

WESTEN

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IT

Caldia murale a gas ad alto rendimento

Manuale per l'uso destinato all'utente e all'installatore

EN

High efficiency wall-mounted gas-fired boilers

Instructions for the User and the Installer

RO

Centrale murale pe gaz cu randament ridicat

Instrucțiuni pentru instalator i pentru utilizator

HU

Nagy hatásfokú falra szerelhető gáztüzelésű kazánok

Felszerelési és használati utasítás

CE 0051

Dear Customer,

We are sure your new boiler will comply with all your requirements.

Purchasing one of the **WESTEN** products satisfies your expectations: good functioning, simplicity and ease of use.

Do not dispose of this booklet without reading it: you can find here some very useful information, which will help you to run your boiler correctly and efficiently.

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

WESTEN declares that these models of boiler bear the CE mark in compliance with the basic requirements of the following Directives:

- Gas Directive 2009/142/EC
- Efficiency Directive 92/42/EEC
- Electromagnetic Compatibility Directive 2004/108/EC
- Low Voltage Directive 2006/95/EC



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1. INSTRUCTIONS PRIOR TO INSTALLATION

This boiler is designed to heat water at a lower than boiling temperature at atmospheric pressure. The boiler must be connected to a central heating system and to a domestic hot water supply system in compliance with its performances and output power.

Have the boiler installed by a Qualified Service Engineer and ensure the following operations are accomplished:

- a) careful checking that the boiler is fit for operation with the type of gas available. For more details see the notice on the packaging and the label on the appliance itself.
- b) careful checking that the flue terminal draft is appropriate; that the terminal is not obstructed and that no other appliance exhaust gases are expelled through the same flue duct, unless the flue is especially designed to collect the exhaust gas coming from more than one appliance, in conformity with the laws and regulations in force.
- c) careful checking that, in case the flue has been connected to pre-existing flue ducts, thorough cleaning has been carried out in that residual combustion products may come off during operation of the boiler and obstruct the flue duct.
- d) to ensure correct operation of the appliance and avoid invalidating the guarantee, observe the following precautions:

1. Hot water circuit:

1.1. If the water hardness is greater than 20 °F (1 °F = 10 mg calcium carbonate per litre of water) a polyphosphate or comparable treatment system responding to current regulations.

1.2. Domestic Hot Water circuit must be thoroughly flushed after the installation of the appliance and before its use.

1.3. The materials used for the domestic hot water circuit of the product comply with Directive 98/83/EC.

2. Heating circuit

2.1. new system

Before proceeding with installation of the boiler, the system must be cleaned and flushed out thoroughly to eliminate residual thread-cutting swarf, solder and solvents if any, using suitable proprietary products. To avoid damaging metal, plastic and rubber parts, use only neutral cleaners, i.e. non-acid and non-alkaline. The recommended products for cleaning are: SENTINEL X300 or X400 and FERNOX heating circuit restore. To use this product proceeding strictly in accordance with the maker's directions.

2.2. existing system

Before proceeding with installation of the boiler, the system must be cleaned and flushed out 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 heating circuit protective. To use this product proceeding strictly in accordance with the maker's directions. Remember that the presence of foreign matter in the heating system can adversely affect the operation of the boiler (e.g. overheating and noisy operation 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 a licensed technician. Ensure the following operations are carried out:

- a) compliance of boiler parameters with (electricity, water, gas) supply systems settings.
- b) compliance of installation with the laws and regulations in force.
- c) appropriate connection to the power supply and grounding of the appliance.

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

Prior to commissioning remove the protective plastic coating from the unit. Do not use any tools or abrasive detergents as you may spoil 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 OF THE BOILER

To correctly light the boiler proceed as follows:







- Provide power supply to the boiler.
- open the gas cock;
- press the  button, for at least two seconds, to set the operating boiler mode (see section 3.2)

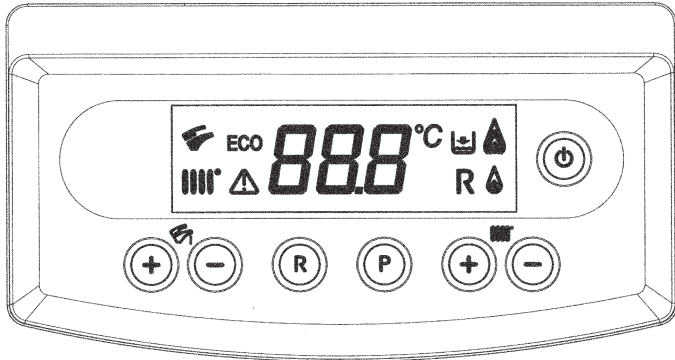
Note: if summertime mode is setting, the boiler will light only during a D.H.W. demand.

- To adjust the CH and D.H.W. temperature, press the +/- respective buttons as described in section 4.

Warning: During initial lighting, until the air contained in the gas pipes is not released, the burner may fail to light immediately and that may cause a 'blockage' of the boiler. Under such circumstances we recommend you to repeat the ignition procedure until the gas is delivered to the burner, and press **R** button for at least 2 seconds.

DISPLAY LEGEND:

-  Operating in Central Heating mode (CH)
-  Operating in Domestic Hot Water mode (D.H.W.)
-  Flame present - power level = 25% (burner switch on)
-  Boiler power levels (3 power levels)
-  Generic ERROR
- R** RESET
-  Water pressure LOW
- 888**^{°C} Numeric signalling (temperature, error codes, etc)
- ECO** FUNCTION ACTIVATED (see Section 4)



0801_0201 / CG_2015

BUTTONS LEGEND




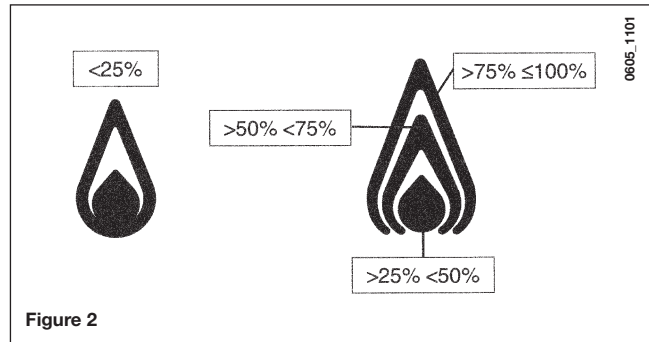
-  + - D.H.W. temperature regulation
-  + - Central Heating (CH) temperature regulation
- R** RESET
- P** ECO - COMFORT
-  MODE BUTTON (see section 3.2)

Figure 1

If the optional remote control device is connected, adjust the boiler using this device. See the instructions accompanying this accessory item.

3.1 SYMBOL MEANING


There are 4 *power levels* displayed during boiler operation regarding the gas boiler modulation, as shown in 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 the **SUMMER** mode, the display shows . The boiler satisfies requests for DHW only while central heating is NOT enabled (ambient frost protection function active).

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


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

In the **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.

4. CENTRAL HEATING (CH) AND DOMESTIC HOT WATER (D.H.W.) TEMPERATURE ADJUSTMENT

The CH  and D.H.W.  temperature adjustment are carried out by pressing the relative +/- buttons (figure 1). When the burner is lighted the display shows the symbol .

CENTRAL HEATING (CH)

The system must be equipped with a room thermostat (see the relevant regulations) to control the temperature in the rooms. During a CH mode, the display shows a CH  blinking symbol and the CH flow temperature value (°C).


DOMESTIC HOT WATER (D.H.W.)

During a D.H.W. request, the display shows a D.H.W.  blinking symbol and the D.H.W. flow temperature value (°C).


There are two different setpoint which can be quickly set: **ECO** and **COMFORT**.


To adjust the temperature values, proceed as follows:

ECO


The ECO temperature setpoint allows the user to quickly set the relative domestic hot water temperature pressing the **P** button. In eco function the display reads out "eco". To set the ECO temperature setpoint press the +/-  buttons.

COMFORT

The COMFORT temperature setpoint allow the user to quickly set the relative domestic hot water temperature pressing the **P** button. To set the COMFORT temperature setpoint press the +/-  buttons.

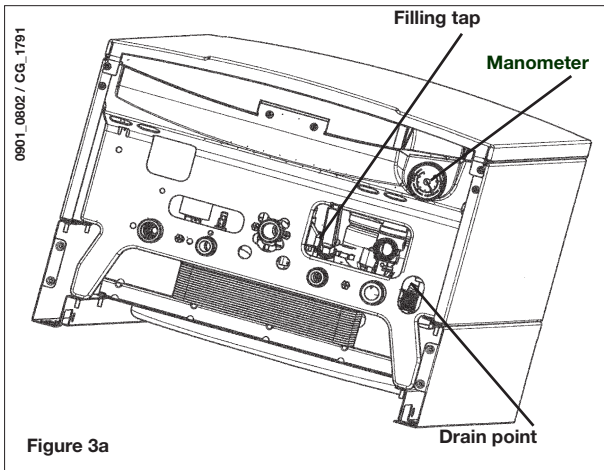
Note: during a D.H.W. demand, with a D.H.W. storage tank connected to the gas boiler, the display shows the  symbol and the flow tank temperature value.

5. FILLING THE BOILER

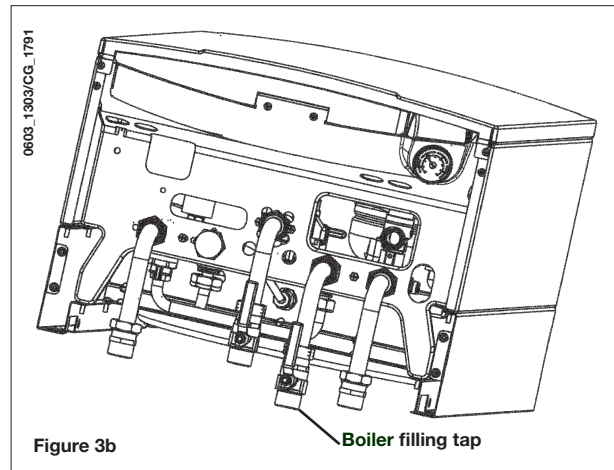
IMPORTANT: Regularly check that the pressure displayed by the pressostat (figure 3) is 0.7 to 1.5 bar, with boiler not operating. In case of overpressure, open the boiler drain valve (Figure 3). In case the pressure is lower open the boiler filling tap (Figure 3). We recommend you open the tap very slowly in order to let off the air. During this operation, the gas boiler must be in “OFF” mode (press the  button - See section 3.2).

NOTE: In case pressure drops occur frequently have the boiler checked by a Qualified Service Engineer.

240i - 240 Fi - 280 Fi - 310 Fi



1.240 Fi - 1.310 Fi



6. TURNING OFF THE BOILER

The electric supply to the boiler must be removed in order to switch it **OFF**. With the gas boiler in “**OFF**” mode (section 3.2), the display reads out “**OFF**” but the main board is still supplied.

7. GAS CHANGE

These boilers set for natural gas can be converted to work with **LPG**. Any gas change must be effected by a Qualified Service Engineer.

8. PROLONGED STANDSTILL OF THE SYSTEM. FROST PROTECTION

We recommend you avoid draining the whole system as water replacements engender purposeless and harmful limestone deposits inside the boiler and on the heating elements. In case the boiler is not operated during wintertime and is therefore exposed to danger of frost we suggest you add some specific-purpose anti-freeze to the water contained in the system (e.g.: propylene glycole coupled with corrosion and scaling inhibitors).

The electronic management of boilers includes a “frost protection” function in the central heating system which operates the burner to reach a heating flow temperature of 30° C when the system heating flow temperature drops below 5°C.

The frost protection function is enabled if:

- * electrical supply to the boiler is on;
- * the gas service cock is open;
- * the system pressure is as required;
- * the boiler is not blocked.

9. ERROR MESSAGES AND TABLE OF FAULTS

The anomalies are carried out on the display with an error code (e.g. E01).

The anomalies which can be reset by the user are shown with the **R** symbol (e.g. figure 4).

The anomalies which cannot be reset are carried out with the **⚠** symbol (e.g. figure 4.1).

To RESET the gas boiler, press **R** button for at least 2 seconds.



ERROR CODE	Description of FAULTS	CORRECTIVE ACTION
E01	Gas supply fault	Press the R button (figure 1) for at least 2 seconds. If this fault persist, call an authorised Service centre.
E02	Safety thermostat sensor tripped	Press the R button (figure 1) for at least 2 seconds. If this fault persist, call an authorised Service centre.
E03	Flue thermostat sensor tripped / Flue pressure switch tripped	Call an authorised Service centre.
E04	Safety error due to frequent flame loss	Call an authorised Service centre.
E05	Central heating NTC sensor fault	Call an authorised Service centre.
E06	Domestic Hot Water NTC sensor fault	Call an authorised Service centre..
E10	Water pressure LOW	Check that the pressure in the system is as specified. See Section 5. If this fault persist, call an authorised Service centre.
E11	Safety thermostat for low temperature system cuts in (if connected)	Call an authorized Service centre
E25	Boiler max temperature exceeded (probable pump jammed)	Call an authorized Service centre
E35	Fault flame (parasitic flame)	Press the R button (figure 1) for at least 2 seconds. If this fault persists, call an authorized Service centre
E97	Electronic board input frequency (Hz) incorrectly set	Change the frequency (Hz) setting
E98	Internal card error	Call an authorised Service centre.
E99	Internal card error	Call an authorised Service centre.

Note: when an anomaly occurs, the display background flashes with the error code.

10. SERVICING INSTRUCTIONS

To maintain efficient and safe operation of your boiler have it checked by a Qualified Service Engineer at the end of every operating period.

Careful servicing will ensure economical operation of the system.

Do not clean the outer casing of the appliance with abrasive, aggressive and/or easily flammable cleaners (i.e.: gasoline, alcohol, and so on). Always isolate the electrical supply to the appliance before cleaning it (see section 6).

11. GENERAL INFORMATION

The following remarks and instructions are addressed to Service Engineers to help them carry out a faultless installation. Instructions regarding lighting and operation of the boiler are contained in the 'Instructions pertaining to the user' section. Note that installation, maintenance and operation of the domestic gas appliances must be performed exclusively by qualified personnel in compliance with current standards.

Please note the following:

- * This boiler can be connected to any type of double- or single feeding pipe convactor plates, radiators, thermoconvectors. Design the system sections as usual though taking into account the available output / pump head performances, as shown in section 24.
- * Do not leave any packaging components (plastic bags, polystyrene, etc.) within children's reach as they are a potential source of danger.
- * Initial lighting of the boiler must be effected by a Qualified Service Engineer.

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

12. INSTRUCTIONS PRIOR TO INSTALLATION

This boiler is designed to heat water at a lower than boiling temperature at atmospheric pressure. The boiler must be connected to a central heating system and to a domestic hot water supply system in compliance with its performances and output power.

Have the boiler installed by a Qualified Service Engineer and ensure the following operations are accomplished:

- a) careful checking that the boiler is fit for operation with the type of gas available. For more details see the notice on the packaging and the label on the appliance itself.
- b) careful checking that the flue terminal draft is appropriate; that the terminal is not obstructed and that no other appliance exhaust gases are expelled through the same flue duct, unless the flue is especially designed to collect the exhaust gas coming from more than one appliance, in conformity with the laws and regulations in force.
- c) careful checking that, in case the flue has been connected to pre-existing flue ducts, thorough cleaning has been carried out in that residual combustion products may come off during operation of the boiler and obstruct the flue duct.

To ensure correct operation of the appliance and avoid invalidating the guarantee, observe the following precautions:

1. Hot water circuit:

1.1. If the water hardness is greater than 20 °F (1 °F = 10 mg calcium carbonate per litre of water) a polyphosphate or comparable treatment system responding to current regulations.

