



MS 24 MI FF - MS 24 FF

MS 24 MI - MS 24 MI VMC - MS 24

FR Chaudière murale à gaz haut rendement

Notice d'installation, d'utilisation et d'entretien

IT Caldaia murale a gas ad alto rendimento

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

EN High performance gas-fired wall-mounted boiler

Operating and installation instructions

ES Caldera mural de gas de alto rendimiento

Manual para el usuario y el instalador

BG Стенен газов котел с висока ефективност

Ръководство за употреба предназначено за потребителя и инсталатора

PL Kocioł ścienny gazowy o wysokiej sprawności

Podręcznik obsługi dla użytkownika i instalatora

RO Centrală murală pe gaz, de înalt randament

Manual de instrucțiuni destinat utilizatorului și instalatorului

EL Επιτοίχιος λέβητας αερίου υψηλής απόδοσης

Εγχειρίδιο χρήσης για τον χρήστη και τον εγκαταστάτη

RU Высокопроизводительные настенные газовые котлы

Руководство по установке и эксплуатации

CN 高效壁挂式燃气锅炉

安装使用手册



МΠ02

De Dietrich



Dear Customer,

We are confident your new boiler will meet all your requirements.

All **De Dietrich** 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.

De Dietrich 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



CONTENTS

INSTRUCTIONS FOR USERS

1.	Instructions prior to installation	69
2.	Instructions prior to commissioning	69
3.	Commissioning the boiler	70
4.	Adjusting room and DHW temperatures	71
5.	Description of button (🔌) (Summer - Winter - Heating only - Off)	71
6.	Filling the system	72
7.	Turning off the boiler	72
8.	Gas conversion	72
9.	Prolonged shutdown. Frost protection (heating circuit)	73
10.	Troubleshooting	73
11.	Routine maintenance instructions	73

INSTRUCTIONS FOR FITTERS

12.	General information	74
13.	Instructions prior to installation	74
14.	Installing the boiler	75
15.	Dimensions of boiler	76
16.	Installation of flue and air ducts	77
17.	Connecting the mains supply	81
18.	Connecting the room thermostat	81
19.	Gas conversion methods	82
20.	Visualisation of electronic board parameters on boiler display ("info" function)	84
21.	Parameter settings	85
22.	Adjustment and safety devices	85
23.	Positioning the ignition and flame-sensor electrode	86
24.	Checking combustion parameters	87
25.	Output/pump head performance	87
26.	Connecting the external probe	88
27.	Connecting an external storage boiler	88
28.	Annual servicing	89
29.	Draining the heating circuit	89
30.	Cleaning the filters	90
31.	Removing scale from the DHW circuit	90
32.	Dismounting the water-water heat exchanger	91
33.	Circuit diagram	92
34.	Illustrated wiring diagram	96
35.	Technical data	100

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 fitter, 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.
- 1.3. The materials used for the product's DHW circuit comply with Directive 98/83/CE.

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 system:

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 warranty 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. 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 appliance is not intended to be used by persons (including children) with reduced physical, sensory or mental capacities, or who lack experience or knowledge, unless, through the mediation of a person responsible for their safety, they have had the benefit of supervision or of instructions on the use of 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 the button (⏻) and switch the boiler to Summer (☀️), Winter (❄️) or heating only (🔥);
- 4) press the heating circuit (+/-) and domestic hot water circuit (🚰) temperature adjustment buttons (⊕/⊖) in order to ignite the main burner.

When the boiler is lit, the symbol (🔥) will appear on the display.

In the Summer position (☀️) the main burner will only ignite if a DHW tap is opened.

WARNING

During initial ignition, the burner may not ignite (causing the boiler to shut down) until any air in the gas pipes is vented. In this case, repeat the ignition procedure until gas reaches the burner. Press button (R), for at least 2 seconds.

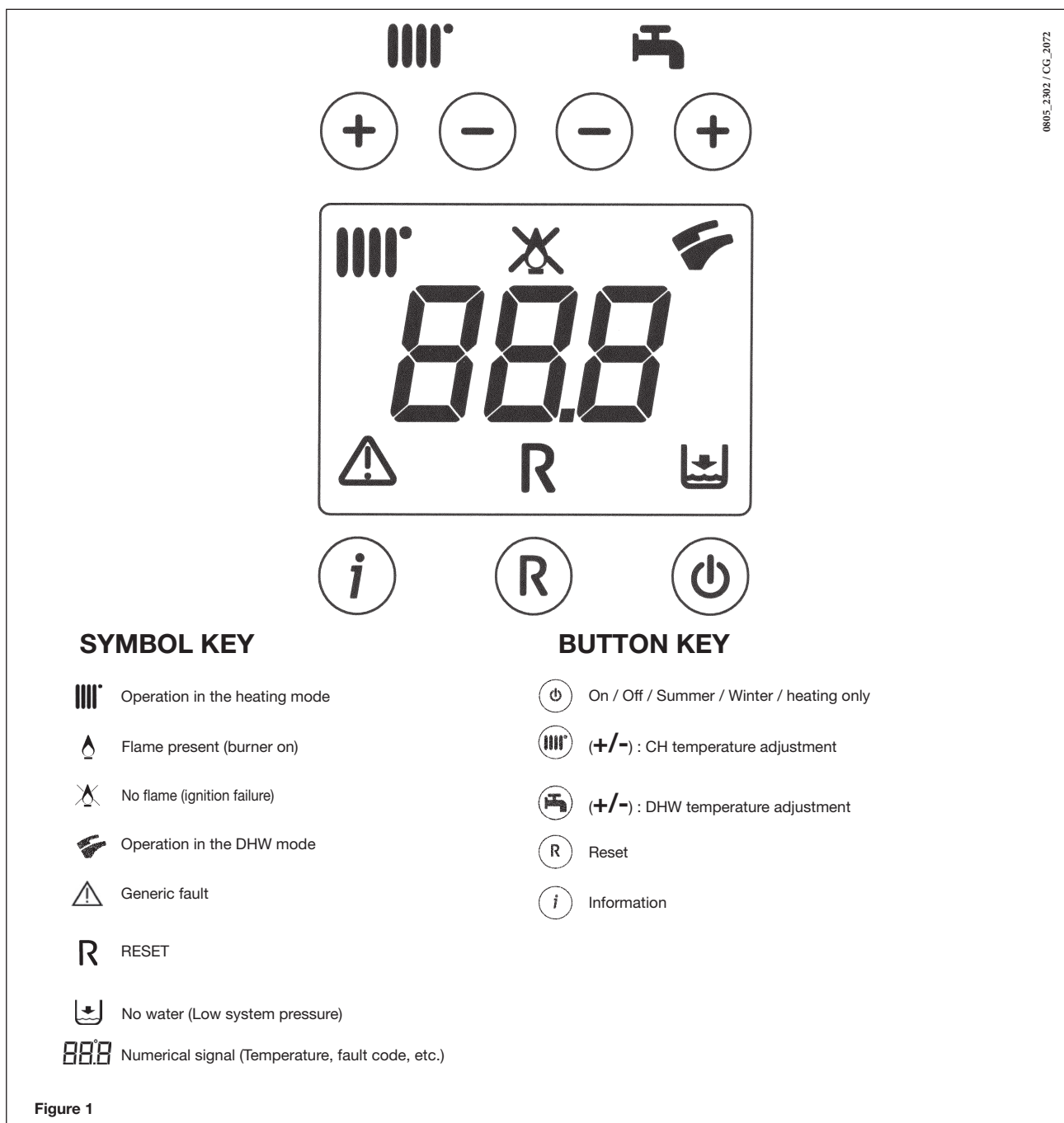


Figure 1

4. ADJUSTING ROOM TEMPERATURE AND DHW TEMPERATURE

The system must be fitted with a room thermostat for controlling indoor temperature.

Adjust the room temperature (||||°) and the DHW temperature (🔥) by pressing the respective +/- (figure 1). The ignition of the burner is shown on the display with the symbol (🔥) as described in section 3.

HEATING

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

DOMESTIC HOT WATER

While the boiler is operating in the DHW mode, the display (figure 1) shows the flashing symbol (🔥) and the DHW output temperature (°C).

5. DESCRIPTION OF BUTTON (Summer - Winter - Heating only - Off)

Press this button to set the following 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 (||||° 🔥). 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).

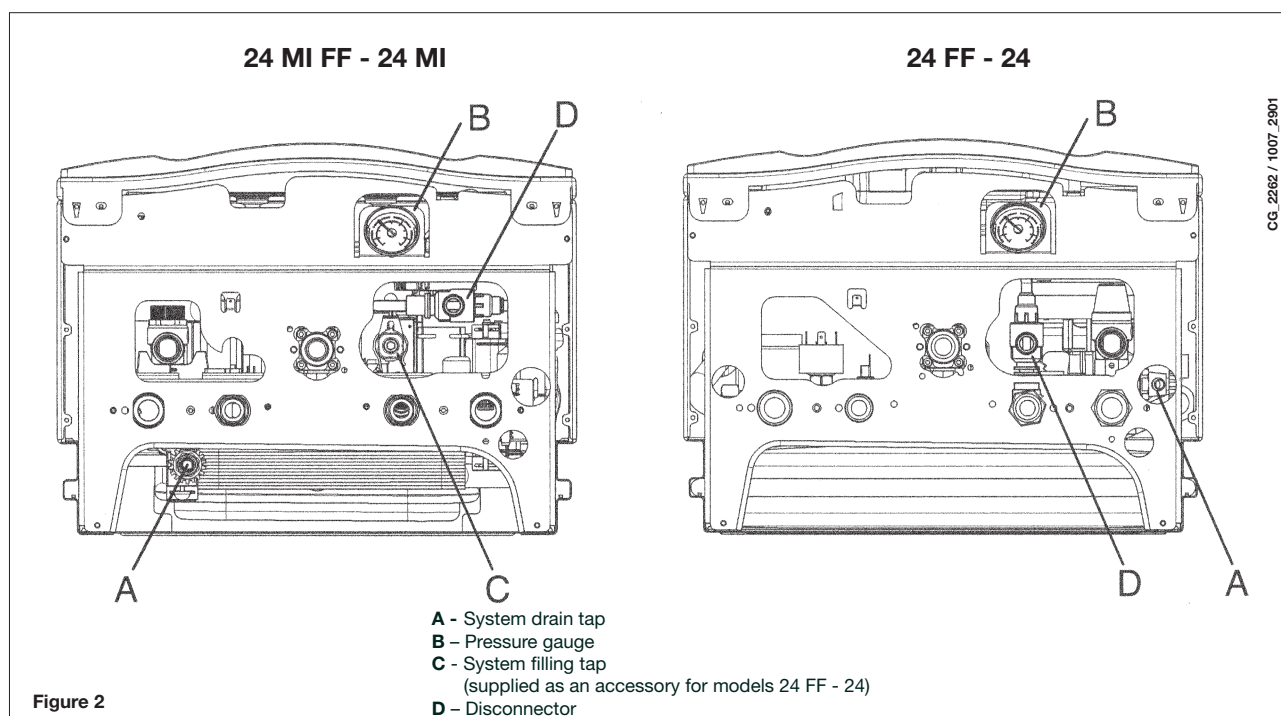
In the **OFF** mode, the display shows neither of the above two symbols (||||°) (🔥). In this mode, only the ambient frost protection function is active while requests for DHW and central heating are not satisfied.

6. FILLING THE SYSTEM

WARNING

Disconnect the boiler from the mains power supply using the two-pole switch.

IMPORTANT: Regularly check that the pressure displayed on the pressure gauge 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.



The boiler is fitted with a hydraulic pressure gauge which prevents the boiler from working if there is no water.

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

7. TURNING OFF THE BOILER

To turn off the boiler, disconnect the electric power supply. In "OFF" mode (section 5) the boiler remains off (the display indicates OFF) though the electrical circuits remain live and the frost protection device is enabled (section 9).

8. GAS CONVERSION

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

9. PROLONGED SHUTDOWN. FROST PROTECTION

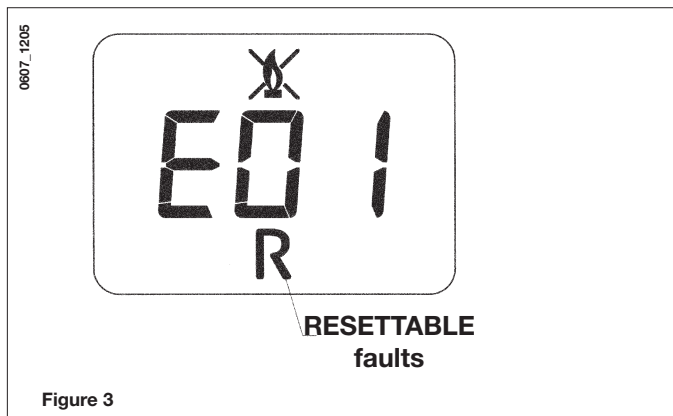
Do not drain the whole system as filling up with water again causes unnecessary and harmful scale to build up inside the boiler and the heating elements. If the boiler is not used during winter and is therefore exposed to the danger of frost, add some specific anti-freeze to the water in the system (e.g.: 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.

10. TROUBLESHOOTING

Faults are shown on the display with an error code (e.g.: E 01):



To RESET the boiler, press and hold down “R” for at least 2 seconds. If this fault persists, call the Authorised Service Centre.

N.B.: 5 reset attempts can be performed after which the boiler shuts down. To reset again, switch off the boiler for a few seconds.

