

ANTEA CONDENSING

GB

Gas fired wall-mounted condensing boiler
Antea 24kW & 28kW Range



INSTALLATION, USE & MAINTENANCE MANUAL

MADE IN ITALY



<u>Natural Gas</u>	
Fondital Antea KC 24KW Combi G.C.N° 47 309 06	SEDBUK SAP 2009 88.1%
<u>LPG</u>	
Fondital Antea KC 24KW Combi G.C.N° 47 309 07	SEDBUK SAP 2009 89.1%

Benchmark

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hot water Industry Council who manage and promote the Scheme.

Visit www.centralheating.co.uk for more information.



Dear Customer,

Thank You for choosing and buying a High quality Fondital Product.

<Please read these instructions carefully in order to properly install, operate, and maintain the equipment.

The Manufacturer recommends that Customers contact competent and qualified personnel only for maintenance and repair operations. All repair and maintenance should be carried out by a Gas Safe registered company/engineer with the relevant qualifications for this appliance. If you require help in to find an engineer please call our UK Help centre on 01329 828555 and we will recommend an engineer for your area

1. GENERAL INFORMATION FOR INSTALLERS, MAINTENANCE TECHNICIANS AND USERS

1.1. General warnings

This INSTRUCTION MANUAL, which is an integral and indispensable part of the product, must be handed over to the user by the installer and must be kept in a safe place for future reference. The manual must accompany the boiler should it be sold or its possession transferred. Following to the boiler installation, the installer is to advise the user on the boiler operation and its safety devices. This Manual must be left with the completed Benchmark commissioning booklet with the boiler as Regulation 29 of the HSC Gas safety (installation and use) Regulations 1998.



This boiler is designed for connection to a domestic heating or hot water system. Any other use is deemed as improper and as such dangerous. Under no circumstances will the manufacturer be held responsible for damage or injury to persons or animals caused by errors in the installation and/or use of the appliance, or through non-compliance with current local and national standards and/or the manufacturer's instructions.

The boiler must be installed by qualified personnel, in compliance with applicable laws and standards and according to the manufacturer's instructions given in this manual.

In the UK, the installation must be carried out by a Registered Installer. To check for authorised qualified engineers please contact Gas Safe 0800 408 5500 It must be carried out in accordance with the relevant requirements of the:

- Gas Safety Regulations;
- The appropriate Building Regulations either The Building Regulation, The Building Regulations (Scotland), Building Regulations (Northern Ireland);
- The Water Fittings Regulations or Water Bylaws in Scotland;
- The current I.E.E. Wiring Regulations.

Where no specific instructions are given, reference should be made to the relevant British Standards Code of Practice. In IE, the installation must be carried out by a competent Person and installed in accordance with the current edition of I.E. 813 "Domestic Gas Installations", the current Building Regulations and reference should be made to the current ETCI rules for electrical installations.

The commissioning of the boiler and any subsequent works carried out on the appliance must be effected by an appropriately qualified technician or an approved Fondital Helpline Service Centre technician.

Damage and/or injury caused by incorrect installation or use, or non-observance of the manufacturer's instructions shall relieve the manufacturer from any and all contractual and extra-contractual liability.

Before installing the boiler, check that the technical data corresponds to the requirements for its correct use in the system design.

Check that the boiler is intact and it has not been damaged during transport and handling: do not install equipment which is damaged and/or faulty. In case of doubt, do not attempt to use the product but refer to the supplier. Packing materials (cardboard box, wooden crate, nails, staples, plastic bags, polystyrene, etc.) must not be left within reach of children in that these items represent a potential hazard and must be disposed of in a responsible manner.

Do not obstruct the air intake or flue exhaust grills and terminals.

Only manufacturer approved and supplied accessories or optional kits (including electric ones) are to be installed with this product.

Properly dispose of the packaging as all the materials can be recycled. The packaging must therefore be sent to specific waste management sites.

In the event of failure and/or malfunction, shut down the system. Do not interfere with or attempt any repairs. Call for professionally qualified technical assistance only. Fondital Helpline UK 01329 828555.

Any warranty repairs to the appliance must be carried out exclusively by the manufacturer's authorised service centre using original spare parts. Non-observance of the above requirements may affect the safety of the boilers and endanger people, animals and property.

The manufacturer, in order to guarantee efficient and correct functioning of the equipment, recommends the boiler to be serviced and repaired by a Gas Safe Registered authorised Service Centre which is best trained for the purpose.

Before carrying out any cleaning or maintenance operations, disconnect the appliance from the mains electricity supply by switching off at the main switch and/or any other isolating device.



Routine boiler maintenance is to be performed according to the schedule indicated in the relevant section of this manual. Appropriate boiler maintenance ensures efficient operation, environment preservation, and safety for people, animals and objects.

In the event of long periods of inactivity of the boiler, disconnect it from power mains and close the gas Isolation valve. Warning! When power mains are disconnected, boiler electronic anti-freeze function will not be operative.

Should there be a risk of freezing, add anti-freeze: it is not advisable to empty the system as this may result in damage; use specific anti-freeze products suitable for multi-metal heating systems.



Should you smell gas:

- do not turn on or off electric switches and do not turn on electric appliances;
 - do not ignite flames and do not smoke;
 - close the main gas tap;
 - open doors and windows;
 - contact a Service Centre, a qualified installer or the gas supply company.
- Never use flames to detect gas leaks.

NATIONAL GRID GAS EMERGENCY 0800 111 999



The boiler is designed for installation in the country indicated on the technical data plate: installation in any other country may be source of danger for people, animals and objects.

The “operating instructions” of this manual must be read carefully as it provides information on the operating and the operating limits of the appliance.

This appliance must be used exclusively in an un-vented central heating system.

The warnings contained in this chapter have been written for the appliance user, the installer and the service engineer.

1.2. Product conformity

FONDITAL S.p.a. declare that all its products are manufactured to a high specification and in compliance with the relevant standards.

All FONDITAL boilers are CE certified and possess technical and functional characteristics that comply with the following standards:

UNI EN 297 for GAS-FIRED CENTRAL HEATING BOILERS TYPE B OF NOMINAL HEAT INPUT ≤ 70 kW

EN 483 for GAS-FIRED CENTRAL HEATING BOILERS TYPE C OF NOMINAL HEAT INPUT ≤ 70 kW

UNI EN 677 for GAS-Fired CENTRAL HEATING BOILERS. SPECIFIC REQUIREMENTS FOR CONDENSING BOILERS WITH NOMINAL HEAT INPUT ≤ 70 kW

Gas fired boilers also comply with the following directives:

GAS APPLIANCES DIRECTIVE 90/396 CEE for CE compliance

LOW VOLTAGE DIRECTIVE 2006/95 CE

BOILER EFFICIENCY DIRECTIVE 92/42 CE

ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 89/336 CE

The materials used such a copper, brass, stainless steel, etc. form a compact, homogeneous, highly functional unit that is easy to install and simple to operate. In its simplicity, the wall-mounted appliance is equipped with all the appropriate accessories required to make it a fully independent boiler capable of satisfying domestic hot water production and central heating needs. All boilers are fully inspected and are accompanied by a quality certificate, signed by the inspector, and a guarantee certificate. This manual must be kept in a safe place and must **accompany the boiler at all times.**

FONDITAL S.p.a. will not be held responsible for any misinterpretation of this manual resulting from the inaccurate translation of same.

FONDITAL S.p.a. will not be held responsible for the consequences in the case of non observance of the instructions contained in this manual or in the case where actions not specifically described herein are undertaken.

FONDITAL S.p.a. declare that no substances harmful to health are contained in the appliance or used during appliance manufacture and have not used or intend to use any of the following substances in the manufacture of Fondital heating products:

- Asbestos
- Mercury
- CFC's



It is a condition of the manufacturers warranty that the Benchmark Commissioning Checklist is fully completed and left with the appliance.

QUICK GUIDE OPERATING INSTRUCTIONS

The following instructions will help you to switch the boiler on quickly and regulate it for immediate use.



It is presumed that the boiler has been installed by a qualified installer, it has been commissioned and is ready to operate correctly.



If any accessories have been fitted on the boiler, these instructions will not cover them. You will therefore have to refer to the full boiler instructions as well as to the specific instructions for the accessories.

This manual contains full details of how the boiler works, and full operating and safety instructions.

1. Open the yellow handled gas cock installed Under the boiler.

2. Turn the Electrical mains switch installed adjacent to the boiler to **ON**: the display comes on and shows the function set via the boiler mode button (fig. 1) and flow water temperature.

3. If **you do not wish** to activate the heating function press the boiler mode button **3** (fig. 1) until displaying the SUMMER symbol: this will activate domestic hot water (DHW) only, and the display will show the DHW temperature.



Boiler mode button



SUMMER symbol

4. If **you wish** to activate the heating function and domestic hot water, press the boiler mode button (**3**, fig. 1) until displaying the WINTER symbol: this will activate both DHW and heating, the display will show the primary flow water temperature.



Boiler mode button



WINTER symbol

5. If **you wish** to activate the heating function press the boiler mode button **3** (fig. 1) until displaying the CENTRAL HEATING ONLY symbol: this will activate heating function, and the display will show the primary flow water temperature.

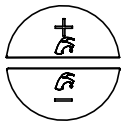


Boiler mode button



CENTRAL HEATING ONLY symbol

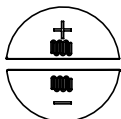
6. To adjust the DHW temperature press domestic hot water temperature buttons (**1** in fig. 1); then set as required. While regulating, the LCD displays the temperature setting and the tap symbol flashes.



Domestic hot water temperature buttons



7. To adjust the heating water temperature press heating water temperature buttons (**6** in fig. 1); then set as required. While the heating water temperature is being regulated, the LCD displays the temperature setting and the CH symbol flashes.