1.2. Domestic Hot Water circuit must be thoroughly flushed after the installation of the appliance and before its use.

1.3. The materials used for the domestic hot water circuit of the product comply with Directive 98/83/EC.

2. Heating circuit

2.1. new system

Before proceeding with installation of the boiler, the system must be cleaned and flushed out thoroughly to eliminate residual thread-cutting swarf, solder and solvents if any, using suitable proprietary products.

To avoid damaging metal, plastic and rubber parts, use only neutral cleaners, i.e. non-acid and non-alkaline. The recommended products for cleaning are:

SENTINEL X300 or X400 and FERNOX heating circuit restore. To use this product proceeding strictly in accordance with the maker's directions.

2.2. existing system

Before proceeding with installation of the boiler, the system must be cleaned and flushed out to remove sludge and contaminants, using suitable proprietary products as described in 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 heating circuit protective. To use this product proceeding strictly in accordance with the maker's directions.

Remember that the presence of foreign matter in the heating system can adversely affect the operation of the boiler (e.g. overheating and noisy operation of the heat exchanger).

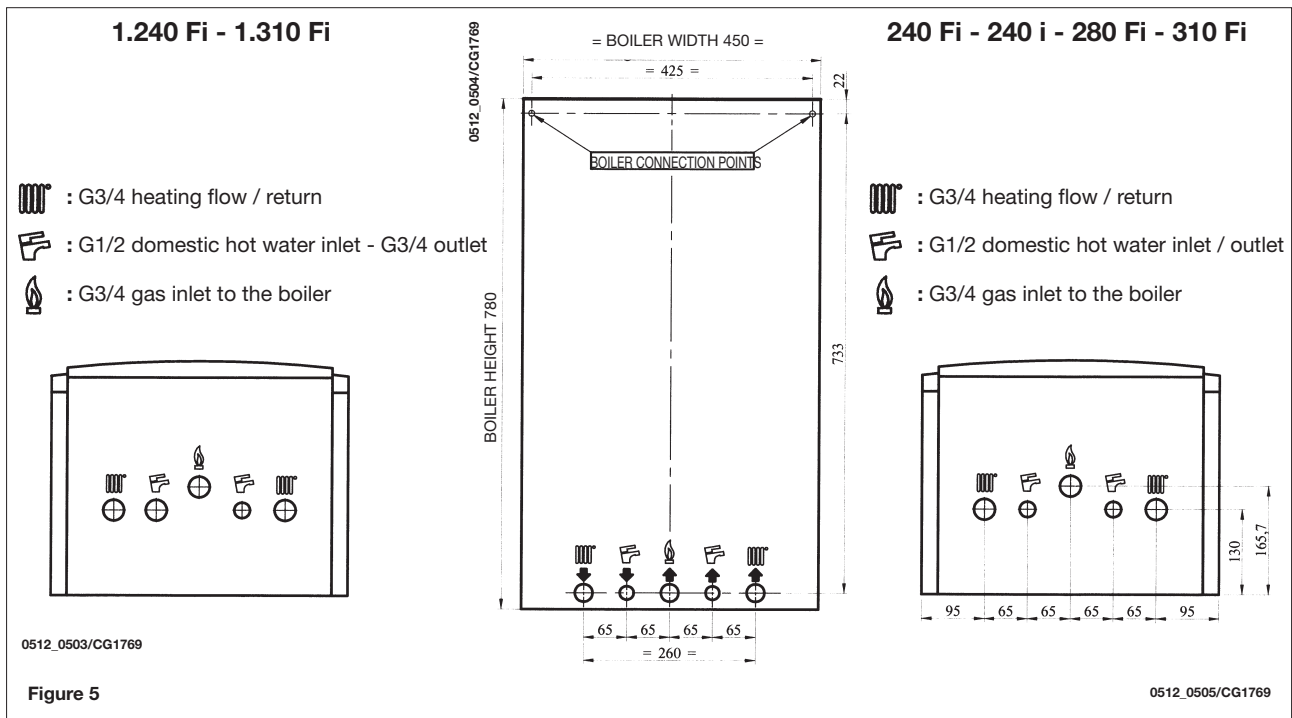
Failure to observe the above will render the guarantee null and void.

13. BOILER INSTALLATION

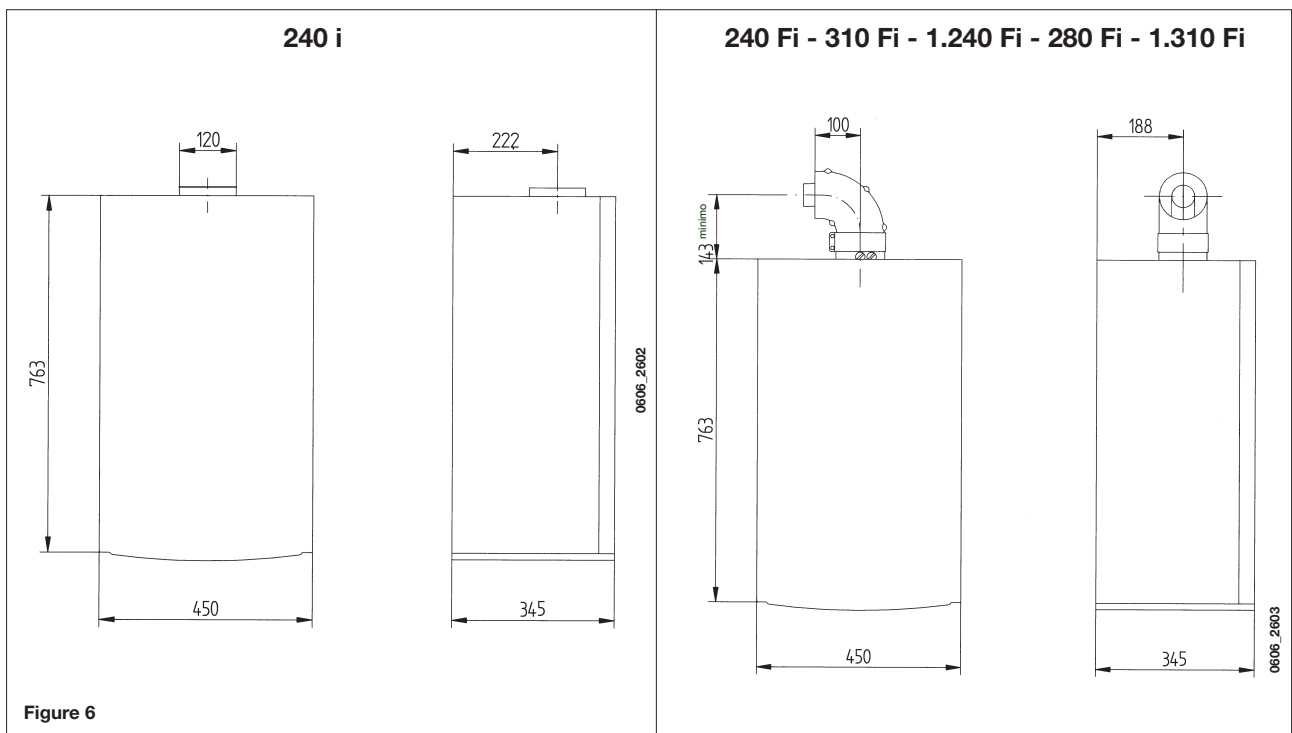
Decide upon the boiler location, then tape the template on the wall. Connect the pipework to the gas and water inlets prearranged on the template lower bar. We suggest you fit two G3/4 stop cocks (available on demand) on the central heating system flow and return pipework; the cocks will allow to carry out important operations on the system without draining it completely. If you are either installing the boiler on a pre-existent system or substituting it, we suggest you also fit settling tank on the system return pipework and under the boiler to collect the deposits and scaling which may remain and be circulated in the system after the purge.

When the boiler is fixed on the template connect the flue and air ducts (fittings supplied by the manufacturer) according to the instructions given in the following sections.

When installing the **240 i** model (boiler with natural draught), make the connection to the flue using a metal pipe which will provide resistance over time to the normal mechanical stresses, heat and the effects of the combustion products and any condensation they form.



14. BOILER SIZE



15. INSTALLATION OF FLUE AND AIR DUCTS

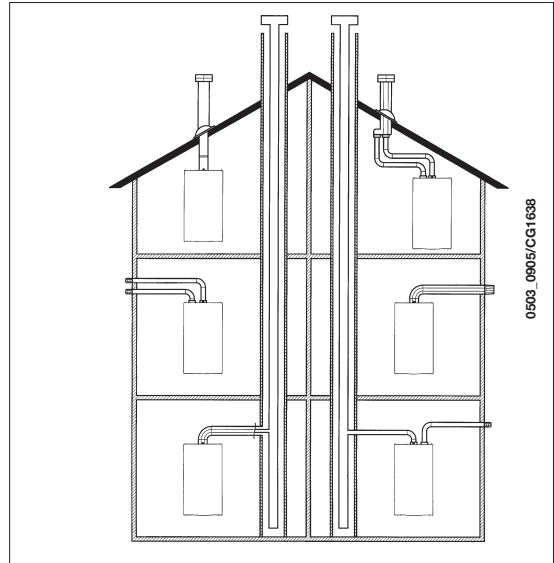
Models 240 Fi - 280 Fi - 310 Fi - 1.240 Fi - 1.310 Fi

We guarantee ease and flexibility of installation for a gas-fired forced draught boiler thanks to the fittings and fixtures supplied (described below).

The boiler is especially designed for connection to an exhaust flue / air ducting, with either coaxial, vertical or horizontal terminal. By means of a splitting kit a two-pipe system may also be installed.

Exclusively install fittings supplied by the manufacturer.

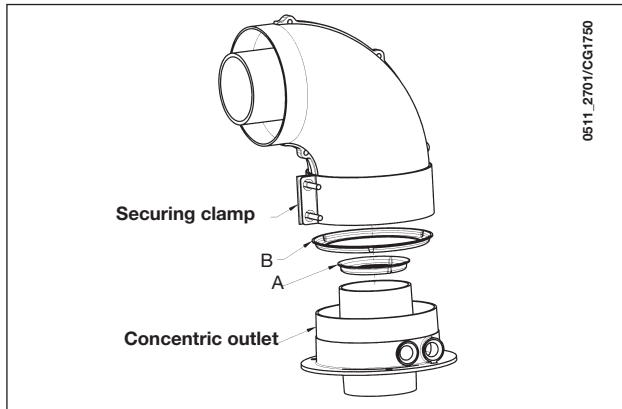
CAUTION: To enhance operating safety, make sure the flue ducts are firmly fixed to the wall with suitable brackets.



... COAXIAL FLUE - AIR DUCT (CONCENTRIC)

This type of duct allows to disengage exhaust gases and to draw combustion air both outside the building and in case a LAS flue is fitted.

The 90° coaxial bend allows to connect the boiler to a flue-air duct in any direction as it can rotate by 360°. It can moreover be used as a supplementary bend and be coupled with a coaxial duct or a 45° bend.



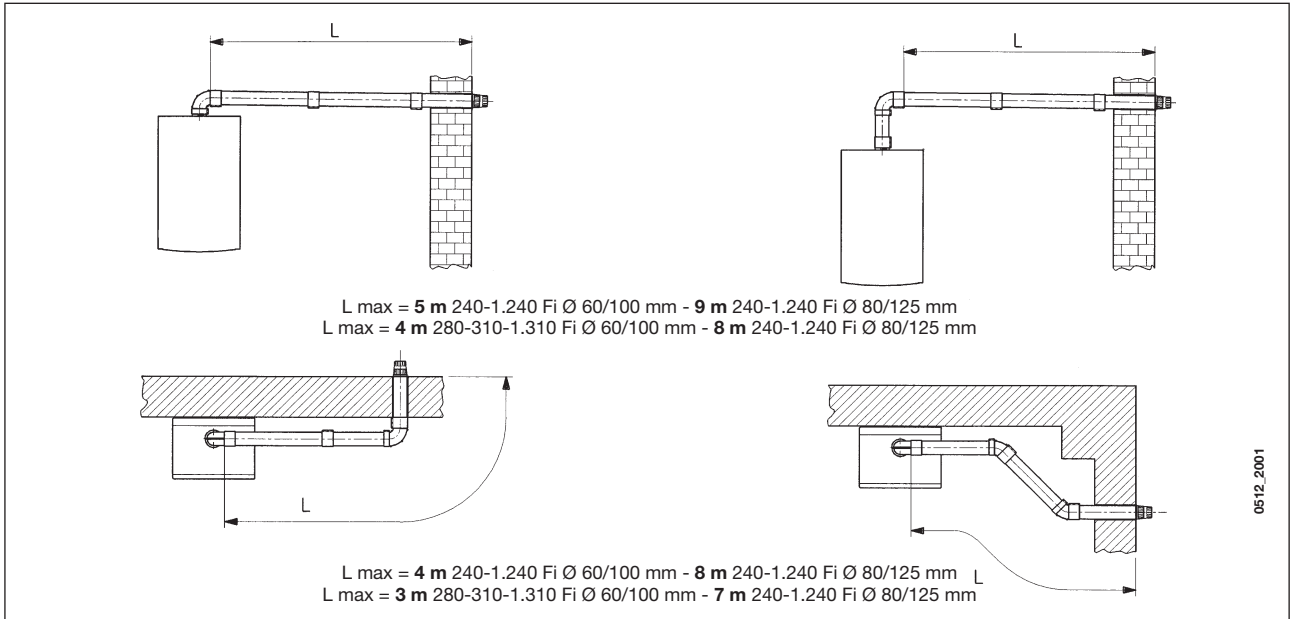
If the flue outlet is placed outside, the flue-air ducting must protrude at least 18mm out of the wall to allow aluminium weathering tile to be fitted and sealed to avoid water leakages. Ensure a minimum downward slope of 1 cm towards the outside per each metre of duct length.

- A 90° bend reduces the total duct length by 1 metre.
- A 45° bend reduces the total duct length by 0.5 metre.

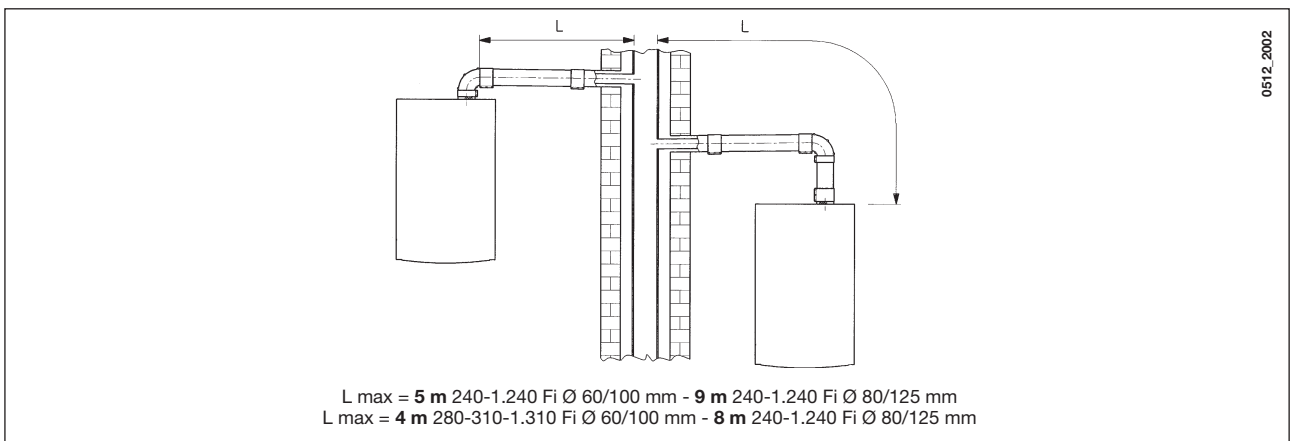
Boiler model	Length (m)	Air suction RESTRICTOR Ⓑ	Flue RESTRICTOR Ⓐ
240 Fi 1.240 Fi	0 ÷ 1	Yes	Yes
	1 ÷ 2		No
	2 ÷ 5	No	No
280 Fi 310 Fi 1.310 Fi	0 ÷ 1	No	Yes
	1 ÷ 2	Yes	No
	2 ÷ 4	No	No

(* The first 90° bend is not included in the maximum available length.