CODE DISPLAYED	FAULT	CORRECTIVE ACTION
E01	Failed ignition shutdown	Press and hold down “R” for at least 2 seconds. If this fault persists, call the Authorised Service Centre.
E02	Safety thermostat tripped	Press and hold down “R” for at least 2 seconds. If this fault persists, call the Authorised Service Centre.
E03	Flue thermostat/ flue pressure switch tripped	Call the Authorised Service Centre.
E04	Shutdown after 6 consecutive flame losses	Press and hold down “R” for at least 2 seconds. If this fault persists, call the Authorised Service Centre.
E05	Flow sensor failure	Call the Authorised Service Centre.
E06	DHW sensor fault	Call the Authorised Service Centre.
E10	Hydraulic pressure switch block	Check that the pressure in the system is correct; See section 6. If this fault persists, call the Authorised Service Centre.
E25/E26	Probable blocked pump safety trip	Call the Authorised Service Centre.
E35	Parasite flame (flame error)	Press and hold down “R” for at least 2 seconds. If this fault persists, call the Authorised Service Centre.
E96	Switching off due to reductions in power supply	RESET is automatic. If this fault persists, call the Authorised Service Centre

N.B.: in case of a fault, the display backlighting flashes together with the error code.

11. 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 7 Switching off the boiler).

12. GENERAL INFORMATION

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

- 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 25.
- Do not leave any packaging (plastic bags, polystyrene, etc.) within reach of children, as it is 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.

ADDITIONAL PUMP WARNING

If an additional pump is used on the heating system, position it on the boiler return circuit. This will allow the correct operation of the water pressure switch.

SOLAR WARNING

if the instantaneous (mixed) boiler is connected to a system with solar panels, the maximum temperature of the domestic hot water entering the boiler must not exceed **60°C**.

13. 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.
- 1.3. The materials used for the product's DHW circuit comply with Directive 98/83/CE.

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 system:

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 warranty null and void.

14. INSTALLING THE BOILER

After deciding the exact location of the boiler, make sure there is sufficient room to perform maintenance operations (at least 450 mm of headroom is required in order to replace the expansion vessel).

Connect the system to the gas and water inlets present on the lower bar of the template. Fit two G3/4 taps (flow 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 the model **24 MI - 24** natural draught boiler is installed, connected it to the flue with a metal pipe resistant to normal mechanical stress, heat, products of combustion and relative condensate.

IMPORTANT

After filling the boiler, vent the entire internal circuit and the system as follows:

- close the gas on-off valve;
- power the boiler.
- open the vent valve on the pump body;
- press **(⏻)** to set the boiler in the "WINTER" operating mode;
- send a heat demand from the room thermostat;
- open a hot water tap to alternate CH demand with DHW demand;
- after a few ignition attempts the boiler will shut down (error E01 appears on the display);
- to rest, press and hold down "R" for at least 2 seconds;
- repeat the procedure at least another two times;
- close the vent valve.

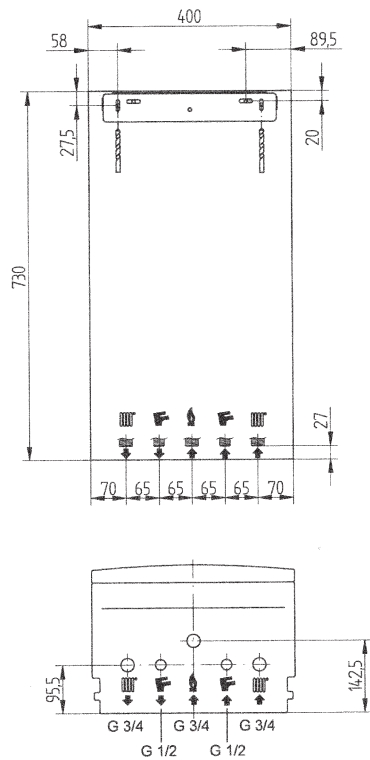
After venting the boiler circuit, proceed with initial lighting.

EXPANSION VESSEL

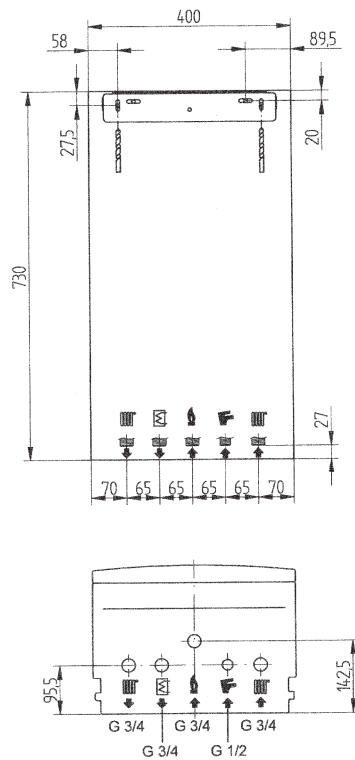
The boiler features a standard 6-litre expansion vessel with a pre-charge pressure of 1 bar. The maximum volume of water in the system is calculated according to hydrostatic pressure at an average water temperature of 80°C (flow: 95°C return: 75°C).

Hydrostatic pressure (m)	5	6	7	8	9	10
Maximum system volume (l)	110	105	95	85	77	70

24 MI - 24 MI FF



24 - 24 FF



CG_2263 / 1007_1403

Figure 4

	G"3/4 HEATING FLOW		G"1/2 DOMESTIC HOT WATER OUTLET
	G"3/4 HEATING RETURN		G"1/2 DOMESTIC COLD WATER INLET
	G"3/4 GAS INLET TO BOILER		G"3/4 STORAGE BOILER COIL FLOW

15. DIMENSIONS OF BOILER

24 FF - 24 MI FF

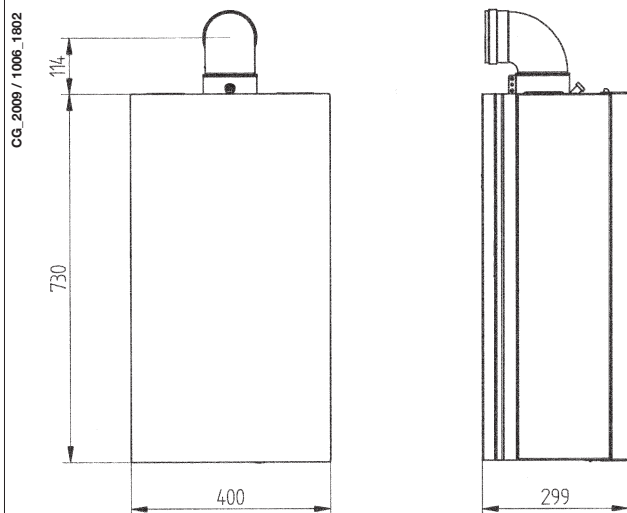
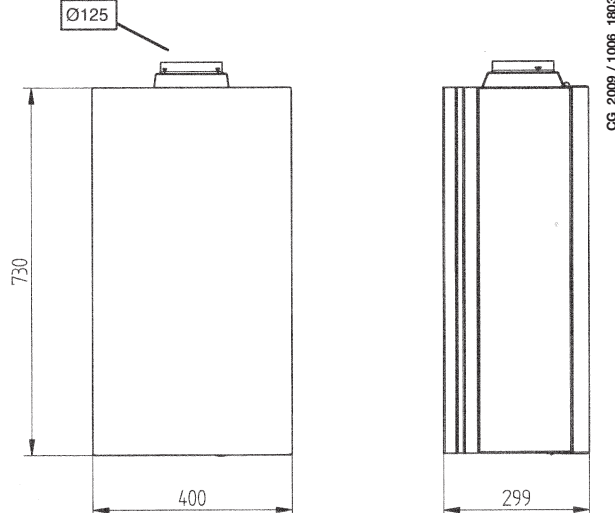


Figure 5

24 - 24 MI



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WARNING

Tighten the boiler nipple water connections with care (maximum tightening torque 30 Nm).

16. INSTALLING THE FLUE AND AIR DUCTS

Model 24 MI FF - 24 FF

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!

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

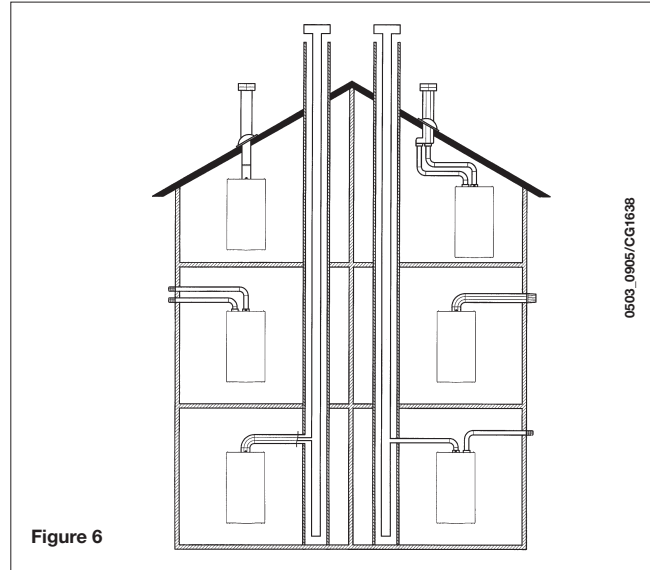


Figure 6

... 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 curve 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 curve combined with a coaxial duct or a 45° curve.

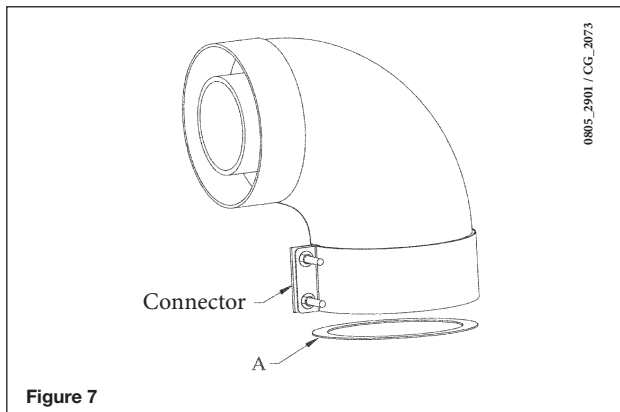


Figure 7

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.

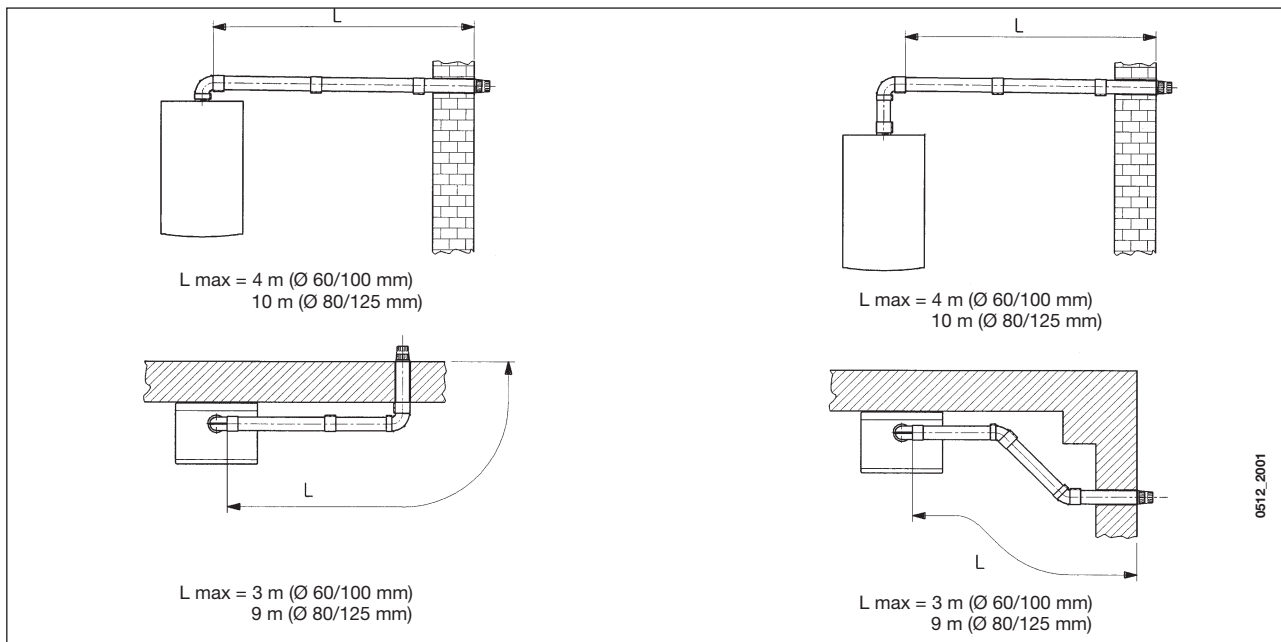
Make sure there is a minimum upward slope towards the outside of 1 cm per metre of duct.

- A 90° curve reduces total duct length by 1 metre.
- A 45° curve reduces total duct length by 0.5 metres.

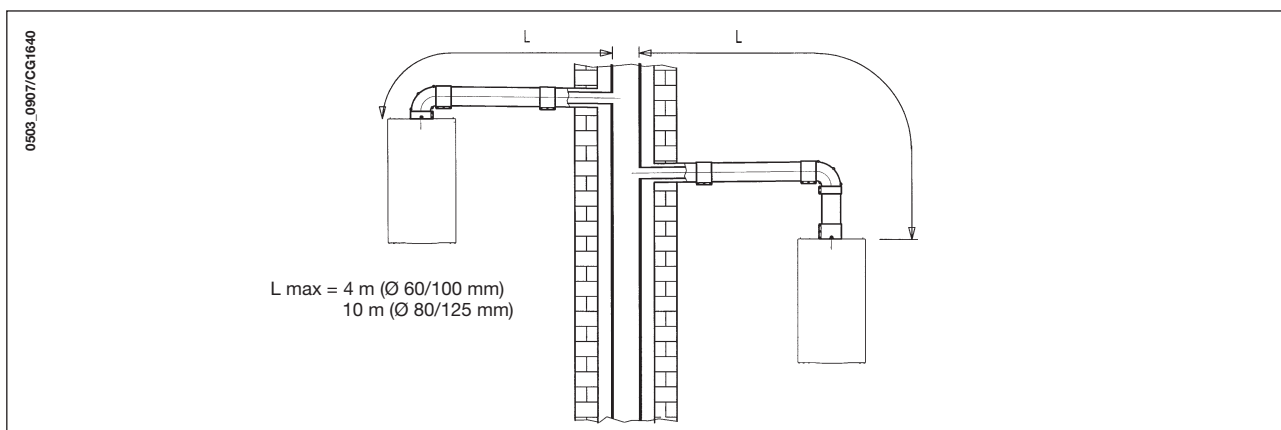
The first 90° curve is not considered when calculating the maximum available length.

