4 heating delivery
5: G 3/4 gas inlet to boiler

Figura 4

14. DIMENSIONS OF BOILER

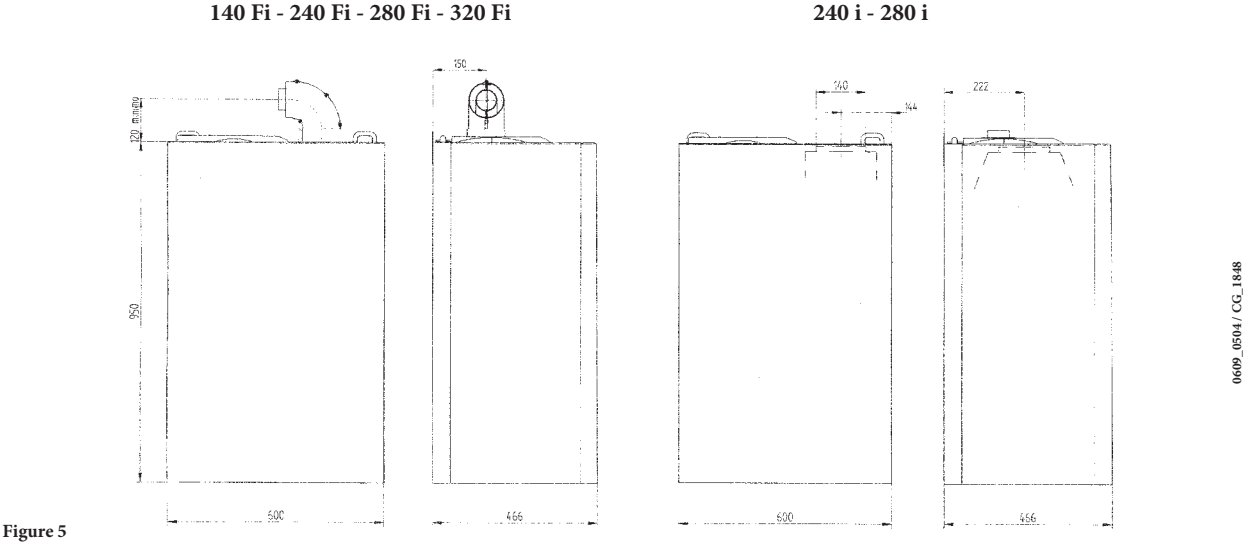


Figure 5

15. CONTENTS OF PACK

- **template**
- **gas tap (1)**
- **water supply tap (2)**
- **gaskets**
- **telescopic joints**
- **8 mm rawlplugs and supports**

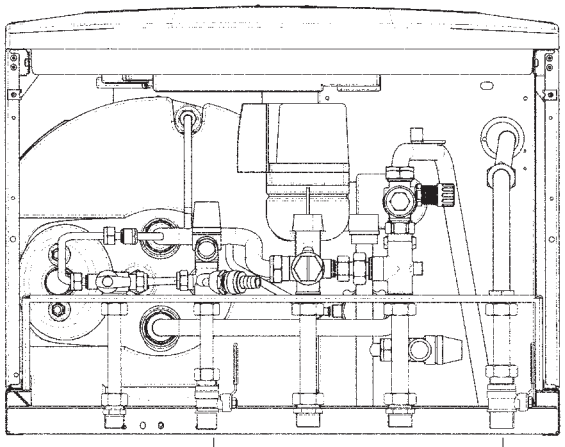


Figure 6

16. INSTALLING THE FLUE AND AIR DUCTS

The boiler is easy and flexible to install thanks to the extensive range of available accessories, as described below. The boiler has been designed for connection to a vertical or horizontal coaxial flue-air duct. A splitting kit is also available if separate ducts are required.

Only accessories supplied by the manufacturer must be used for installation!

… Coaxial flue-air duct (concentric)
This type of duct is used to discharge exhaust fumes and draw combustion air both outside the building and if a LAS flue is fitted.
The 90° coaxial bend allows the boiler to be connected to a flue-air duct in any direction as it can be rotated by 360°. It can also be used as a supplementary bend combined with a coaxial duct or a 45° bend.

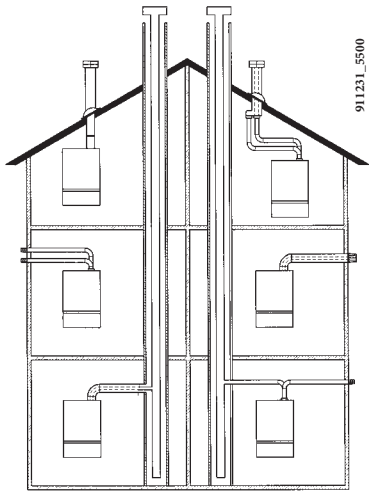


Figure 7

WARNING
To optimise operating safety, make sure the flue ducts are firmly fixed to the wall with suitable brackets.

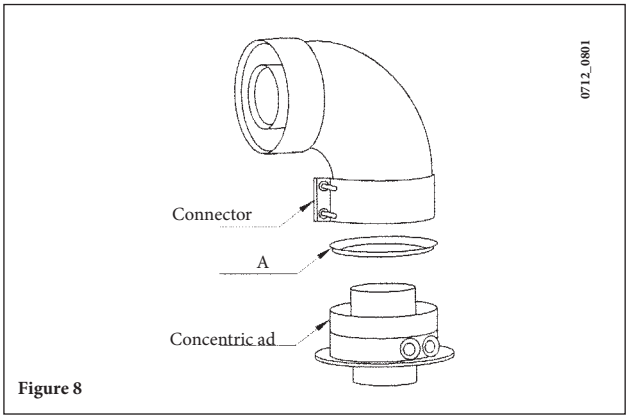


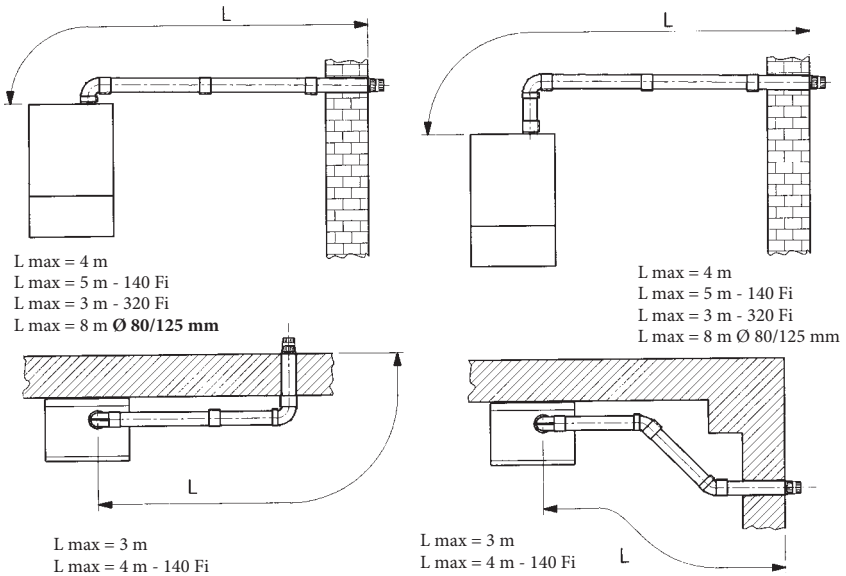
Figure 8

BOILER MODEL	MAX. LENGTH *(m)*	INLET DIAPHRAGM Ⓐ *(mm)*
NUVOLA 3 140 Fi	0 ÷ 2,5	73
	2,5 ÷ 5	NO
NUVOLA 3 240 Fi	0 ÷ 0,5	73
	0,5 ÷ 2	80
	2 ÷ 4	NO
NUVOLA 3 280 Fi	0 ÷ 1	76
	1 ÷ 4	NO
NUVOLA 3 320 Fi	0 ÷ 1	80
	1 ÷ 3	NO

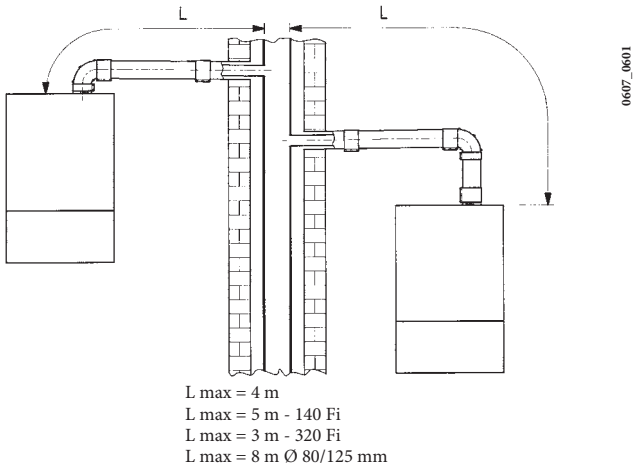
If fumes are discharged outside the building, the flue-air duct must protrude at least 18 mm from the wall to allow an aluminium weathering surround to be fitted and sealed to avoid water infiltrations. Make sure there is a minimum upward slope towards the outside of 1 cm per metre of duct.

a 90° bend reduces total duct length by 1 metre.
a 45° bend reduces total duct length by 0.5 metres.

16.1 HORIZONTAL FLUE INSTALLATION OPTIONS

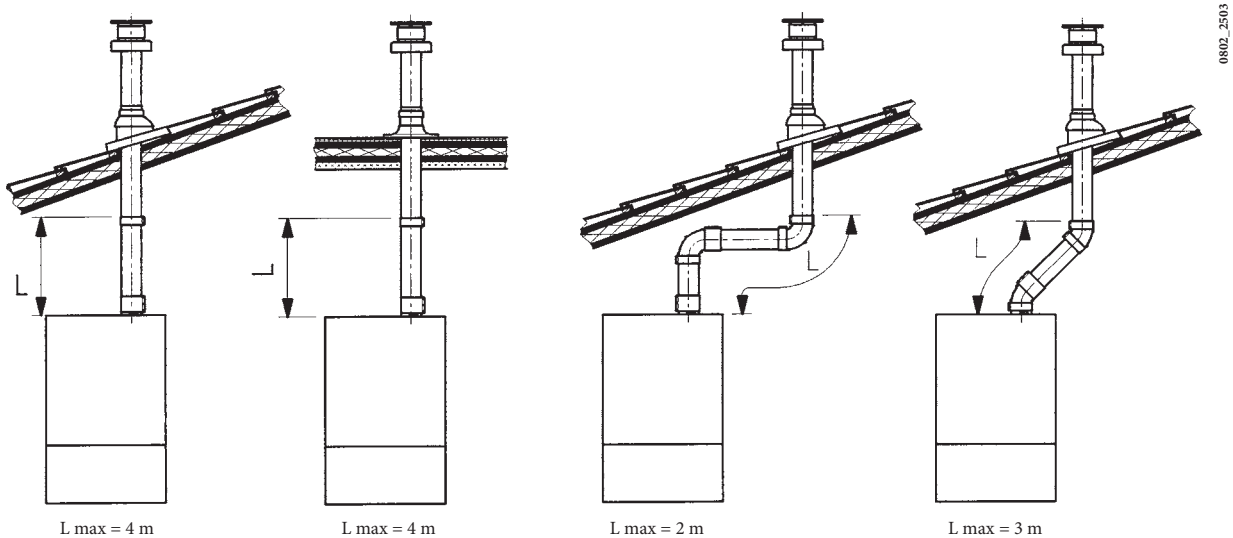


16.2 LAS FLUE DUCT INSTALLATION OPTIONS



16.3 VERTICAL FLUE INSTALLATION OPTIONS

This type of installation can be carried out on either a flat or a pitched roof by fitting a flue terminal and a special weathering surround with sleeve (both available on request.