15.1 HORIZONTAL FLUE TERMINAL INSTALLATION OPTIONS

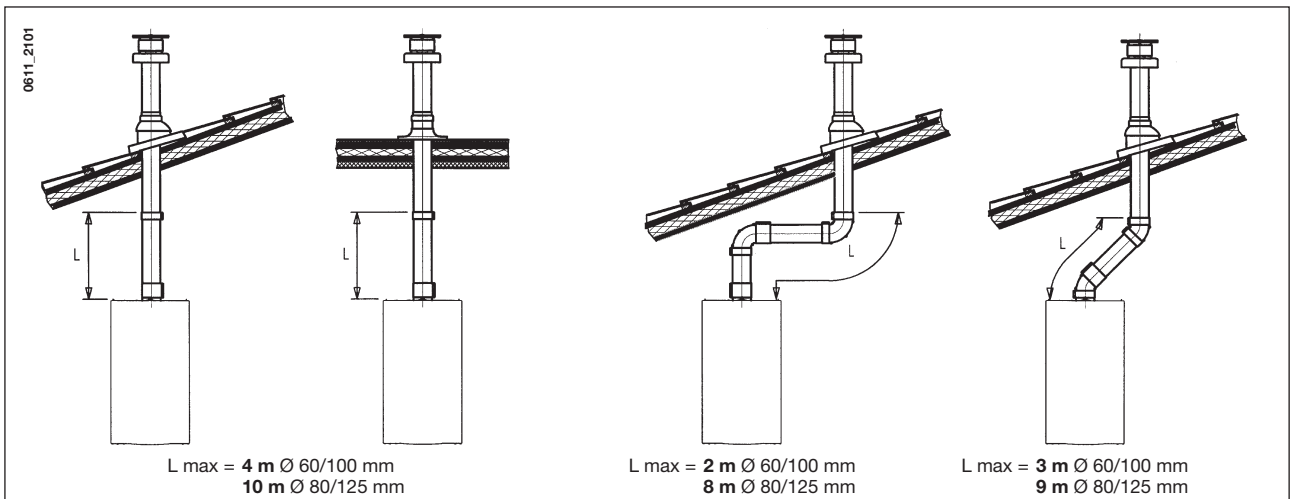


15.2 LAS FLUE DUCT INSTALLATION OPTIONS



15.3 VERTICAL FLUE TERMINAL INSTALLATION OPTIONS

This type of installation can be carried out both on a flat or pitched roof by fitting a terminal, an appropriate weathering tile and sleeve, (supplementary fittings supplied on demand).



For detailed instructions concerning the installation of fittings refer to the technical data accompanying the fittings.

... SEPARATED FLUE-AIR DUCTING

This type of ducting allows to disengage exhaust flue gases both outside the building and into single flue ducts. Comburant air may be drawn in at a different site from where the flue terminal is located. The splitting kit consists of a flue duct adaptor (100/80) and of an air duct adaptor. For the air duct adaptor fit the screws and seals previously removed from the cap.

The restrictor must be removed in the following cases

Boiler model	(L1+L2)	Air suction coupling position	Flue RESTRICTOR Ⓐ	CO2 %	
				G20	G31
240 Fi 1.240 Fi	0 ÷ 4	3	Yes	6,4	7,3
	4 ÷ 15	1	No		
	15 ÷ 25	2			
	25 ÷ 40	3			
280 Fi 310 Fi 1.310 Fi	0 ÷ 2	1	No	7,4	8,4
	2 ÷ 8	2			
	8 ÷ 25	3			

(*) The first 90° bend is not included in the maximum available length.

The 90° bend allows to connect the boiler to flue-air ducting regardless of direction as it can be rotated by 360°. It can moreover be used as a supplementary bend to be coupled with the duct or with a 45° bend.

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

Split flue air control adjustment

The adjustment of this control is required to optimise performance and combustion parameters. The air suction coupling can be rotated to adjust excess air according to the total length of the flue and intake ducts for the combustion air. Turn this control to increase or decrease excess combustion air (figure 9):

To improve optimisation a combustion product analyser can be used to measure the CO₂ contents of the flue at maximum heat output, gradually adjusting air to obtain the CO₂ reading in the table below, if the analysis shows a lower value.

To properly install this device, also refer to the technical data accompanying the fitting.

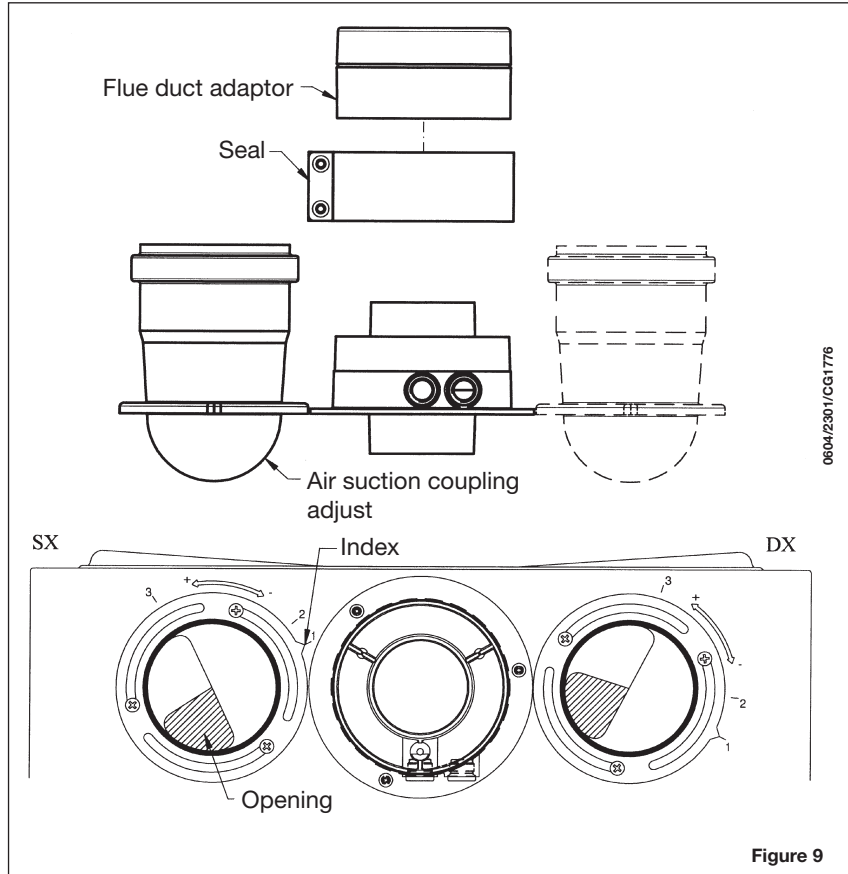
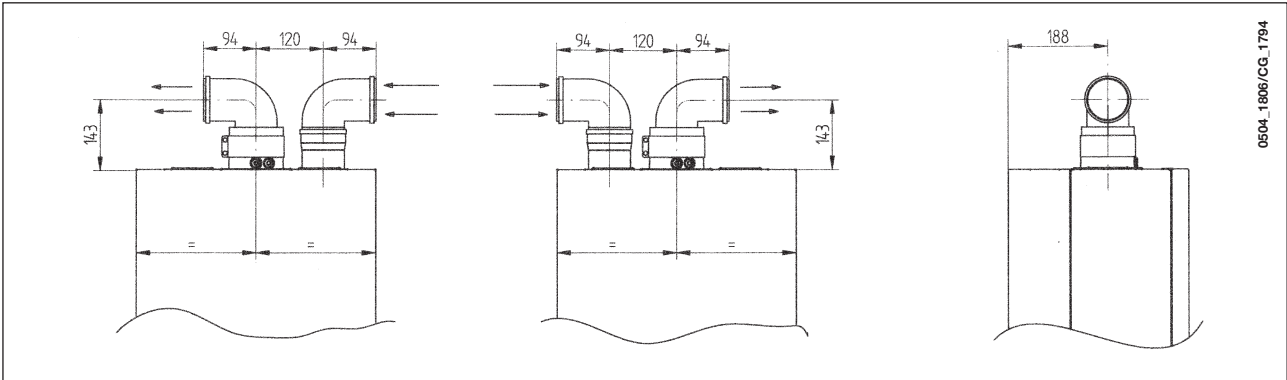


Figure 9

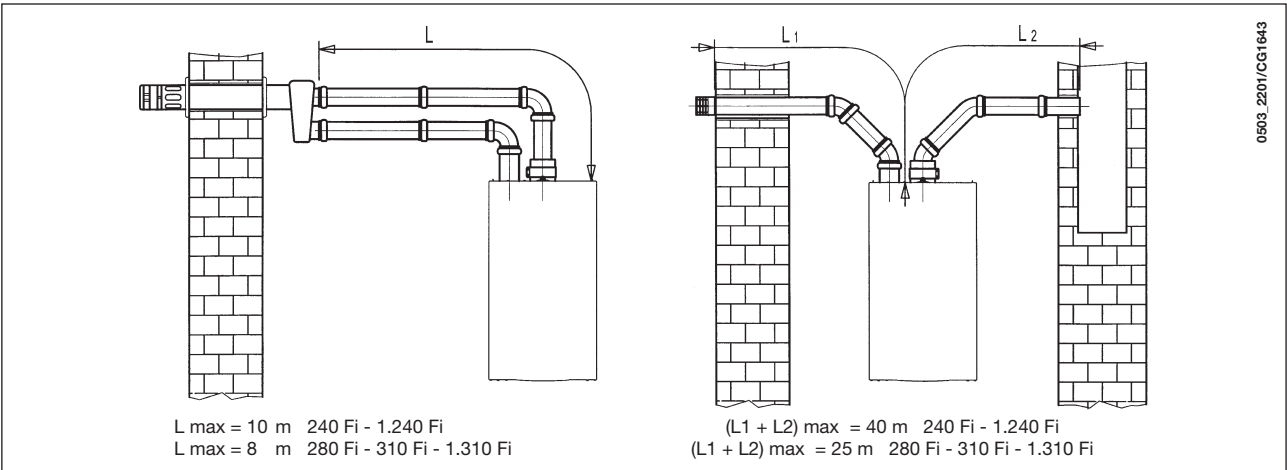
15.4 SPLIT FLUE OVERALL DIMENSIONS



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15.5 SEPARATED HORIZONTAL FLUE TERMINALS INSTALLATION OPTIONS

IMPORTANT: Ensure a minimum downward slope of 1 cm toward the outside per each metre of duct length. In the event of installation of the condensate collection kit, the angle of the drain duct must be directed towards the boiler.

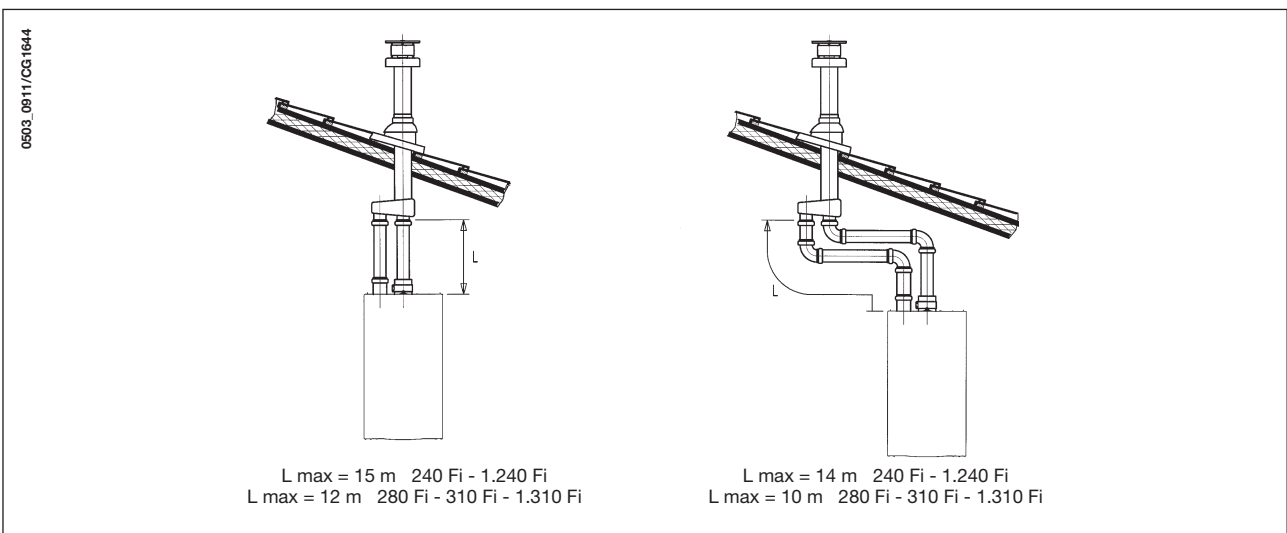


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NB: For C52 types, terminals for combustion air suction and combustion product extraction must never be fitted on opposite walls of the building.

The maximum length of the suction duct must be 10 metres. If the flue duct exceeds 6 m, the condensate collection kit (supplied as an accessory) must be fitted close to the boiler.

15.6 SEPARATED VERTICAL FLUE TERMINALS INSTALLATION OPTIONS



0503_0911/CG1644

Important: if fitting a single exhaust flue duct, ensure it is adequately insulated (e.g.: with glass wool) wherever the duct passes through building walls.

For detailed instructions concerning the installation of fittings refer to the technical data accompanying the fittings.

16. CONNECTING THE MAINS SUPPLY

Electrical safety of the appliance is only guaranteed by correct grounding, in compliance with the applicable laws and regulations.

Connect the boiler to a 230V monophase + ground power supply by means of the three-pin cable supplied with it and make sure you connect polarities correctly.

Use a double-pole switch with a contact separation of at least 3mm in both poles.

In case you replace the power supply cable fit a HAR H05 VV-F' 3x0.75mm² cable with an 8mm diameter max.

...Access to the power supply terminal block

- isolate the electrical supply to the boiler by the double-pole switch;
- unscrew the two screws securing the control board to the boiler;
- rotate the control board;
- unscrew the lid and gain access to the wiring (Figure 10).

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

IMPORTANT: be sure to connect polarities correctly L (LIVE) - N (NEUTRAL).

(L) = **Live** (brown)

(N) = **Neutral** (blue)

⊕ = **Ground** (yellow/green)

(1) (2) = **Room thermostat terminal**

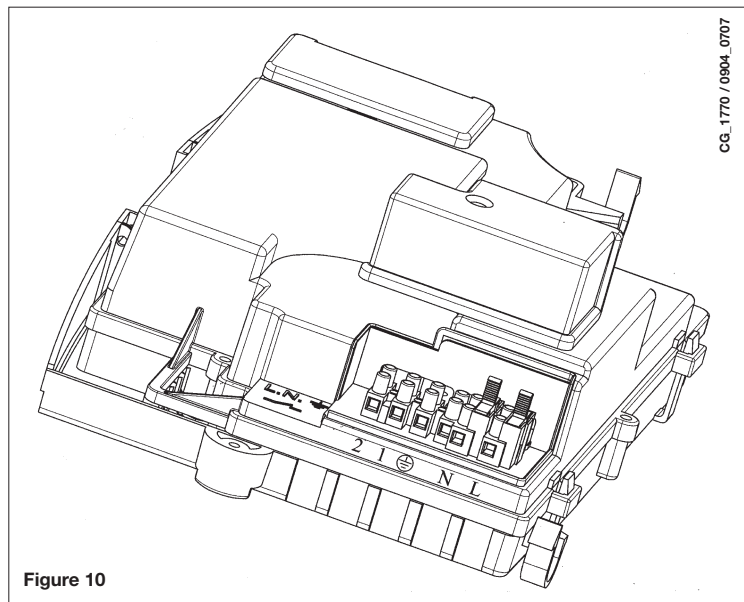


Figure 10

CG-1770 / 0904_0707

CAUTION: If the appliance is directly connected to a underfloor system, the fitter must install a safety thermostat to prevent it from overheating.