Diameter coaxial flue-air duct (mm)	Length (m)	Use of DIAPHRAGM on INLET LINE A (mm)
60/100	0 ÷ 1	Ø 80
	1 ÷ 4	NO
80/125	0 ÷ 10	Ø 90

16.1 HORIZONTAL FLUE INSTALLATION EXAMPLES

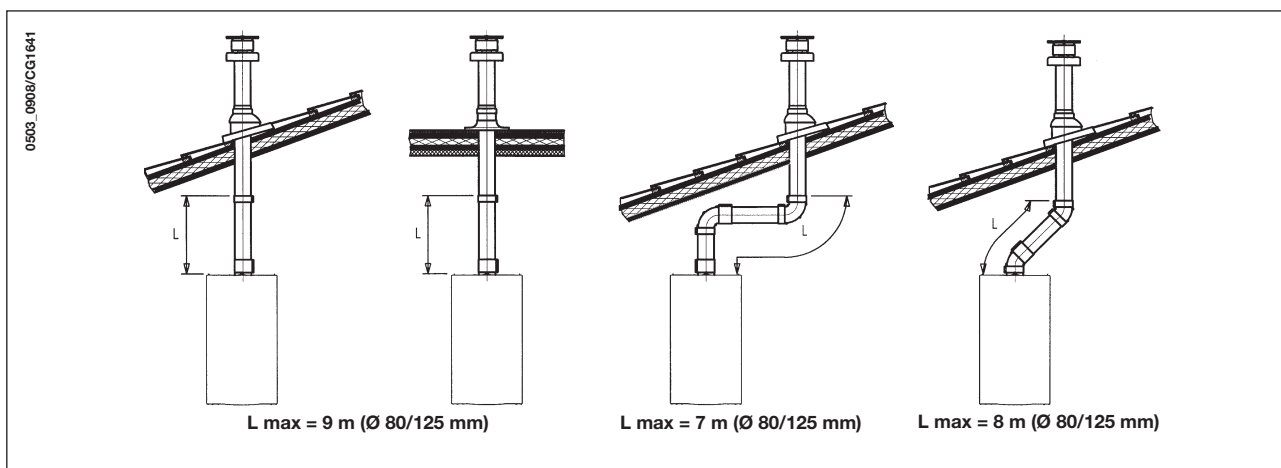


16.2 LAS FLUE DUCT INSTALLATION EXAMPLES C42 TYPE



16.3 VERTICAL FLUE INSTALLATION EXAMPLES

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.

Boiler model	(L1+L2)	Position of air regulator	CO ₂ %	
			G20	G31
24 MI FF 24 FF	0 ÷ 4	1	7,2	8
	4 ÷ 18	2		
	18 ÷ 30	3		

The first 90° curve is not considered when calculating the maximum available length.

The 90° curve 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 curve combined with a duct or a 45° curve.

- A 90° curve reduces total duct length by 0.5 metres.
- A 45° curve 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 connector, 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 anticlockwise 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

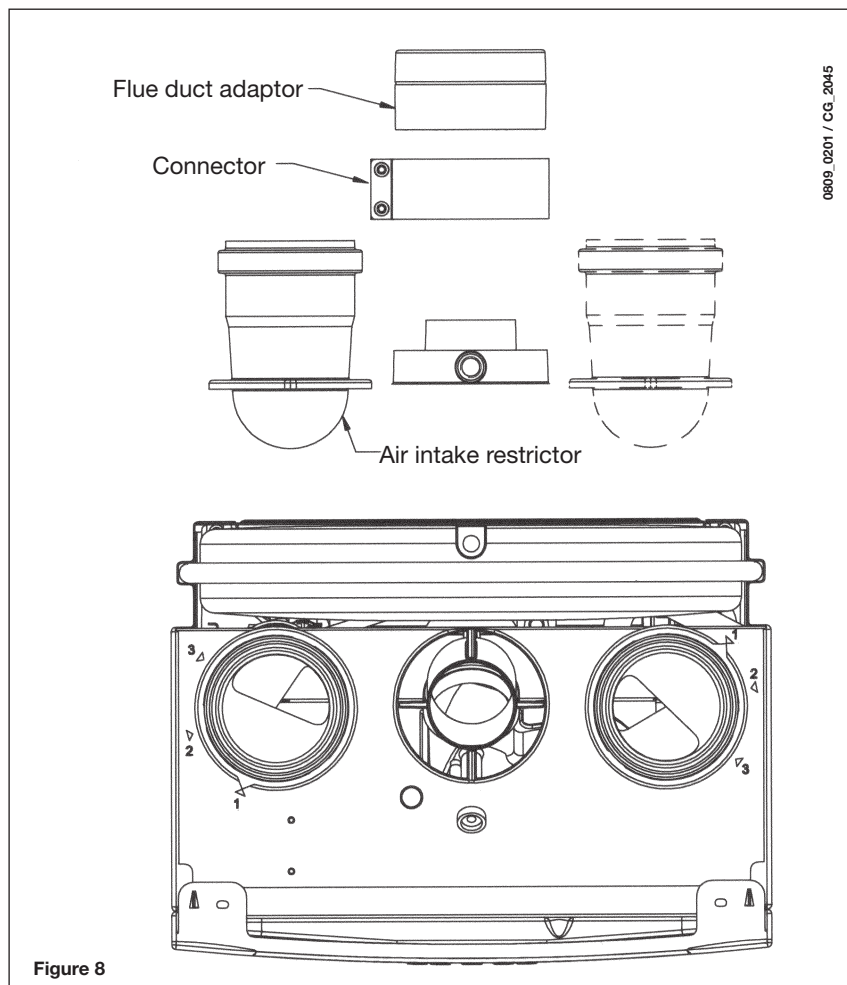
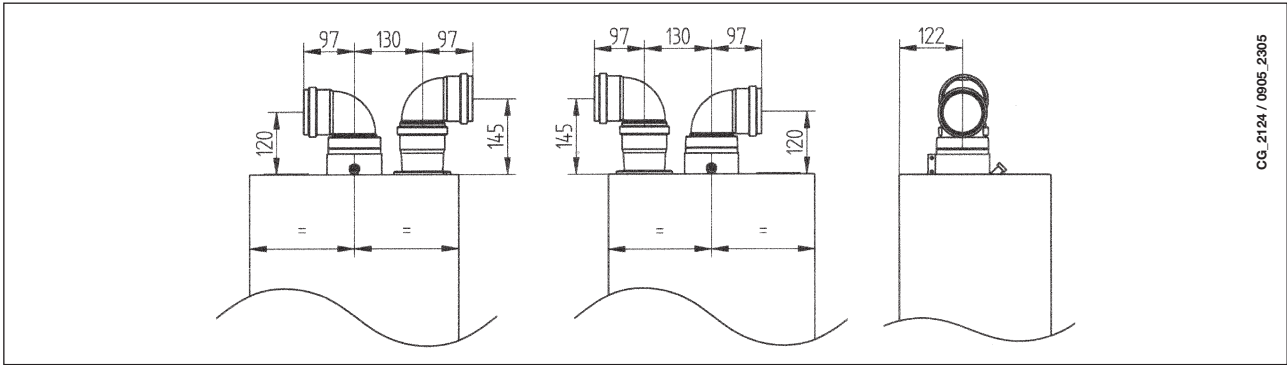


Figure 8

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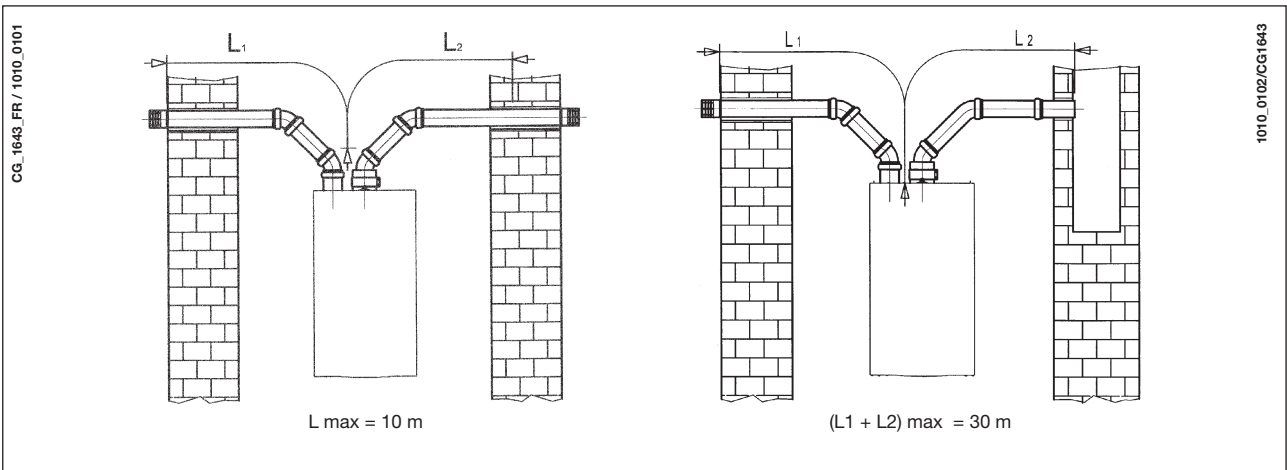
16.4 DIMENSIONS OF SEPARATE OUTLETS



CG_2124 / 0905_2305

16.5 HORIZONTAL SEPARATE FLUE INSTALLATION EXAMPLES - C82

IMPORTANT - Make sure there is a minimum downward slope towards the outside of 1 cm per 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.



CG_1643_FR / 1010_0101

1010_0102/CG1643

N.B.: For the C52 type, do not fit the flue and air duct terminals on opposite walls of the building. The inlet flue must have a maximum length of 10 metres for C52 fumes outlets.

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.

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 9).

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).

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

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

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

⊕ = **Earth** (yellow-green)

(1) (2) = **Contact for room thermostat**

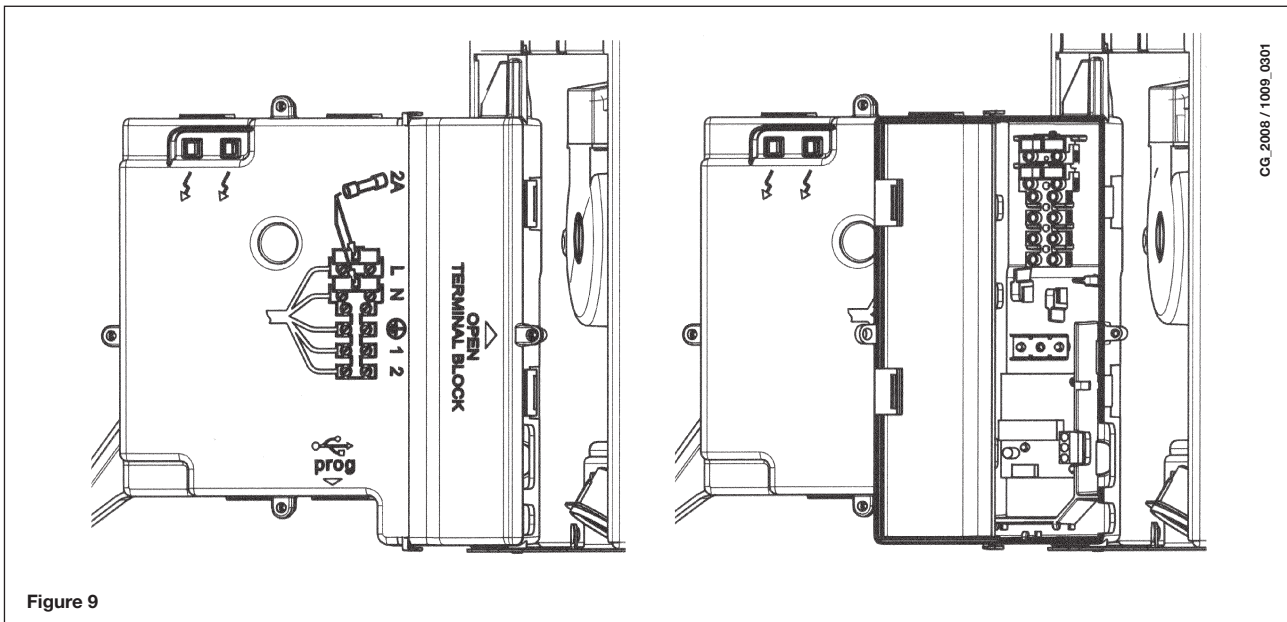


Figure 9

18. CONNECTING THE ROOM THERMOSTAT

- Access the power supply terminal block (figure 9) as described in the previous section;
- remove the jumper on terminals (1) and (2);
- thread the two-wire cable through the grommet and connect it to these two terminals.

19. GAS CONVERSION

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

Carry out the following operations:

- A) replace the nozzles of the main burner and the gas diaphragm (if fitted);
- B) new max. and min. calibration of the pressure regulator.