For detailed installation instructions, consult the technical data provided with the accessories.

… separate flue and air ducts

This type of installation makes it possible to discharge exhaust fumes both outside the building and into single flue ducts. Comburent air can be drawn in at a different location from that of the flue terminal. The splitting kit comprises a flue duct adaptor (100/80) and an air duct adaptor. For the air duct adaptor, fit the screws and seals previously removed from the cap.
The diaphragm in the boiler must be removed in the event of installation with these types of ducts.

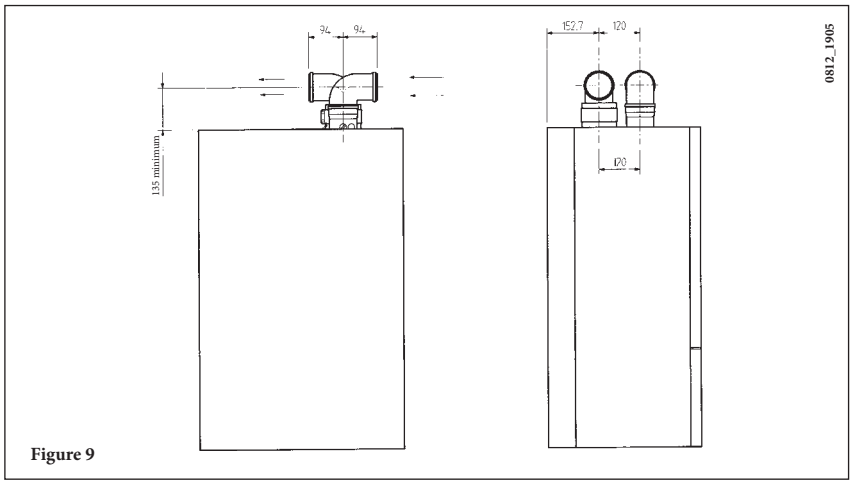


Figure 9

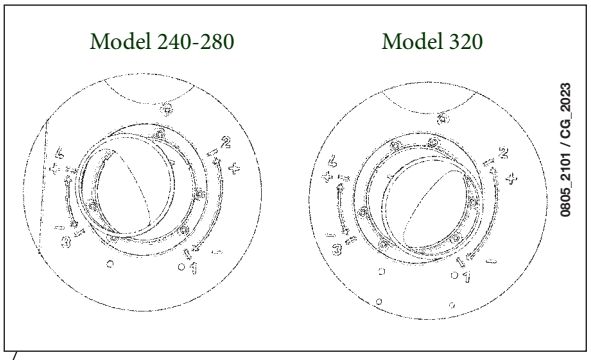
NOTE: ***The first 90° bend is not included when calculating the maximum available length.***

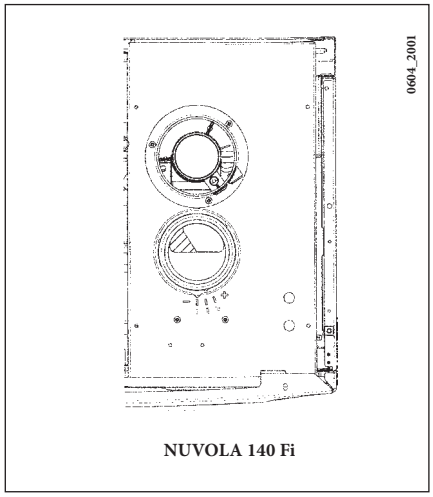
The 90° bend allows the boiler to be connected to a flue-air duct in any direction as it can be rotated by 360°. It can also be used as a supplementary bend combined with a duct or a 45° bend.

- ***A 90° bend reduces total duct length by 0.5 metres.***
- ***A 45° bend reduces total duct length by 0.25 metres.***

Adjusting the air regulator for separate flues

This regulator must be adjusted to optimise combustion efficiency and parameters. After turning the air intake connecter, which can be mounted both to the right and the left of the exhaust flue duct, suitably adjust the excess air according to the total length of the combustion exhaust and inlet flue ducts.
Turn this regulator clockwise to decrease the excess of comburent air and vice versa to increase it.
To fine tune, use a combustion product analyser to measure the amount of CO2 in the fumes at maximum heat capacity, and, if a lower value is measured, gradually adjust the air regulator until the amount of CO2 indicated in the following table is measured. To mount this device correctly, consult the relative instructions.





NUVOLA 140 Fi

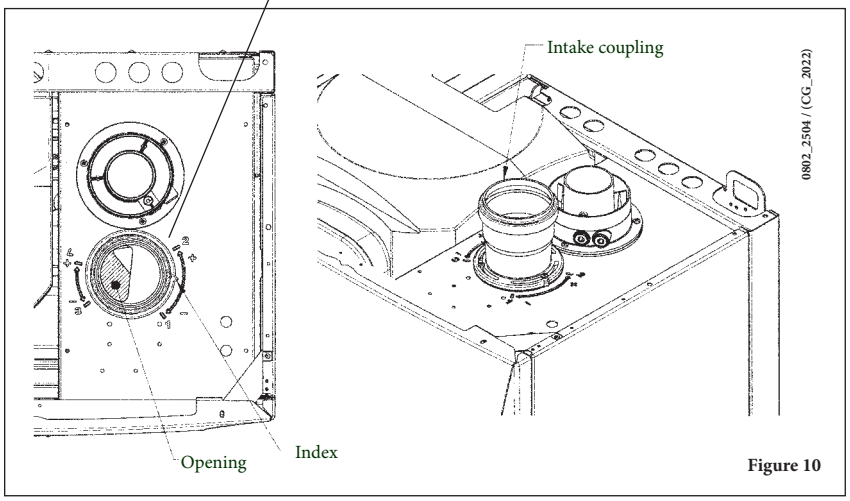


Figure 10

	MAX LENGTH	POSITION OF AIR REGULATOR	CO2%		
	L1+L2 (m)	AFR	G20	G30	G31
NUVOLA3 COMFORT 140 Fi	0 ÷ 10	1	4,0	—	4,3
	10 ÷ 20	2			
	20 ÷ 30	3			
NUVOLA3 COMFORT 240 Fi	0 ÷ 20	1	6,1	8,7	8,7
	20 ÷ 30	2			
NUVOLA3 COMFORT 280 Fi	0 ÷ 20	1	7,1	8,0	8,0
	20 ÷ 30	2			
NUVOLA3 COMFORT 320 Fi	0 ÷ 10	3	6,7	—	7,6
	10 ÷ 25	4			

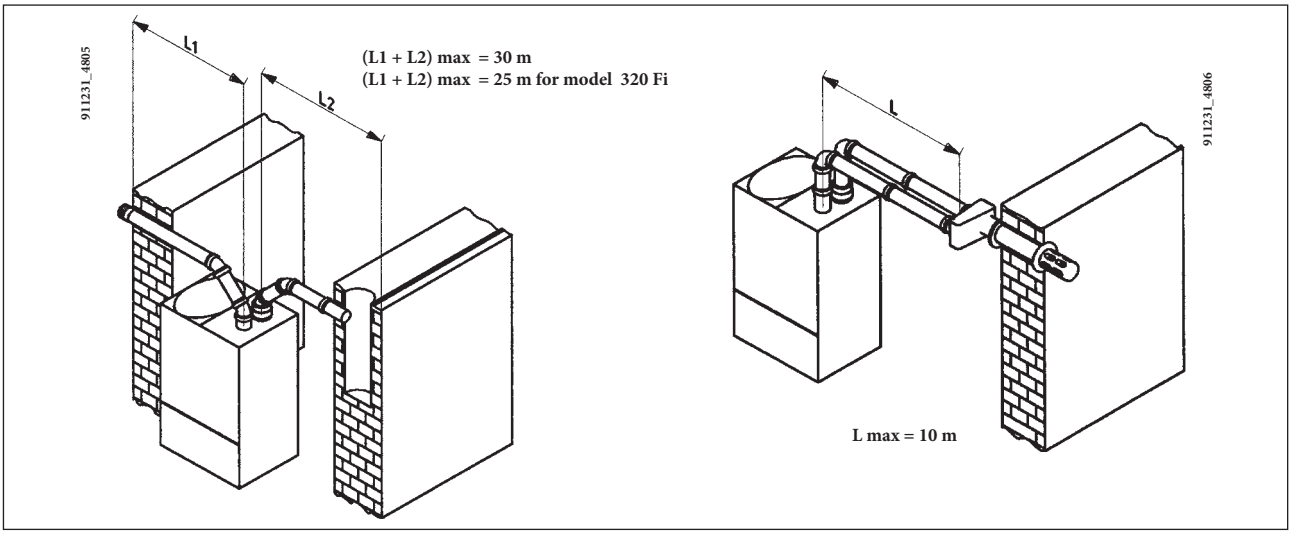
NB: For the C52 type, do not fit the flue and air duct terminals on opposite walls of the building. The air duct (for horizontal discharges) must have a maximum length of 10 metres (6m for model 140 Fi).

If the discharge duct is longer than 6 metres, install the condensate collection kit, supplied as an accessory, near the boiler.

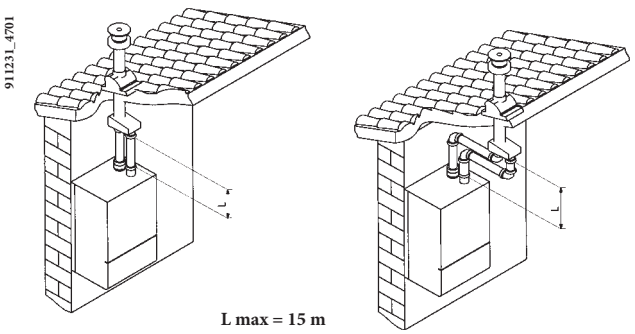
IMPORTANT: if fitting a single flue duct, make sure it is adequately insulated (e.g.: with glass wool) wherever the duct passes through building walls. For detailed installation instructions, consult the technical data provided with the accessories.

16.4 SEPARATE HORIZONTAL FLUE TERMINALS INSTALLATION OPTIONS

IMPORTANT - Make sure there is a minimum downward slope towards the outside of 1 cm per metre of duct length. If the condensate collection kit is installed, the discharge duct must slope down towards the boiler.



16.5 SEPARATE VERTICAL FLUE INSTALLATION OPTIONS



17. ELECTRICAL CONNECTIONS

This machine is only electrically safe if it is correctly connected to an efficient earth system in compliance with current safety regulations.
Connect the boiler to a 230V single-phase earthed power supply using the supplied three-pin cable, observing correct LIVE-NEUTRAL polarity.
Use a double-pole switch with a contact separation of at least 3 mm.
When replacing the power supply cable, fit a harmonised HAR H05 VV-F' 3x0.75mm2 cable with a maximum diameter of 8 mm.

…Access to the power supply terminal block

- disconnect the boiler from the mains power supply using the two-pole switch;
- remove the two screws fixing the control panel to the boiler;
- rotate the control panel;
- remove the cover and access the wiring area (figure 11).

The 2A fast-blowing fuse is incorporated in the power supply terminal block (to check and/or replace the fuse, pull out the black fuse carrier).