17. FITTING A ROOM THERMOSTAT

To connect the room thermostat to the boiler terminal block, proceed as follows:

- reach the power supply terminal block (figure 10);
- connect the room thermostat to the terminals (1) - (2) and remove the jumper.

18. GAS CHANGE MODALITIES

A Qualified Service Engineer may adapt this boiler to operate with natural gas (**G. 20**) or with liquid gas (**G. 31**).

The procedure for calibrating the pressure regulator may vary according to the type of gas valve fitted (HONEYWELL or SIT; see figure 11).

Carry out the following operations in the given sequence:

- A) substitute the main burner injectors;**
- B) change the modulator voltage;**
- C) proceed with a new max. and min. setting of the pressure adjusting device.**

A) Substitute the main burner injectors

- carefully pull the main burner off its seat;
- substitute the main burner injectors and make sure you tighten them to avoid leakage. The nozzle diameters are specified in table 1.

B) Change the modulator voltage


- setting **F02** parameter according to the gas used as described in section 20.

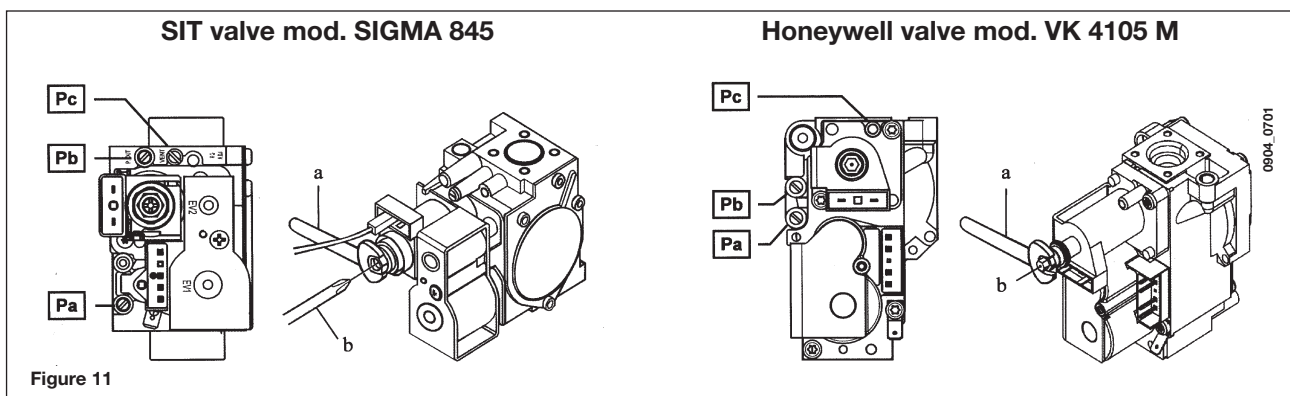
C) Pressure adjusting device setting

- connect the positive pressure test point of a differential (possibly water-operated) manometer to the gas valve pressure test point (**Pb**) (Figure 11); connect, for sealed chamber models only, the negative pressure test point of the manometer to a "T" fitting in order to join the boiler adjusting outlet, the gas valve adjusting outlet (**Pc**) and the manometer. (The same measurement can be carried out by connecting the manometer to the pressure test point (**Pb**) after removing the sealed chamber front panel);

If you measure the pressure of burners in a different way you may obtain an altered result in that the low pressure created in the sealed chamber by the fan would not be taken into account.

C1) Adjustment to nominal heat output

- open the gas tap;
- press  button (figure 1) and set the boiler in winter mode (section 3.2);
- open a hot water tap to reach a minimum 10 l/min flow rate or ensure that maximum heating requirements are set;
- remove the modulator cover;
- adjust the tube brass screw (a) Fig. 12 to obtain the pressure settings shown in table 1;
- check that boiler feeding dynamic pressure, as measured at the inlet gas valve pressure test point (**Pa**) (Figure 11) is correct (37 mbar for propane gas **G.31**, 20 mbar for natural gas **G20**);



C2) Adjustment to reduced heat output

- disconnect the modulator feeding cable and unscrew the (b) Fig. 12 screw to reach the pressure setting corresponding to reduced heat output (see table 1);
- connect the cable again;
- fit the modulator cover and seal.

C3) Final checks

- apply the additional dataplate, specifying the type of gas and settings applied.

Table of burner pressures

	240 Fi - 1.240 Fi		240 i		280 Fi		310 Fi - 1.310 Fi	
Gas used	G20	G31	G20	G31	G20	G31	G20	G31
nozzle diameter (mm)	1,18	0,74	1,18	0,74	1,28	0,77	1,28	0,77
Burner pressure (mbar*) REDUCED HEAT OUTPUT	1,9	4,9	1,9	4,7	1,8	4,9	1,8	4,9
Burner pressure (mbar*) NOMINAL HEAT OUTPUT	11,3	29,4	10,0	26,0	11,3	31,0	13,0	35,5
no. of nozzles	15							

* 1 mbar = 10,197 mm H₂O

Table 1

	240 Fi - 1.240 Fi		240 i	
Gas consumption at 15 °C - 1013 mbar	G20	G31	G20	G31
Nominal heat output	2,84 m ³ /h	2,09 kg/h	2,78 m ³ /h	2,04 kg/h
Reduced heat output	1,12 m ³ /h	0,82 kg/h	1,12 m ³ /h	0,82 kg/h
p.c.i.	34,02 MJ/m ³	46,3 MJ/kg	34,02 MJ/m ³	46,3 MJ/kg

	280 Fi		310 Fi - 1.310 Fi	
Gas consumption at 15 °C - 1013 mbar	G20	G31	G20	G31
Nominal heat output	3,18 m ³ /h	2,34 kg/h	3,52 m ³ /h	2,59 kg/h
Reduced heat output	1,26 m ³ /h	0,92 kg/h	1,26 m ³ /h	0,92 kg/h
p.c.i.	34,02 MJ/m ³	46,3 MJ/kg	34,02 MJ/m ³	46,3 MJ/kg

Table 2

19. INFORMATION DISPLAY

19.1 FIRST DISPLAYED INFORMATION

To correct light the boiler, proceed as follows:

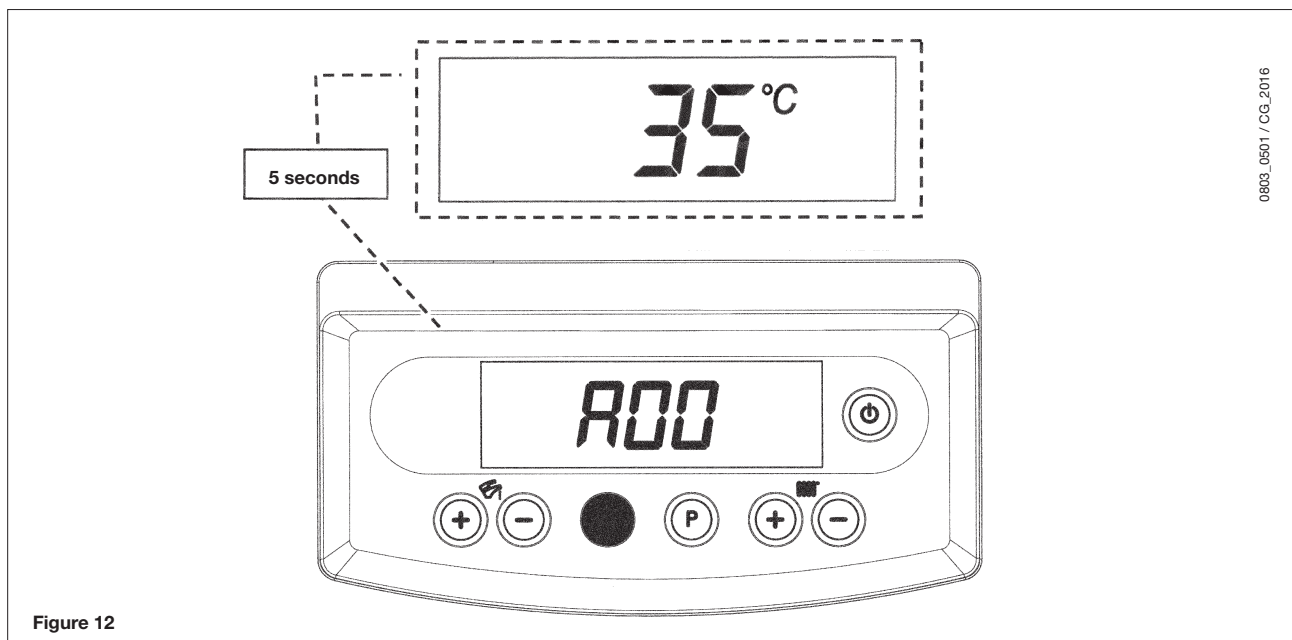
- Provide power supply to the boiler.
When the gas boiler is power suppli, the display shows the following information:
 1. all symbols alight;
 2. manufacture information;
 3. manufacture information;
 4. manufacture information;
 5. Type of boiler and gas used (eg. \square \cap).
The displayed letters mean the following:

\square = natural boiler chamber	\square = sealed boiler chamber
\cap = natural gas <u>METANE</u>	\sqcup = <u>LPG</u> gas
 6. Hydraulic system;
 7. Software version (two numbers x.x);
- open the gas cock;
- press the ⏻ button, for at least two seconds, to set the operating boiler mode (see section 3.2).

19.2 OPERATION INFORMATION

To display some useful information during the boiler operation proceed as follows:


- Press the R button for at least 6 seconds until the display shows “A00” (...“A07”) alternating with the respective value (e.g. figure 13);



- Press the +/- domestic hot water buttons to display the following instantaneous information:

A00: domestic hot water temperature value (°C);
A01: outside temperature (with external probe sensor connected);
A02: modulating current value (100% = 230 mA METANE - 100% = 310 mA GPL);
A03: power range level value (%) - see parameter F13 (section 20);
A04: temperature setpoint value (°C);
A05: central heating flow temperature value (°C);
A06: flow water value (l/min x 10);
A07: flame signal value (8-100%).



Note: lines **A08** and **A09** are not used.

- This function is active for 3 minutes. To exit the function, press  button as described in section 3.2.

19.3 ANOMALIES DISPLAY

Note: the resetting operation is available only for 5 consecutive attempts, after which the RESET function is disabled and the gas boiler remains blocked.

To carry out a new RESET attempt, proceed as follows:


- press the  button for at least 2 seconds;
- reset the boiler pressing the **R** button for at least 2 seconds, the display shows “**OFF**”;
- press the  button for at least 2 seconds as describe in section 3.2.

See section 9 for error codes and anomalies description.




19.4 ADDITIONAL INFORMATION

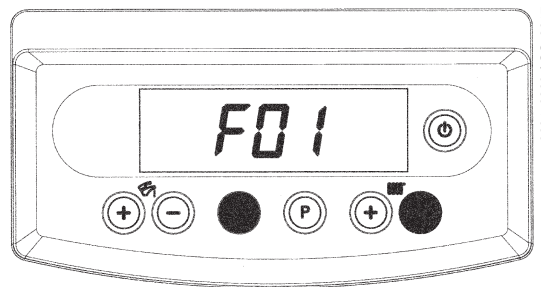
For more detailed technical information, please consult the “SERVICE INSTRUCTIONS”.

20. PARAMETERS SETTING

To set the boiler parameters press the **R** and **-**  buttons together for at least 6 seconds. When the function is activated, the display shows “F01” alternated with the value of the parameter.

Parameters setting

- Press +/-  buttons for scrolling parameters;
- Press +/-  buttons to change the single parameter value;
- Press the **P** button to save changes, the display shows “MEM”;
- Press the  button to leave the function without saving, the display shows “ESC”;



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	Description of parameter	Default value				
		240 Fi - 1.240 Fi		240 i	280 Fi - 310 Fi - 1.310 Fi	
F01	Type of gas boiler 10 = sealed chamber 20 = atmospheric chamber	10		20	10	
F02	Type of gas 00 = natural (metane) - 01 = LPG	00 0 01				
F03	Hydraulic system 00 = instantaneous appliance 05 = appliance with external storage boiler 08 = appliance for heating only	00	08	00	00	08
F04	Programmable relay 1 setting 2 = zone system (See SERVICE Instructions)	02				
F05	Programmable relay 2 setting 13 = “cool” function for external air-conditioning system (See SERVICE Instructions)	04				
F06	External sensor programmable input setting (See SERVICE Instructions)	00				
F07...F12	Manufacturer information	00				
F13	CH max. heating output (0-100%)	100				
F14	D.H.W. max. heating output (0-100%)	100				
F15	CH min. heating output (0-100%)	00				
F16	Maximum temperature setpoint setting 00 = 85°C - 01 = 45°C	00				
F17	Pump overrun time (01-240 minutes)	03				
F18	Minimum burner pause in central heating mode - 00=10 seconds	03				
F19	Manufacturer information	07				
F20	Manufacturer information	--				
F21	Anti-legionella function 00 = Disabled - 01 = Enabled	00				
F22	Manufacturer information	00				
F23	Maximum D.H.W. setpoint	60				
F24	Manufacturer information	35				
F25	Lack of water safety device	00				
F26...F29	Manufacturer information (read-only parameters)	--				
F30	Manufacturer information	10				
F31	Manufacturer information	30				
F34...F41	Diagnostics (See SERVICE Instructions)	--				
Final parameter	Calibration function activation (See SERVICE Instructions)	00				

WARNING: do not modify the values of the “Manufacturer information” parameters.

21. CONTROL AND OPERATION DEVICES

The boiler has been designed in full compliance with European reference standards and in particular is equipped with the following:

- **Air pressure switch for forced draught model (240 Fi - 280 Fi - 310 Fi - 1.240 Fi - 1.310 Fi)**

This switch allows the burner to switch on provided the exhaust flue duct efficiency is perfect.

In the event of one of the following faults:

- the flue terminal is obstructed;
- the venturi is obstructed;
- the fan is blocked;
- the connection between the venturi and the air pressure switch is interrupted;

The boiler will stay on stand-by and the display shows error code E03 (see section 9).

- **Flue thermostat for natural draught (model 240 i)**

This device has a sensor positioned on the left section of the flue extraction hood and shuts off the gas flow to the burner if the flue duct is obstructed or in the event of draught failure.

Under such conditions the boiler is blocked and the display shows E03 error (see section 9).

To relight the main burner immediately, see section 9.

It is forbidden to disable this safety device

- **Overheat safety thermostat**

Thanks to a sensor placed on the heating flow, this thermostat interrupts the gas flow to the burner in case the water contained in the primary circuit has overheated. Under such conditions the boiler is blocked and relighting will only be possible after the cause of the anomaly has been removed.

It is forbidden to disable this safety device

- **Flame ionization detector**

The flame sensing electrode, placed on the right of the burner, guarantees safety of operation in case of gas failure or incomplete interlighting of the burner. The boiler is blocked after 3 relight attempt.

See section 9 to RESET normal operating conditions.

- **Hydraulic pressure sensor**

This device (3 - figure 24/25) enables the main burner only to be switched on if the system pressure is over 0.5 bars.