A) Replace the burner nozzles

- carefully pull the main burner off its seat;
- replace the main burner nozzles making sure to fully tighten them to prevent gas leaks. Nozzle diameters are specified in table 2.

B) 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 10). Only for models with sealed chambers, connect the negative pressure test point of the manometer to a "T" fitting in order to join the boiler adjustment outlet, the gas valve adjusting 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.

B1) Adjustment to nominal heat output:

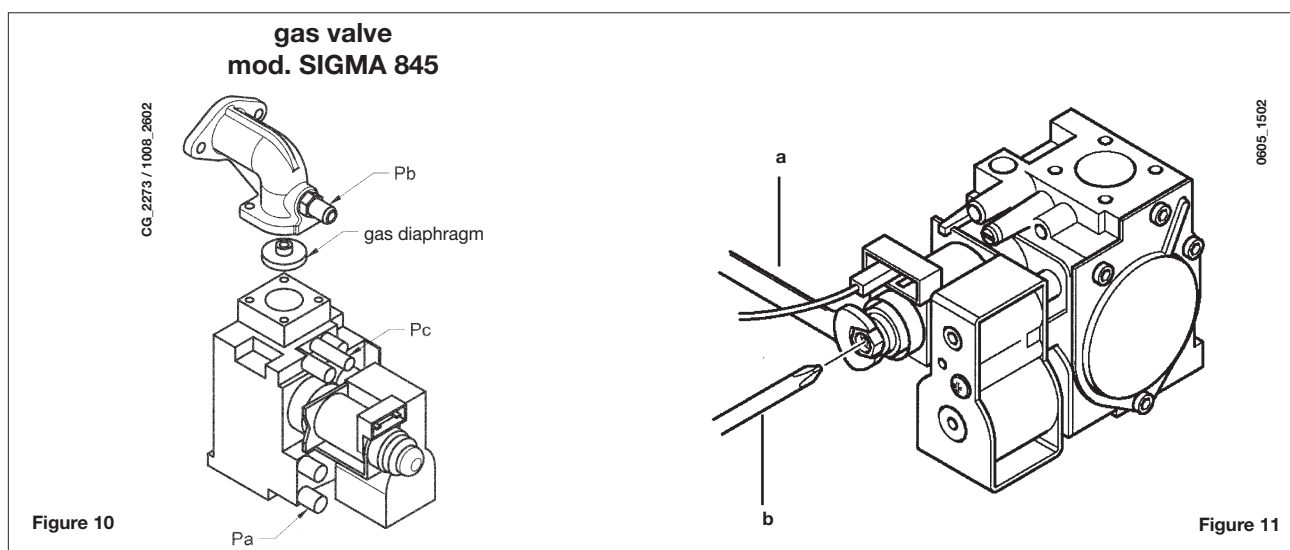
- open the gas tap and switch the boiler to the Winter mode;
 - open a hot water tap that can provide a flow rate of at least 10 litres a minute or make sure there is maximum heat demand;
 - remove the modulator cover;
 - adjust the tube brass screw (a) until the pressure values shown in table 1 are obtained;
- make sure that the dynamic inlet pressure of the boiler, measured at the gas valve pressure test point (Pa) (Figure 10) is correct (37 mbar for propane or 20 mbar for natural gas).

B2) Adjustment to reduced heat output:

- disconnect the modulator power cable and unscrew the screw (b) until a pressure value corresponding to reduced heat output is achieved (see tab. 1);
- reconnect the cable;
- mount the modulator cover and seal.

B3) Final checks

- attach the additional plate supplied with the transformer, specifying the type of gas and the calibration performed.



ATTENTION

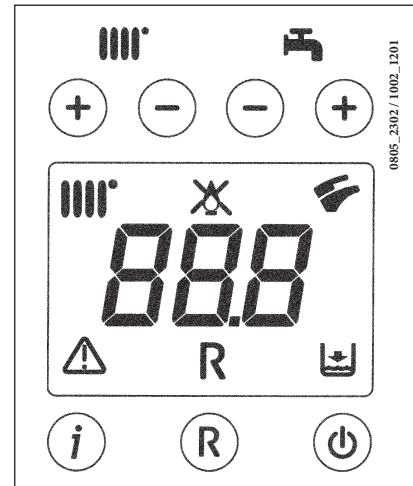
If the natural gas inlet pressure is too low (less than 17 mbar) remove the gas diaphragm installed over the gas valve (fig. 10) and set parameter **F02=00** on the electronic board (§21).

19.1 GAS VALVE CALIBRATION FUNCTION

To simplify calibration of the gas valve, the calibration function may be set directly on the boiler control panel as follows:

- a) hold down the buttons + and + together for at least 6 seconds;
- b) after about 6 seconds, the symbols flash;
- c) the display shows, at intervals of one second, "100" and the **flow temperature**. In this phase, the boiler works at the maximum heating output (100%).
- d) press +/- to immediately set the power of the boiler (100% or 0%);
- e) adjust the "Pmax/Pmin" screw (figure 10) to set the burner pressure value as described in table 1.
To adjust pressure at maximum power, turn the "Pmax" screw (fig. 10) clockwise to increase or anti-clockwise to decrease pressure at the burner.
To adjust pressure at minimum power, turn the "Pmin" screw (fig. 10) clockwise to increase or anti-clockwise to decrease pressure at the burner.
- f) press +/- to gradually set the desired power level (interval = 1%).

Press the button to leave the function.



Note:

The function is automatically deactivated after a period of 15 minutes, at the end of which the electronic board returns to its operating status prior to the activation of the function or prior to reaching the set maximum temperature.

Table of burner nozzles

	24 MI FF - 24 FF		24 - 24 MI	
	G20	G31	G20	G31
gas type	G20	G31	G20	G31
diameter of nozzles (mm)	1,28	0,77	1,18	0,77
Burner pressure (mbar*) REDUCED HEAT OUTPUT	2,0	5,7	2,4	5,6
Burner pressure (mbar*) RATED HEAT OUTPUT	11,6	32,6	13,8	31,0
Diameter of gas diaphragm (mm)	4,8	—	5,5	—
N° nozzles	13			

Table 1

Consumption 15°C-1013 mbar	24 MI FF - 24 FF		24 - 24 MI	
	G20	G31	G20	G31
Rated power	2,80 m³/h	2,00 kg/h	2,80 m³/h	2,04 kg/h
Reduced power	1,12 m³/h	0,82 kg/h	1,12 m³/h	0,82 kg/h
p.c.i.	34,02 MJ/m³	46,34 MJ/kg	34,02 MJ/m³	46,34 MJ/kg

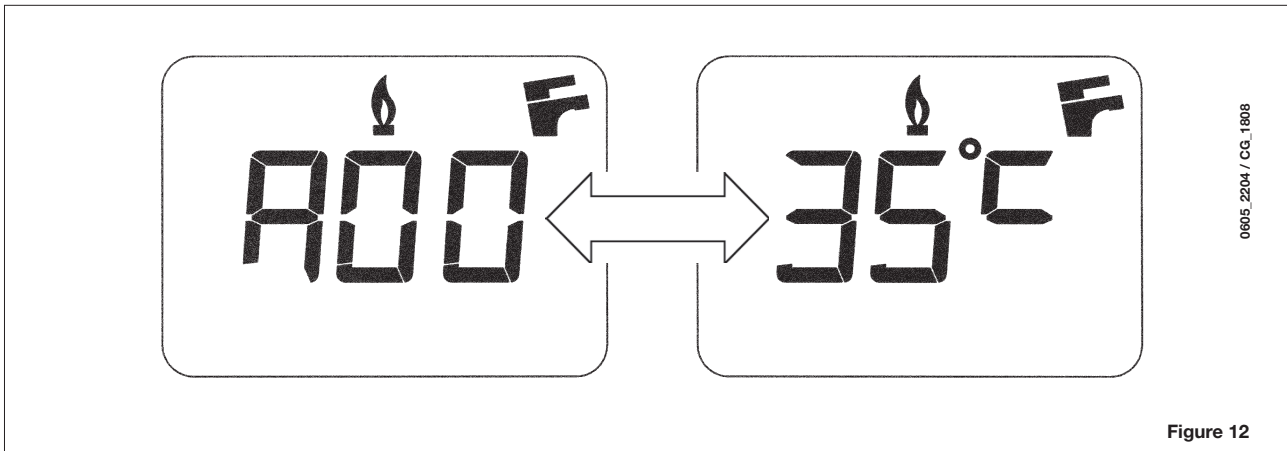
Table 2


* 1 mbar = 10,197 mmH₂O


20. VISUALISATION OF PARAMETERS ON THE DISPLAY ("INFO" FUNCTION)

Press "i" for at least 5 seconds to visualise certain boiler information on the display on the front panel of the boiler.



N.B: when the "INFO" function is enabled, the message "A00", alternating with the boiler delivery temperature, is shown on the display (figure 12):







- Press buttons  (+/-) to display the following information:

- A00:** current DHW temperature (°C);
 - A01:** current external temperature (°C) (with external sensor connected);
 - A02:** modulation current value (100% = 310 mA METHANE - 100% = 310 mA LPG);
 - A03:** power range (%) (MAX R);
 - A04:** heating setpoint temperature (°C) - - If the external sensor is connected, the value of the "kt" curve is displayed (section 26);
 - A05:** current heating delivery temperature (°C);
 - A06:** DHW temperature setpoint (°C);
 - A07:** — — ;
 - A08:** value (l/minx10) of the DHW flow rate;
 - A09:** last error that occurred in the boiler.
- This function remains active for 3 minutes. It is possible to interrupt the "INFO" function in advance by pressing button  for at least 5 seconds, or turning off the power to the boiler.

21. PARAMETER SETTINGS

To set the boiler parameters, press (– ) and (– ) together and hold down for at least 6 seconds. When the function is activate, the “F01” appears on the display alternating with the value of the parameter shown.


Edit parameters

- Press (+/– ) to scroll through the parameters;
- Press (+/– ) to edit each parameter;
- Press () to save the changes. “MEM” appears on the display;
- Press () to exit without saving. “ESC” appears on the display.

	Description of parameters	Factory settings			
		24 MI FF	24 FF	24 MI	24
F01	Type of boiler 10 = sealed chamber 20 = atmospheric chamber	10	10	20	20
F02	Gas used 00 = METHANE 01 = LPG 02 = METHANE (WITH DIAPHRAGM)	02			
F03	Hydraulic system 00 = instantaneous appliance 03 = appliance with external storage boiler 04 = appliance for heating only 13 = preheating (24h) 14 = preheating (1h)	13	04	13	04
F04/ F05	Setting programmable relays 1 and 2 (See SERVICE instructions) 00 = no associated function	00			
F06	Maximum CH setpoint (°C) 00 = 85°C - 01 = 45°C (function unavailable)	00			
F07	DHW inlet priority configuration	00	01	00	01
F08	CH max. output (0-100%)	100			
F09	DHW max. output (0-100%)	100			
F10	Min. heating output (0-100%)	00			
F11	Delay prior to new ignition in CH mode (00-10 minutes) - 00=10 seconds	03			
F12	Diagnostics (See SERVICE Instructions)	--			
F13-F14-F15	Factory settings	00			
F16	Anti-legionella function (with F03=03) 00 = disabled 55...67 = enabled (setpoint °C)	00			
F17	CH pressure sensor selection 00 = hydraulic pressure sensor 01 = hydraulic differential pressure sensor	00			
F18	Manufacture information	00			

22. ADJUSTMENT AND SAFETY DEVICES

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

- **Air pressure switch (model 24 MI FF - 24 FF)**
This device 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 10).
- **Fumes thermostat (model 24 MI - 24)**
This device has a sensor positioned on the left section of the fumes hood and shuts off the gas flow to the main burner if the flue is obstructed and/or if there is no draught. In these conditions the boiler shuts down and displays error code E03 (section 10). After eliminating the problem, press button () for at least 2 seconds to re-ignite immediately.

It is forbidden to disable this safety device

- **Safety thermostat**

Thanks to a sensor placed on the CH flow line, this 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 by pressing **(R)**, for at least 2 seconds.

It is forbidden to disable this safety device

- **Flame ionization 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.

Press **(R)**, for at least 2 seconds to re-establish normal operating conditions.

- **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 180 seconds and is enabled, in the heating mode, if the ambient thermostat causes the burner to go out.

- **Pump overrun for DHW circuit**

The electronically-controlled pump post-circulation function lasts 30 seconds and is enabled, in the DHW mode, if the probe causes the burner to go out.

- **Frost protection device (CH 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.

This function is enabled when the boiler is switched on, the gas supply is open and the system is correctly pressurised.

- **Water not circulating in primary circuit (pump probably blocked)**

If there is insufficient or no water circulating in the primary circuit, the boiler blocks and the error code E25 is shown on the display (section 10).

- **Anti-block pump function**

If no heat demand is received for 24 consecutive hours, in the heating mode, 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.