(L) = **Live** (brown)
(N) = **Neutral** (blue)
⏚ = **Earth** (yellow-green)
(1) (2) = **Contact for ambient thermostat**

IMPORTANT: respect polarity **L** (LIVE) - **N** (NEUTRAL)

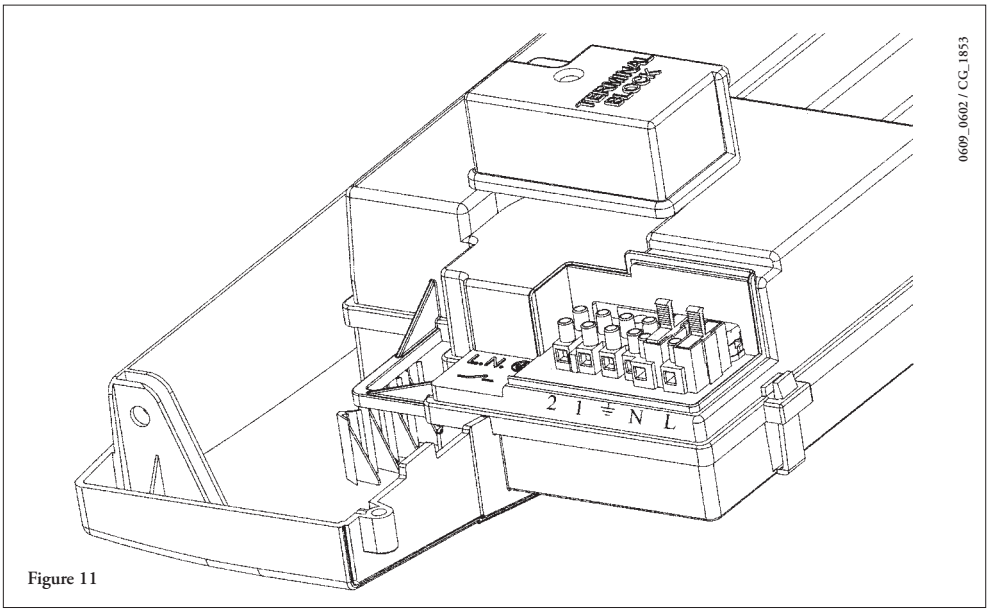


Figure 11

WARNING: ***If the appliance is directly connected to an underfloor system, install a safety thermostat to prevent the latter from overheating.***

18. INSTALLING THE CLIMATE CONTROLLER

To connect the climate controller, proceed as follows:

- Prise open the climate controller (there are no screws) with your hands;
- Connect the two wires from the M2 terminal block on the boiler (figure 11), as illustrated in figure C.

WARNING
the climate controller is powered at LOW VOLTAGE. Do not connect it to the 230 V mains supply. For electrical connections, see sections 28 and 31.

The climate controller can either be directly installed on the boiler or mounted on the wall.

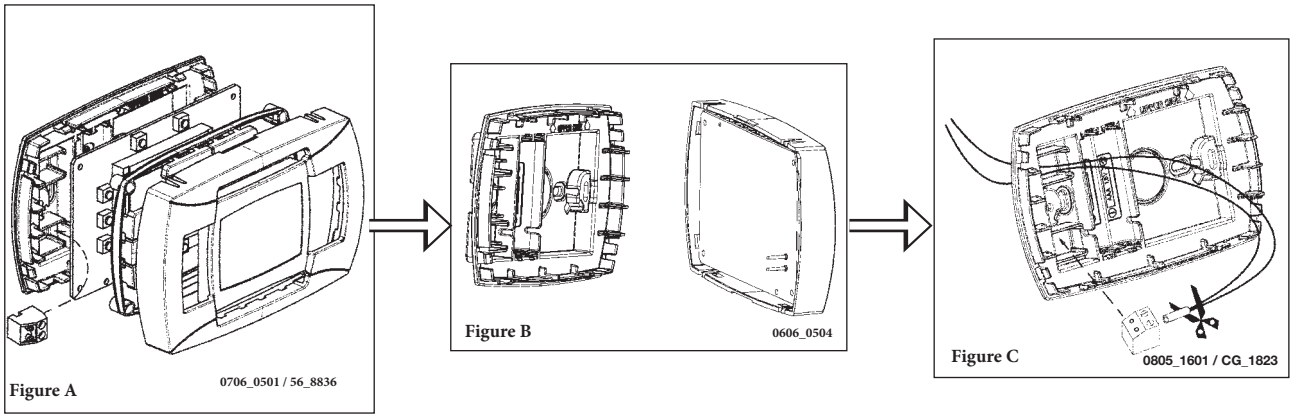


Figure A

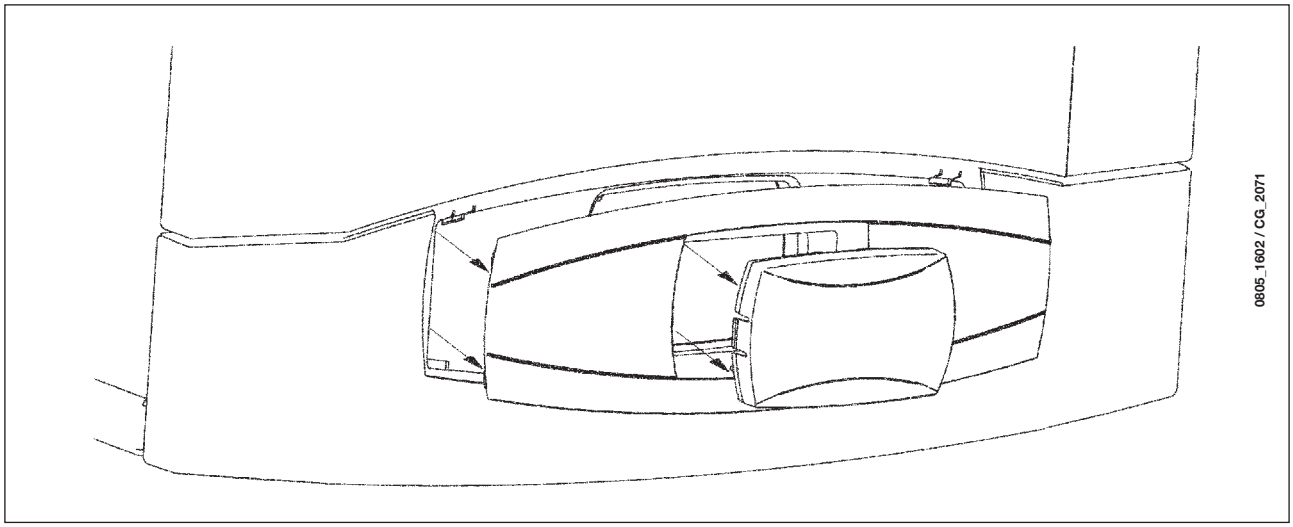
Figure B

Figure C

18.1 INSTALLING THE CLIMATE CONTROLLER ON THE FRONT PANEL OF THE BOILER

To install the climate controller inside the control strip of the front panel of the boiler, proceed as follows:

1. Remove the grille from the front panel of the boiler with your hands as shown in the figure below;
2. Remove the cover from the template and then put it back on the front panel;
3. Cut the two red wires and connect them as shown in figure C.
4. Push the climate controller into the relative housing on the control strip of the front panel without applying excessive force;



CONNECTING THE AMBIENT THERMOSTAT

- access the power supply terminal block (figure 10);
- connect the ambient thermostat terminals to terminals (1) and (2);
- power the boiler;

Operation of key

The key is no longer operative as described in section 4.1 (ECONOMY-COMFORT function).
The boiler supplies heat to the heating system only when the time band programmed by the user and the ambient thermostat are both requested.

By pressing the key it is possible to enable boiler operation when the ambient thermostat is requested but the programmed time band does not require heat (manual "forcing"). In this case the display of the climate controller shows the flashing symbol Manual operation ends at the next time band when heat is not requested in heating.

18.2 INSTALLING THE CLIMATE CONTROLLER ON THE WALL

To mount the climate controller on the wall, proceed as follows:

1. Unscrew the two screws (**a**-**b** figure 11) that fix the casing to the boiler;
2. Access the **M2** terminal block, as illustrated in the figure below;
3. remove the two red wires from the terminals **1**-**2** and connect the two wires from the climate controller.
4. insert the climate controller in the housing provided on the dashboard of the front panel without applying excessive force;

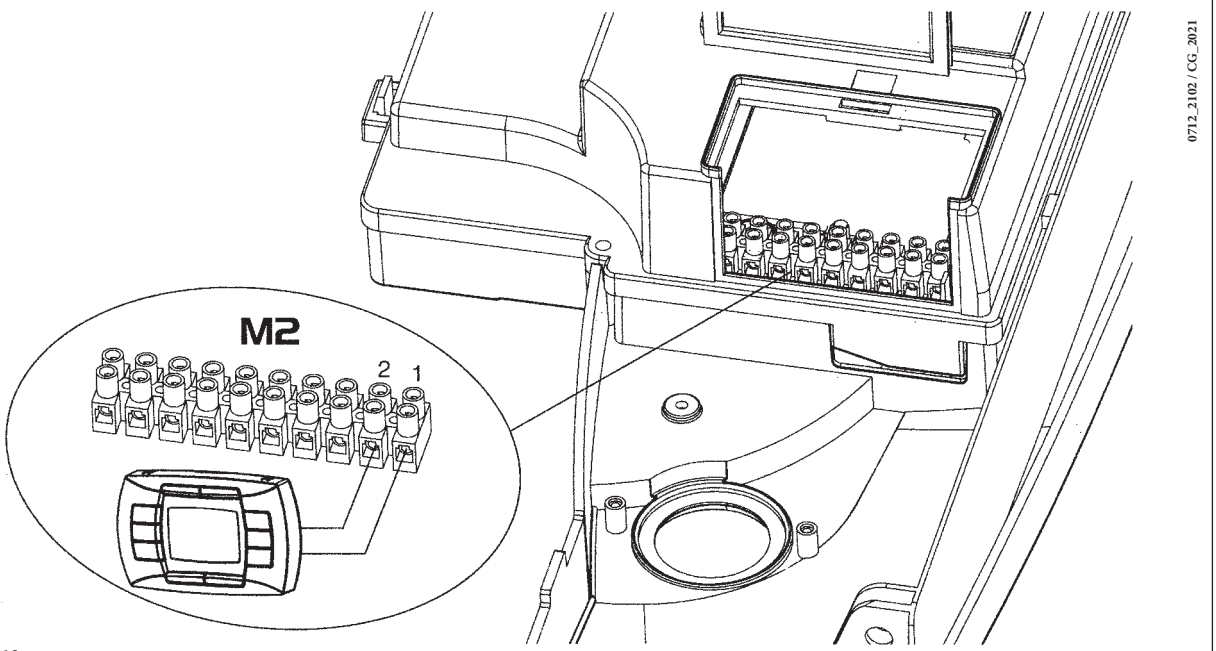


Figure 12

IMPORTANT: After installing the climate controller, power the appliance and make sure the former works correctly.

19. GAS CONVERSION

The authorised Technical Assistance Service can convert this boiler to natural gas (**G. 20**) or liquid gas (**G.30, G. 31**).

Carry out the following operations:

A) replace the main burner nozzles;
B) change the modulator voltage
C) new max. and min. calibration of the pressure regulator.

A) Replace the burner injectors
- carefully pull the main burner off its seat;
- replace the main burner injectors making sure to fully tighten them to prevent gas leaks. Injector diameters are specified in table 2.

How to change the diaphragm nozzle
(for models 240i and 240 Fi)
- remove the gas supply pipe (1 in Figure 13b);
- change the diaphragm nozzle fitted on the gas valve (2);
- replace the gas supply pipe .