- **Pump overrun for central heating circuit**

The electronically-controlled supplementary running of the pump lasts 3 minutes (F17 - Section 20), when the boiler is in the central heating mode, after the burner has switched off due to a room thermostat or intervention.

- **Pump overrun for domestic hot water circuit**

The electronic control system keeps the pump operating for 30 seconds in domestic hot water mode after the D.H.W. sensor has switched off the burner.

- **Frost protection device (central heating and domestic hot water systems)**

Boiler's electronic management includes a "frost protection" function in the central heating system which operates the burner to reach a heating flow temperature of 30°C when the system heating flow temperature drops below 5 °C.

This function is enabled when the boiler is connected to electrical supply, the gas supply is on and the system pressure is as required.

- **Lack of water circulation (probable pump jammed)**

If the water inside the primary circuit doesn't circulate, the display shows E25 error (see section 9).

- **Anti-block pump function**

In the event that no heat is required, the pump will automatically start up and operate for one minute during the following 24 hours. This function is operative when the boiler is powered.

- **Three-way anti-blockage valve**

In the case of no heat is request for a period of 24 hours the three way valve carries out a complete commutation. 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.

The safety valve should be connected to a siphoned drain. Use as a means of draining the heating circuit is strictly prohibited.

- **Antilegionella function (models 1. 240 Fi - 1.310 Fi with D.H.W. storage tank)**

The antilegionella function is NOT enable.

To enable the function, set the parameter F21=01 (as described in section 20). When the function is activated, at weekly intervals the boiler's electronic control system brings the water inside the hot water tank to a temperature above 60°C (the function is only operational if the water has never exceeded 60°C in the previous 7 days).

Note: domestic hot water is guaranteed even if the NTC sensor (5 - figure 24 - 25) is damaged. In this case, the temperature control is carried out by the boiler flow temperature.

22. POSITIONING OF THE IGNITION AND FLAME SENSING ELECTRODE

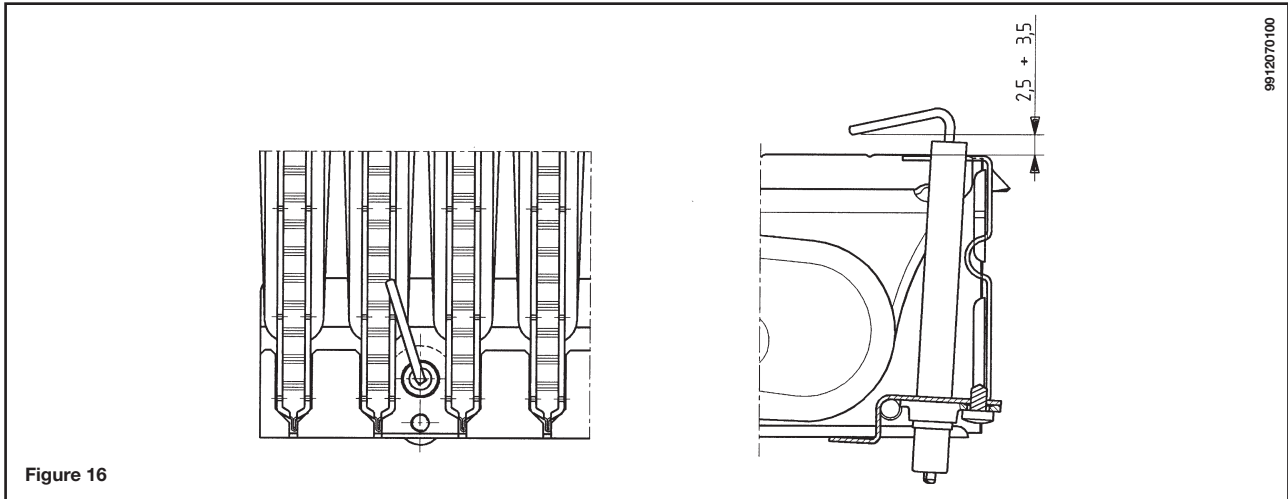


Figure 16

23. CHECK OF COMBUSTION PARAMETERS

The boiler has two connection points specifically designed to allow technicians to measure the combustion efficiency after installation and ensure that the combustion products do not constitute a health risk.

One connection point is connected to the flue gas discharge circuit, and allows monitoring of the quality of the combustion products and the combustion efficiency.

The other is connected to the combustion air intake circuit, allowing checking of any recycling of the combustion products in case of coaxial pipelines.

The following parameters can be measured at the connection point on the flue gas circuit:

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

The combustion air temperature must be measured at the connection point on the air intake circuit, inserting the measurement probe to a depth of about 3 cm.

For natural draught boiler models, a hole must be made in the flue gas discharge pipe at a distance from the boiler equal to twice the inside diameter of the pipe itself.

The following parameters can be measured through this hole:

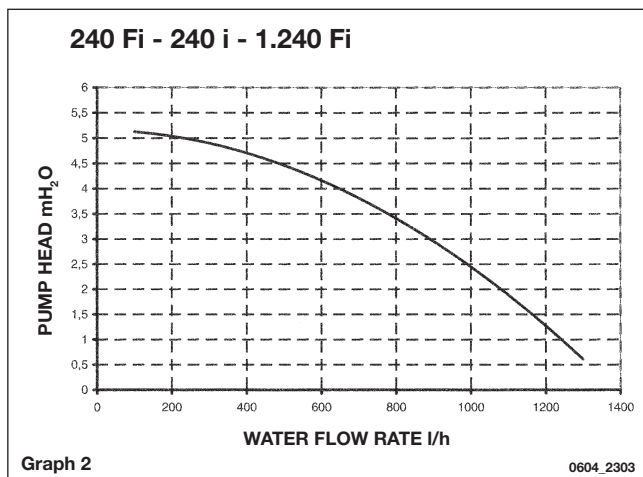
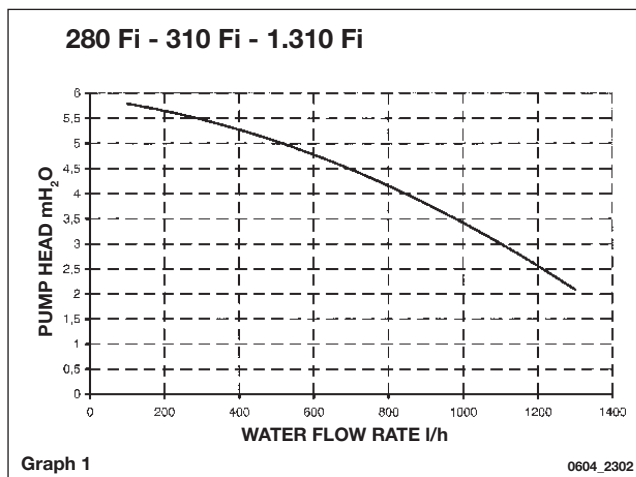
- temperature of the combustion products;
- oxygen (O₂) or carbon dioxide (CO₂) concentration;
- carbon monoxide (CO) concentration.

The combustion air temperature 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 operating the system when it is commissioned, must be sealed in a way which ensures that the combustion product discharge pipe is airtight during normal operation.

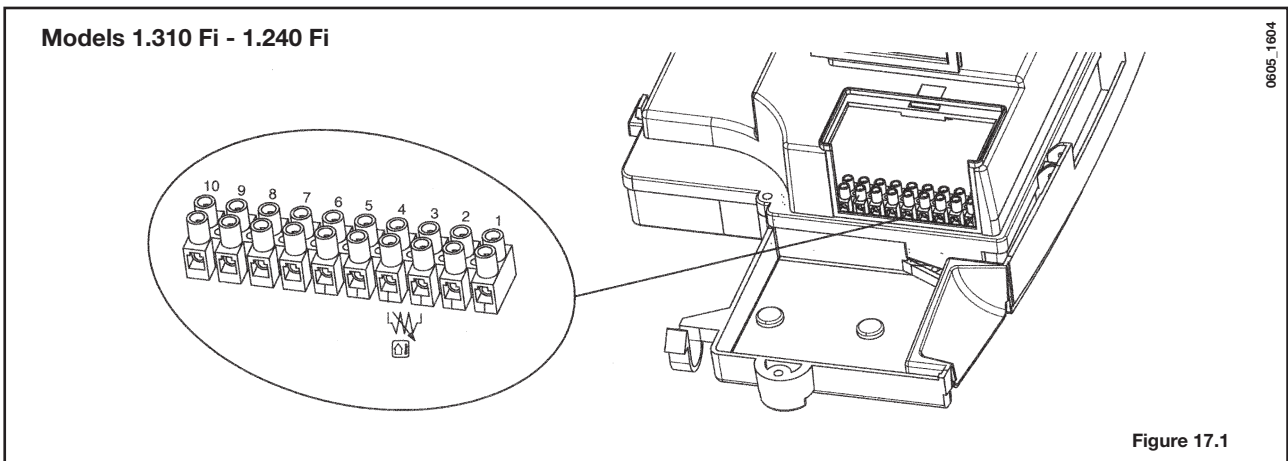
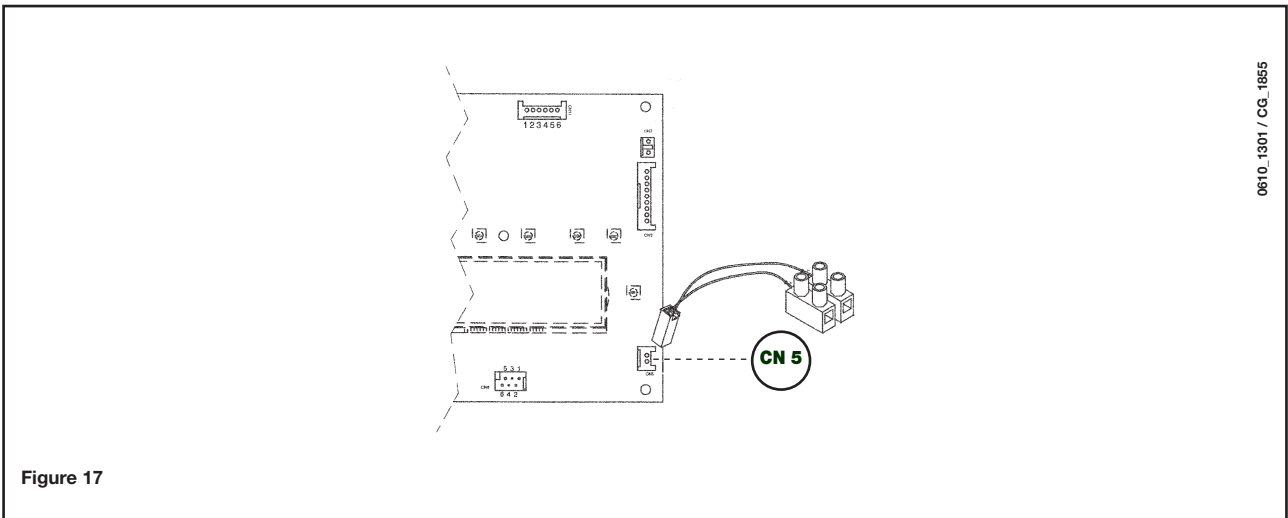
24. OUTPUT / PUMP HEAD PERFORMANCES

This is a high static head pump fit for installation on any type of single or double-pipe heating systems. The air vent valve incorporated in the pump allows quick venting of the heating system.



25. CONNECTION OF THE EXTERNAL PROBE

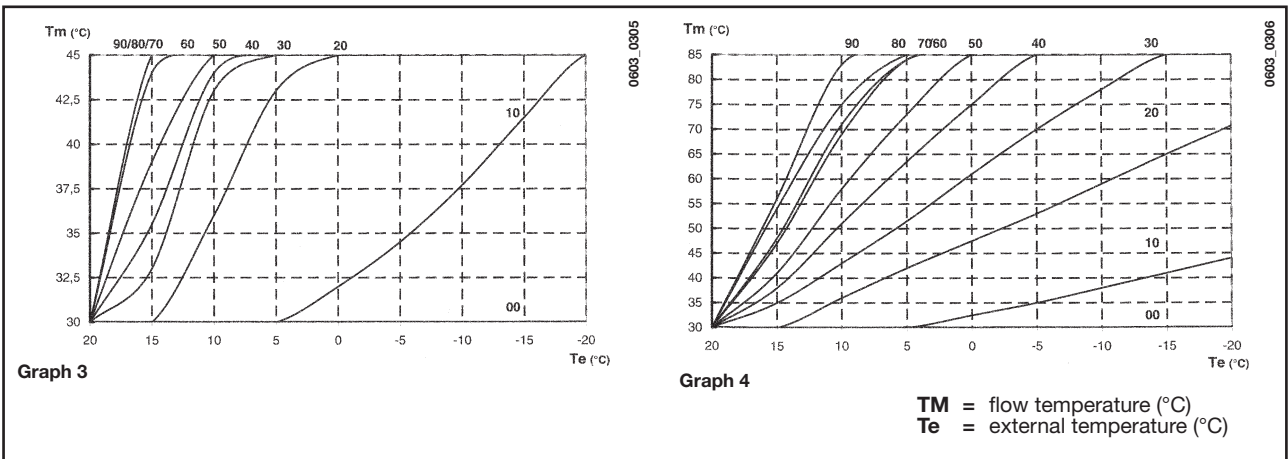
The boiler is prearranged for connection of an external probe (supplied as accessory).
For the connection, refer to the figure below and the instructions supplied with the probe.



When the external probe is connected, the heating circuit temperature control device regulates the dispersal coefficient **Kt**. To set the curves (0...90) press the +/-  buttons.

NOTE: the maximum value of the flow temperature **TM** depends on the *F16* parameter setting (see section 20). The maximum flow temperature it may 85° or 45°C.

Kt curves



26. CONNECTING AN EXTERNAL HOT WATER TANK AND 3-WAY VALVE MOTOR

Models 1.310 Fi - 1.240 Fi

NB: The DHW priority NTC sensor and the 3-way valve motor are not included, but are supplied as accessories.

HOT WATER TANK SENSOR CONNECTION

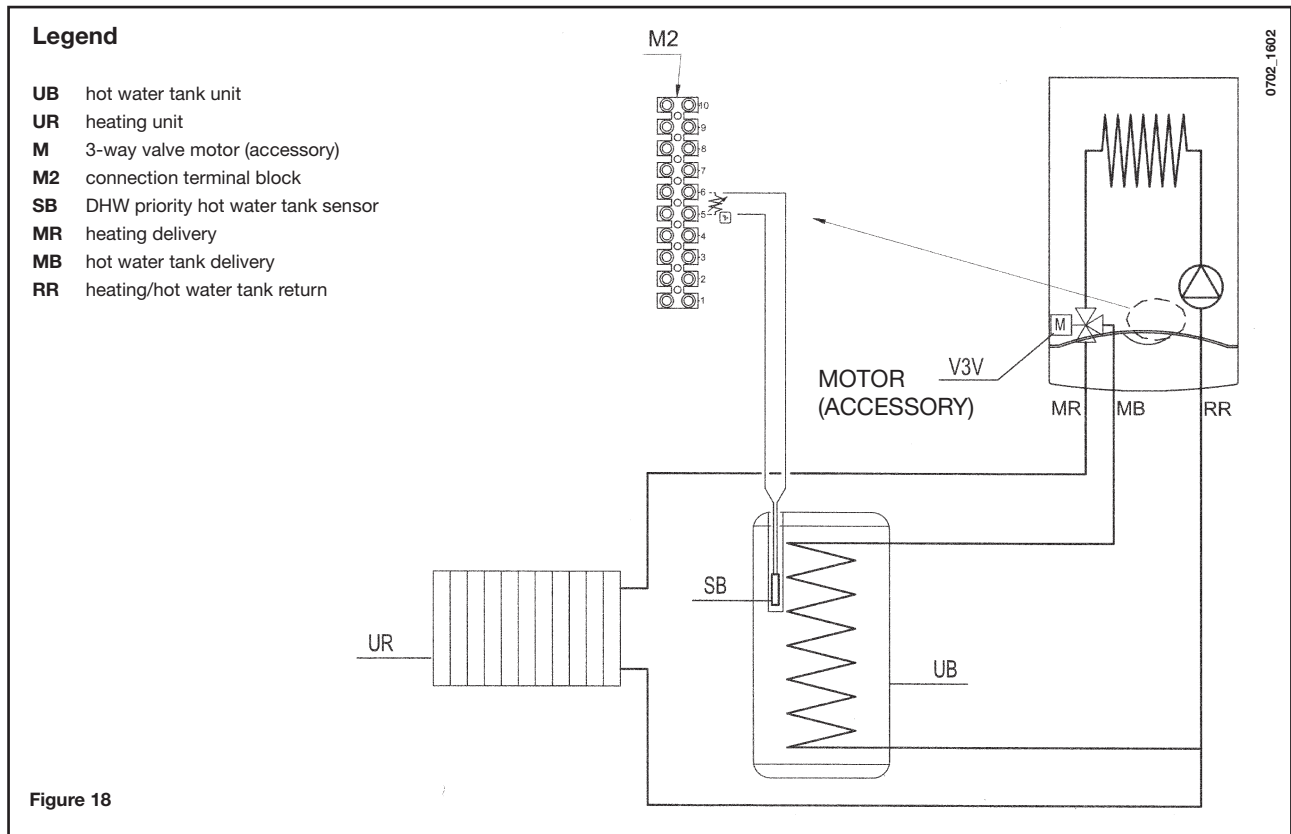
The boiler is arranged for connection of an external D.H.W. storage tank.