Central heating water temperature buttons



8. Set the desired temperature on the (optional) room thermostat in the building.
The boiler is now ready to operate.

If the boiler shuts down, press boiler reset button (**4** in fig. 1). If the boiler does not restart, contact contact the Fondital Helpline UK.

CONTENTS

General information	2
Precautions	3
1. General information for the installer, maintenance technician and users	4
1.1. General warnings	4
1.2. Product conformity	5
Quick guide operating instructions	6
2. Instructions for the user	9
2.1. Control panel	9
2.2. LCD	10
2.3. Interpreting BOILER STATUS from LCD DISPLAY INDICATIONS	11
2.4. Boiler operation	12
2.4.1. Switching on	12
2.4.2. CH function	12
2.4.3. DHW function	12
2.4.4. Freeze protection function	13
2.4.5. Pump and valve anti-shutdown function	13
2.4.6. Operation with (optional) remote control	13
2.5. Boiler shutdown	14
2.5.1. Burner shutdown	14
2.5.2. Shutdown due to air intake/flue gas system malfunction	14
2.5.3. Shutdown due to a water circulation malfunction	14
2.5.4. Shutdown due to fan malfunction	15
2.5.5. Alarm due to temperature probe malfunction	15
2.5.6. Alarm due to (optional) remote control connection malfunction	15
2.5.7. Alarm due to (optional) external probe malfunction	15
2.6. Maintenance	16
2.7. Notes for the user	16
3. Technical features and dimensions	17
3.1. Technical features	17
3.2. Dimensions	18
3.3. Boiler layout	19
3.4. Operating data	19
4. Instructions for installation	21
4.1. Installation standards	21
4.2. Reference standard	21
4.3. System details	22
4.3.1. Central heating circuit	22
4.3.2. Filling the central heating system	22
4.3.3. Domestic Hot Water circuit	22
4.4. Site requirements	22
4.4.1. Choosing where to install the boiler	22
4.4.2. Positioning the boiler	23
4.4.3. Boiler room ventilation	24
4.4.4. Flue	24
4.5. Installation (authorised personnel only)	25
4.5.1. Packaging	25
4.5.2. Installing the boiler	25
4.5.3. Gas main connection	25
4.5.3. Hydraulic connection	26
4.5.5. Air intake and flue gas discharge system	28
4.6. Configuration of air intake and flue gas discharge ducts	29
4.6.1. Ø 100/60 mm or Ø 125/80 mm air intake/flue gas discharge via coaxial ducts	29
4.6.2. Ø 80 mm air intake and flue gas discharge via split ducts	31
4.7. Connection to electrical mains	32
4.8. Connection to room thermostat (optional)	32
4.9. Installation and operation with Open Therm remote control (optional)	32
4.10. Installation of the (optional) external probe and "weather compensation" operation	33
4.11. Setting parameters	34
4.12. Filling the system	36
4.13. Starting up the boiler	36
4.13.1. Preliminary checks	36
4.13.2. Switching on and switching off	36
4.14. Conversion to other gas types and burner adjustment	37
4.14.1. Switching from NATURAL GAS to PROPANE	37
4.14.2. Switching from PROPANE to NATURAL GAS	37
4.14.3. Burner adjustment	37
5. Testing the boiler	40
5.1. Preliminary checks	40
6. Maintenance	41
6.1. Maintenance schedule	41
6.2. Combustion analysis	41
6.3. Checking combustion efficiency	42
6.3.1. Flue cleaning function	42
6.3.2. Measurement procedure	42
6.4. Wiring diagram	43
6.5. Available head	45
7. Routine Servicing	46
7.1. Checks before servicing	46
7.2. Prepare for servicing	46
7.3. Boiler cleaning	46

7.4. Reassemble the boiler.....	46
8. Component replacement.....	47
8.1. Electrode	47
8.2. Gas injectors	48
8.3. Fan	48
8.4. Flue temperature probe	48
8.5. Gas valve	48
8.6. Fuse	48
8.7. Electronic board	48
8.8. Three-way valve motor	49
8.9. DHW temperature probe	49
8.10. Heat exchanger flue probe	49
8.11. DHW flow switch	49
8.12. Primary heat exchanger	49
8.13. Double flow temperature probe and return probe	49
8.14. Automatic air vent	49
8.15. Primary pressure switch	49
8.16. Pressure relief valve	50
8.17. DHW heat exchanger	50
8.18. Three-way valve cartridge	50
8.19. Expansion vessel	50
8.20. Condensate trap	50
9. Spare part list.....	51
10. Table of fault codes.....	54
Gas boiler system commissioning checklist.....	56
Service Record	57

PICTURE INDEX

fig. 1 - Control panel.....	9
fig. 2 - LCD.....	10
fig. 3 - Filling loop.....	15
fig. 4 - Dimensions.....	18
fig. 5 - Boiler layout.....	19
fig. 6 - Filling the system (manual)	22
fig. 6b - Filling the system (automatic)	22
fig. 7 - Positioning the boiler	23
fig. 8 - Installation template.....	23
fig. 9 - Position of flue terminals	24
fig. 10 - Isolating valves	25
fig. 11 - Gas mains connection	26
fig. 12 - Installation examples	28
fig. 13 - Air intake and flue gas discharge coaxial pipe system	30
fig. 13b - Air intake and on-roof flue gas discharge coaxial pipe system	30
fig. 14 - Dimensions for connection to coaxial pipe system	30
fig. 15 - Air intake and flue gas discharge split pipe system	31
fig. 16 - Dimensions for connection to split pipe system.....	31
fig. 17 - Central heating curves with external probe operation	33
fig. 18 - Boiler casing opening procedure	38
fig. 18a - Boiler casing opening procedure II.....	38
fig. 19 - Gas valve adjustment.....	38
fig. 20 - Injector replacement.....	38
fig. 21 - Conversion to other gas types.....	39
fig. 22 - Air intake and flue gas discharge tower.....	42
fig. 22a - Openings for combustion efficiency measurement.....	42
fig. 23 - Wiring diagram.....	43
fig. 24 - Available head, model KC 24.....	45
fig. 25 - Available head, model KC 28.....	45
fig. 26 - Sealed chamber opening procedure.....	46
fig. 27 - Boiler internal view	46
fig. 28 - Boiler internal view II.....	47
fig. 29 - Electronic board replacement	47
fig. 30 - Boiler internal view III.....	48
fig. 31 - Boiler exploded view I.....	51
fig. 32 - Boiler exploded view II	52

TABLE INDEX

Table 1 - BOILER STATUS - LCD DISPLAY INDICATIONS during normal operation.....	11
Table 2 - BOILER STATUS - LCD DISPLAY INDICATIONS in the event of malfunction.....	11
Table 3 - KC 24 model adjustment rates.....	19
Table 4 - KC 28 model adjustment rates.....	19
Table 5 - General specifications, model KC	20
Table 6 - Combustion specifications, model KC 24	20
Table 7 - Combustion specifications, model KC28	20
Table 8 - Limits to be set for TSP parameters and default values in relation to boiler type (TSP0).....	33
Table 9 - Configurable limits for parameters and default values	34
Table 10 - Fan speeds.....	37
Table 12 - CO ₂ rates.....	37
Table 13 - CO ₂ - O ₂ rates	42
Table 14 - Relationship between Temperature and Nominal resistance for temperature probes.....	44

2. INSTRUCTIONS FOR THE USER

Fondital is a licensed member of the Benchmark Scheme which aims to improve the standards of installation and commissioning of domestic heating and hot water systems in the UK and to encourage regular servicing to optimise safety, efficiency and performance.

Benchmark is managed and promoted by the Heating and Hotwater Industry Council.
For more information visit www.centralheating.co.uk

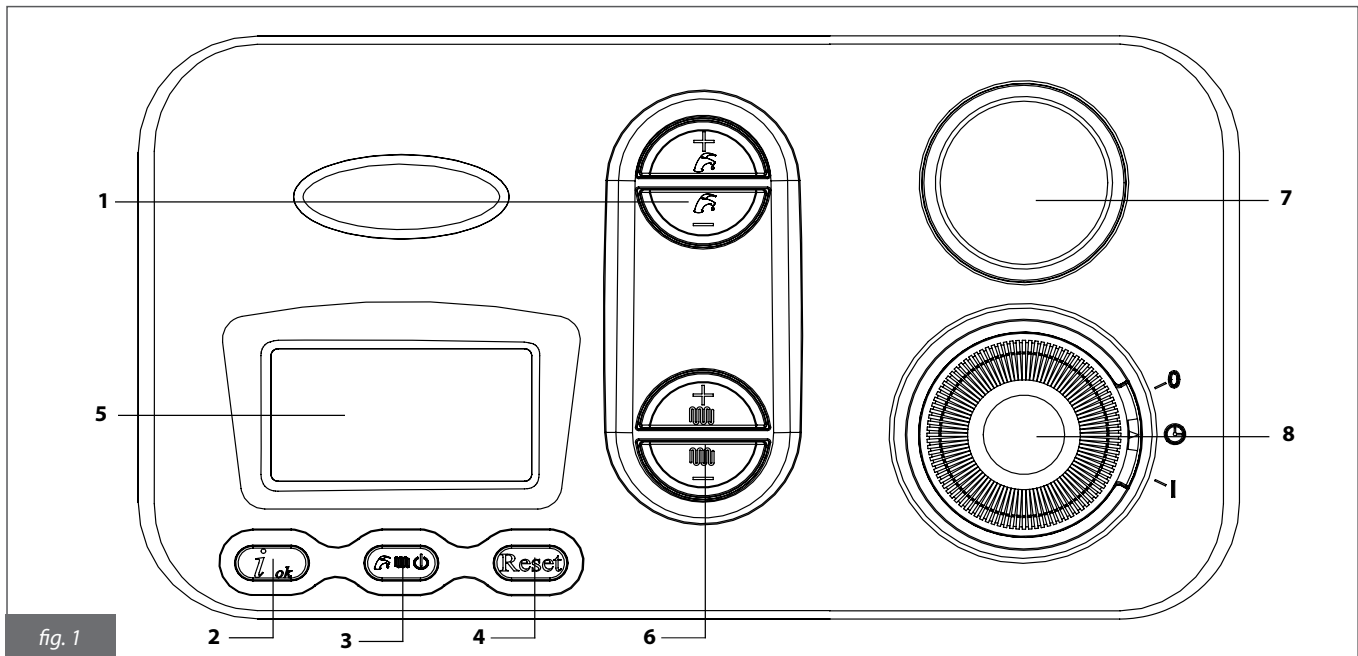
Please ensure that the installer has fully completed the Benchmark Checklist on the inside back pages of the installation instructions supplied with the product and that you have signed it to say that you have received a full and clear explanation of its operation. The installer is legally required to complete a commissioning checklist as a means of complying with the appropriate Building Regulations (England and Wales).