B) Change the modulator voltage
- set parameter **F02** according to the gas used, as described in section 21.

C) Calibrate the pressure regulator
- connect the positive pressure test point of a differential pressure gauge (possibly water-operated) to the gas valve pressure test point (**Pb**) (Figure 13a). For models 240 i/Fi use the pressure tap (3) in the gas supply pipe (figure 13b). Only for models with sealed chambers, connect the negative pressure test point of the pressure gauge to a „**T**" fitting in order to join the boiler adjustment outlet, the gas valve adjustment outlet (**Pc**) and the pressure gauge. (The same measurement can be made by connecting the pressure gauge to the pressure test point (**Pb**) after removing the front panel of the sealed chamber). Measuring burner pressure using methods other than those described could lead to incorrect results as the low pressure created by the fan in the sealed chamber would not be taken into account.

SIT Gas valve
SIGMA 845 model

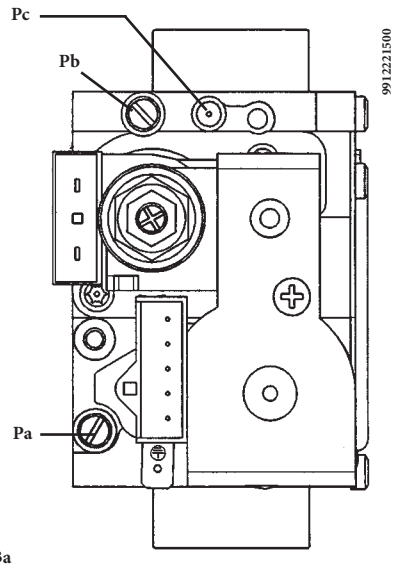


Figure 13a

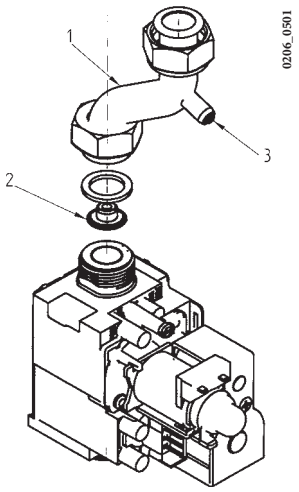


Figure 13b (model 240i - 240 Fi)

C1) Adjustment to nominal heat output:
- open the gas tap;
- press ⏻ (section 3.2) and set the boiler on winter position;
- open a hot water tap that can provide a flow rate of at least 10 litres a minute or make sure there is maximum heat demand;
- make sure that the dynamic inlet pressure of the boiler, measured at the gas valve pressure test point (Pa) (Figure 13a) is correct (30 mbar for butane gas, 37 mbar for propane gas or 20 mbar for methane gas).
- remove the cover of the modulator;
- adjust the brass screw of the sleeve until you obtain the pressure values indicated in table 1;

C2)Adjustment to reduced heat output:
- disconnect the modulator supply lead and slacken the red screw until you reach the pressure value corresponding to the reduced power (see table 1);
- reconnect the wire;
- fit the modulator cover and seal the fixing screw.

C3) Final checks
- attach the additional plate supplied with the transformer specifying the type of gas and the calibration performed.

Table of burner injectors

	240 i			240 Fi			280 i			280 Fi			320 Fi	
gas type	**G20**	**G30**	**G31**	**G20**	**G30**	**G31**	**G20**	**G30**	**G31**	**G20**	**G30**	**G31**	**G20**	**G31**
diameter of nozzles (mm)	1,18	0,69	0,69	1,18	0,69	0,69	1,18	0,69	0,69	1,18	0,69	0,69	1,18	0,77
Burner pressure (mbar*) **REDUCED HEAT OUTPUT**	1,6	3,9	6,9	1,7	3,9	6,9	1,6	3,8	5,7	1,7	4,3	5,9	1,7	3,8
Burner pressure (mbar*) **RATED HEAT OUTPUT**	7,7	19,8	25,6	8,1	20,6	26,3	10,3	27,6	35,4	10,6	28,1	35,6	13,5	29,9
N° 1 diaphragm diameter (mm)	4,5	3,5	3,5	4,5	3,5	3,5	-	-	-	-	-	-	-	-
N° nozzles	18													

* 1 mbar = 10,197 mm H_2O

Table 1

	140 Fi	
gas type	**G20**	**G31**
diameter of nozzles (mm)	1,18	0,77
Burner pressure (mbar*) **REDUCED HEAT OUTPUT**	1,8	4,2
Burner pressure (mbar*) **RATED HEAT OUTPUT**	8,5	18,8
N° nozzles	10	

* 1 mbar = 10,197 mm H_2O

Table 1

	240 i			280 i		
Consumption 15 °C - 1013 mbar	**G20**	**G30**	**G31**	**G20**	**G30**	**G31**
Rated power	2,87 m^3/h	2,14 kg/h	2,11 kg/h	3,29 m^3/h	2,45 kg/h	2,42 kg/h
Reduced power	1,26 m^3/h	0,94 kg/h	0,92 kg/h	1,26 m^3/h	0,94 kg/h	0,92 kg/h
p.c.i.	34,02 MJ/m^3	45,60 MJ/kg	46,30 MJ/kg	34,02 MJ/m^3	45,60 MJ/kg	46,30 MJ/kg

Table 2

	240 Fi			280 Fi		
Consumption 15 °C - 1013 mbar	**G20**	**G30**	**G31**	**G20**	**G30**	**G31**
Rated power	2,78 m^3/h	2,07 kg/h	2,04 kg/h	3,18 m^3/h	2,37 kg/h	2,34 kg/h
Reduced power	1,26 m^3/h	0,94 kg/h	0,92 kg/h	1,26 m^3/h	0,94 kg/h	0,92 kg/h
p.c.i.	34,02 MJ/m^3	45,60 MJ/kg	46,30 MJ/kg	34,02 MJ/m^3	45,60 MJ/kg	46,30 MJ/kg

Table 2

	320 Fi		140 Fi	
Consumption 15 °C - 1013 mbar	**G20**	**G31**	**G20**	**G31**
Rated power	3,65 m^3/h	2,68 kg/h	1,62 m^3/h	1,19 kg/h
Reduced power	1,26 m^3/h	0,92 kg/h	0,73 m^3/h	0,54 kg/h
p.c.i.	34,02 MJ/m^3	46,30 MJ/kg	34,02 MJ/m^3	46,30 MJ/kg

Table 2

20. DISPLAY OF PARAMETERS

20.1 ADVANCED INFORMATION AND SETTINGS MODE

To enter the advanced information and settings mode, press IP and hold down for at least 3 seconds; access to the mode is confirmed by the moving "**INFO**" message.

To exit, simply press **IP** briefly.

To scroll the information, press **OK**; when the large figures start flashing, the value can be modified by pressing +/- .

WARNING

Communication between the boiler electronic board and the climate controller is not immediate. In some cases it may be necessary to wait a certain time, depending on the type of information transmitted, before the command requested is carried out.

HEATING CIRCUIT

- **"CH SI"** Maximum temperature of heating circuit, set value with a +/- .

WARNING

press to change the unit of measurement from °C to °F..

- **"EXT°c"** External temperature (with external probe connected).
- **"CH O>"** Temperature of heating circuit delivery water.
- **"CH R<"** Temperature of heating circuit return water (not contemplated).
- **"CH S^"** Set-point of heating circuit water.
- **"CH MX"** Maximum heating circuit setpoint (max. settable value).
- **"CH MN"** Minimum heating circuit setpoint (min. settable value)

DHW CIRCUIT

- **"HW O>"** Temperature of DHW circuit or storage boiler delivery water.
- **"HW S^"** Set-point of DHW circuit water. Value settable with the +/- keys.
- **"HW MX"** Maximum DHW circuit water setpoint (max. settable value)
- **"HW MN"** Minimum DHW circuit water setpoint (min. settable value)

ADVANCED INFORMATION

- **"PWR %"** Flame power level/modulation (in %).
- **"P BAR"** Heating circuit water pressure (in bar).
- **"F L/M"** Water flow leaving DHW circuit (in litres/min).

PARAMETER SETTINGS

- **"K REG"** Adjustment constant (0.5...9.0) of the temperature of the heating system delivery water (factory setting = 3 - See section 27 - Chart 3).

  Set value with +/- . A high value generates a higher delivery temperature in the heating system. By setting a correct **K REG** adjustment constant, the ambient temperature remains at the set value regardless of the changes in external temperature.

- **"BUILD"** Adjustment parameter for the size of the building (1..10 - factory setting 5). Set value with +/- . An elevated value is associated with a building / heating system with elevated heat inertia, vice-versa, a low value is associated with small rooms or systems with low heat inertia (thermoconvectors).

- **"YSELF"** Enable/disable the self-adapting function of the heating delivery temperature (factory setting 1): The "**K REG**" constant undergoes a variation to reach ambient comfort. A value of 1 indicates that the function is enabled while a value of 0 indicates that it is disabled. This function is operative when connecting the external probe.

  Press the keys +/- to change this value.

- **"AMBON"** Enable/disable the Ambient Probe of the climate controller (factory setting 1). A value of 1 indicates that the ambient probe is enabled while a value of 0 indicates that it is disabled (factory setting 1). In these conditions the temperature control in the rooms depends on the chosen boiler delivery temperature ("CH SL"). If the climate controller is installed in the boiler, the function must be excluded.
  Press the keys +/- to change this value.
  NOTE: see the table summarising the possible combinations between AMBON and MODUL.

- **"MODUL"** Enable/disable modulation of the delivery temperature as a function of the ambient temperature (with Ambient Probe enabled) and of the external temperature (if an external probe is present). Factory setting 1. A value of 1 indicates that the modulation of the delivery set point is enabled, while a value of 0 indicates that it is disabled.
  Press the keys +/- to change this value.

  NOTE: see the table summarising the possible combinations between AMBON and MODUL.

Table summarising the combination of the **AMBON** and **MODUL** functions

AMBON	MODUL	BUTTON FUNCTIONS +/-
1	1	Regulation of the ambient temperature (modulating delivery temperature)
0	1	With external probe : Regulation of KREG curves Without external probe : Regulation of calculated delivery temperature . (it is advisable to set MODUL = 0)
0	0	Regulation of delivery temperature setpoint .
1	0	Regulation of the ambient temperature (fixed delivery temperature)

- **"HW PR"** Enables the DHW programmer (0-1-2). Factory setting = 1.
  - 0: Disabled
  - 1: Always enabled
  - 2: Enabled with weekly DHW programme ("HW PR" see section 3.7)

- **"NOFR"** Enable/disable Boiler Antifreeze function (factory setting 1). A value of 1 indicates that the ambient antifreeze function is enabled, while a value of 0 indicates that it is disabled.

  ATTENTION: always leave this function enabled (1).

- **"COOL"** Enable/Disable control of ambient temperature in summer (factory setting=0). Set this parameter to 1 to enable the function and add two new boiler operating modes, as per section 3.2:
  SUMMER – OFF - WINTER – HEATING ONLY - SUMMER+COOL - COOL
  To enable the function press button ⏻ repeatedly until the display is shows ✱ to the right of the time.
  This function is used to enable the climate controller to command one or more external conditioning devices (e.g.:
  air-conditioners) in summer. The boiler relay board therefore enables the external conditioning system when ambient temperature exceeds the temperature value set on the climate controller. During an operating request in this mode ✱ flashes on the display. For relay board connections, see the SERVICE instructions.