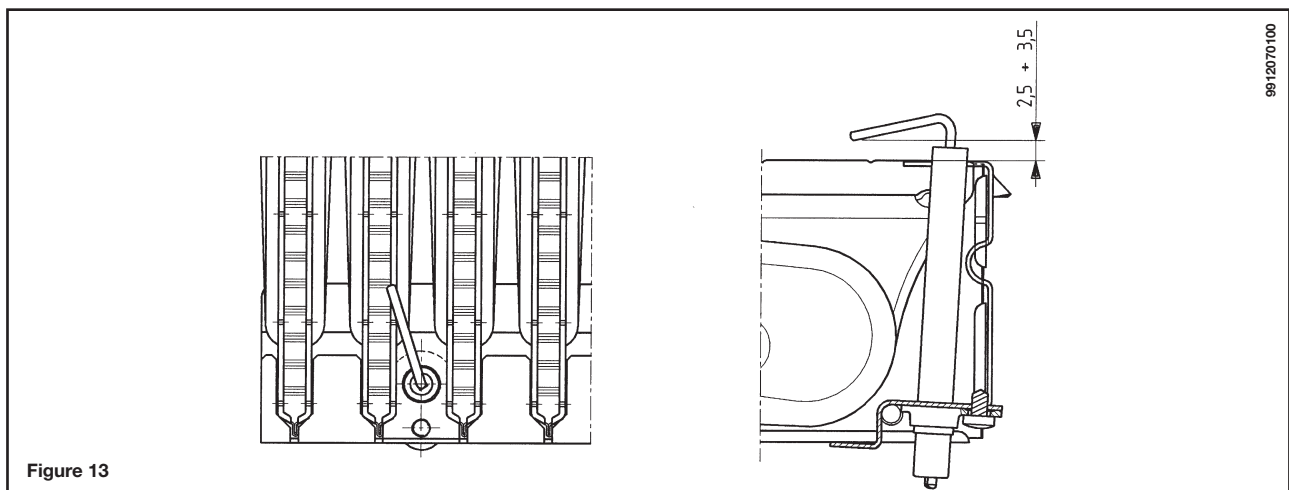
- **Hydraulic safety valve (heating circuit)**

This device is set to 3 bar and is used for the heating circuit-

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

N.B.: domestic hot water is guaranteed even if the NTC sensor develops a fault. In this case, temperature is controlled by the delivery sensor.

23. POSITIONING THE IGNITION AND FLAME-SENSING ELECTRODE



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 connection 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 circuit 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.

N.B.: to regulate the rated power, see chapter 19 (B1)

For natural draught boiler models, a hole must be made in the exhaust flue at a distance from the boiler equal to twice the internal diameter of the flue.

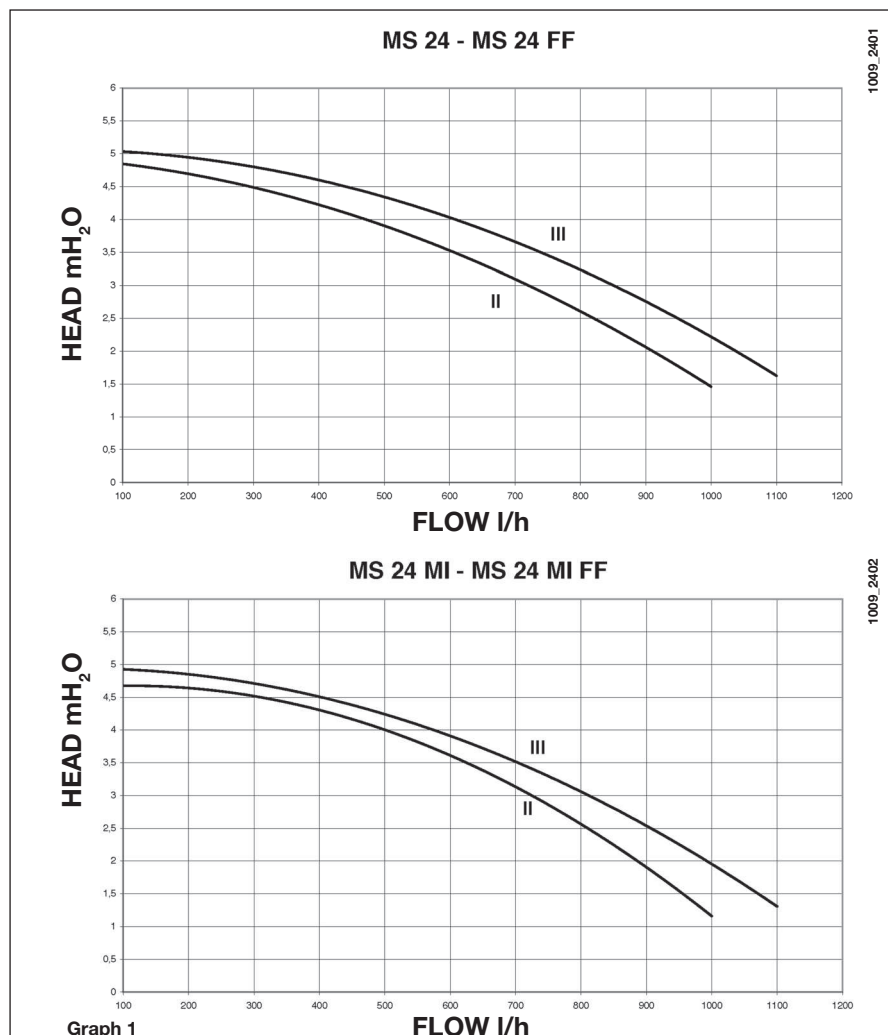
The following parameters can be measured through this hole:

- 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 (GRUNDFOS UPSO 15-50), 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.

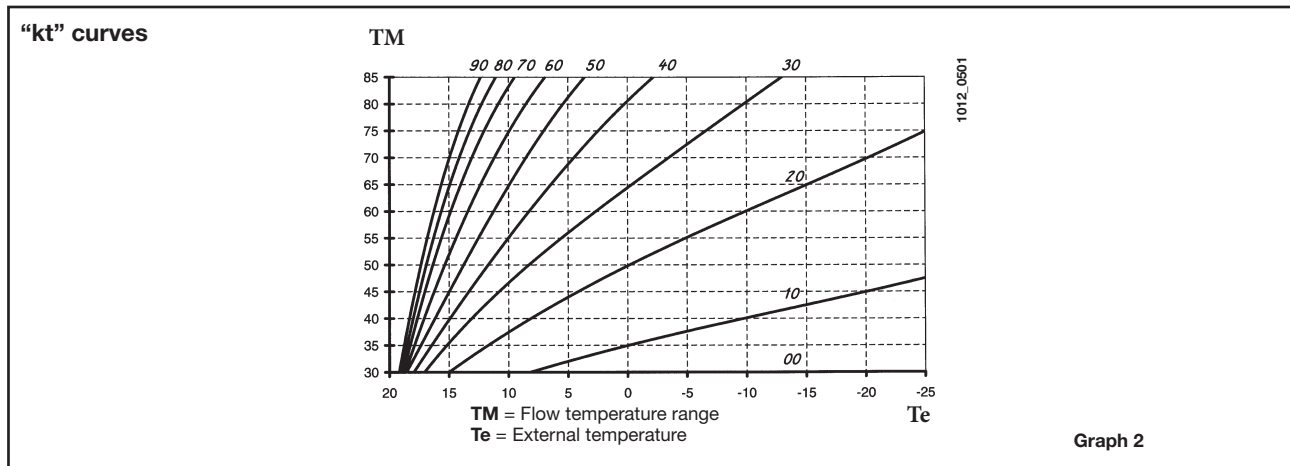


26. CONNECTING THE EXTERNAL SENSOR

The wiring harness leaving the control board includes two RED wires fitted with faston covers. Connect the external sensor to these two wires.

With the external sensor connected, the “kt” curve (Graph 2) can be changed by pressing **+/-** .

N.B.: In case of installation in an average living unit (good perimeter insulation and radiator systems), set the “kt” climate curve to “25”.




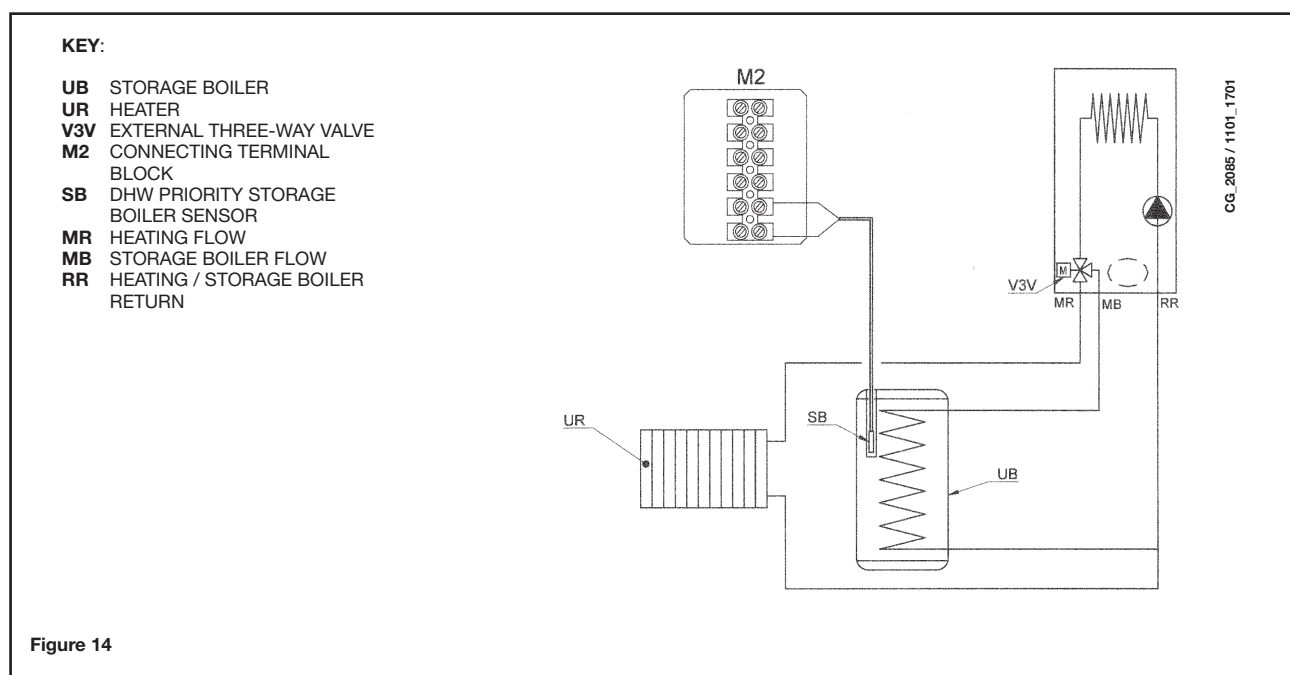
27. CONNECTING AN EXTERNAL STORAGE BOILER

Model 24 - 24FF

The DHW priority sensor NTC is supplied as an accessory.

CONNECTING THE STORAGE BOILER SENSOR

The boiler can be connected to an external storage boiler. Hydraulically connect the storage boiler as shown in fig. 14. Connect the DHW priority sensor NTC to terminals 5-6 on terminal block M2. The sensitive element of the NTC sensor must be inserted in the special well located on the storage boiler. Adjust DHW temperature (35 °C...60 °C) by pressing **+/-** .



IMPORTANT : Make sure that parameter **F03 = 03** (section 21).

28. 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.

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.

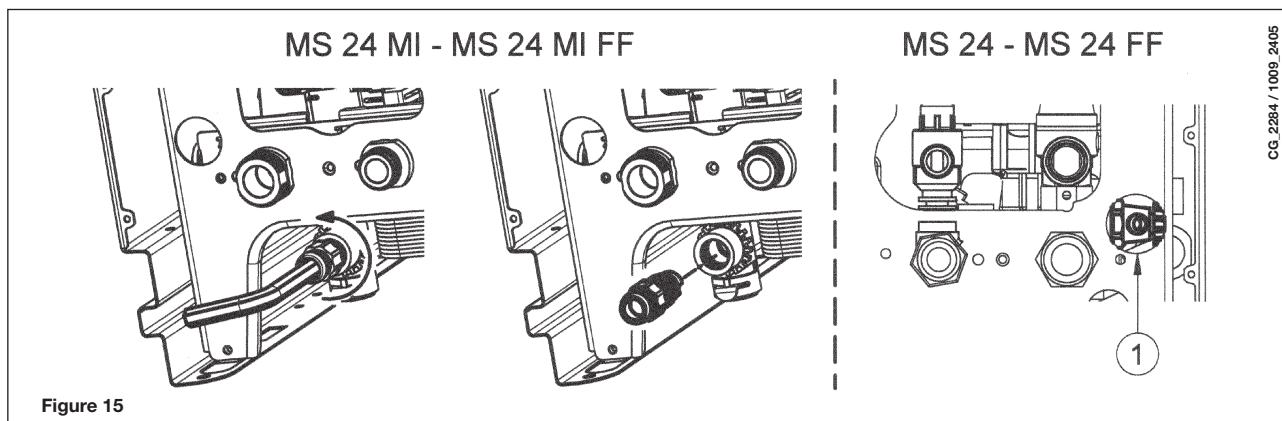
29. DRAINING THE BOILER CIRCUIT

Drain the boiler by opening the drain tap.

In boilers MS 24 MI and MS 24 MI FF the drain tap is located at the bottom while for boilers MS 24 and MS 24 FF it is next to the pump (1 – fig. 15).

To drain the boiler using the drain tap located at the bottom, proceed as follows (fig. 15):

- close the boiler on/off valves;
- open the drain tap using an 8 mm hex wrench;
- drain the boiler;
- close the drain tap using the 8 mm hex wrench.



30. CLEANING THE FILTERS

The DHW and CH filters are housed in special extractable cartridges. The CH cartridge is located on the CH return line (figure 16F) while the DHW cartridge is on the cold water input (figure 16E). To clean the filters, proceed as described below:

- switch off the boiler;
- shut the DHW inlet tap
- drain the water in the CH circuit by opening tap A in figure 16.
- remove the clip (1-E/F) from the filter as illustrated in the figure and take out the cartridge (2-E/F) containing the filter, taking care not to apply excessive force;
- to extract the heating filter cartridge, first remove the 3-way valve motor (1-2G - figure 16);
- eliminate any impurities and deposits from the filter;
- reposition the filter in the cartridge and put it back into its housing, securing it with the clip.
- to change the DHW NTC sensor, see figure 16D.