All installations must be notified to Local Area Building Control either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer who should, on receipt, write the Notification Number on the Benchmark Checklist.

This product should be serviced regularly to optimise its safety, efficiency and performance. The service engineer should complete the relevant Service Record on the Benchmark Checklist after each service.

The Benchmark Checklist may be required in the event of any warranty work and as supporting documentation relating to home improvements in the optional documents section of the Home Information Pack.

2.1. Control panel



1. Set domestic hot water temperature

These buttons are used to set the domestic hot water temperature within a range from 35°C to 57°C.

2. Recall information and confirm parameters

This button is used to scroll the sequence of the values of some parameters, such as: primary flow water temperature, DHW temperature and display of the last 5 shutdowns. This button is also used to confirm parameter settings.

3. Select boiler mode

Press this button to set the following functions.

SUMMER

Boiler only produces domestic hot water.

WINTER

Boiler provides central heating water and produces domestic hot water.

CENTRAL HEATING ONLY

The boiler provides central heating water only.

STANDBY OFF

Boiler in standby mode: central heating function and DHW production disabled.

4. Boiler Reset function

This button resets the boiler operation after the burner shutdown device (lockout) has been activated.

5. LCD

The LCD displays the boiler status and operating data (see fig. 2).

6. Set central heating water temperature

These buttons are used to set the heating water temperature within a range from 20°C to 78°C.

7. Water pressure gauge

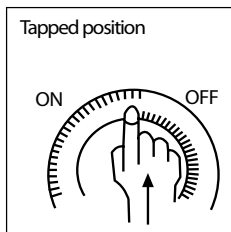
This shows the pressure of the water in the primary heating system.

8. Time clock

The time clock is for central heating control only. The clock is provided with a selector switch with three positions:

- Position "I" CONSTANT:** in this position, the clock circuit is always closed (switch on), therefore the boiler will constantly on and will only shut off upon the request of the room thermostat (if installed) or the heating thermostat;
- Position "O" HEATING OFF:** in this position, the clock circuit is always open (switch off) and the boiler will therefore never fire for heating, Domestic hot water will operate on demand;
- "Central" position PROGRAMMING ACTIVE:** in this position, the programming set by the user is active.

Using the three position switch the timer will allow constant operation, timed operation or central heating off. Move the switch lever by sliding to the desired position.



The time clock is provided with 72 switches, each of which cover a time interval of 20 minutes (three per hour).

When a tappet is switched from the outside (on setting) to the inside of the clock border (off setting), the circuit is open (switch off) for a period of 20 minutes and then the boiler stops.

To set the time of day, turn the timer outer bezel clockwise, to align the pointer with the correct time to the nearest 20 minutes. Do not at any time attempt to turn the bezel anti-clockwise.

For set the timed heating program, decide which times of the day the central heating is required. The heating will operate when the green tappets are set to the outer edge of the bezel.

To ensure the heating stays OFF set the required tappets inwards towards the centre of the bezel.

2.2. LCD

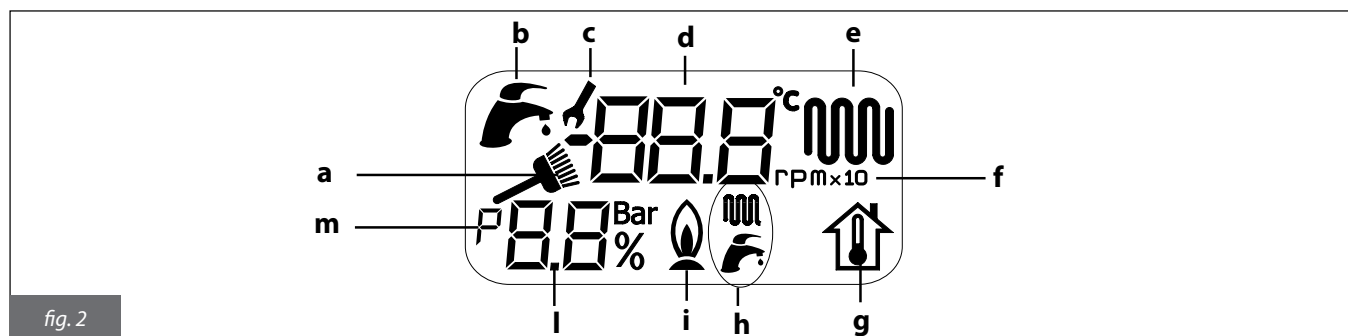


fig. 2

a. Flue cleaning function indicator (function reserved for installation/service technician)

This indicator flashes when the flue cleaning function is active (press the "info" and "reset" buttons simultaneously). The boiler flow water temperature and the fan speed (rpm) are shown (in this case, symbol **f** is also shown)

b. DHW indicator

This comes on when the boiler is in DHW mode.

Flashes when adjusting the DHW temperature with the buttons **1** (fig. 1).

c. Parameter editing indicator

This comes on when the value of the parameter can be modified (in this case, the indicator lights together with the symbol **m**). When edited parameter value is confirmed this symbol will flash.

d. Alphanumeric indicator

This shows the following:

- CH flow water temperature
- CH temperature setting
- DHW temperature setting
- boiler status
- boiler diagnostics

e. Central heating indicator

This comes on when the boiler is in CH mode.

It flashes when adjusting the central heating water temperature with the buttons **6** (fig. 1).

f. Fan speed in rpm (function reserved for installation/service technician)

When the flue cleaning function is activated, symbol **a** turns on and flow water temperature and fan rpm are shown (in this case, this symbol is also shown).

g. Calculated room temperature indicator

When an external probe is installed, this indicator flashes when the calculated room temperature is set via buttons **6**.

h. Boiler status indicator

The two icons indicate the currently active operating modes:

SUMMER: only icon lit.

WINTER: both icons lit.

CENTRAL HEATING ONLY: only icon lit.

STANDBY: symbol displayed in alphanumeric indicator **d**

i. Flame indicator

This comes on when the burner flame is present.

l. Parameter indicator

Figures to view and edit parameters and indicate the burner current power rate (percentage).

m. Parameter indicator

It turns on when entering the parameter programming mode.

2.3. Interpreting BOILER STATUS from LCD DISPLAY INDICATIONS

Normal operation





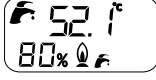
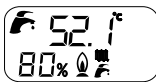
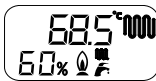


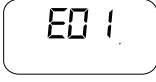

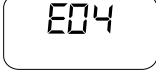



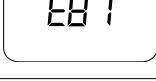

Boiler in STANDBY mode	
Boiler in SUMMER mode No function active The flow water temperature is displayed	
Boiler in WINTER mode No function active The flow water temperature is displayed	
Boiler in CENTRAL HEATING ONLY mode No function active The flow water temperature is displayed	
Boiler in SUMMER mode DHW temperature outlet DHW temperature displayed	
Boiler in WINTER mode DHW temperature outlet DHW temperature displayed	
Boiler in WINTER mode CH function active The flow water temperature is displayed	
Boiler in CENTRAL HEATING ONLY mode CH function active The flow water temperature is displayed	

Table 1 - BOILER STATUS - LCD DISPLAY INDICATIONS during normal operation

Malfunction

Boiler not powered on	
Boiler lockout due to flame absence	
Boiler lockout due to flue gas thermostat activation	
Boiler lockout due to water pressure switch triggering	
CH probe failure	
DHW probe failure	
Lockout due to CH low water level	
Shutdown due to CH low water level	
Shutdown due to CH low water level	

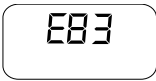
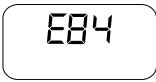
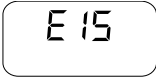
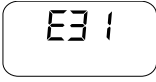
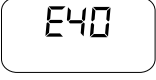

Shutdown due to CH low water level	
Shutdown due to CH low water level	
Return probe fault	
Remote control (optional) connection failure	
Fan failure	
Max. number of resume attempts from remote exceeded	

Table 2 - BOILER STATUS - LCD DISPLAY INDICATIONS in the event of malfunction

2.4. Boiler operation

2.4.1. Switching on



It is presumed that the boiler has been installed by a Gas safe qualified installer, a tightness test has been carried out and the boiler has been commissioned and is ready to operate correctly.

- Open the gas stop cock situated under the boiler;
- turn the mains fused spur switch installed adjacent to the boiler ON. The LCD activates and indicates the function currently active (see tables 1 and 2);
- select boiler operation mode via button **3** (fig. 1): OFF/SUMMER/WINTER/CENTRAL HEATING ONLY;
- set desired CH temperature (see par. 2.4.2.);
- set desired DHW temperature (see par. 2.4.3.);
- set desired room temperature by means of the room thermostat if fitted.