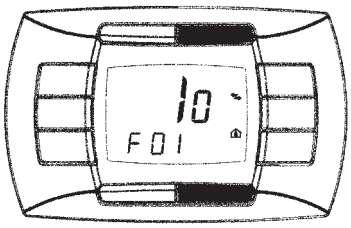
20.2 ADDITIONAL INFORMATION

See Service Instruction.

21. PARAMETERS SETTING

To set the boiler parameters, proceed as follows:

- press the key **IP** for at least three seconds ;
- press and hold down the key and then press (see figure at side). When the function is active, the letters "F01" and the value of the selected parameter appear on the display.



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Changing the parameters

- Press the +/- buttons to scroll through the parameters;
- Press the +/- buttons to change each parameter value;

NOTE: the value is automatically memorised after about 3 seconds. (Do not press any key until the value starts to flash).

	Description of parameters	Factory settings					
		140 Fi	240 Fi	280 Fi	320 Fi	240 i	280 i
F01	Type of boiler **10** = sealed chamber - **20** = atmospheric chamber	10				20	
F02	Gas used **00** = NATURAL (METHANE) - 01 = LPG	00 or 01					
F03	Hydraulic system	06					
F04	Setting programmable relays 1 **02** = zone system (See SERVICE Instructions)	02					
F05	Setting programmable relays 2 **13** = "cool" function for external conditioning system (See SERVICE Instructions)	04					
F06	Configuration of external probe inlet (See SERVICE Instructions)	00					
F07...F09	Manufacturer's information	00					
F10	**Mode of installing the climate controller** **00** = on the wall (paragraph 18.2) **01** = Not used **02** = in the boiler (paragraph 18.1)	00					
F11...F12	Manufacturer's information	00					
F13	Max heating power **(0-100%)**	100					
F14	Max DHW power **(0-100%)**	100					
F15	Min heating power **(0-100%)**	00					
F16	Setting of maximum heating setpoint (°C) **00** = 85°C - **01** = 45°C	00					
F17	Pump post-circulation time in heating (01-240 minutes)	03					
F18	Waiting time in heating before a new ignition **(00-10 minutes) - 00=10 seconds**	03					
F19	Manufacturer's information	07					
F20	Manufacturer's information	00					
F21	Anti-legionella function **00** = Disabled - **01** = Enabled	00					
F22	Manufacturer's information	00					
F23	Maximum DHE setpoint temperature (ACS)	65					
F24	Manufacturer's information	35					
F25	Protection device against water lack	01					
F26...F29	Manufacturer's information (read-only parameters)	--					
F30	Manufacturer's information	10					
F31	Manufacturer's information	00					
F32...F41	Diagnostics (See SERVICE Instructions)	--					
last parameter	Activation of calibration function (See SERVICE Instructions)	0					

ATTENTION: do not change the value of the "Manufacturer's information" parameters.

22. ADJUSTMENT AND SAFETY DEVICES

This boiler has been designed in full compliance with European reference standards and, in particular, it is fitted with the following:

- **Air pressure switch (model 140 Fi - 240 Fi - 280 Fi - 320 Fi)**
  This device (17 - figure 20) only allows the burner to ignite if the exhaust flue duct is in perfect working order.
  In the event of one or more of the following faults:
  - flue terminal obstructed
  - venturi tubes obstructed
  - fan blocked
  - venturi tube connection - pressure switch tripped

  The boiler remains on standby and error code E03 is displayed (see table in section 9).

- **Fumes thermostat (model 240 i - 280 i)**
  This device (15 - figure 21), the sensor of which is positioned to the left of the fumes hood, interrupts the flow of gas to the main burner if the flue is obstructed and/or there is no draught.
  In these conditions the boiler shuts down and displays error code E03 (section 9).
  To restart immediately, after having removed the cause of intervention, see section 9.

It is forbidden to disable this safety device

- **Safety thermostat**
  Thanks to a sensor placed on the heating delivery line, the thermostat interrupts the flow of gas to the burner if the water in the primary circuit overheats. In these conditions, the boiler is blocked and only after the fault has been eliminated can it be ignited again (See section 9).

It is forbidden to disable this safety device

- **Flame ionisation detector**
  The flame sensing electrode, located on the right-hand side of the burner, guarantees safety of operation in case of gas failure or incomplete ignition of the burner.
  In these conditions, the boiler is blocked after 3 ignition attempts.
  To re-establish normal operating conditions, see section 9.

- **Hydraulic pressure switch**
  This device allows the main burner to be ignited only if system pressure is higher than 0.5 bars.

- **Pump overrun for heating circuit**
  The electronically-controlled pump post-circulation function lasts 3 minutes (F17 – section 21) and is enabled, in the heating mode, if the ambient thermostat causes the burner to go out.

- **Post-circulation of the DHW circuit pump**
  The pump post-circulation, which is obtained electronically, has a duration of 30 seconds and is activated at the end of operation of the DHW pump.

- **Frost protection device (heating and DHW systems)**
  The electronic boiler management system includes a "frost protection" function for the heating system which, when delivery temperature falls below 5°C, operates the burner until a delivery temperature of 30°C is reached.

- **Lack of water circulation in the primary circuit (probably pump blocked or presence of air)**
  If there is insufficient or no water circulating in the primary circuit, the boiler blocks and the error code 25E is shown on the display (section 9).

- **Anti-block pump function**
  If no heat demand is received for 24 consecutive hours, the pump will automatically start and operate for 10 seconds.
  This function is operative when the boiler is powered.

- **Three-way valve anti-blockage function**
  If no heat demand is received for a period of 24 hours, the three-way valve performs a complete switching cycle. This function is operative when the boiler is powered.

- **Hydraulic safety valve (heating circuit)**
  This device is set to 3 bar and is used for the heating circuit.

Connect the safety valve to a drain tap. Do not use it to drain the heating circuit.

- **Anti-legionellosis function**
  The anti-legionellosis function is NOT active.
  To activate the function, set the parameter F21=01 (as described in section 21). When the function is active, at intervals of one week the boiler electronic management brings the water contained inside the boiler to a temperature higher than 60°C (the function is operative only if the water has never exceeded 60°C in the previous 7 days).

NOTE: domestic hot water is guaranteed even if the NTC sensor (ref. 5 – figures 19-20) develops a fault. In this case, temperature is controlled by the delivery sensor.

23. POSITIONING THE IGNITION AND FLAME-SENSING ELECTRODE

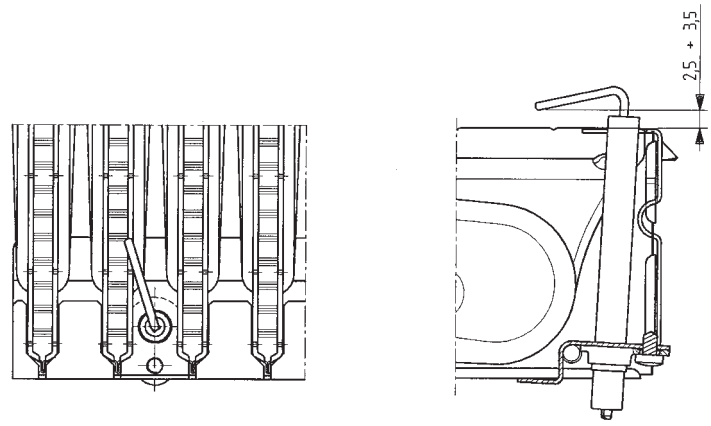


Figure 14

24. CHECKING COMBUSTION PARAMETERS

To measure combustion efficiency and the toxicity of the products of combustion, the boiler is fitted with two dedicated test points.
One test point is connected to the exhaust duct and is used to measure combustion efficiency and the toxicity of the products of combustion.
The other is connected to the air intake duct and is used to check for the presence of any products of combustion circulating in installations with co-axial flues.
The following parameters can be measured using the test point connected to the exhaust duct:

- temperature of the products of combustion;
- concentration of oxygen (O2) or, alternatively, carbon dioxide (CO2);
- concentration of carbon monoxide (CO).

The temperature of the comburent air must be measured on the test point located on the air intake flue by inserting the measurement sensor by about 3 cm.

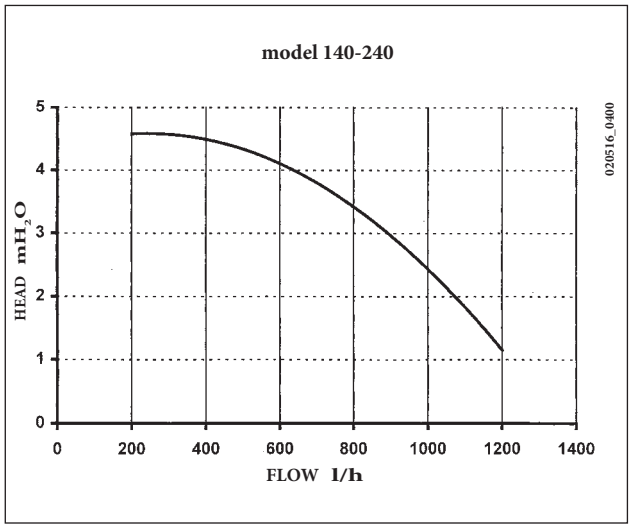
For natural draught boiler models, a hole must be made in the exhaust duct at a distance from the boiler equal to twice the internal diameter of the flue. The following parameters can be measured inside this hole:

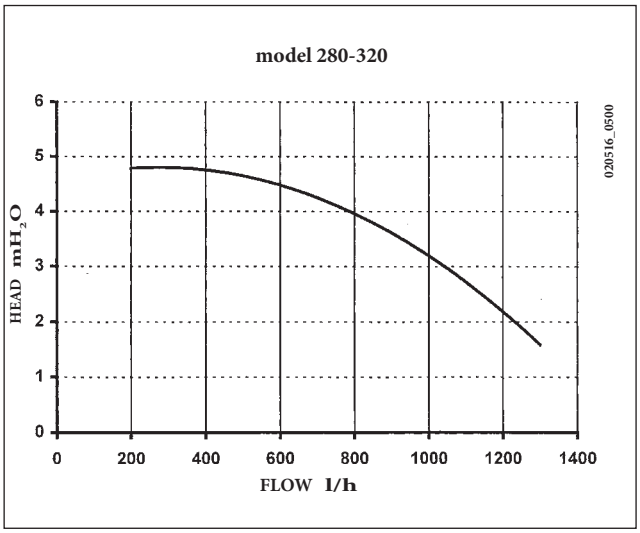
- temperature of the products of combustion;
- concentration of oxygen (O2) or, alternatively, carbon dioxide (CO2);
- concentration of carbon monoxide (CO).

The temperature of the combustion air must be measured close to the point where the air enters the boiler.
The hole, which must be made by the person in charge of the system during commissioning, must be sealed so as to ensure that the exhaust duct is airtight during normal operation.

25. PUMP CAPACITY/ HEAD

A high static head pump, suitable for installation on any type of single- or double-pipe heating system, is used. The automatic air valve incorporated in the pump allows quick venting of the heating system.





NOTE: For models Nuvola 3 240 a larger pump is available that has the same characteristics as the pump fitted on models Nuvola 3 Comfort 280 - 320.

26. DRAINING THE STORAGE BOILER

Drain the water in the storage boiler as follows:

- close the water inlet tap;
- open a user tap;
- unscrew the ring nut from the relative drain tap (figure 14);
- loosen the nut on the DHW outlet pipe on the storage boiler.

27. CONNECTING THE EXTERNAL PROBE

The boiler is provided with the connection for an external probe supplied as an accessory.
For connection, see the figure below (terminals 3-4) as well as the instructions supplied with the probe itself.