WARNING

when replacing and/or cleaning the O-rings on the hydraulic assembly, only use Molykote 111 as a lubricant, not oil or grease.

31. REMOVING SCALE FROM THE DHW CIRCUIT

The DHW circuit can be cleaned without removing the water-water heat exchanger if the assembly is fitted with the special tap (available on request) located on the DHW outlet. To clean, proceed as follows:

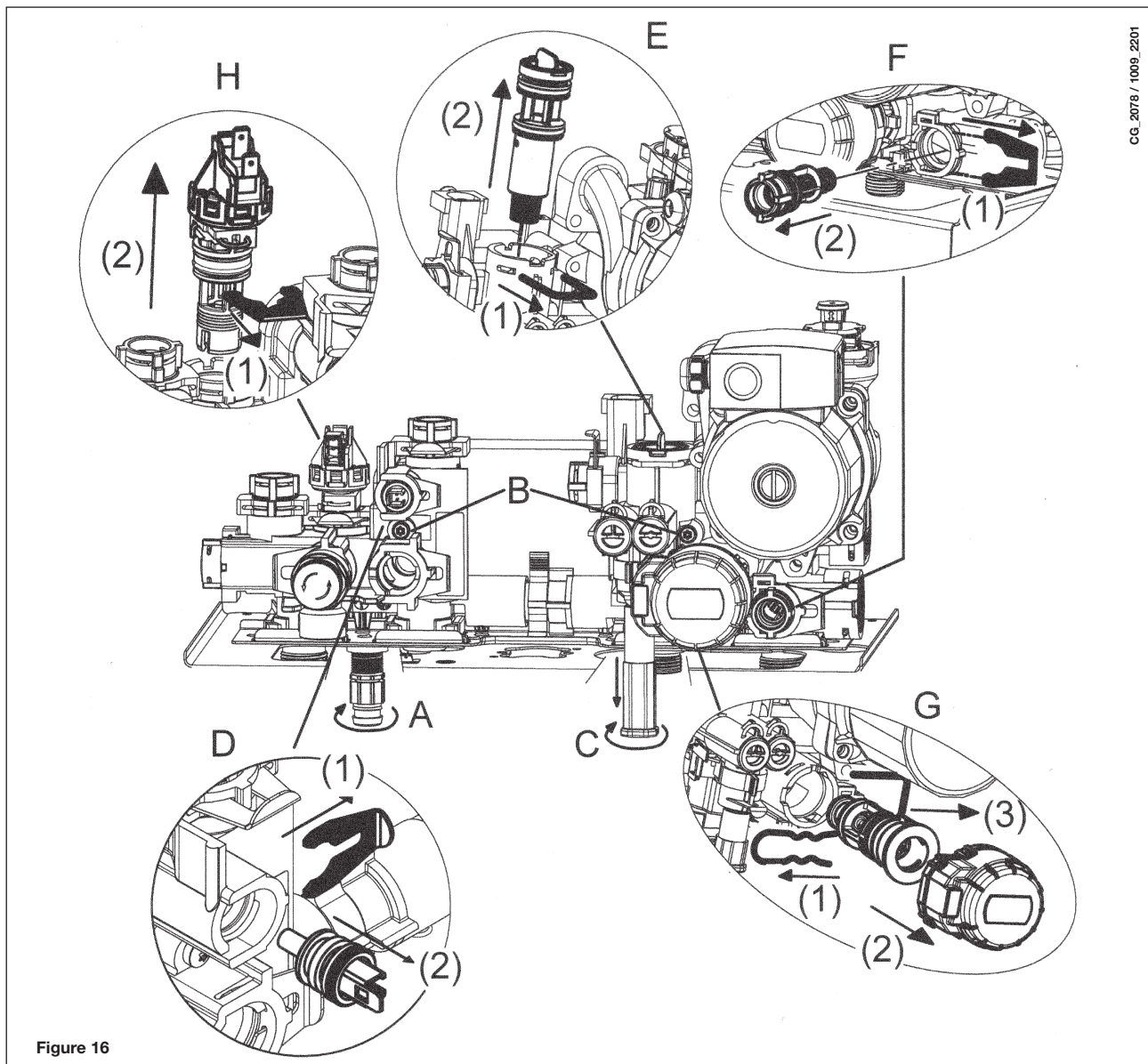
- Close the DHW inlet tap;
- Drain the DHW system by opening a hot water tap;
- Close the DHW outlet tap;
- Remove the clip 1E in figure 16;
- Remove the filter (2E figure 16);
- to change the DHW NTC sensor, see figure 16D.

If the special tap is not supplied, dismount the water-water heat exchanger, as described in the next section, and clean it separately. Remove the scale from the seat and relative NTC sensor fitted on the DHW circuit (figure 16D). To clean the exchanger and/or DHW circuit, use Cillit FFW-AL or Benckiser HF-AL.

32. DISMOUNTING THE WATER-WATER HEAT EXCHANGER

The stainless steel plate-type water-water heat exchanger can be disassembled with a hex wrench by operating as described below:

- drain the system, just the boiler if possible, **through the drain tap**;
- drain the DHW system;
- unscrew the pipe connecting the expansion vessel to the hydraulic assembly;
- remove the heating pressure switch (16H) without disconnecting the cable harness;
- remove the two screws (fig. 16B) at the front securing the water-water heat exchanger and pull it out using the space created after removing the heating pressure switch;
- clean the heat exchanger and put it back in place;
- screw on the pipe connecting the expansion vessel to the hydraulic assembly;
- put the hydraulic pressure switch back in place.



CG_20718 / 1009_2201

WARNING

Pay great attention when dismantling the individual parts of the hydraulic assembly. Do not use sharp tools, do not apply excessive force when removing the fixing clip.

33. FUNCTIONAL CIRCUIT DIAGRAM

24 MI FF

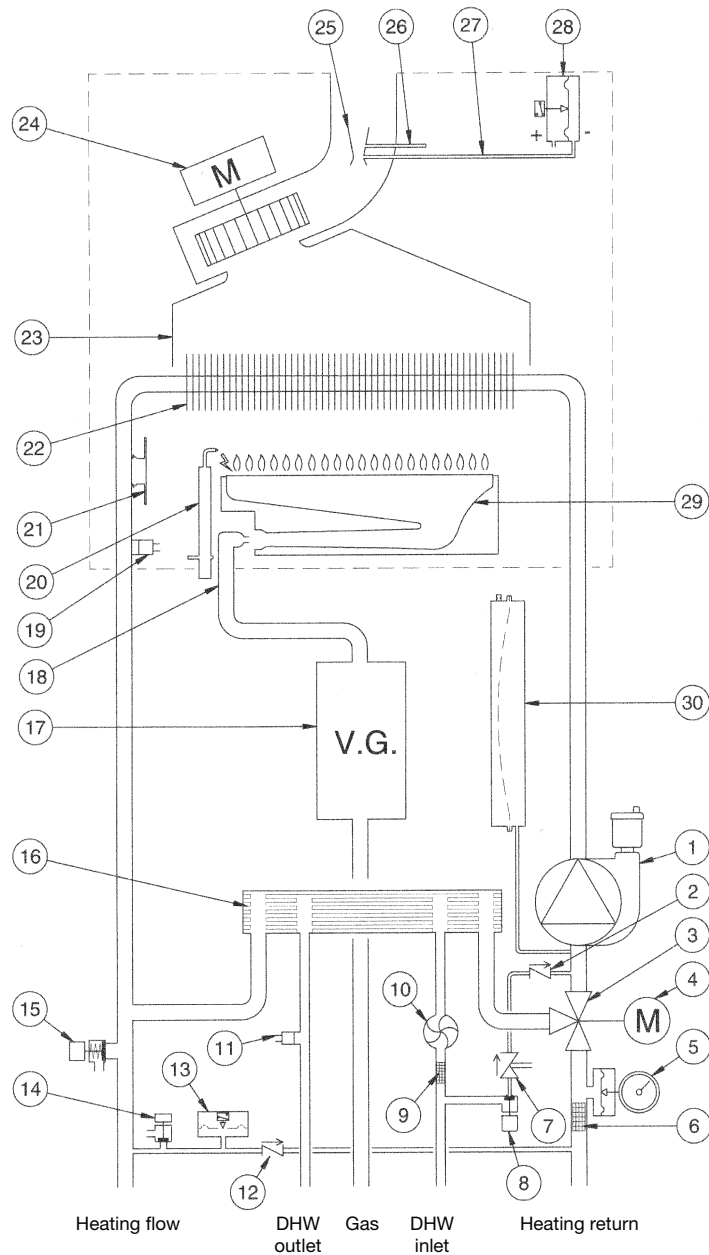


Figure 17

Key:

- | | |
|--------------------------------------|---------------------------------------|
| 1 Pump and air separator | 16 Water-water plate heat exchanger |
| 2 No-return valve | 17 Gas valve with gas diaphragm |
| 3 Three-way valve | 18 Gas train with nozzles |
| 4 Three-way valve motor | 19 Central heating NTC sensor |
| 5 Pressure gauge | 20 Ignition/flame detection electrode |
| 6 Heating circuit extractable filter | 21 Safety thermostat |
| 7 Disconnecter | 22 Water-fumes exchanger |
| 8 Boiler filling tap | 23 Fumes conveyor |
| 9 Cold water extractable filter | 24 Fan |
| 10 DHW priority sensor | 25 Venturi tube |
| 11 NTC domestic hot water sensor | 26 Positive pressure point |
| 12 Check valve on automatic by-pass | 27 Negative pressure point |
| 13 Water pressure switch | 28 Air pressure switch |
| 14 Boiler drain tap | 29 Burner |
| 15 Safety valve | 30 Expansion vessel |

24 MI

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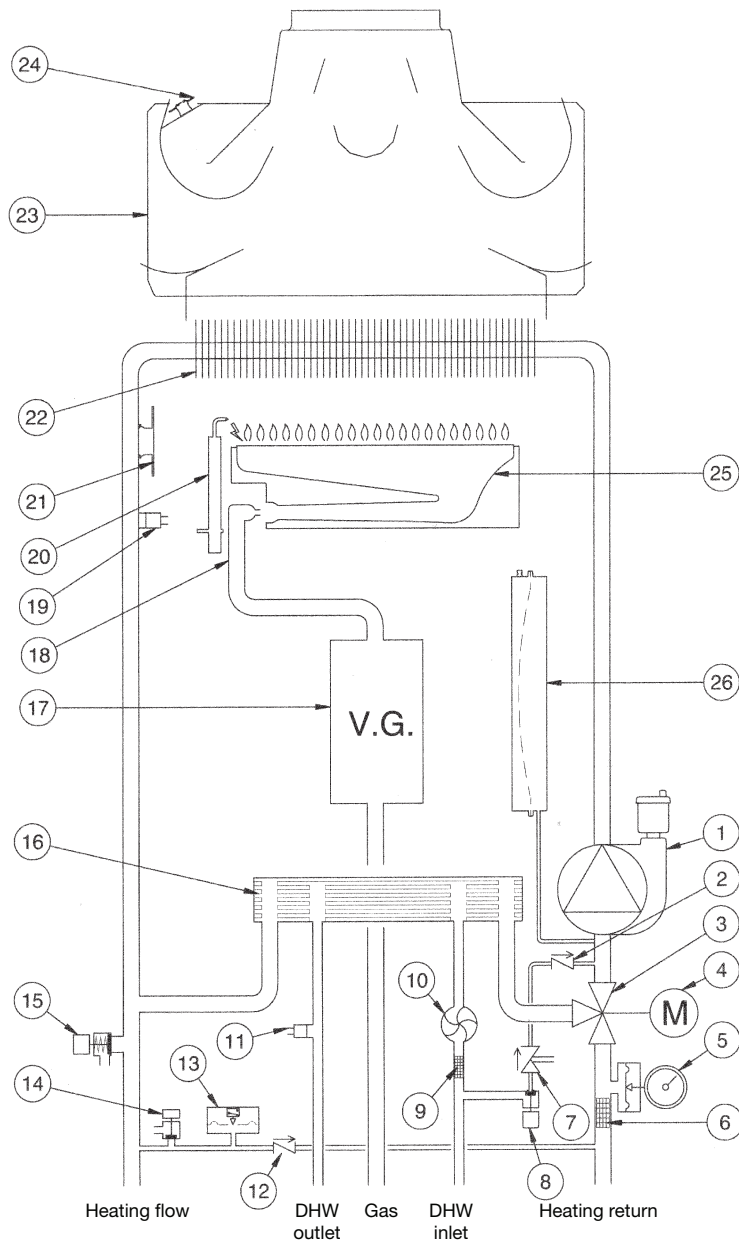


Figure 18

Key:

- | | |
|--------------------------------------|---------------------------------------|
| 1 Pump and air separator | 14 Boiler drain tap |
| 2 Check valve | 15 Safety valve |
| 3 Three-way valve | 16 Water-water plate heat exchanger |
| 4 Three-way valve motor | 17 Gas valve with gas diaphragm |
| 5 Pressure gauge | 18 Gas train with nozzles |
| 6 Heating circuit extractable filter | 19 Central heating NTC sensor |
| 7 Disconnector | 20 Ignition/flame detection electrode |
| 8 Boiler filling tap | 21 Safety thermostat |
| 9 Cold water extractable filter | 22 Water-fumes exchanger |
| 10 DHW priority sensor | 23 Fumes conveyor |
| 11 NTC domestic hot water sensor | 24 Fumes thermostat |
| 12 Check valve on automatic by-pass | 25 Burner |
| 13 Water pressure switch | 26 Expansion vessel |