WARNING

Should the boiler be left inactive for longer than one month, particularly when boiler is propane-fired, ignition might be difficult. Before starting the boiler, carry out a full purge of the gas supply in line with the requirements of the Gas Safe regulations. Beware that even by following this procedure, the boiler might still experience some starting difficulties and shut down once or twice. Reset boiler operation by pressing button 4 (fig. 1).

2.4.2. CH function

Set desired heating water temperature via buttons **6** (fig. 1);
CH water temperature adjusting range depends on operation range set through parameter **P10**:

- **standard range:** 20°C to 78°C;
- **reduced range:** 20°C to 45°C.

Operation range selection is to be implemented by a installer or a qualified Service Centre.

During temperature setting, the CH symbol on the LCD flashes and the CH setting is displayed.

When the central heating system requests heat from the boiler, the LCD displays the CH symbol (fixed) and the current CH flow water temperature.

The burner symbol  only shows while the burner is operating.

To prevent frequent ignition and switching off in the heating mode, the boiler has an anti cycling timer of 4 minutes between ignitions. Should water temperature in the system fall below set minimum value, the waiting time is reset and the boiler re-ignites.

2.4.3. DHW function

Set desired DHW temperature via buttons **1** (fig. 1);
Such function has always priority over CH water supply.

DHW temperature may be set within a range from 35°C to 57°C. During temperature setting, the DHW symbol on the LCD flashes and the DHW temperature setting is displayed.

WARNING

A flow restrictor is installed within the boiler, which limits domestic hot water output flow rate. This limit is: 13 litres per minute (for model KC 24) and 14 litres per minute (for model KC 28).

Domestic hot water temperature supplied depends on the DHW temperature setting and on the quantity requested by the user. The temperature of the water mains supply temperature is also a determining factor.

Available DHW litres per minute depend on boiler thermal output and water mains supply temperature, according to the following formula:

$$l = \text{DHW litre per min.} = \frac{K}{\Delta T}$$

where

K represents:

- 393 in KC 24 model

- 419 in KC 28 model

Δt = DHW temperature – water mains supply temperature

For instance, with model KC 24, if the water supplied is at 8°C and you want shower water at 38°C, the value of ΔT is:

$$\Delta T = 38^\circ\text{C} - 8^\circ\text{C} = 30^\circ\text{C}$$

and the number of DHW litres per minute available at 38°C is:

$$l = \frac{393}{30} = 13.1 \text{ [litres per minute - water mixed at tap]}$$


2.4.4. Freeze protection function

This boiler is fitted with an anti-freeze protection system, which works when the following functions are activated: SUMMER, WINTER and CENTRAL HEATING ONLY.



The anti-freeze function only protects the boiler, not the whole heating system.

A room thermostat must be used to provide freeze protection for the central heating system. Please be aware that the thermostat is disabled when the boiler is in OFF mode.

Therefore, if you want to protect both the boiler and the system, use button 3 in fig. 1 to select the WINTER mode .

When the heating water temperature sensor detects a water temperature of 5°C, the boiler switches on and stays on at its minimum heat output until the temperature reaches 30°C or 15 minutes have elapsed.

The pump continues to operate even if the boiler shuts down.

The anti-freeze function also protects the DHW circuit.

When the DHW temperature sensor detects a temperature of 5°C, the boiler switches on and stays on at its minimum thermal power until the temperature reaches 10°C or 15 minutes have elapsed (the diverter valve is in the DHW position).

The pump continues to operate even if the boiler shuts down.

2.4.5. Pump and valve anti-shutdown function

If the boiler remains inactive and:

- the boiler operating mode is NOT OFF,

- the boiler is still connected to the mains supply,

the pump and the switching valve activate briefly every 24 hours to keep them efficient.

2.4.6. Operation with (optional) remote control (part number: 0CREMOTO04)

The boiler can be linked to an (optional) remote control (supplied by the Manufacturer), which can be used for setting numerous parameters:

- boiler status

- room temperature

- CH system water temperature

- DHW system water temperature

- CH system or external water heater (optional) activation times;

- boiler diagnostics display

- boiler reset

and others.

Once the remote control has been installed, the boiler LCD will display the following code:



For instructions on how to connect the remote control, refer to par. 4.9. and the remote thermostat instruction booklet.



**Only original remote controls supplied by the manufacturer must be used.
If non-original remote controls are used, correct operation of the boiler, or of the remote control, cannot be guaranteed.**

2.5. Boiler shutdown

The boiler locks out automatically if a malfunction occurs.

Refer to Tables 1 and 2 to identify the boiler operating mode.

To determine the possible causes of malfunction, see also paragraph 10. *Table of fault codes* section is at the end of this manual.

Below is a list of shutdowns and the procedure to follow for each.

2.5.1. Burner shutdown

Fault code **E01** is displayed flashing on the LCD display in the event of burner shutdown due to no flame recognition.

If this happens, proceed as follows:

check that the gas cock is open and that gas is available at the appliance to check the gas supply by turning on another gas appliance and check the emergency control valve is on;

- once you have confirmed fuel is available, press the reset button (4) (fig.1) to restore burner operation: if, after two starting attempts, the boiler still fails to start and enters shutdown mode again, contact the **Fondital Helpline 01329 282555** or qualified personnel for maintenance.

If the burner shuts down frequently, there is a recurring malfunction, so contact a service Centre or a qualified service engineer.

2.5.2. Shutdown due to air intake/flue gas discharge system malfunction

If the air/flue gas system malfunctions, the boiler shuts down. The code **E03** (flue gas thermostat activation) is displayed flashing on the LCD.

Should the above happen contact the Fondital helpline UK or CORGI registered engineer with appropriate competence for service.

2.5.3. Shutdown due to a water circulation malfunction

If there is a malfunction in water circulation in the heating system, the boiler shuts down.

The codes **E81** or **E82** or **E83** or **E84** are displayed, according to the malfunction.

Malfunction code	Water flow l/h (mod. KC 24)	Water flow l/h (mod. KC 24)
E81	367	550
E82	333	500
E83	300	450
E84*	300	450

*When code E84 is displayed both flow and return temperatures vary by 0.25 °C per second.

There can be 2 different situations:

a) the pressure gauge (7, fig. 1) shows a pressure lower than 1 bar

Proceed as follows to restore the correct water pressure:

- open the loading tap upstream the boiler to fill the system with water;

- keep the tap open until the pressure gauge shows a value of 1-1.3 bar.

- turn the tap off on completion.

- press the reset button (4 in fig. 1) to restore boiler operation then set it to the desired operating position.

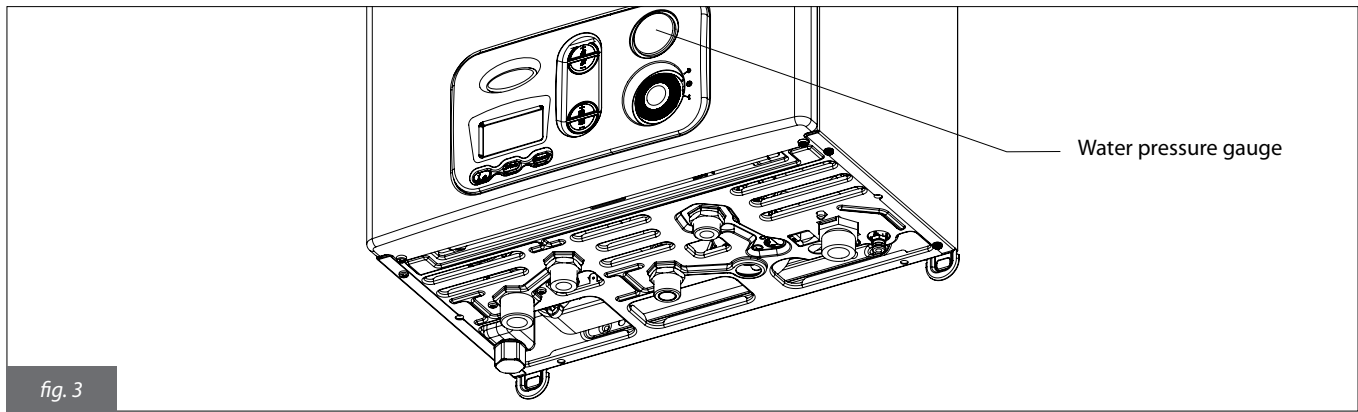
If the boiler still fails to operate, contact the **Fondital helpline UK** or CORGI registered engineer with appropriate competence for service.



**Make sure you close the cock carefully after filling.
If you do not, when the pressure increases, the safety valve may activate and discharge water.**

b) the pressure gauge (7, fig. 1) shows a pressure of 1-1.3 bar

Should the boiler shut down again, contact the **Fondital helpline UK 01329 828555** or a Gas Safe registered engineer with appropriate competence for service.



2.5.4. Shutdown due to fan malfunction

The fan operation is constantly monitored and in case of malfunction the burner goes off; the code E40 flashes on the LCD. This mode is maintained until the fan recovers normal working parameters. Should the boiler not re-start and still remain in the above status, contact the Fondital helpline UK or CORGI registered engineer with appropriate competence for service.

E40

2.5.5. Alarm due to temperature probe malfunction

The following fault codes are shown on the LCD display in the event of burner shutdown due to a temperature probe fault:

- **E05** for the CH probe.
In this case the boiler does not work.
- **E06** for the DHW probe.
In this case, the boiler functions in central heating mode only, and the DHW function is disabled.
- **E15** for the return probe.
In this case the boiler does not work.

Should the boiler not re-start and still remain in the above status, contact the Fondital helpline UK or CORGI registered engineer with appropriate competence for service.

2.5.6. Alarm due to (optional) remote control connection malfunction

The boiler recognises whether or not there is a remote control (optional).

If the remote control is connected but the boiler does not receive instructions from it, the boiler attempts to re-establish communication for 60 seconds, after which the fault code **E31** is shown on the remote control display.