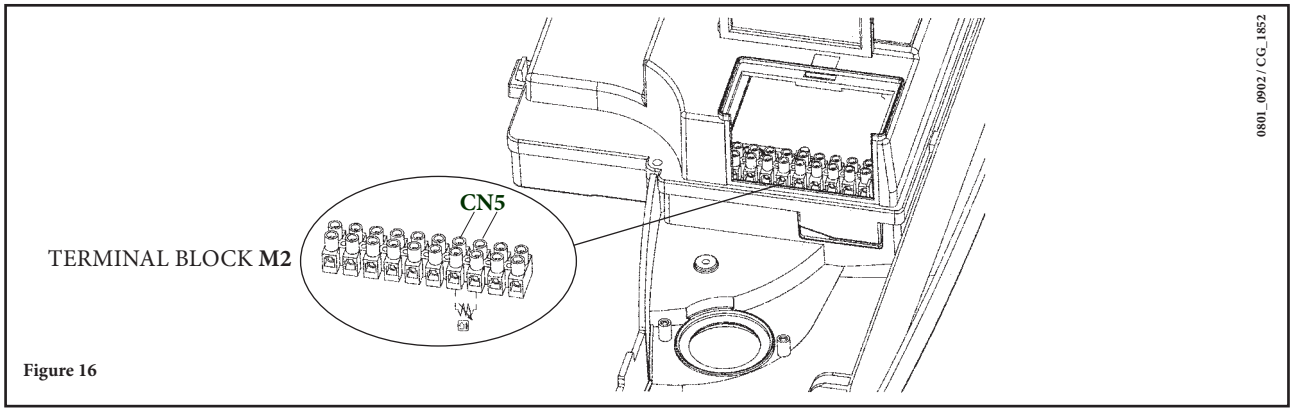


Figure 16

With the external probe connected it is possible to regulate the heating delivery temperature in two different ways.
If the climate controller has been installed in the boiler (section 18.1), the regulation of the heating delivery temperature depends on the **K REG** curve (Chart 3) which is manually set using the keys +/- .
If the climate controller has been installed on the wall (section 18.2), the regulation of the heating delivery temperature is automatic. The electronic management automatically sets the correct climate curve, depending on the external temperature and on the ambient temperature found (see also chapter 20.1).

IMPORTANT: the value of the delivery temperature **TM** depends on the setting of the parameter F16 (chapter 21). The max. settable temperature may in fact be 85 or 45 °C.

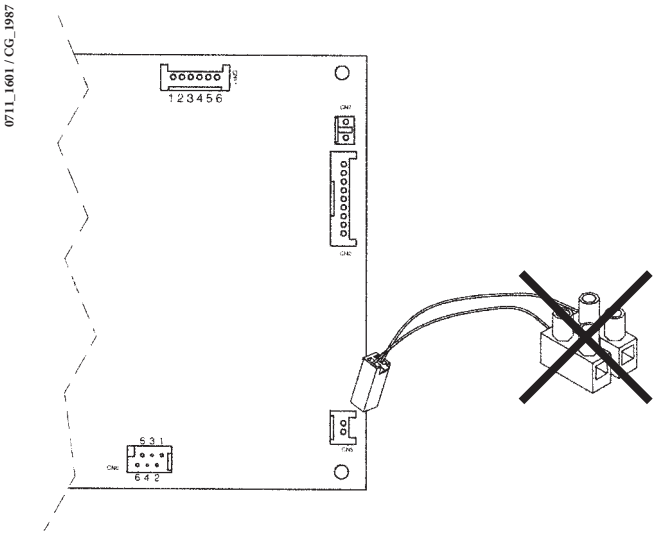


Figure 16.1

Connect the cable, supplied as an accessory with the external probe, to the connector **CNn5** of the boiler electronic board as illustrated in figure 16.1.

Remove the two-pin terminal block, connected to the cable, and connect the terminals to the terminals **3-4** on the terminal block **M2** as illustrated in figure 16.

K REG Curves

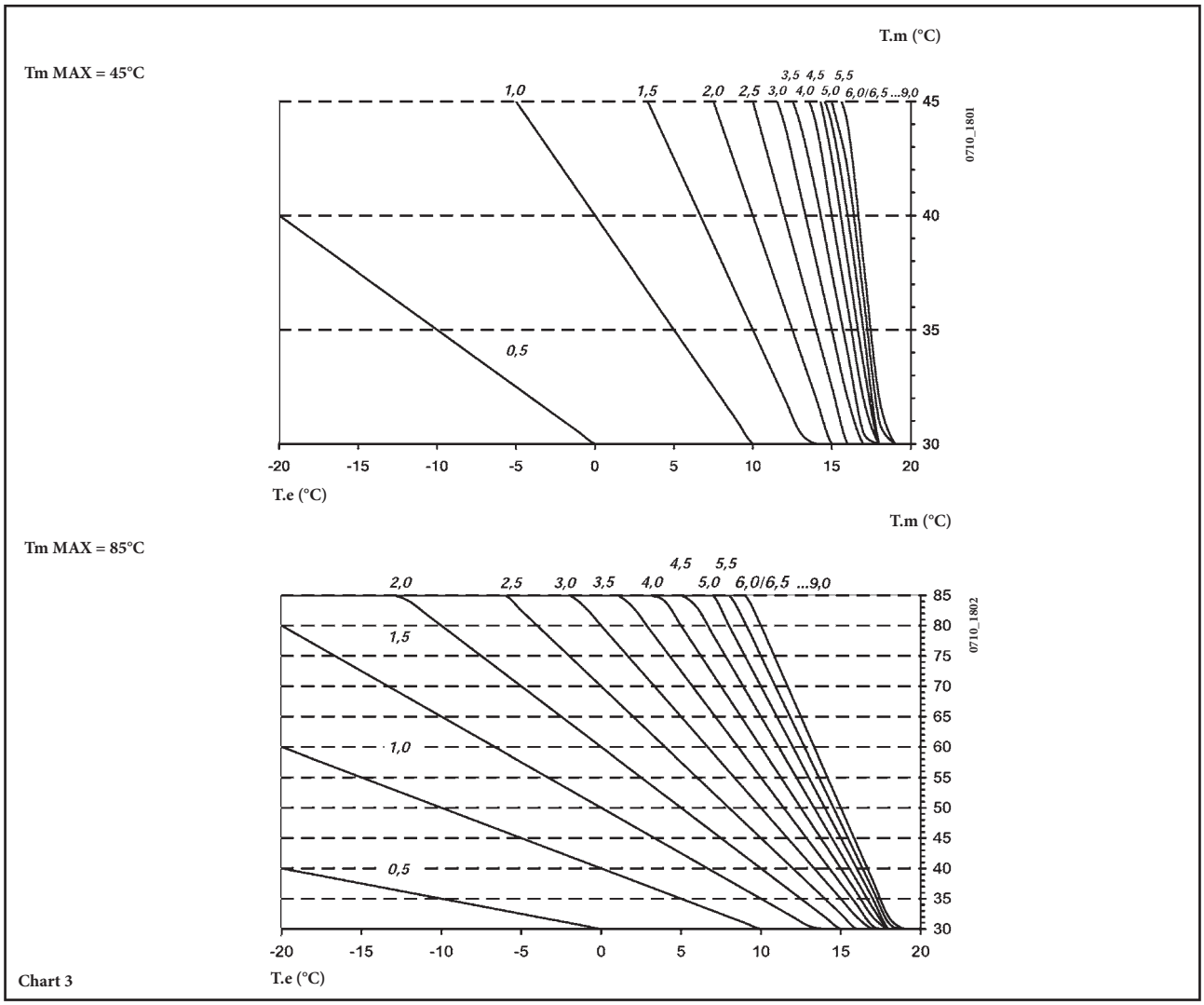


Chart 3

Tm = Delivery temperature
Te = External temperature

28. ELECTRICAL CONNECTION TO A ZONE SYSTEM

28.1 - CONNECTION OF THE RELAY BOARD (SUPPLIED AS ACCESSORY)

The relay board is not included in the standard boiler equipment and is supplied as an accessory.
Connect the connectors CN6 of the boiler electronic board and of the relay board by means of the FLAT cable provided. Connect the terminals **1-2-3** of the connector CN1 to terminals **10-9-8** of the boiler terminal block **M2** (figure 17).

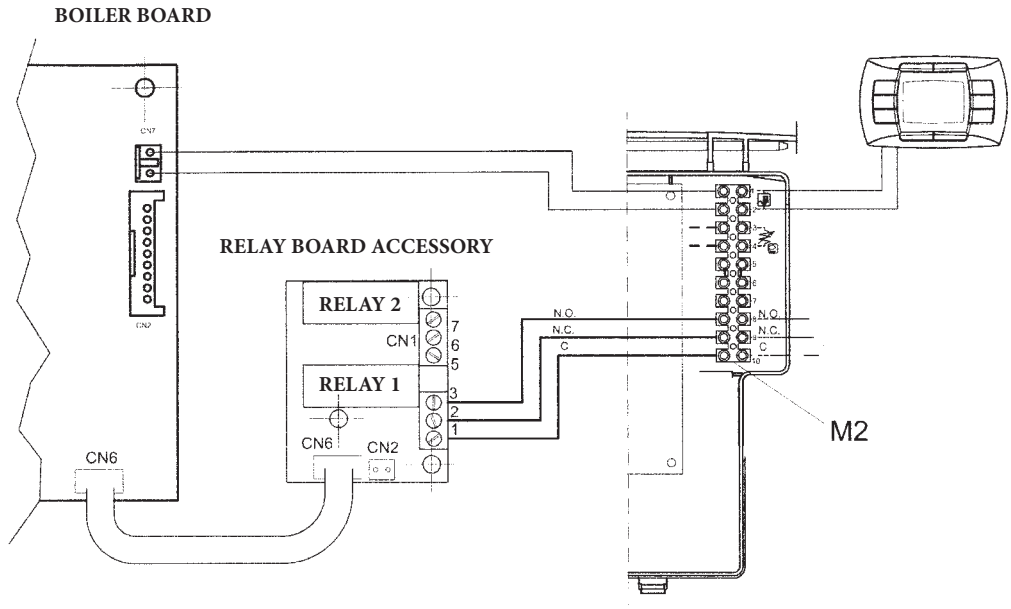


Figure 17

28.2 - ZONE CONNECTION

The contact for requesting the operation of the zones not controlled by the climate controller must be connected in parallel and connected to the terminals 1-2 "**Ta**" of the terminal block **M1** in figure 18.
The zone controlled by the climate controller is managed by the solenoid valve of zone 1, as illustrated in figure 18.