Connect the D.H.W. storage tank pipes as shown in figure 18.

Connect the DHW priority **NTC** sensor to terminals 5-6 on the terminal block **M2** after removing the heating element present.

Insert the NTC sensor probe in the special hole on the D.H.W. storage tank.

The domestic hot water temperature (35°...65 °C) is adjusted by operating the buttons +/- .



NOTES Make sure parameter F03 = 05 (section 20).

3-WAY VALVE MOTOR ELECTRICAL CONNECTION (Models 1.310 Fi - 1.240 Fi)

The 3-way valve motor and relevant wiring are supplied separately as a kit. Connect the 3-way valve motor as shown in figure 19.1.

To connect the wiring, proceed as follows:

- 1) undo the 3 fixing screws and lift the control panel;
- 2) connect the 3-way valve motor wires (white-red-black) as shown in figure 19; **IMPORTANT:** check correct clamping of the wires on the connector CN1.
- 3) secure the wiring cable to the control panel cable clamp;
- 4) close the control panel, securing it with the fixing screws.

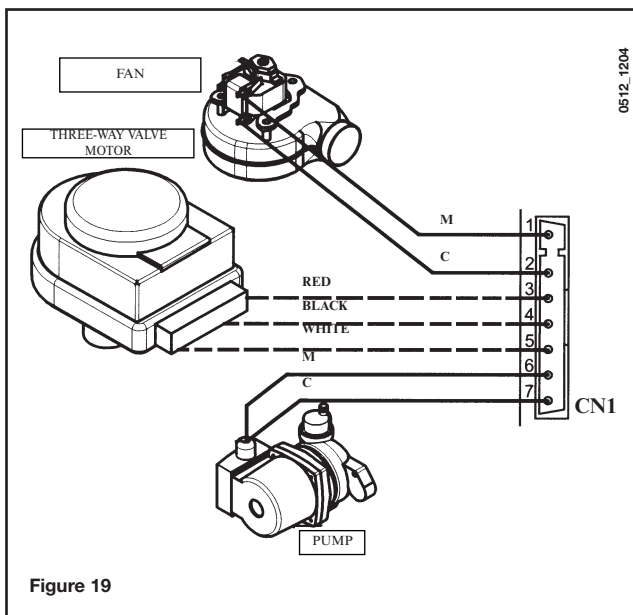


Figure 19

3-WAY VALVE MOTOR ASSEMBLY (Models 1.310 Fi - 1.240 Fi)

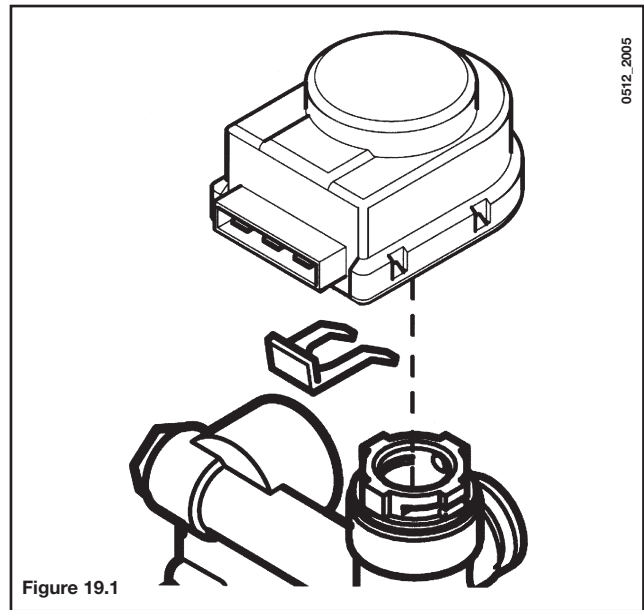


Figure 19.1

Note: before installing the 3-way motor remove the cap upon the 3 way valve.

27. ELECTRICAL CONNECTION TO REMOTE CONTROL DEVICE

(SUPPLIED AS AN ACCESSORY)

The remote control device is not a standard boiler component as it is supplied as an accessory. Open the electronic board and connect the cable (supplied together with the two-pin terminal board) to connector CN7 on the electronic boiler board. Connect the terminals of the remote control device to the two-pin terminal board (figure 19).

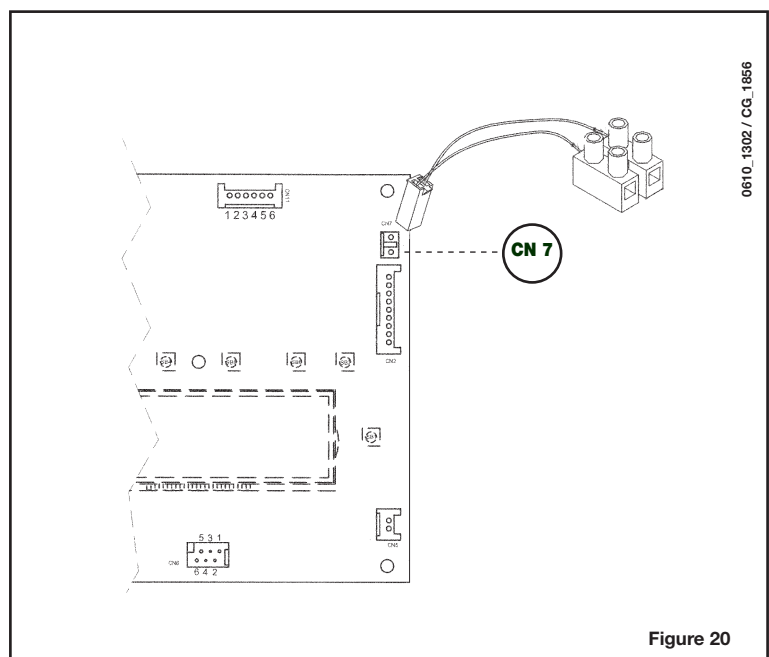


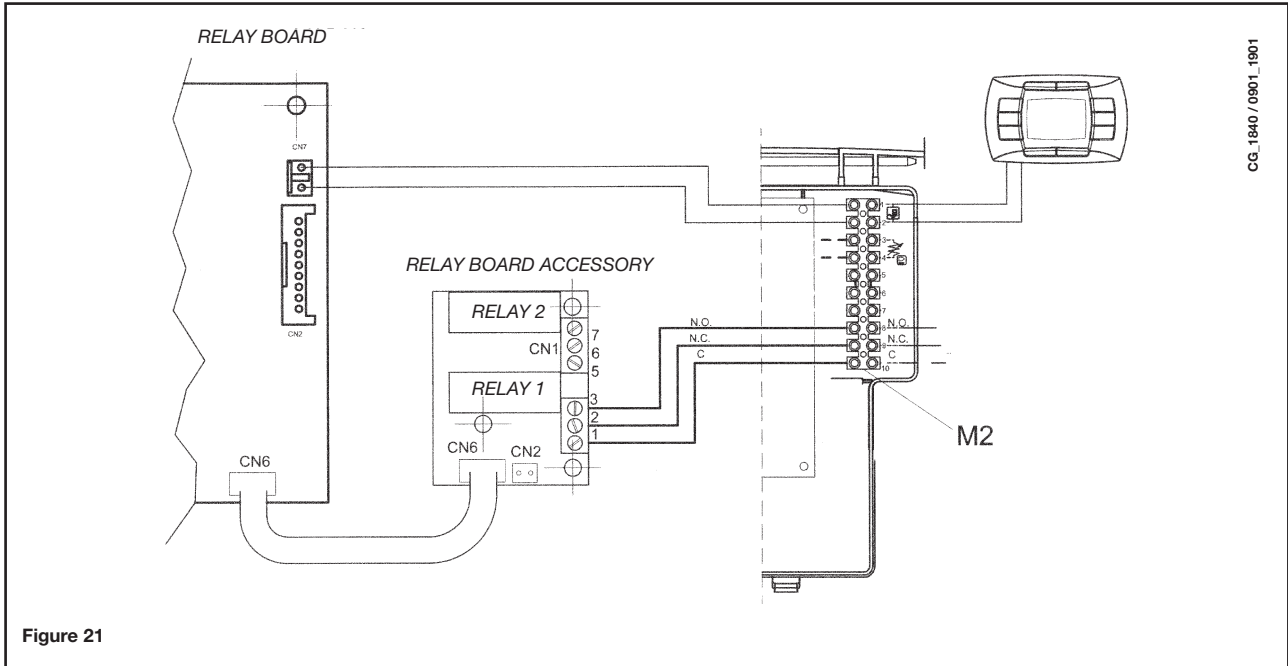
Figure 20

Note: for model 1.310 Fi, connect the remote control device as described in paragraph 28.1 (figure 20).

28. ELECTRICAL CONNECTIONS TO A ZONAL HEATING SYSTEM

28.1 CONNECTING THE RELAY BOARD

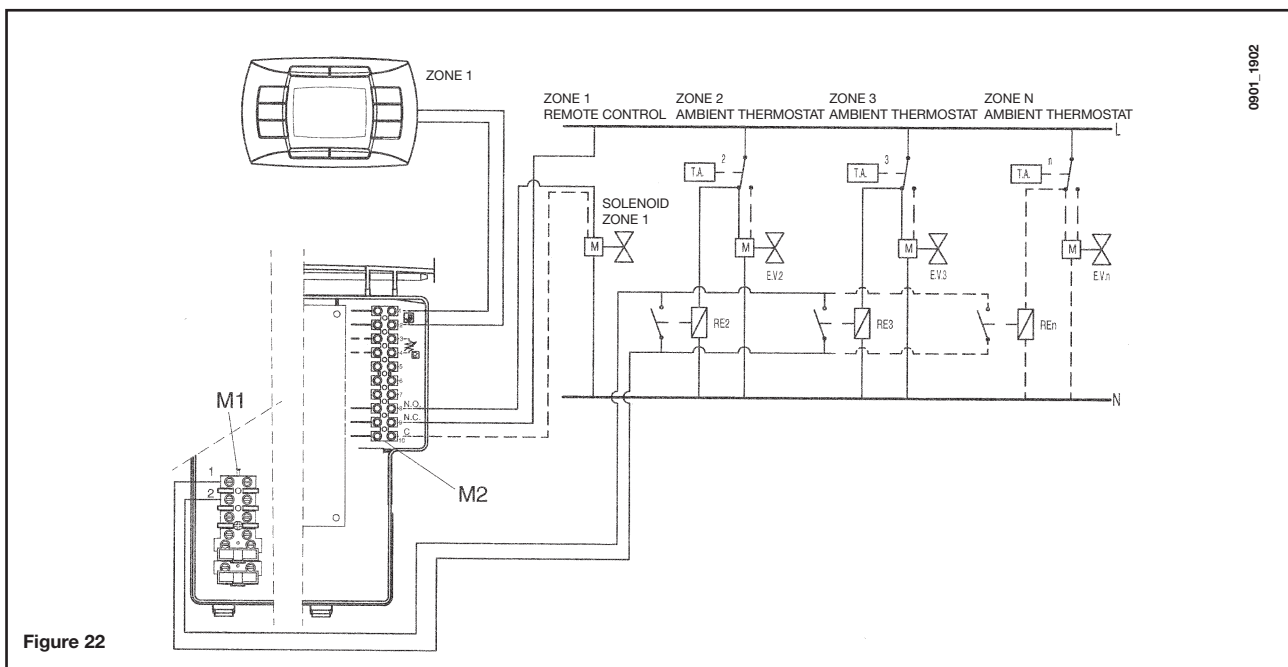
The relay board is not a standard boiler component as it is supplied as an accessory. Connect terminals 1-2-3 (common - normally closed - normally open) of connector **Cn1** on the relay board to the respective terminals 10-9-8 on the boiler terminal board **M2** (figure 21).



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28.2 CONNECTING THE ZONES

Connect the contact relative to heating requests in zones that are not controlled by the remote control device in parallel to terminals 1-2 "TA" on terminal board M1. Remove the jumper. The zone controlled by the remote control device is managed by the zone 1 solenoid, as illustrated in figure 22.



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29. HOW TO PURGE THE DHW SYSTEM FROM LIMESTONE DEPOSITS

Not fitted on 1.240 Fi and 1.310 Fi models

To clean the DHW system it is not necessary to remove the DHW heat exchanger if the assembly is equipped with the appropriate taps (supplied on demand) placed on the hot water outlet and inlet.

To carry out the purge it is necessary to:

- close the cold water inlet
- drain the DHW system from the water contained therein by means of a hot water tap
- close the DHW outlet
- unscrew the two stop cocks caps
- remove the filters.

In case the appropriate tap is not supplied it is necessary to disassemble the DHW heat exchanger, as described in the following section, and do the purge aside. We recommend you also purge from limestone deposits the DHW heat exchanger seat and the NTC sensor fitted on the DHW system.

To purge the exchanger and/or the DHW system we suggest the use of Cillit FFW-AL or Beckinser HF-AL.

30. HOW TO DISASSEMBLE THE DHW HEAT EXCHANGER

Not fitted on 1.240 Fi and 1.310 Fi models

The stainless steel plate-type DHW heat exchanger is easily disassembled with a screwdriver by operating as described below:

- drain, if possible, only the boiler system, **through the drain tap**;
- drain the DHW system from water;
- remove the two screws (right in front of you) securing the DHW heat exchanger and pull it off its seat (figure 23).