The boiler will continue to operate according to the settings on the control panel (fig. 1) and ignore the remote control settings.

The remote control can indicate faults or shutdown conditions and can also restore boiler operation after shutdown up to a maximum of 3 times in a 24 hour period. If the maximum number of attempts is exceeded, fault code **E99** is shown on the boiler display.

E31

E99

Should the boiler not re-start and still remain in the above status, contact the Fondital helpline UK or CORGI registered engineer with appropriate competence for service.

2.5.7. Alarm due to (optional) external probe malfunction

If the (optional) external temperature probe malfunctions, the boiler is still operating, but the "weather compensation" operation is disabled; heating water temperature is adjusted according to the value set through buttons **6** (fig. 1) that, in this case, will no longer work as calculated room temperature adjusters (see paragraph 4.10.).

Should the boiler not re-start and still remain in the above status, contact the Fondital helpline UK or CORGI registered engineer with appropriate competence for service.

2.6. Maintenance

Routine boiler maintenance must be provided according to manufacturer's instructions in the country of installation and following the instructions given in the relevant section in this manual. Correct maintenance ensures that the boiler operates efficiently, is environmentally friendly, and is not a danger to people, animals or property.

Please ensure that the Benchmark service schedule is filled out on completion of a annual service maintenance.
By law, only qualified personnel are allowed to service the boiler.

The Manufacturer recommends that Customers contact the **Fondital Helpline UK** service centre for maintenance and repairs.
For boiler breakdowns and advice on repair carried out by a Gas Safe Technician, refer to section 6 – *Maintenance*.

It is recommended that the boiler case is only cleaned with non abrasive standard household cleaning products.

2.7. Notes for the user

**The user may only access boiler parts that can be reached without using any technical equipment or tools. The user is not authorised to remove the boiler casing or attempt to access any of the internal parts.
No one, including qualified service engineers, are authorized to modify the boiler**

The manufacturer cannot be held liable for damage to people, animals, or property due to tampering or improper work carried out on this boiler.

If the boiler remains inactive and the power supply disconnected for longer than one month, the pump may not operate.

Pump servicing includes removing the boiler housing and accessing the internal parts of the boiler, so this must only be carried out by a qualified service engineer.

Pump blockage can be avoided by adding propriety inhibitors additives suitable for multi-metal systems.

3. TECHNICAL FEATURES AND DIMENSIONS

3.1. Technical features

The boiler is equipped with a fully pre-mixed gas burner. The following model is available:

- **KC**: condensing boiler with sealed chamber and forced draught, supplying CH water and for instant DHW production;

This version is available with two power ratings:

- KC 24: with heat input of 24.9 kW
- KC 28: with heat input of 27.9 kW

Both models are equipped with electronic ignition and ionisation flame sensing device.

The boilers meet local applicable Directives enforced in the country of destination, which are stated on their rating plate. Installation in any other country may be a source of danger for people, animals and property.

The key technical features of the boilers are listed below:

Manufacturing characteristics

- IPX4D electrically protected control panel
- Integrated, modulating electronic safety board
- Electronic ignition and ionisation flame detection device
- Stainless steel, fully pre-mixed burner
- Mono-thermal, high efficiency, composite and stainless steel heat exchanger with air purging device
- Twin shutter modulating gas valve with constant air/gas ratio
- Modulating, electronically managed combustion fan
- Three-speed pump with air purging device
- Minimum pressure switch
- DHW and CH temperature probe
- Safety limit thermostat
- Flue gas thermostats
- Integrated, automatic by-pass
- 9 litre expansion vessel
- Stainless steel plate DHW heat exchanger
- Motorised diverter valve
- DHW priority flow switch
- 13 l/min DHW flow-restrictor (KC24), 14 l/min (KC28)

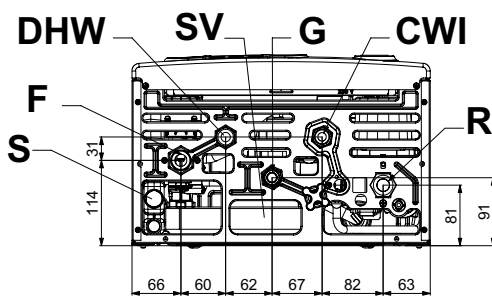
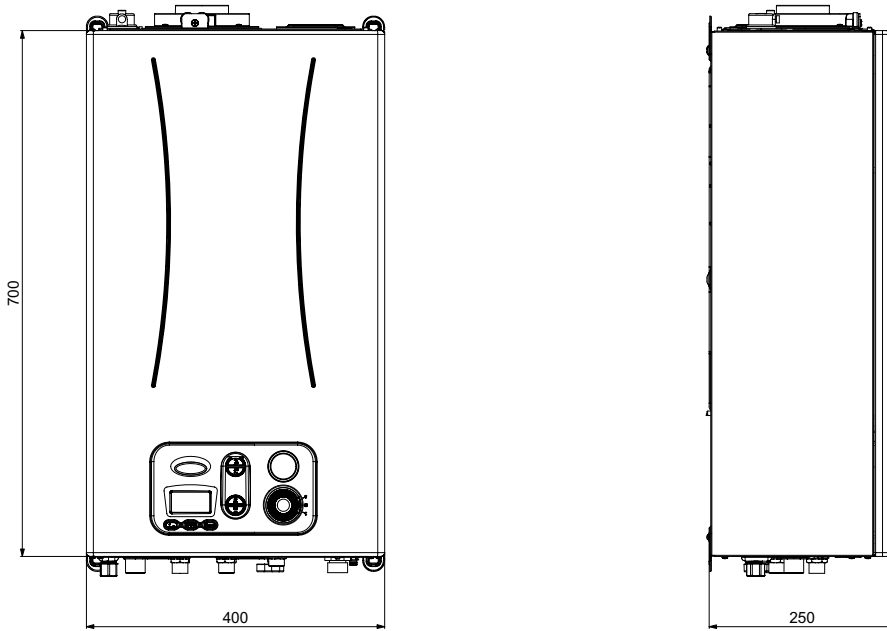
User interface

- Liquid crystal display showing the boiler operating status
- Mode button: OFF, WINTER, SUMMER and CENTRAL HEATING ONLY
- DHW water temperature regulator: 35-57°C
- CH water temperature regulator: 20-78°C (standard range) or 20-45°C (reduced range)
- Heating water pressure gauge

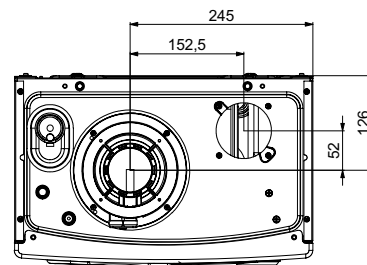
Operating features

- CH electronic flame modulation with timer-controlled rising ramp (60 seconds)
- Electronic flame modulation in DHW mode
- DHW priority function
- CH flow anti-freeze function: ON 5°C; OFF 30°C or after 15 minutes of operation if CH temperature > 5°C
- DHW anti-freeze function: ON 5°C; OFF 10°C or after 15 minutes of operation if DHW temperature > 5°C
- Timer-controlled flue cleaning function (15 minutes)
- CH maximum heat output adjustment through parameter P7
- Ignition heat output adjustment through parameter P6
- Possibility to select the heating range through parameter P10: standard or reduced
- Ignition flame propagation function
- CH thermostat timer adjustable through parameter P11: 4 minutes
- Heating pump post-circulation function in CH, ANTI-FREEZE and FLUE CLEANING mode (30 seconds)
- DHW post-circulation function: 30 seconds
- Post-circulation function for heating temperature > 78°C (30 seconds)
- Post-ventilation function after working: 10 seconds
- Post-ventilation function for heating temperature > 95°C
- Pump and diverter valve anti-seize function: 30 seconds of operation every 24 hours with boiler not in use
- Ready for connection to a room thermostat (optional)
- Ready for operation with an external probe (optional supplied by the manufacturer, part number 0SONDAES01)
- Ready for operation with an OpenTherm remote control (optional, supplied by the manufacturer)
- Ready for operation with a module for different temperature zones
- Anti- water hammer function: can be set from 0 to 3 seconds through parameter P15