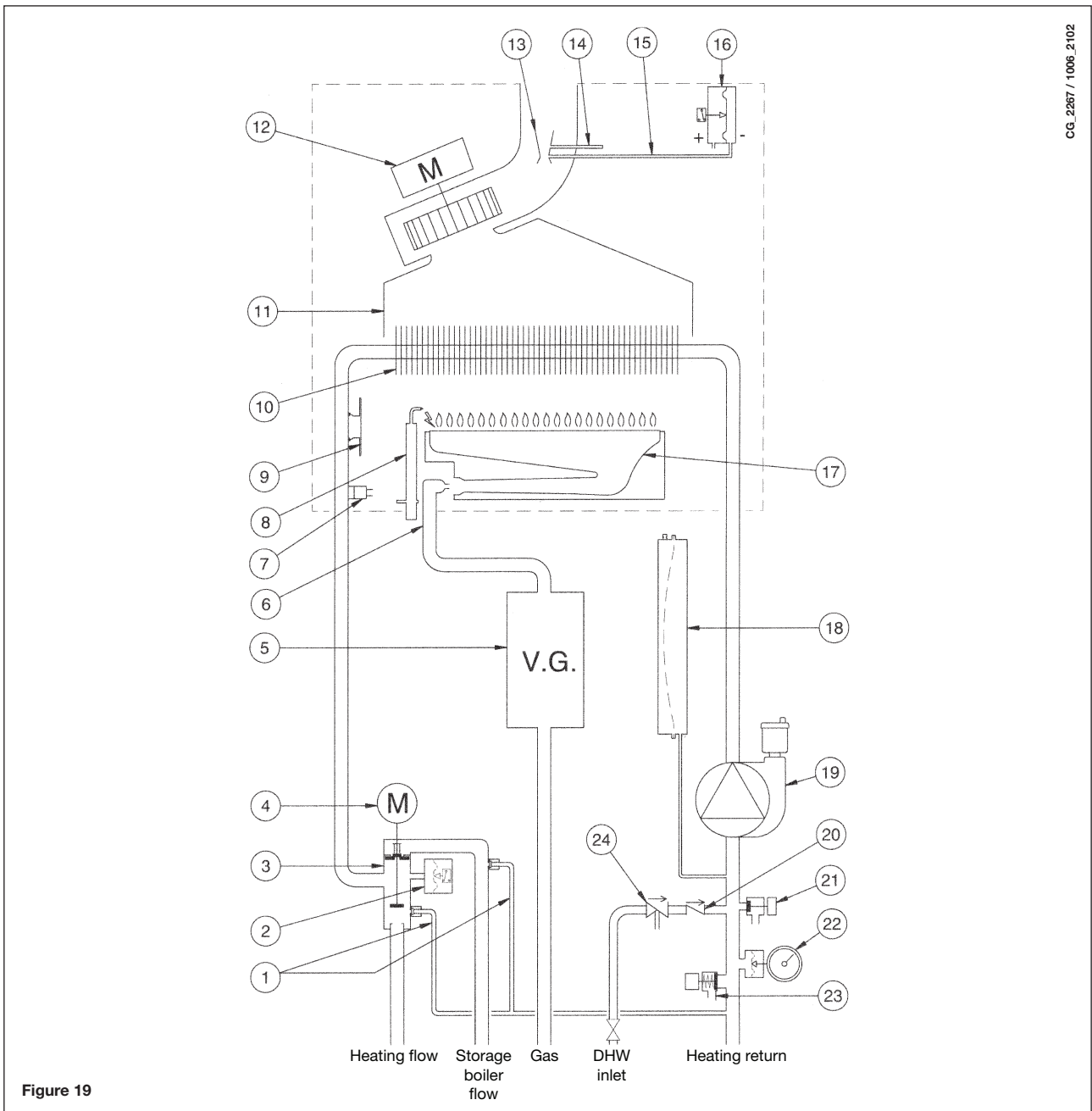


Figure 19

Key:

- | | |
|--------------------------------------|---------------------------|
| 1 Automatic by-pass with check valve | 13 Venturi tube |
| 2 Hydraulic pressure switch | 14 Positive pressure tap |
| 3 Three-way valve | 15 Negative pressure tap |
| 4 Three-way valve motor | 16 Air pressure switch |
| 5 Gas valve with gas diaphragm | 17 Burner |
| 6 Gas train with nozzles | 18 Expansion vessel |
| 7 NTC heating sensor | 19 Pump and air separator |
| 8 Ignition/flame detection electrode | 20 Non-return valve |
| 9 Safety thermostat | 21 Boiler drain tap |
| 10 Water-fumes exchanger | 22 Pressure gauge |
| 11 Fumes conveyor | 23 Safety valve |
| 12 Fan | 24 Disconnecter |

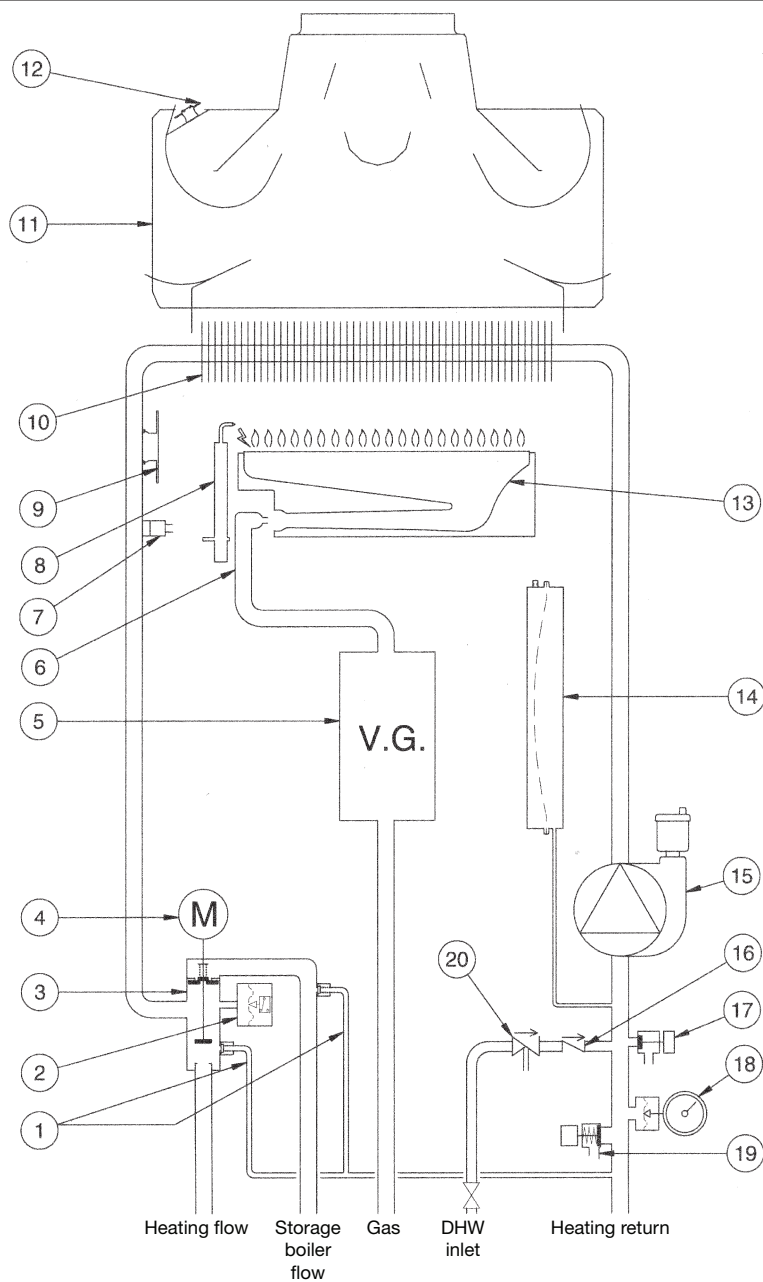


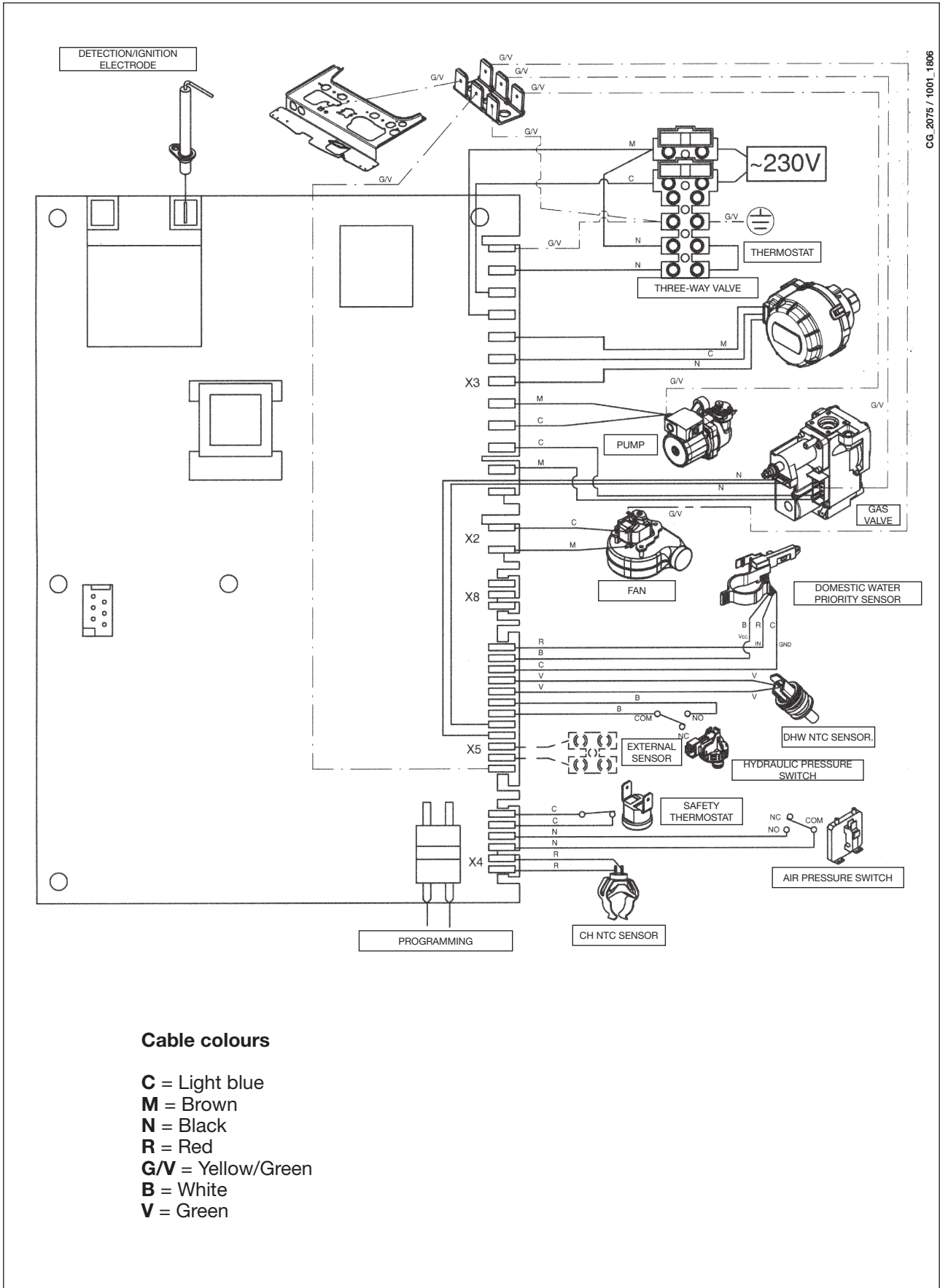
Figure 20

Key:

- | | |
|--------------------------------------|---------------------------|
| 1 Automatic by-pass with check valve | 11 Fumes conveyor |
| 2 Hydraulic pressure switch | 12 Fumes thermostat |
| 3 Three-way valve | 13 Burner |
| 4 Three-way valve motor | 14 Expansion vessel |
| 5 Gas valve with gas diaphragm | 15 Pump and air separator |
| 6 Gas train with nozzles | 16 Non-return valve |
| 7 NTC heating sensor | 17 Boiler drain tap |
| 8 Ignition/flame detection electrode | 18 Pressure gauge |
| 9 Safety thermostat | 19 Safety valve |
| 10 Water-fumes exchanger | 20 Disconnecter |