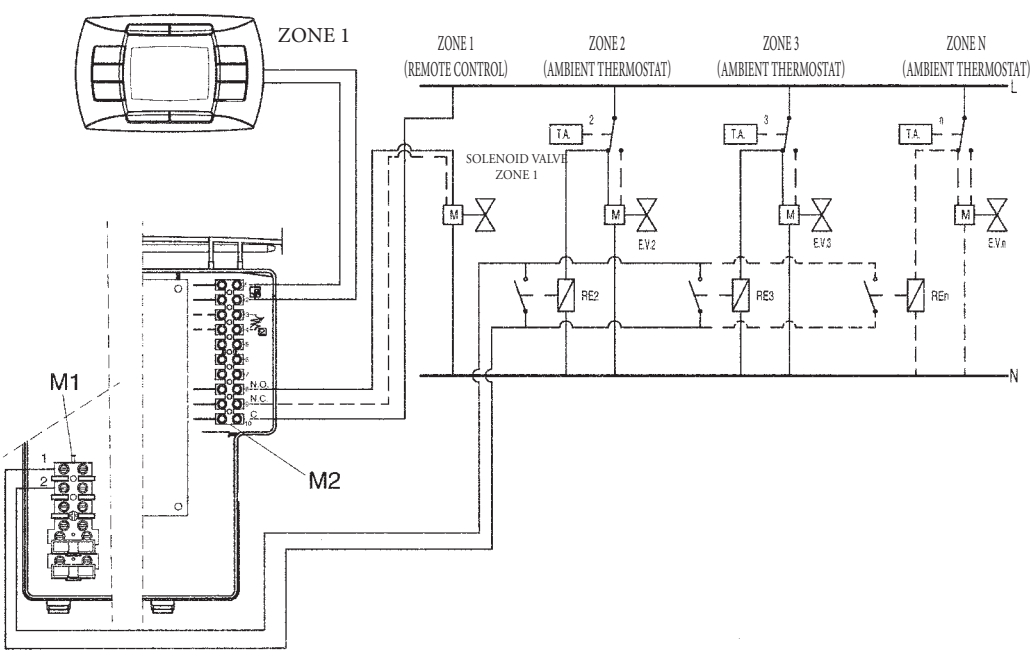


Figure 18

IMPORTANT: ensure that the parameter **F04 = 2** (as in the factory setting - chapter 21).

29. ANNUAL SERVICING

To optimise boiler efficiency, carry out the following annual controls:

- check the appearance and air-tightness of the gaskets of the gas and combustion circuits;
- check the state and correct position of the ignition and flame-sensing electrodes;
- check the state of the burner and make sure it is firmly fixed;
- check for any impurities inside the combustion chamber.
  Use a vacuum cleaner to do this;
- check the gas valve is correctly calibrated;
- check the pressure of the heating system;
- check the pressure of the expansion vessel;
- check the fan works correctly;
- make sure the flue and air ducts are unobstructed;
- check for any impurities inside the siphon fitted on certain boilers;
- check the magnesium anode, where present, for boilers fitted with storage boilers.

WARNINGS

Before commencing any maintenance operations, make sure the boiler is disconnected from the power supply.
Afterwards, move the knobs and/or operating parameters of the boiler to their original positions.

30. FUNCTIONAL CIRCUIT DIAGRAM

240 i - 280 i

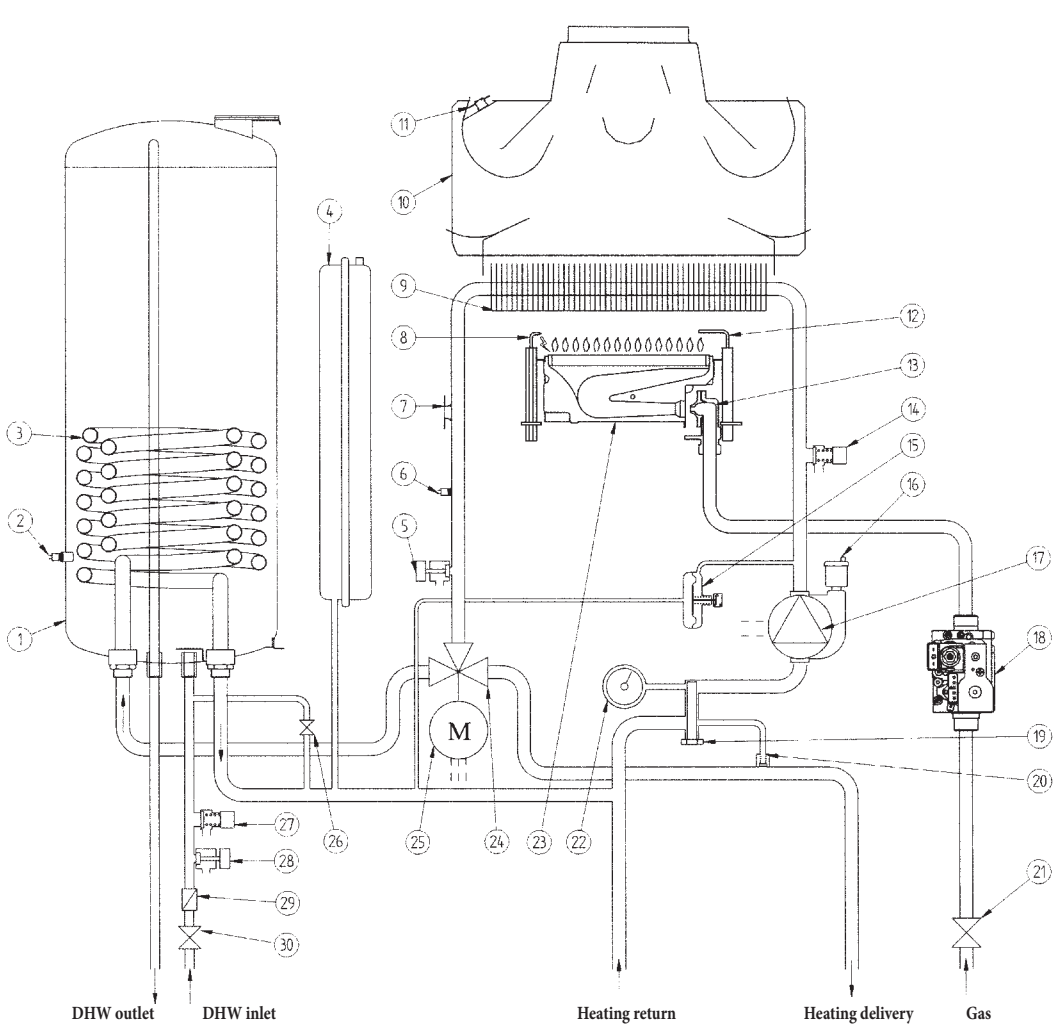


Figure 19

Legend :

1 boiler
2 boiler probe
3 DHW exchanger
4 Expansion vessel
5 Boiler drain tap
6 Central heating NTC sensor
7 Safety thermostat
8 Ignition electrode
9 Water-fumes exchanger
10 fumes hood
11 fumes thermostat
12 flame detection electrode
13 Gas train with injectors
14 safety valve on heating circuit 3 bar
15 differential hydraulic pressure switch
16 automatic air vent
17 pump with air separator
18 Gas valve
19 heating return filter
20 automatic by-pass
21 gas tap
22 Pressure gauge
23 Burner
24 Three-way valve
25 Three-way valve motor
26 Boiler filling tap
27 safety valve on DHW circuit 8 bar
28 storage boiler drain tap
29 flow adjuster
30 water supply tap