3.2. Dimensions

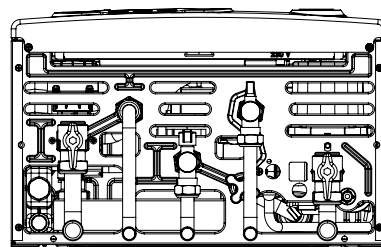


bottom view



top view

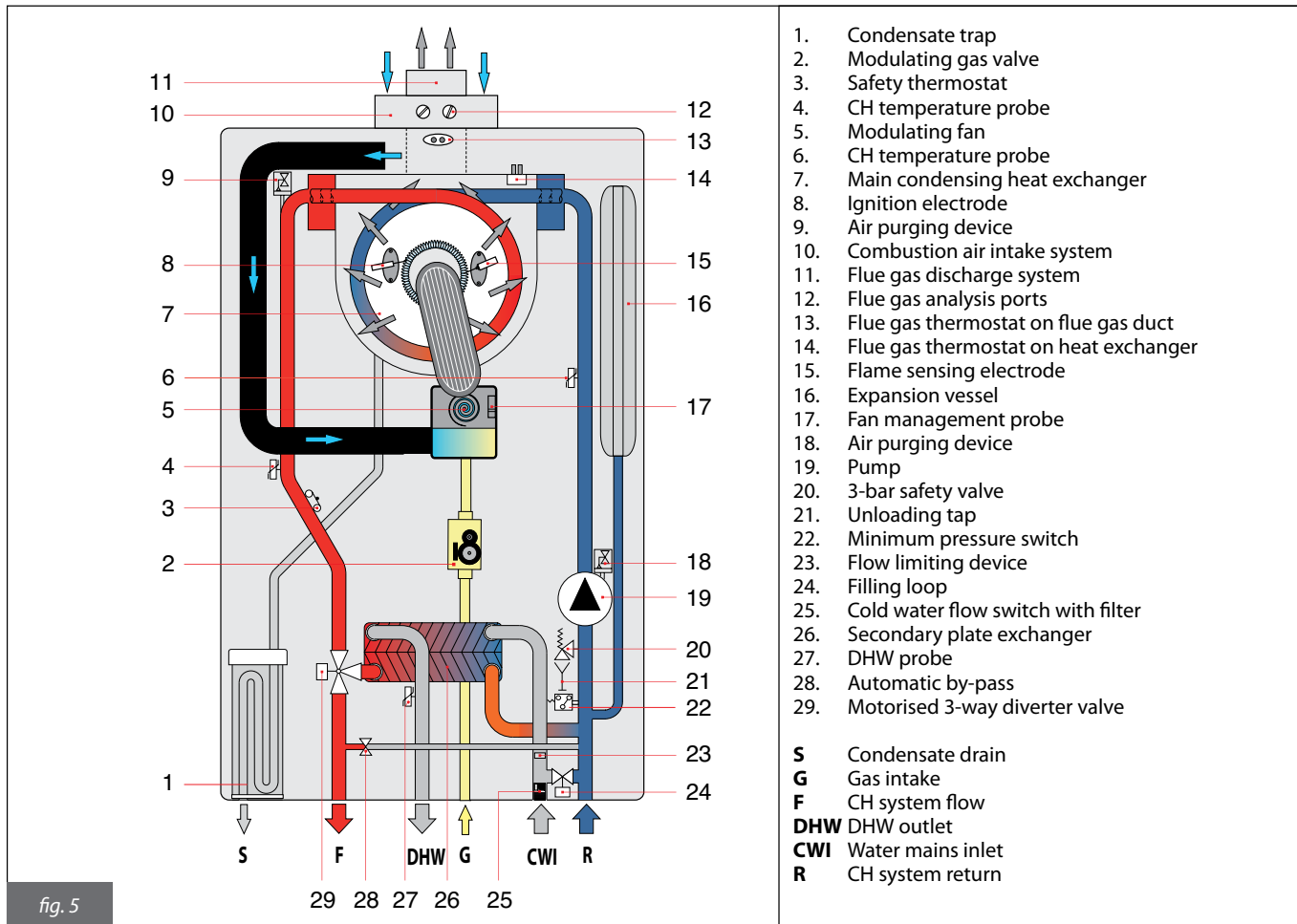
- | | | | |
|------------|-------------------------|-----------|-------------------------------|
| G | Gas inlet (1/2") | R | CH return (3/4") |
| F | CH flow (3/4") | S | Condensate drain |
| DHW | DHW outlet (1/2") | SV | 3-bar safety valve drain cock |
| CWI | Cold water inlet (1/2") | | |



Dimensions for connection to base hydraulic kit (option)

fig. 4

3.3. Boiler layout



3.4. Operating data

Burner pressures must be verified after a three minute boiler operation time

KC 24

Function	Max. CH heat input [kW]	CH heat output (80-60°C) [kW]		CH heat output (50-30°C) [kW]		DHW output [kW]		Gas mains pressure [mbar]	Nozzle [mm/100]	Flue gas CO ₂ [%]
		min	max	min	max	min	max			
Natural gas G20	23.7	2.7	22.9	3.2	24.9	3.0	27.4	20	3.70	9.0 ÷ 9.3
Propane Gas G31	23.7	2.7	22.9	3.2	24.9	3.0	27.4	37	3.00	9.8 ÷ 10.1

Table 3 - KC 24 model adjustment rates

Hot water supply ΔT 45°C = 9.0 l/min
 Hot water supply ΔT 40°C = 10.1 l/min
 Hot water supply ΔT 35°C = 11.6 l/min

Hot water supply ΔT 30°C = 13.5 l/min *
 Hot water supply ΔT 25°C = 16.2 l/min *
***Note: water mixed at tap**

KC 28

Function	Max. CH heat input [kW]	CH heat output (80-60°C) [kW]		CH heat output (50-30°C) [kW]		DHW output [kW]		Gas mains pressure [mbar]	Nozzle [mm/100]	Flue gas CO ₂ [%]
		min	max	min	max	min	max			
Natural gas G20	26.4	3.0	25.4	3.45	27.8	3.0	29.2	20	4.00	9.0 ÷ 9.3
Propane Gas G31	26.4	3.0	25.4	3.45	27.8	3.0	29.2	37	3.30	10.0 ÷ 10.3

Table 4 - KC 28 model adjustment rates

Hot water supply ΔT 45°C = 10.0 l/min
 Hot water supply ΔT 40°C = 11.2 l/min
 Hot water supply ΔT 35°C = 12.9 l/min

Hot water supply ΔT 30°C = 15.0 l/min *
 Hot water supply ΔT 25°C = 18.0 l/min *
***Note: water mixed at tap**

KC MODEL		24	28
Equipment category	-	I12H3P	I12H3P
Minimum CH system pressure	bar	0.5	0.5
Maximum CH system pressure	bar	3	3
DHW min. pressure	bar	0.5	0.5
DHW max. pressure	bar	6	6
DHW specific flow rate (Δt 30 K) EN 625	l/min	13.5	15.0
Electric power supply – voltage / frequency	V - Hz	230 - 50	230 - 50
Power mains supply fuse	A	2	2
Maximum power consumption	W	131	133
Electric protection rating	IP	X4D	X4D
Net weight	kg	28.5	32
Natural gas consumption at maximum CH output (*)	m ³ /h	2.51	2.8
Propane gas consumption at maximum CH output	kg/h	1.84	2.1
Maximum CH working temperature	°C	83	83
Maximum DHW working temperature	°C	62	62
Total capacity of expansion vessel	l	9	9
Maximum recommended system capacity (**)	l	200	200

Table 5 - General specifications, model KC

(*) Value referred to 15°C - 1013 mbar

(**) Maximum water temperature 83°C, expansion vessel pressure 1 bar

KC 24		Max. output	Min. output	30% load
Casing heat loss with burner on	%	0.97	6.49	-
Casing heat loss with burner off	%	0.28		
Chimney heat loss with burner on	%	2.62	2.09	-
Flue gas mass capacity	g/s	12.43	1.33	-
Flue gas temp. – air temp	°C	61	33	-
Maximum heat output efficiency rating (60/80°C)	%	96.7	-	-
Maximum heat output efficiency rating (30/50°C)	%	105.1	-	-
Minimum heat output efficiency rating (60/80°C)	%	-	91.4	-
Minimum heat output efficiency rating (30/50°C)	%	-	104.9	-
30% heat output efficiency rating	%	-	-	106.5
Efficiency rating (according to 92/42/EC)	-	★★★★		
NO _x emission class	-	5		

Table 6 - Combustion specifications, model KC 24

KC 28		Max. output	Min. output	30% load
Casing heat loss with burner on	%	1.40	5.70	-
Casing heat loss with burner off	%	0.25		
Chimney heat loss with burner on	%	2.40	2.00	-
Flue gas mass capacity	g/s	13.93	1.47	-
Flue gas temp. – air temp	°C	60	45	-
Maximum heat output efficiency rating (60/80°C)	%	96.4	-	-
Maximum heat output efficiency rating (30/50°C)	%	105.5	-	-
Minimum heat output efficiency rating (60/80°C)	%	-	92.3	-
Minimum heat output efficiency rating (30/50°C)	%	-	104.5	-
30% heat output efficiency rating	%	-	-	107
Efficiency rating (according to 92/42/EC)	-	★★★★		
NO _x emission class	-	5		

Table 7 - Combustion specifications, model KC 28

4. INSTRUCTIONS FOR INSTALLATION

4.1. Installation standards

This is an II2H3P category boiler and must be installed in compliance with laws and standards enforced in the country of installation, which are herein considered as entirely transcribed.

4.2. Reference standard

In UK, the installation must be carried out by a Gas Safe Registered Installer. To check for authorised qualified engineers please contact Gas Safe register 0800 408 5500 . It must be carried out in accordance with the relevant requirements of the:

- Gas Safety Regulations;
- The appropriate Building Regulations either The Building Regulation, The Building Regulations (Scotland), Building Regulations (Northern Ireland);
- The Water Fittings Regulations or Water Bylaws in Scotland;
- The current I.E.E. Wiring Regulations.

Where no specific instructions are given, reference should be made to the relevant British Standards Code of Practice. The following list is the full lists of codes of practice and British Standards that engineers should work to in the UK.

It is law in the UK that a competent person installs all gas-burning appliances. Please ensure that the installer is a class of person approved for the time being by the Health and Safety Executive for the purpose of carrying out this work. An approved engineer should be registered to an approved scheme i.e. Gas Safe Register.

In GB, the following Codes of Practice apply:

BS 5440: Part 1 2000 - Flues

BS 5440: Part 2 2000 - Air Supply

BS 5446: Installation of hot water supplies for domestic purposes (1st, 2nd and 3rd family gases)

BS 5449: 1990 Forced circulation hot water systems

BS 6700: 1987 - Installation of cold water supplies for domestic purposes (1st, 2nd and 3rd family gases)

BS 6798: 2000 Specification for installation of gas-fired boilers of rated input not exceeding 70 kW net

BS 6891: Specification for installation of low pressure gas pipe work of up to 28 mm (R!) in domestic premises (2nd family gas)

BS 7074: Expansion Vessels and ancillary equipment for sealed water systems

BS 7593: 1992 Code of practice for treatment of water in domestic hot water central heating systems

BS 7671: 2001 IEE wiring regulations.