34. WIRING DIAGRAM

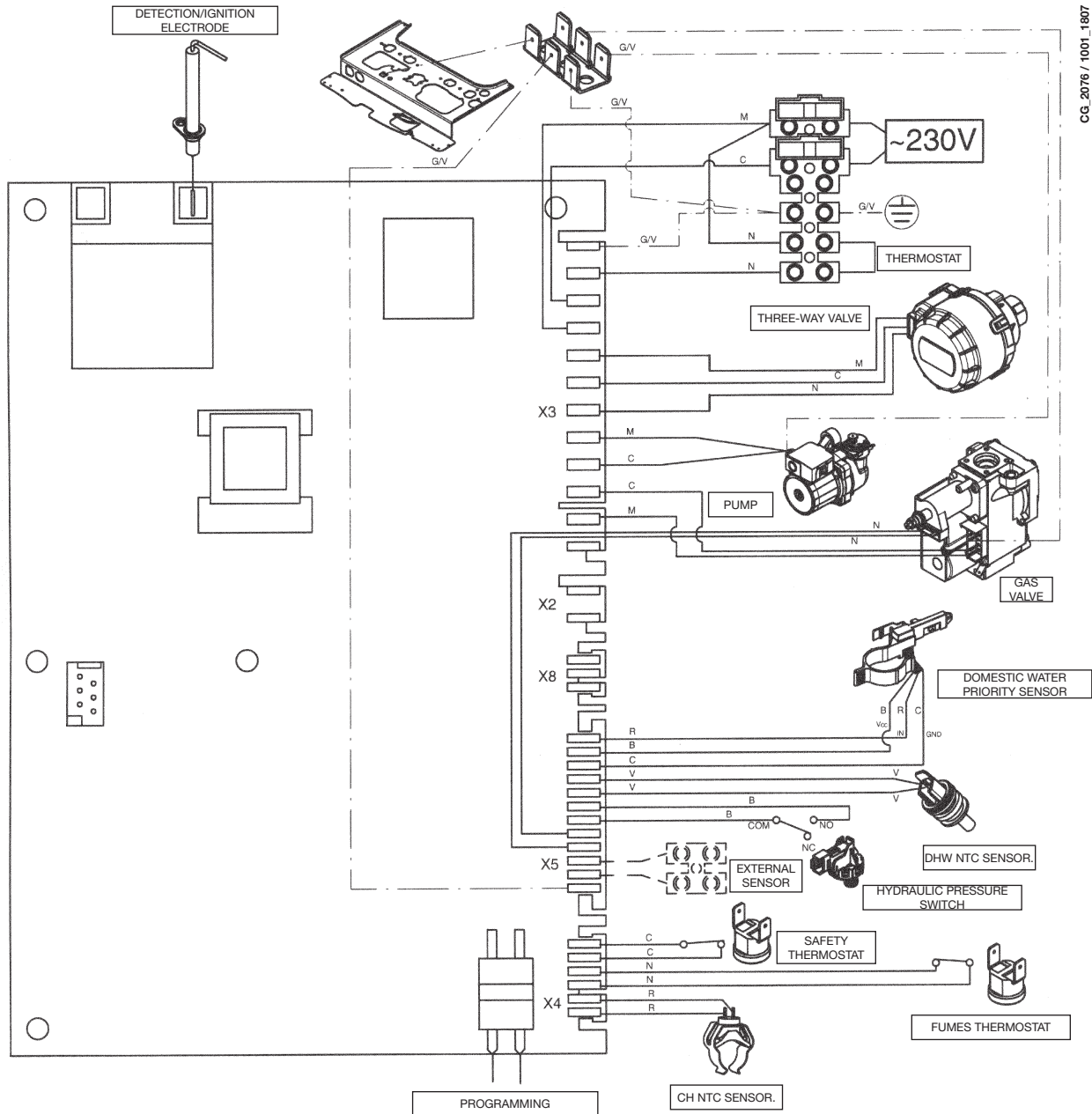
24 MI FF



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24 MI

CG_2076 / 1001_1807

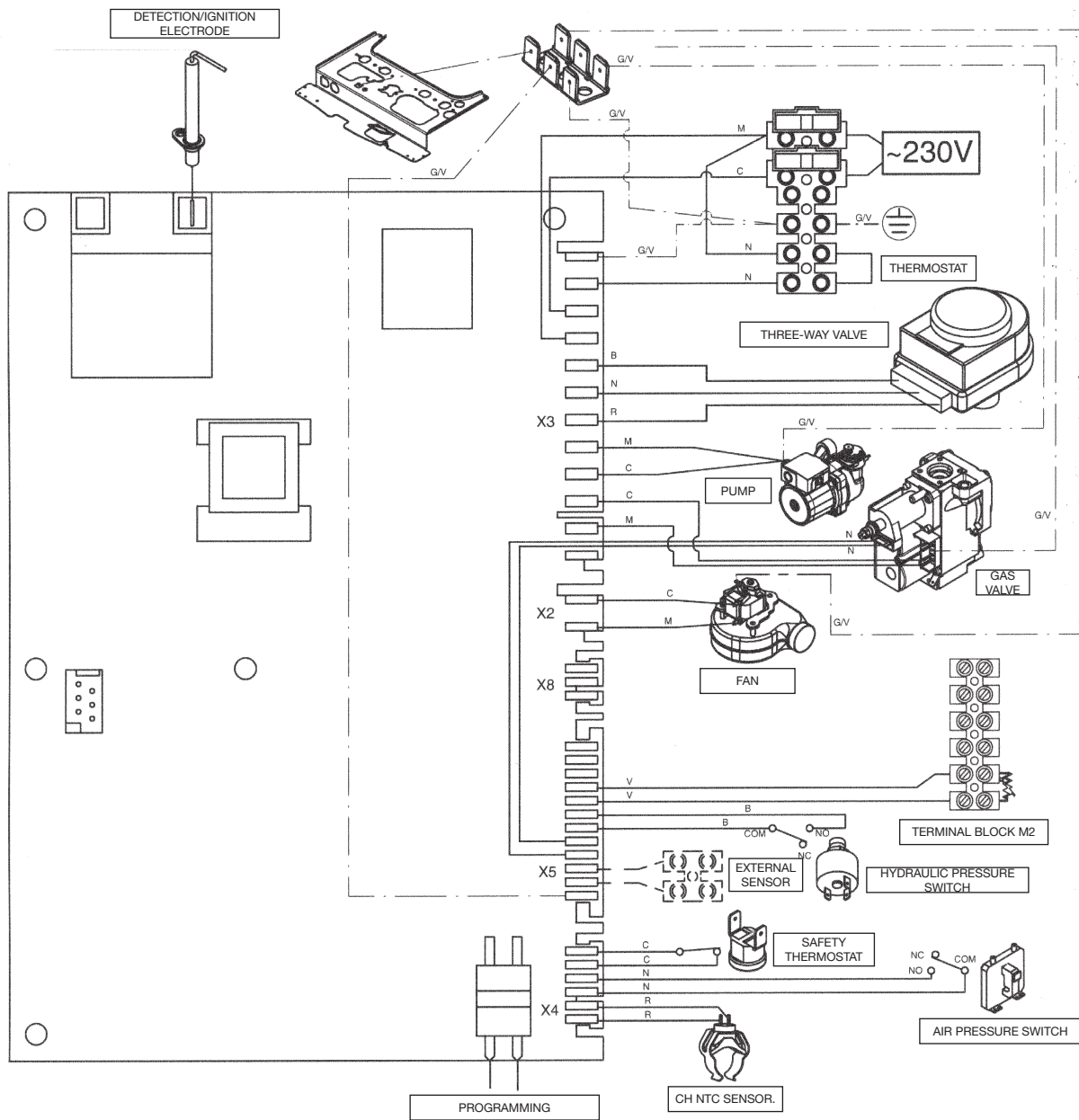


Cable colours

- C** = Light blue
- M** = Brown
- N** = Black
- R** = Red
- G/V** = Yellow/Green
- B** = White
- V** = Green

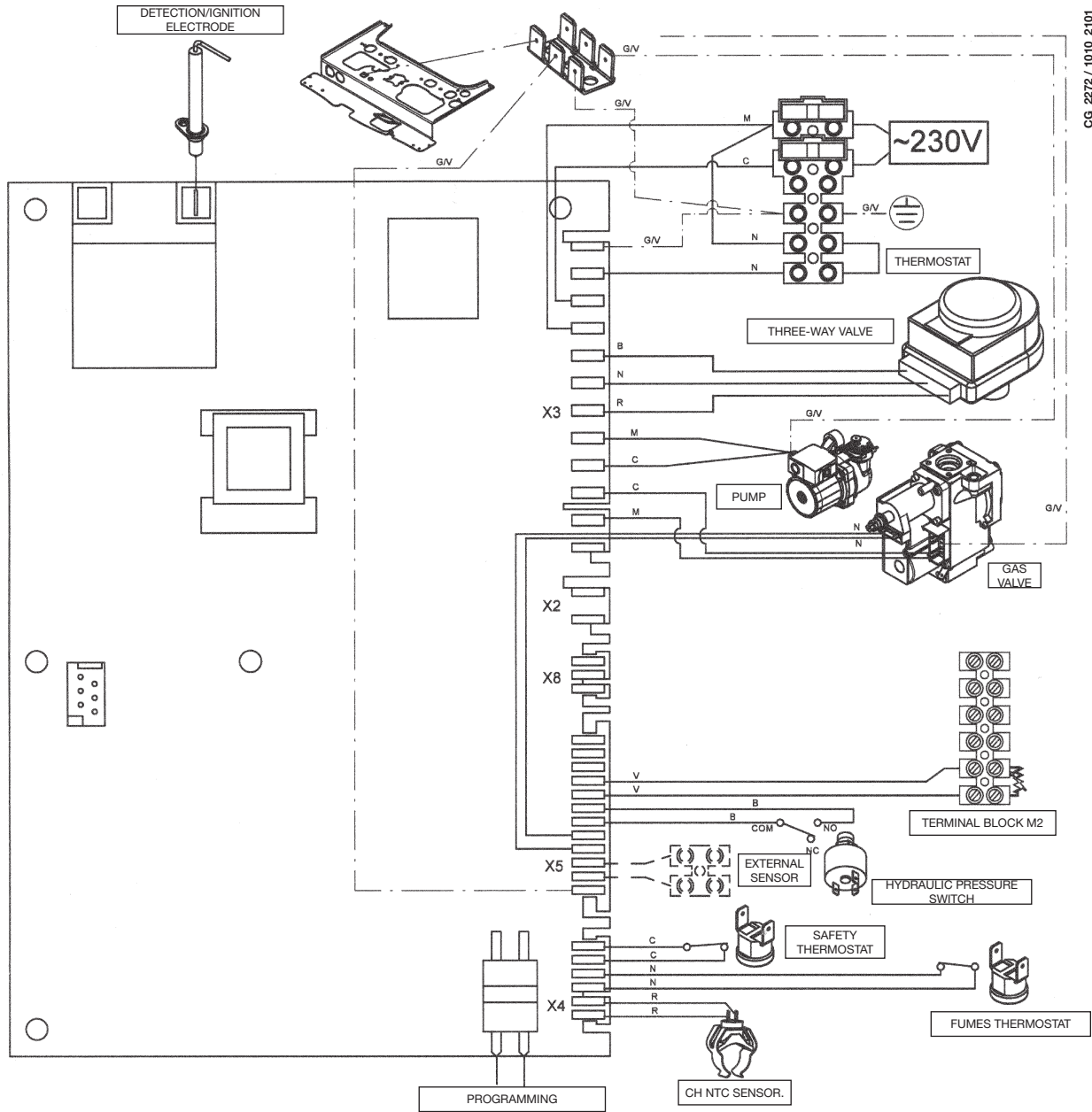
24 FF

CG_2271 / 1006_1603



Cable colours

- C** = Light blue
- M** = Brown
- N** = Black
- R** = Red
- G/V** = Yellow/Green
- B** = White
- V** = Green



Cable colours

- C** = Light blue
- M** = Brown
- N** = Black
- R** = Red
- G/V** = Yellow/Green
- B** = White
- V** = Green

35. TECHNICAL SPECIFICATIONS

Model MS		24 MI FF	24 FF	24 MI	24
Category		II2H3P	II2H3P	II2H3P	II2H3P
Rated heat input	kW	25,8	25,8	26,3	26,3
Reduced heat input	kW	10,6	10,6	10,6	10,6
Rated heat output	kW	24	24	24	24
	kcal/h	20.600	20.600	20.600	20.600
Reduced heat output	kW	9,3	9,3	9,3	9,3
	kcal/h	8.000	8.000	8.000	8.000
Useful efficiency according to directive 92/42/EEC	—	★★★	★★★	★★	★★
Max. water pressure in CH system	bar	3	3	3	3
Expansion vessel capacity	l	6	6	6	6
Expansion vessel pressure	bar	1	1	1	1
DHW max. water pressure	bar	8	—	8	—
DHW min. dynamic water pressure	bar	0,15	—	0,15	—
Minimum DHW flow	l/min	2,0	—	2,0	—
DHW output at $\Delta T=25\text{ }^{\circ}\text{C}$	l/min	13,7	—	13,7	—
DHW output at $\Delta T=35\text{ }^{\circ}\text{C}$	l/min	9,8	—	9,8	—
Specific output (*)	l/min	12	—	12	—
Temperature range in heating system	$^{\circ}\text{C}$	30/85	30/85	30/85	30/85
Temperature range in DHW system	$^{\circ}\text{C}$	35/60	35/60***	35/60	35/60***
Type	—	C12-C32-C42-C52-C82-B22		B _{11BS}	B _{11BS}
Coaxial flue duct diameter	mm	60	60	-	-
Coaxial air duct diameter	mm	100	100	-	-
2-pipe flue duct diameter	mm	80	80	-	-
2-pipe air duct diameter	mm	80	80	-	-
Flue duct diameter	mm	-	-	125	125
Max. flue mass flow rate	kg/s	0,014	0,014	0,020	0,020
Min. flue mass flow rate	kg/s	0,014	0,014	0,018	0,018
Max. exhaust temperature	$^{\circ}\text{C}$	146	146	110	110
Min. exhaust temperature	$^{\circ}\text{C}$	116	116	85	85
NOx Class	—	3	3	3	3
Type of gas	—	G20	G20	G20	G20
	—	G31	G31	G31	G31
Natural gas supply pressure	mbar	20	20	20	20
Propane gas supply pressure	mbar	37	37	37	37
Power supply voltage	V	230	230	230	230
Power supply frequency	Hz	50	50	50	50
Rated power supply	W	130	130	80	80
Net weight	kg	33	32	29	28
Dimensions	Height	mm	730	730	730
	Width	mm	400	400	400
	Depth	mm	299	299	299
Protection against humidity and water	(**)	IP X5D	IP X5D	IP X5D	IP X5D

(*) according to EN 625

(**) according to EN 60529

(***) with external storage boiler

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