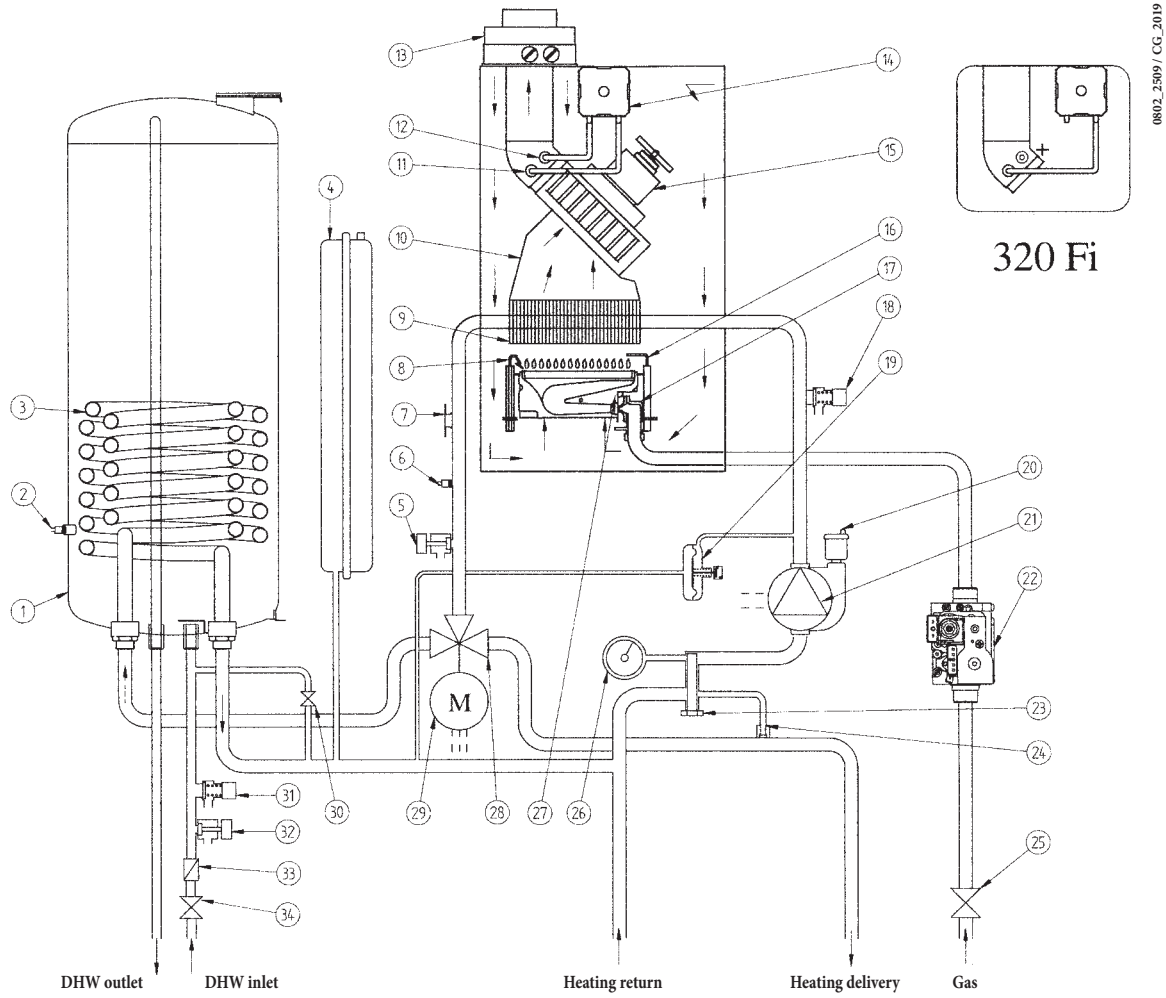


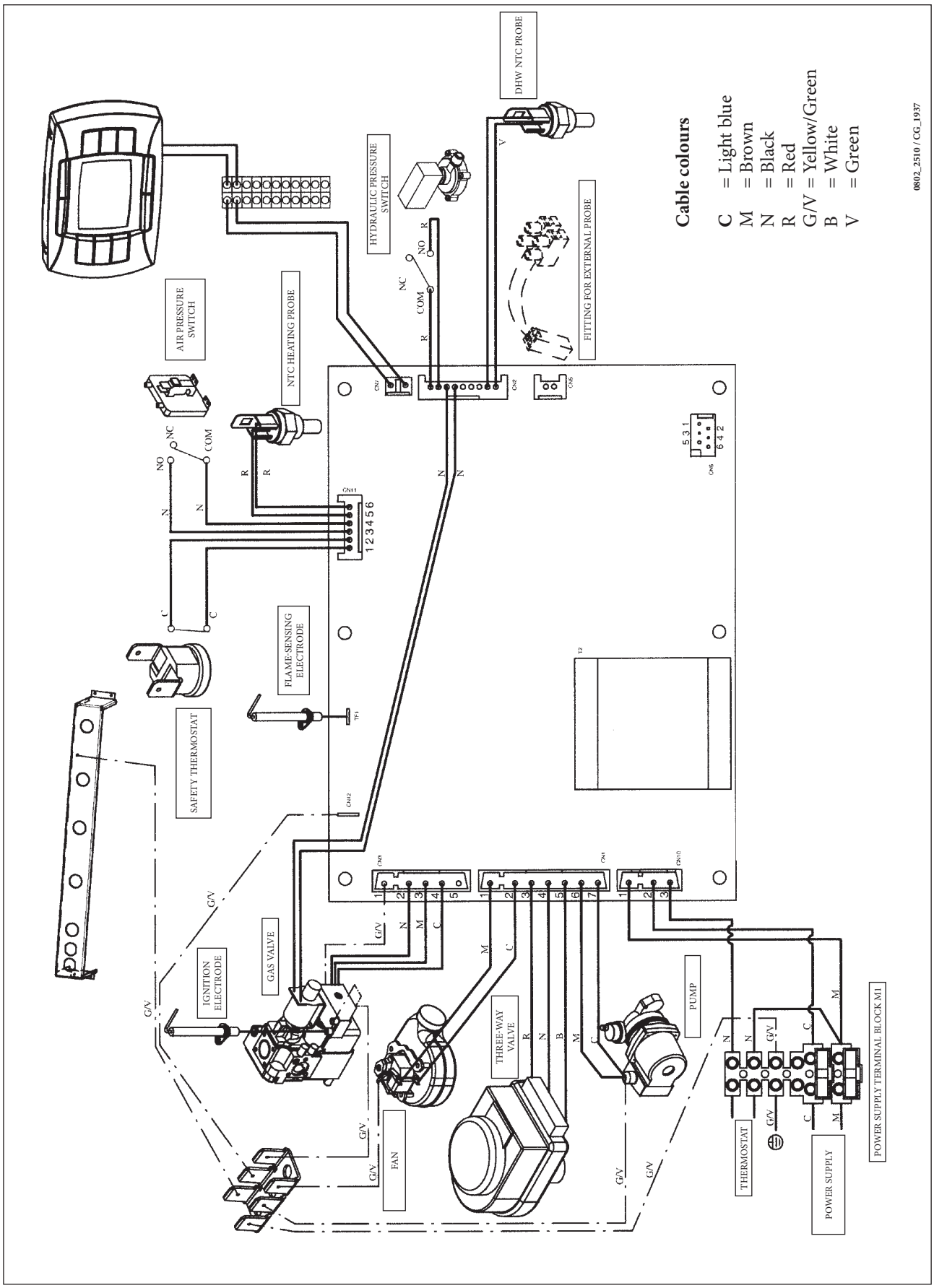
Figure 20

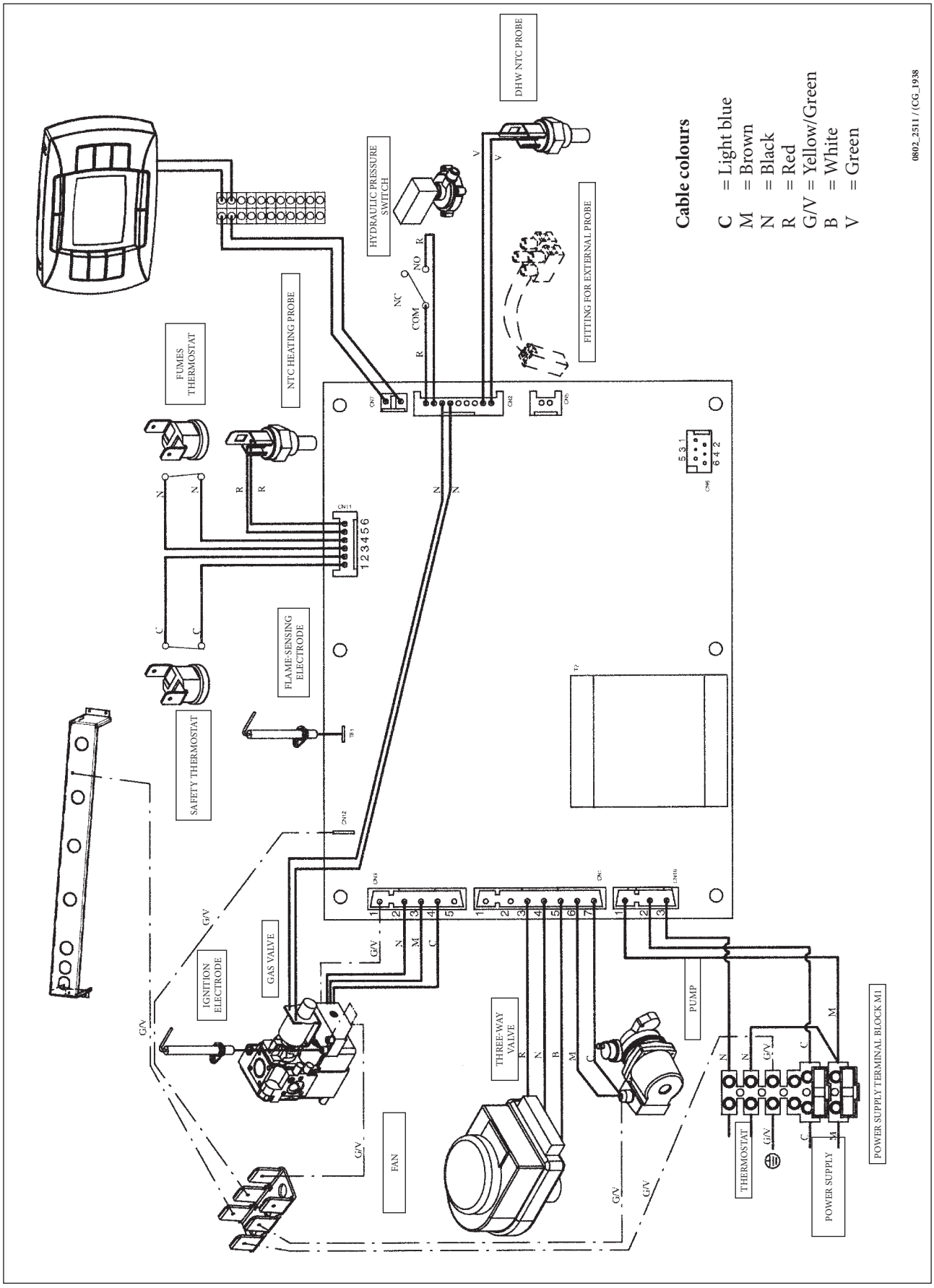
Legend :

1 boiler
2 boiler probe
3 DHW exchanger
4 expansion vessel
5 Boiler drain tap
6 Central heating NTC sensor
7 Safety thermostat
8 Ignition electrode
9 Water-fumes exchanger
10 Fumes conveyor
11 Negative pressure point
12 Positive pressure point
13 Concentric ad
14 Air pressure switch
15 fan
16 flame detection electrode
17 Gas train with injectors
18 safety valve on heating circuit 3 bar
19 differential hydraulic pressure switch
20 automatic air vent
21 pump with air separator
22 gas valve
23 heating return filter
24 automatic by-pass
25 gas tap
26 Pressure gauge
27 burner
28 Three-way valve
29 Three-way valve motor
30 Boiler filling tap
31 safety valve on DHW circuit 8 bar
32 storage boiler drain tap
33 flow adjuster
34 water supply tap

31. WIRING DIAGRAM

140 Fi - 240 Fi - 280 Fi - 320 Fi




Cable colours
C = Light blue
M = Brown
N = Black
R = Red
G/V = Yellow/Green
B = White
V = Green
0802_2511 / (CG_1938
DHW NTC PROBE
HYDRAULIC PRESSURE SWITCH
FITTING FOR EXTERNAL PROBE
FUMES THERMOSTAT
NTC HEATING PROBE
FLAME-SENSING ELECTRODE
SAFETY THERMOSTAT
IGNITION ELECTRODE
GAS VALVE
THREE-WAY VALVE
PUMP
FAN
THERMOSTAT
POWER SUPPLY
POWER SUPPLY TERMINAL BLOCK M1

32. TECHNICAL DATA

MODEL NUVOLA 3 COMFORT		240 i	280 i	140Fi	240 Fi	280 Fi	320 Fi
Category		II_{2H3+}	II_{2H3+}	II_{2H3P}	II_{2H3+}	II_{2H3+}	II_{2H3P}
Rated heat input	kW	27,1	31,1	15,3	26,3	30,1	34,5
Reduced heat input	kW	11,9	11,9	6,9	11,9	11,9	11,9
Rated heat output	kW	24,4	28	14	24,4	28	32
	kcal/h	21.000	24.080	12.100	21.000	24.080	27.520
Reduced heat output	kW	10,4	10,4	6	10,4	10,4	10,4
	kcal/h	8.900	8.900	5.160	8.900	8.900	8.900
Efficiency according to Directive 92/42/EEC	–	★★	★★	★★	★★★	★★★	★★★
Max. pressure in central heating system	bar	3	3	3	3	3	3
Capacity of storage boiler	l	60	60	60	60	60	60
Capacity of expansion vessel	l	7,5	7,5	7,5	7,5	7,5	7,5
Pressure of expansion vessel	bar	0,5	0,5	0,5	0,5	0,5	0,5
Production of DHW at discharge ΔT=30°C	l/30min	390	450	—	390	450	490
Boiler reset time	min	6	4	—	6	4	4
Max. pressure in DHW system	bar	8	8	8	8	8	8
DHW output at ΔT=25 °C	l/min	14	16,1	8,1	14	16,1	18,3
DHW output at ΔT=35 °C	l/min	10	11,5	5,8	10	11,5	13,1
Specific output (*)	l/min	18,2	19	14,1	18,2	19	21,5

Type		—	B_{11BS}	B_{11BS}	C12 - C32 - C42 - C52 - C82 - B22			
Diameter of concentric flue duct		mm	—	—	60	60	60	60
Diameter of concentric air duct		mm	—	—	100	100	100	100
Diameter of 2-pipe flue duct		mm	—	—	80	80	80	80
Diameter of 2-pipe air duct		mm	—	—	80	80	80	80
Diameter of flue duct		mm	140	140	—	—	—	—
Max. mass flow of fumes		kg/s	0,022	0,024	0,015	0,018	0,018	0,022
Min. mass flow of fumes		kg/s	0,021	0,021	0,015	0,017	0,018	0,021
Max. temperature of fumes		°C	110	115	120	134	142	142
Min. temperature of fumes		°C	82	82	77	108	108	108
NOx class		—	3	3	3	3	3	3
Type of gas		—	G20	G20	G20	G20	G20	G20
		—	G30-G31	G30-G31	G31	G30-G31	G30-G31	G31
Natural gas supply pressure		mbar	20	20	20	20	20	20
Butane gas supply pressure		mbar	28-30	28-30	—	28-30	28-30	—
Propane gas supply pressure		mbar	37	37	37	37	37	37
Power supply voltage		V	230	230	230	230	230	230
Input frequency		Hz	50	50	50	50	50	50
Rated electrical input		W	110	110	190	190	190	190
Net weight		kg	60	60	70	70	70	70
Dimensions	height	mm	950	950	950	950	950	950
	width	mm	600	600	600	600	600	600
	depth	mm	466	466	466	466	466	466
Protection against humidity and water penetration (**)		—	IP X5D	IP X5D	IP X5D	IP X5D	IP X5D	IP X5D

(*) according to EN 625

(**) according to EN 60529

Ediz. 1 - 12/08 **C607215**