This appliance meets the requirements of:

- UNI EN 677 for GAS-FIRED CENTRAL HEATING BOILERS. SPECIFIC REQUIREMENTS FOR CONDENSING BOILERS WITH NOMINAL HEAT INPUT \leq 70 kW,
- IPX4D rating for electrical appliances,
- EMC DIRECTIVE 89/336 CE,
- LVD DIRECTIVE 2006/95 CE,
- BOILER EFFICIENCY DIRECTIVE 92/42 CE

Failure to install a gas appliance correctly and in accordance with the above norms could lead to prosecution. It is in the interest of the installer and safety that the law is complied with.

The manufacturers instructions form an integral part of the installation and should be left with the appliance but do not over ride in anyway statutory obligations.

4.3. System details

4.3.1. Central heating circuit

The boiler is designed for use in a sealed central heating system in accordance with the requirements of BS 5449 and BS 6798. The system should be designed to operate with flow temperatures of up to 78 °C. When designing the system, the pump head, expansion vessel size, mean radiator temperature, ect. must all be taken into account. Refer to the pump performance table for guidelines.

System volume: the expansion vessel incorporated into the boiler is suitable for a sealed heating system. The boiler is supplied with the following components built in:

Pressure relief valve: set to operate at 3 bars. The outlet connection of the boiler safety valve must terminate to atmosphere in accordance with current regulations. The manufacturer will not be held responsible for flooding caused by the operation of the safety valve in the case of system overpressure.

Pressure gauge: to indicates the system pressure to be maintained.

Expansion vessel: capacity of 8 litres.

By-pass: The boiler incorporates an automatic by-pass.

All circulating primary water systems will be subject to corrosion unless an appropriate water treatment is applied. This means that the efficiency of the system will deteriorate as corrosion (sludge) accumulates within the system, risking damage to pump and valves, boiler noise and circulation problems.

All systems must be thoroughly drained and flushed out. System additives - corrosion inhibitors and flushing agents/descalers should comply to BS7593 requirements. It is important to check the inhibitor concentration after installation, system modification and at every service in accordance with the manufacturer's instructions.

4.3.2. Filling the central heating system

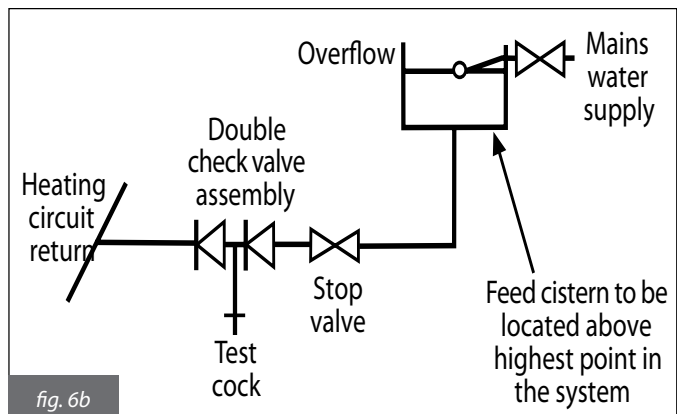
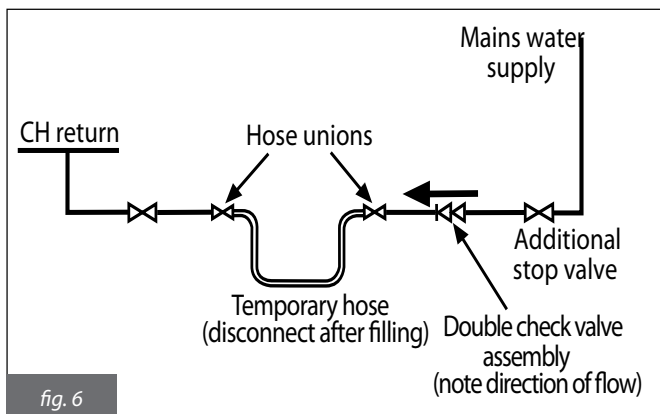
The system design pressure (cold) should be set to 1,5 bar. This pressure is equivalent to a static head of 15,4 metres of water.

Provision should be made to replace water lost from the system. This can be by manual or automatic means as shown in figs. 6 and 7. A double check valve assembly must be used as show in pic 7.

Filling of the system must be carried out in a manner approved by the local Water authority. Where allowed the system may be filled via a temporary connection as shown in pic 6. After filling, always disconnect the flexible hose of the filling loop. All fittings used in the system must be able to withstand pressures up to 3 bar. Drain taps must be fitted at the lowest point of the system to allow the system to be completely drained.



In order to prevent scaling or deposits in the primary heat exchanger, the mains supply water to the heating circuit must be treated according to the requirements of standard. This treatment is indispensable in the case where the circuit is frequently topped-up or when the system is often either partially or fully drained.



4.3.3. Domestic Hot Water Circuit

All DHW circuits, connections, fittings, etc. should be fully in accordance with relevant standards and water supply regulations. Your attention is drawn for GB: Guidance G17 to G24 and recommendation R17 to R24 of the Water Regulations Guide.

4.4. Site requirements

4.4.1. Choosing where to install the boiler

The following must be taken into account when choosing where to install the boiler:

- Approved document L1 + L2 government guidelines.
- Check the wall is strong enough to support the weight of the boiler.
- Do not fit the boiler above any equipment that may affect operation (kitchen appliances that emit steam or greasy vapour, washing machines, etc.).
- Do not install natural draught boilers in corrosive or very dusty atmosphere areas, such as hairdressing salons or laundries as this would greatly reduce the boiler's lifespan.

4.4.2. Positioning the boiler

Each boiler is supplied with a paper template (fig. 8), within its packaging, allowing arrangement of CH pipe system, DHW pipe system, gas supply pipe system and air intake/flue gas discharge system before actually installing the boiler.

The template is made of heavy-duty paper, it is to be affixed to the wall where the boiler is to be mounted using a level.

It provides all the locations required to drill the boiler fixing holes to the wall, procedure which is done using two 'L' shaped hanging hooks and wall plugs.

The lower area of the template displays where to mark the exact point at which the couplings are to be positioned for boiler connection to the gas supply pipe, water mains supply pipe, DHW flow pipe, CH flow and return pipes.

The upper area of the template displays where air intake and flue gas ducts are to be positioned.

The manufacturer recommends leaving a space all round the boiler during installation as follows:

- at least 25mm on the right and left;
- at least 250 mm above and below.

This facilitates service operations on the boiler, e.g. maintenance and repair (fig. 7).

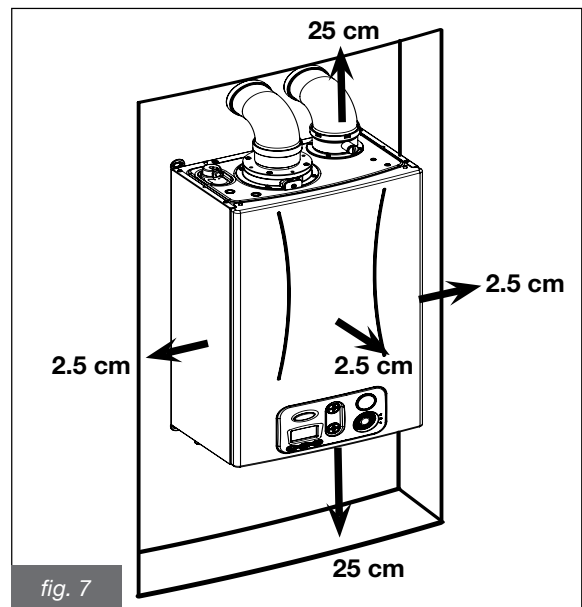


fig. 7



Since the temperature of the walls on which the boiler is mounted and external temperature of coaxial air/flue gas system do not exceed 60 °C, no minimum distance from flammable walls is to be accounted for.

Boilers with split pipe flue system: in presence of flammable walls and flue gas ducts through such walls, ensure air gap of 15 mm between wall and flue gas ducts.