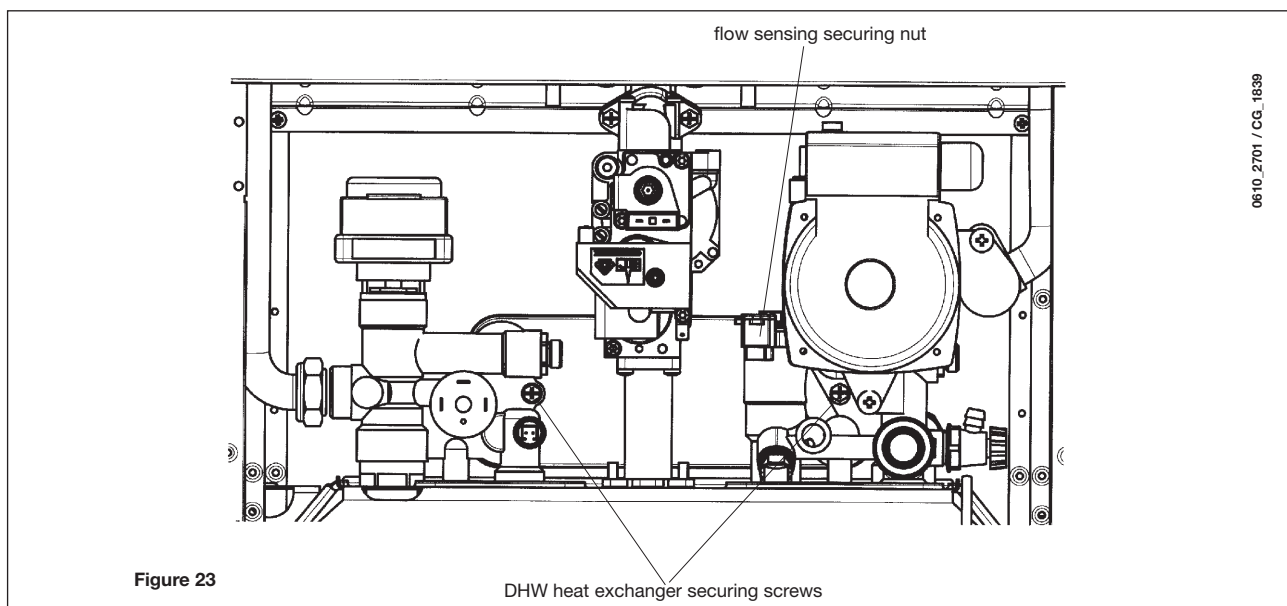
31. CLEANING THE COLD WATER FILTER

Not fitted on 1.240 Fi and 1.310 Fi models

The boiler is equipped with a cold water filter placed on the hydraulic assembly. To clean it do the following:

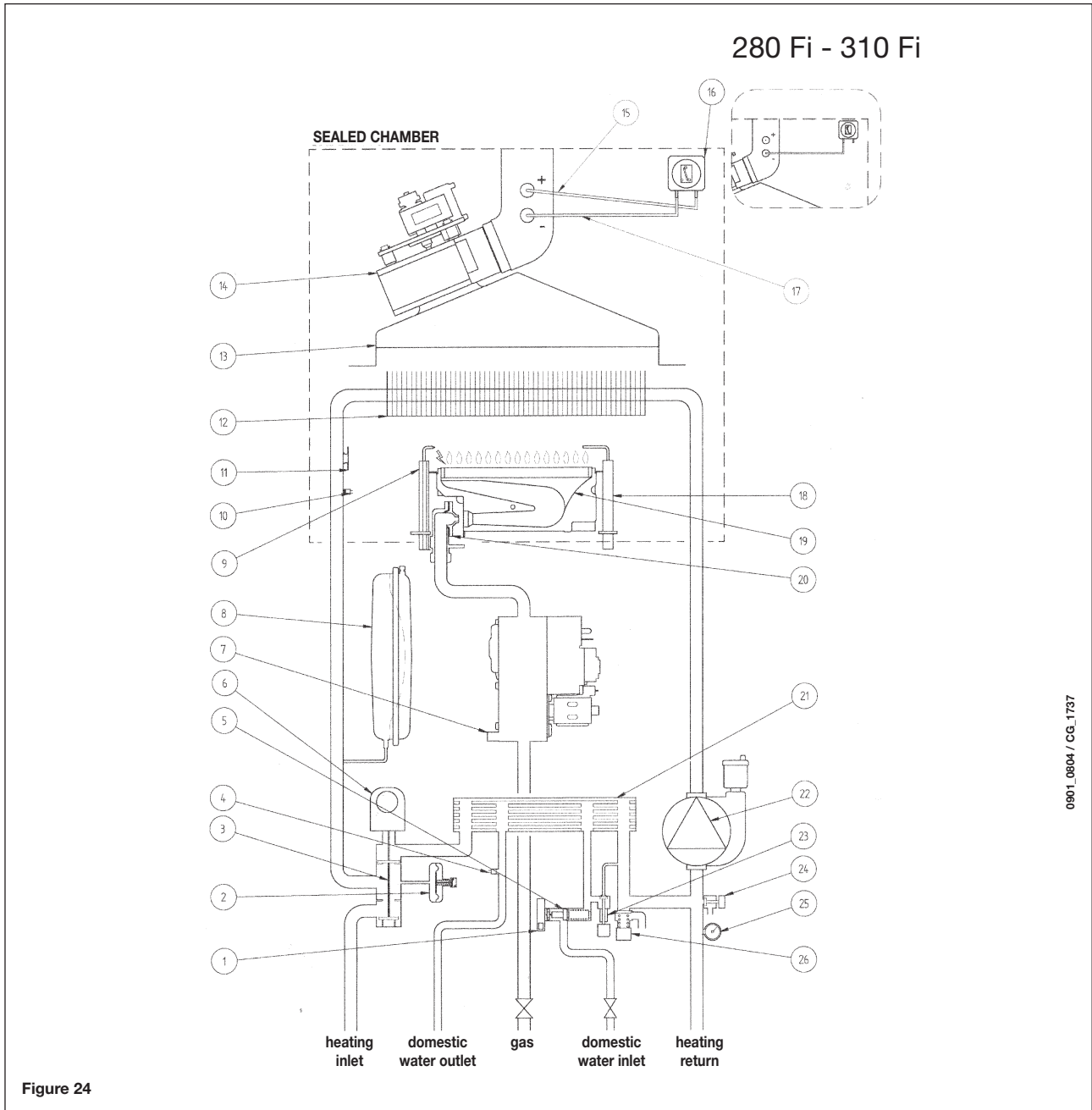
- drain the DHW system from water;
- unscrew the nut on the flow sensing assembly (Figure 23);
- pull out the flow sensing device and its filter;
- remove the impurities.

Important: in the event of replacements and/or cleaning of the O-rings on the hydraulic unit, do not use oil or grease as lubricant but exclusively Molykote 111.



32. BOILER SCHEMATIC

32.1 - 240 Fi - 280 Fi - 310 Fi

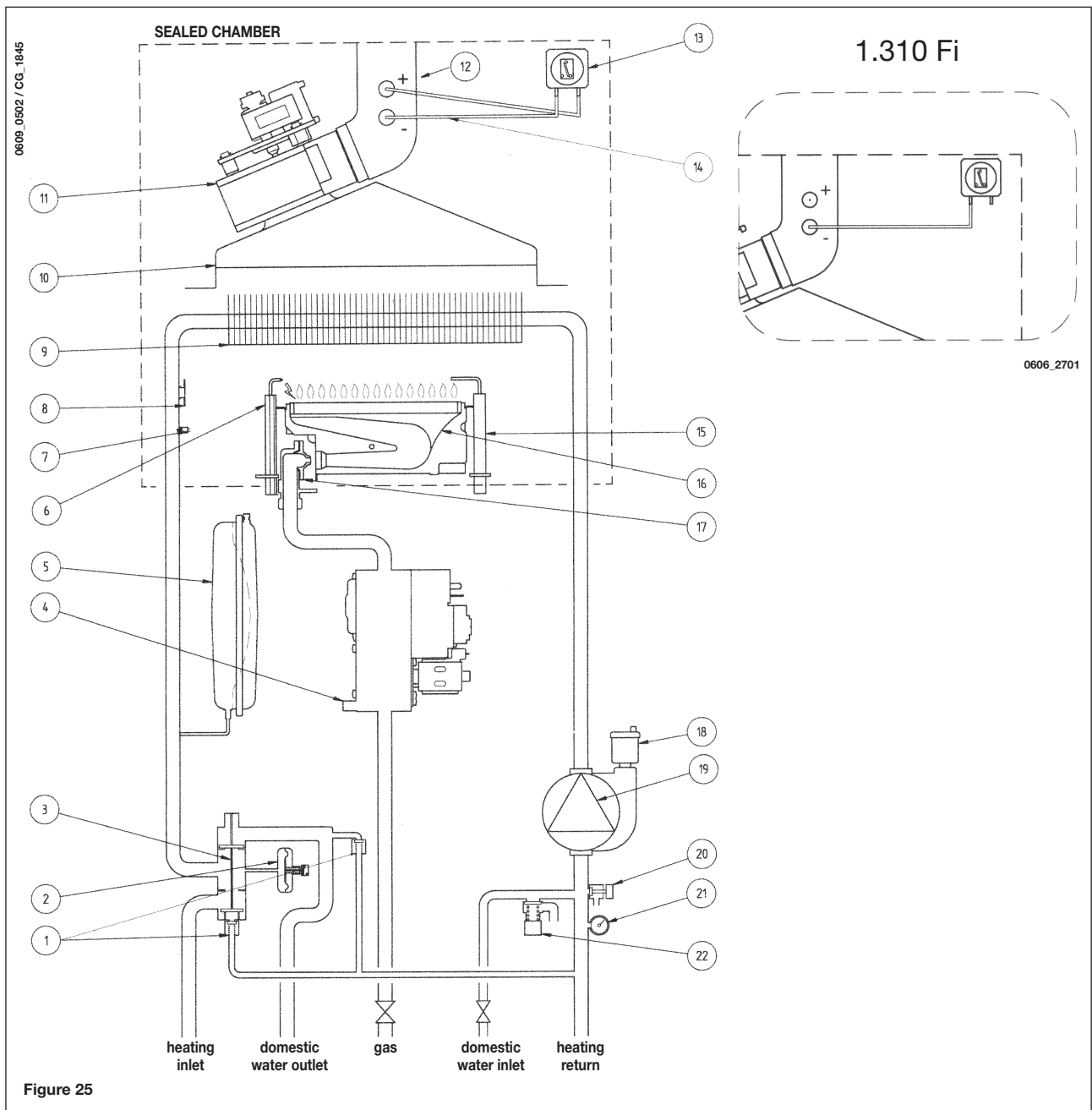


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Key:

- | | |
|---|---|
| <ul style="list-style-type: none"> 1 D.H.W. priority sensor 2 Water pressure switch 3 Three way valve 4 D.H.W. NTC sensor 5 Flow sensor with filter and water flow rate limiter 6 Three way valve motor 7 Gas valve 8 Expansion vessel 9 Ignition electrode 10 Central heating NTC sensor 11 Overheat safety thermostat 12 Flue-water exchanger 13 Flue hood | <ul style="list-style-type: none"> 14 Fan 15 Positive pressure point
(for 280 Fi - 310 Fi model the positive point must be closed) 16 Air pressure switch 17 Negative pressure point 18 Flame detector electrode 19 Burner 20 Burner injectors 21 D.H.W. plate heat exchanger (automatic by-pass) 22 Pump and air separator 23 System filling cock 24 Boiler drain point 25 Manometer 26 Pressure relief valve |
|---|---|

32.2 - 1.240 Fi - 1.310 Fi



Key:

- | | |
|--|---|
| <ul style="list-style-type: none"> 1 Automatic by-pass 2 Water pressure switch 3 Three way valve 4 Gas valve 5 Expansion vessel 6 Ignition electrode 7 Central heating NTC sensor 8 Overheat safety thermostat 9 Flue-water exchanger 10 Flue hood 11 Fan | <ul style="list-style-type: none"> 12 Positive pressure point
(for 1.310 Fi model the positive point must be closed) 13 Air pressure switch 14 Positive pressure point 15 Flame detector electrode 16 Burner 17 Burner injectors 18 Automatic air vent 19 Pump and air separator 20 Boiler drain point 21 Manometer 22 Pressure relief valve |
|--|---|

32.3 - 240 i

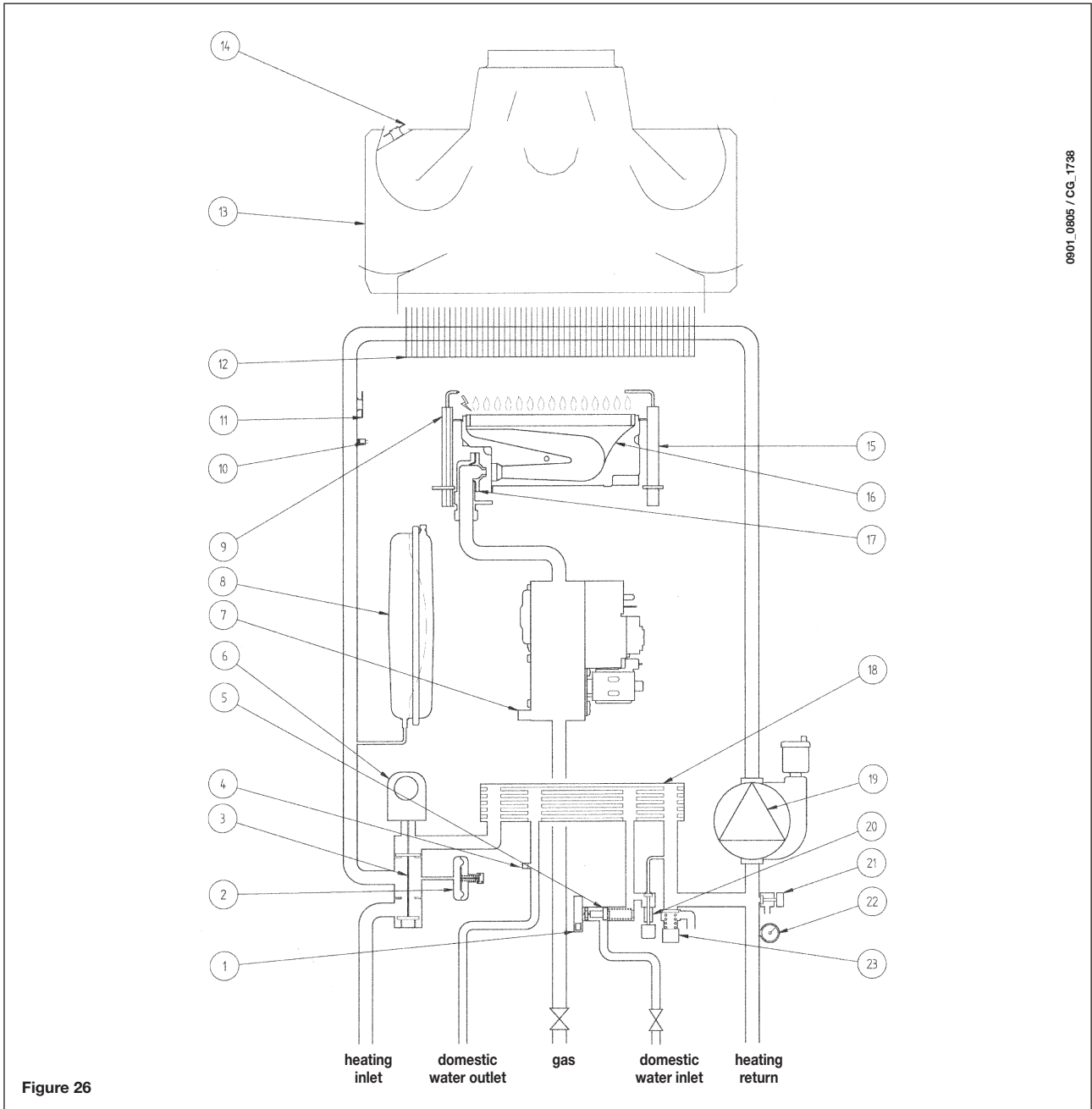


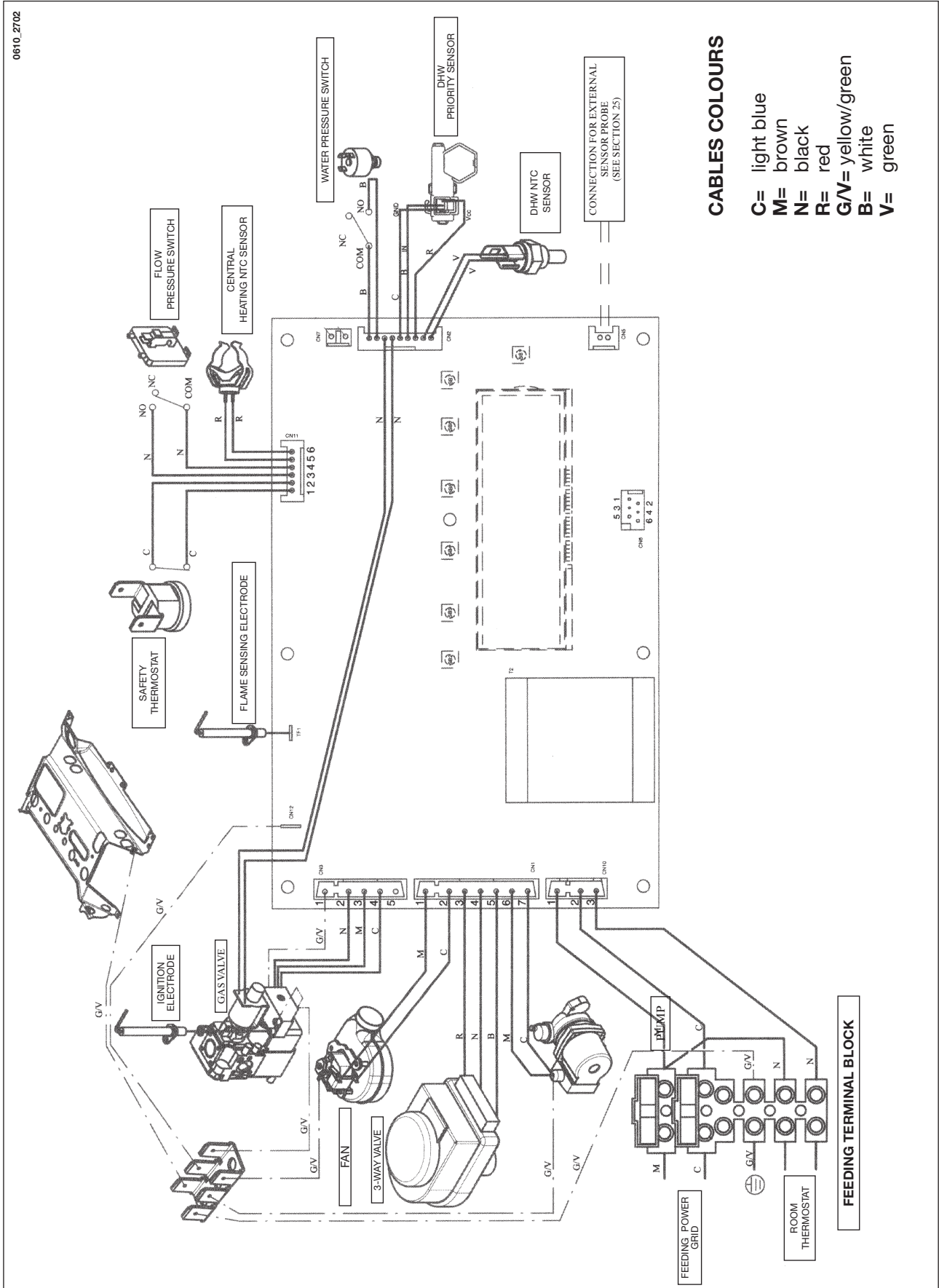
Figure 26

Key:

- | | |
|---|---|
| <ul style="list-style-type: none"> 1 D.H.W. priority sensor 2 Water pressure switch 3 Three way valve 4 D.H.W. NTC sensor 5 Flow sensor with filter and water flow rate limiter 6 Three way valve motor 7 Gas valve 8 Expansion vessel 9 Ignition electrode 10 Central heating NTC sensor 11 Overheat safety thermostat 12 Flue-water exchanger | <ul style="list-style-type: none"> 13 Flue hood 14 Flue thermostat 15 Flame detector electrode 16 Burner 17 Burner injectors 18 D.H.W. plate heat exchanger (automatic by-pass) 19 Pump and air separator 20 System filling cock 21 Boiler drain point 22 Manometer 23 Pressure relief valve |
|---|---|

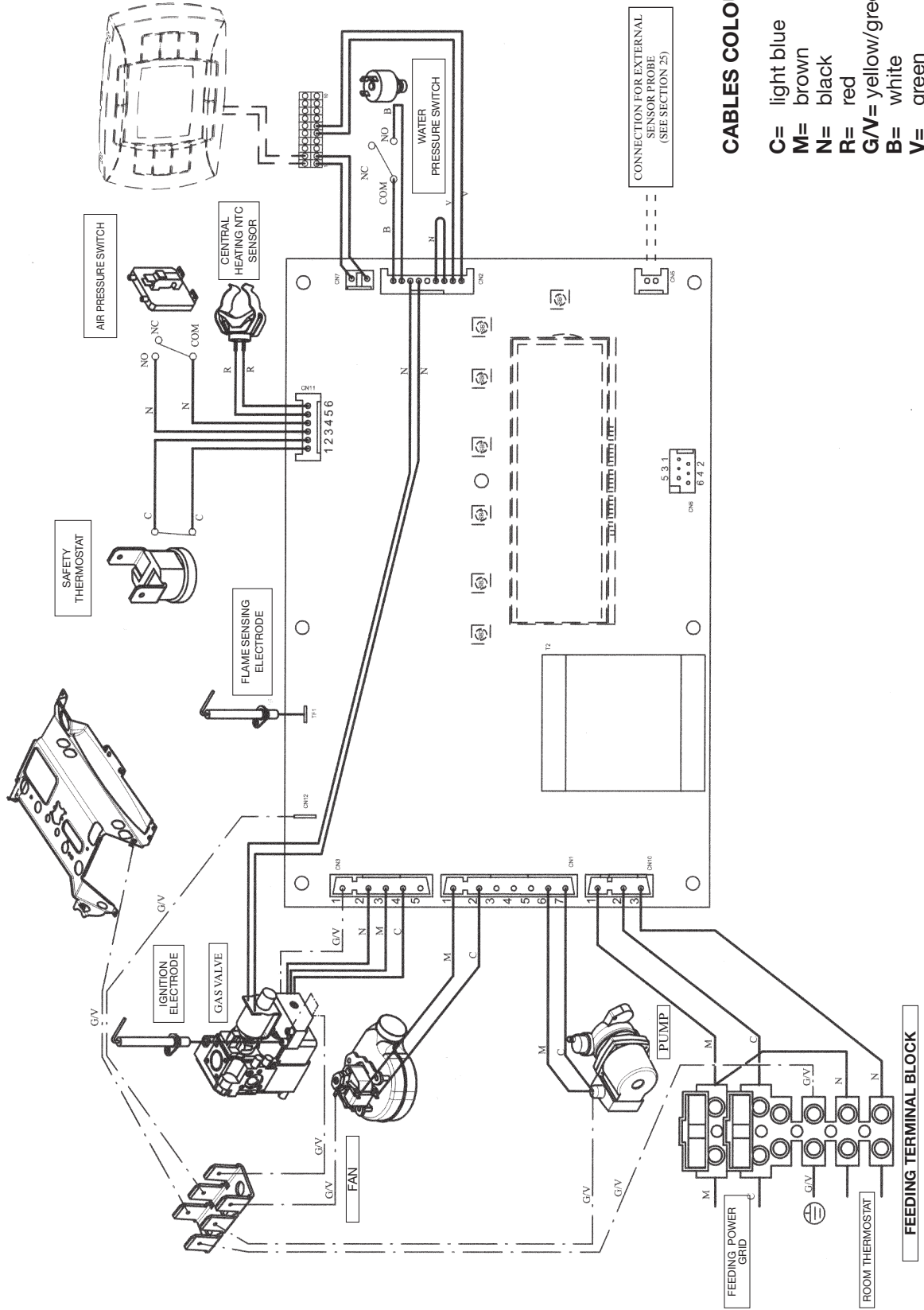
33. ILLUSTRATED WIRING DIAGRAM

33.1 - 240 Fi - 280 Fi - 310 Fi



33.2 - 1.240 Fi - 1.310 Fi

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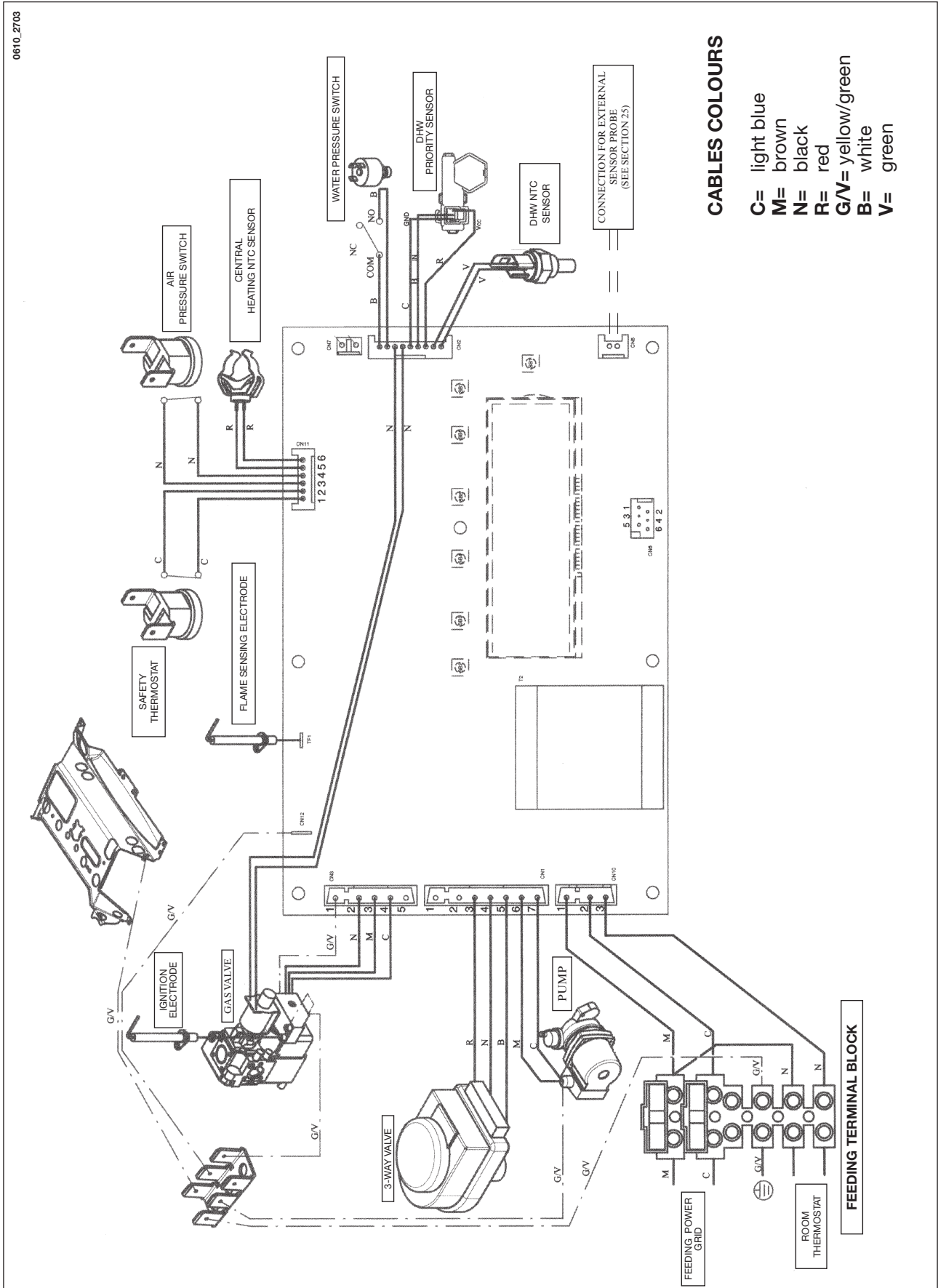


CABLES COLOURS

- C= light blue
- M= brown
- N= black
- R= red
- G/V= yellow/green
- B= white
- V= green

33.3 - 240 i

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CABLES COLOURS

- C= light blue
- M= brown
- N= black
- R= red
- G/V= yellow/green
- B= white
- V= green

34. TECHNICAL DATA

Model STAR DIGIT		240 i	240 Fi	280 Fi	310 Fi	1.240 Fi	1.310 Fi
Category		II2H3P	II2H3P	II2H3P	II2H3P	II2H3P	II2H3P
Maximum heat input	kW	26,3	26,9	30,1	33,3	26,9	33,3
Reduced heat input	kW	10,6	10,6	11,9	11,9	10,6	11,9
Maximum heat output	kW	24	25	28	31	25	31
	kcal/h	20.600	21.500	24.080	26.700	21.500	26.700
Reduced heat output	kW	9,3	9,3	10,4	10,4	9,3	10,4
	kcal/h	8.000	8.000	8.900	8.900	8.000	8.900
Useful efficiency according to 92/42/CEE directive	—	★★	★★★	★★★	★★★	★★★	★★★
Central heating system max. pressure	bar	3	3	3	3	3	3
Expansion vessel capacity	l	8	8	10	10	8	10
Expansion vessel pressure	bar	0,5	0,5	0,5	0,5	0,5	0,5
DHW system max. pressure	bar	8	8	8	8	—	—
DHW system min. dynamic pressure	bar	0,15	0,15	0,5	0,15	—	—
DHW system min. output	l/min	2,0	2,0	2	2,0	—	—
DHW production at $\Delta T=25\text{ }^{\circ}\text{C}$	l/min	13,7	14,3	16	17,8	—	—
DHW production at $\Delta T=35\text{ }^{\circ}\text{C}$	l/min	9,8	10,2	11,4	12,7	—	—
Specific output (*)	l/min	10,7	11,5	12,5	13,7	—	—
Type	—	B _{11BS}	C12 - C32 - C42 - C52 - C82 - B22				
Concentric flue duct diameter	mm	—	60	60	60	60	60
Concentric air duct diameter	mm	—	100	100	100	100	100
2-pipe flue duct diameter	mm	—	80	80	80	80	80
2-pipe air duct diameter	mm	—	80	80	80	80	80
Discharge pipe diameter	mm	120	—	—	—	—	—
Max. flue mass flow rate (G20)	kg/s	0,019	0,017	0,017	0,018	0,017	0,018
Min. flue mass flow rate (G20)	kg/s	0,017	0,017	0,017	0,019	0,017	0,019
Max. flue temperature	$^{\circ}\text{C}$	110	135	140	145	135	145
Min. flue temperature	$^{\circ}\text{C}$	85	100	110	110	100	110
NOx Classe	—	3	3	3	3	3	3
Type of gas used	—	G20-G31	G20-G31	G20-G31	G20-G31	G20-G31	G20-G31
Natural gas feeding pressure 2H (G20)	mbar	20	20	20	20	20	20
Propane gas feeding pressure 3P (G31)	mbar	37	37	37	37	37	37
Power supply voltage	V	230	230	230	230	230	230
Power supply frequency	Hz	50	50	50	50	50	50
Power consumption	W	80	135	165	165	135	165
Net weight	kg	33	38	40	40	38	38
Dimensions	height	mm	763	763	763	763	763
	width	mm	450	450	450	450	450
	depth	mm	345	345	345	345	345
Protection-limit against humidity and water leakages (**)	—	IP X5D	IP X5D	IP X5D	IP X5D	IP X5D	IP X5D

(*) according to EN 625

(**) according to EN 60529

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