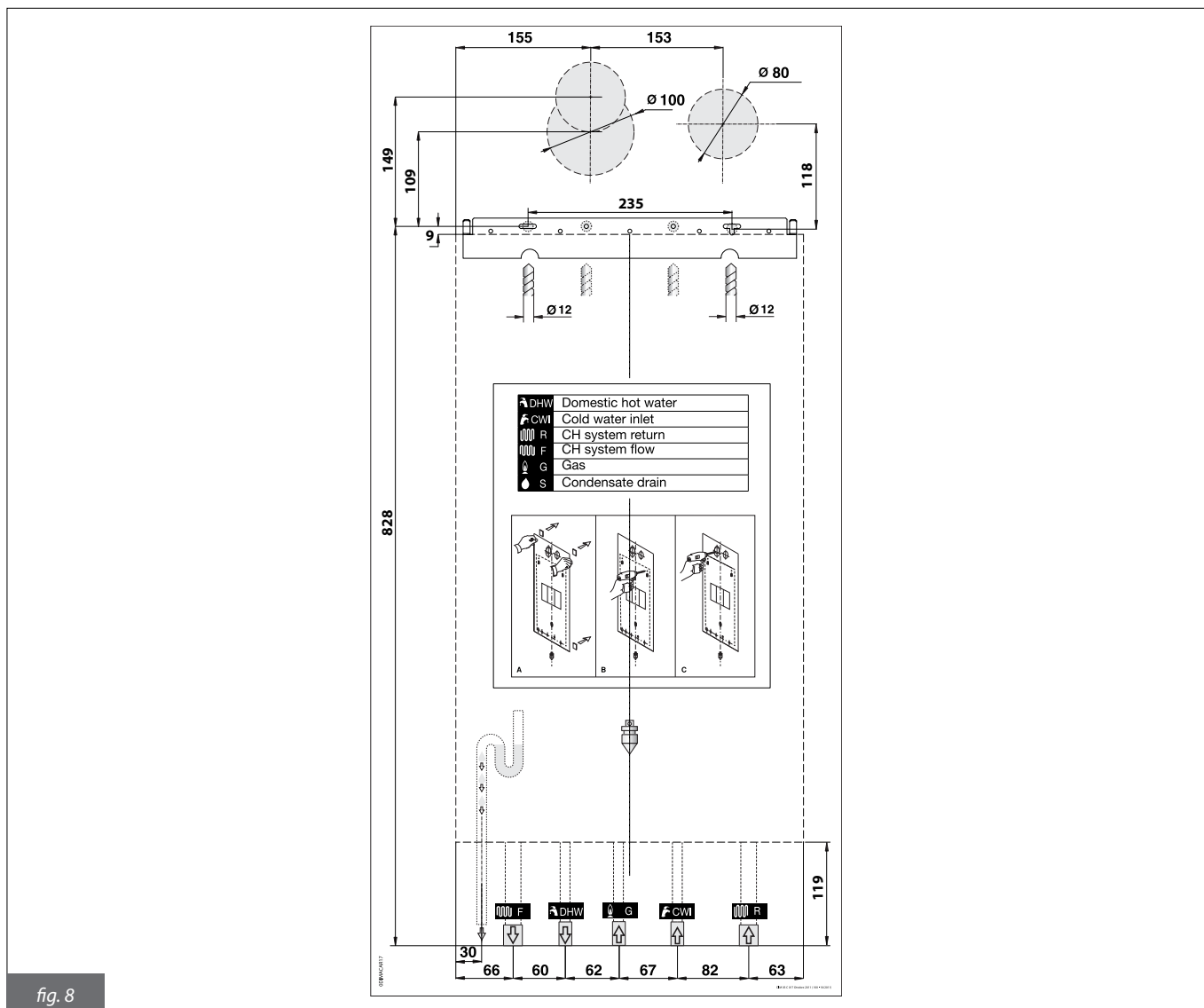


fig. 8

4.4.3. Boiler room ventilation

The boiler has sealed combustion chamber. Combustion air is not drawn from boiler room or area surrounding the boiler therefore specific recommendations for ventilation in the area of the appliance is not required.



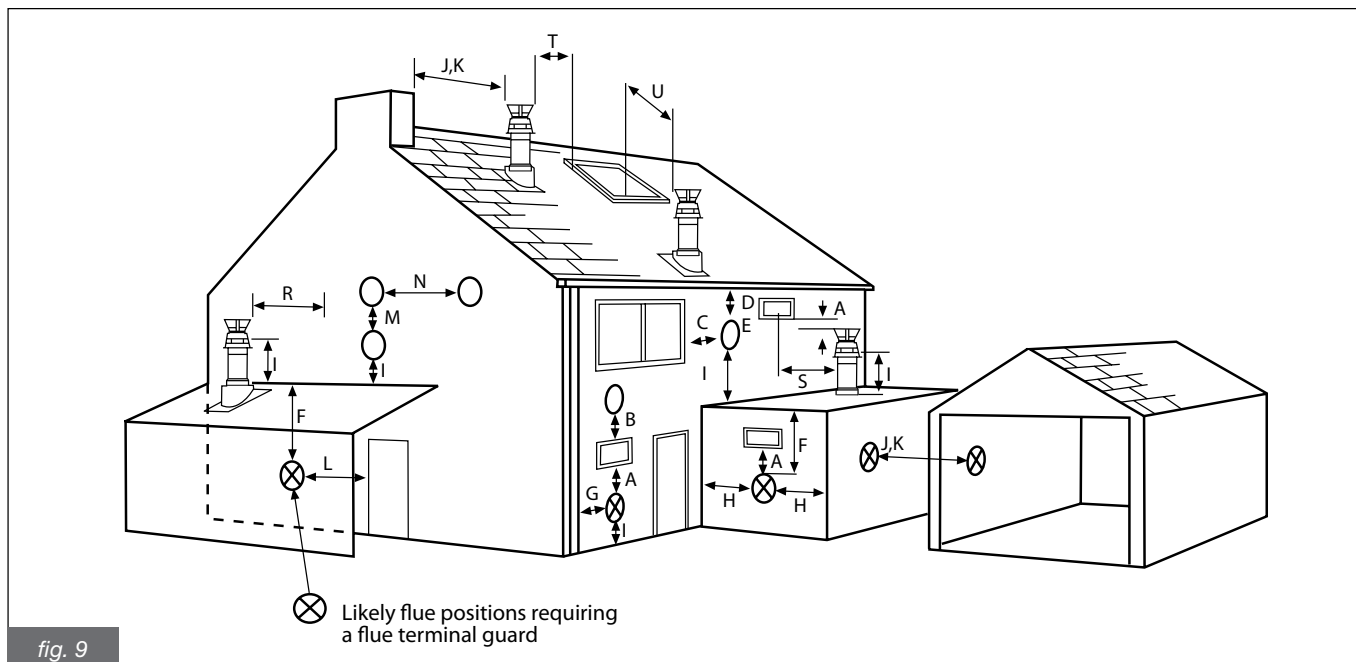
It is mandatory to install the boiler in an adequate room following laws and standards applicable in the country of installation, which are considered as fully transcribed in this manual.

4.4.4. Flue

The following guidelines indicate the general requirements for siting balanced flue terminals. For GB recommendations are given in BS 5440 Part 1. If the terminal discharges onto a pathway or passageway, check that combustion products will not cause a nuisance and that the terminal will not obstruct the passageway. If a terminal is less than 2 metres above a balcony, above ground or above a flat roof to which people have access, then a suitable terminal guard must be provided.

TERMINAL POSITION WITH MINIMUM DISTANCE (mm)	
Aa Directly below an opening, air brick, opening windows, etc.	300
Ba Above an opening, air brick, opening window etc.	300
Ca Horizontally to an opening, air brick, opening window etc.	300
D Below gutters, soil pipes or drain pipes	25
E Below eaves.	25
F Below balconies or car port roof.	25
G From a vertical drain pipe or soil pipe.	25
H From an internal or external corner.	25
I Above ground, roof or balcony level.	300
J From a surface or boundary line facing a terminal.	600
K From a terminal facing a terminal (Horizontal flue).	1200
From a terminal facing a terminal (Vertical flue).	600
L From an opening in carport (e.g. door, window) into the dwelling.	1200
M Vertically from a terminal on the same wall.	1500
N Horizontally from a terminal on the same wall.	300
R From adjacent wall to flue (vertical only).	300
S From an adjacent opening window (vertical only).	1000
T Adjacent to windows or openings on pitched and flat roofs	600
U Below windows or openings on pitched roofs	2000

a In addition, the terminal should be no nearer than 150 mm to an opening in the building fabric formed for the purpose of accommodating a built-in element such as a window frame. See BS 5440 Pt. 1.



4.5. Installation (authorised personnel only)



Accessories and spare parts for installation and service procedures are to be supplied by the Manufacturer. Under no circumstances should parts that are not type tested and approved by the manufacturer be used for service or repair of Fondital appliances.

4.5.1. Packaging

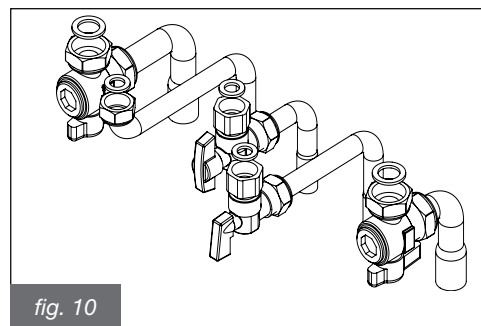
Boiler is shipped in a sturdy cardboard box. Remove boiler from cardboard box and check its integrity.

The packing materials can be recycled and should be disposed of at an appropriate waste collection site. **Keep packaging out of reach of children, as it may be dangerous.**

The manufacturer shall not be held responsible for harm to people and/or animals, and/or damage to property due to failure in following the above mentioned instructions.

Packaging includes:

- copper pipe kit for boiler connection to the gas mains, to the CH system and DHW system (fig.10);
- four isolating valves: one for gas, one for heating flow, one for heating return and one for cold water supply (fig.10);
- a bag containing:
 - a) boiler installation, use and maintenance manual;
 - b) boiler wall mounting template (fig. 8);
 - c) two 'L' Shaped hanging screws and wall plugs for fixing the boiler to the wall;
 - d) one closing plate for split pipe aperture with gaskets.
 - e) Benchmark commissioning booklet.
 - f) air intake diaphragm.



4.5.2. Installing the boiler



Before connecting the boiler to the CH and DHW systems, clean primary pipe work carefully. Prior to operating a NEW system, eliminate any metallic deposit during manufacturing and soldering process, and any oil or grease deposits, which might get into the boiler and damage it or affect operation. Prior to operating an UPGRADED system (addition of radiators, boiler replacement, etc.), clean it thoroughly to remove all sludge and foreign particles.

Clean the system using a non-acid propriety brand product. Do not use solvents as they could damage the components of the system. In the (new or upgraded) central heating system, it is always advisable to add to the water, in a suitable concentration, a corrosion inhibiting product for use in multi-metal systems to produce a protective film on internal metal surfaces. The Manufacturer can not be held liable for injury to people or animals or damage to property resulting from failure to follow the above instructions.

Proceed as follows to install the boiler:

- Fix the template (fig. 8) onto the wall.
- Drill two 12 mm Ø holes in the wall to accommodate the boiler bracket wall plugs.
- Arrange air intake/flue gas system in the wall as needed.
- Screw in the L shaped hanging hooks to the wall.
- Position the gas supply fitting (G), the mains water fitting (CWI), the DHW flow fitting (DHW), the CH flow fitting (F) and the CH return fitting (R) as shown on the template (refer to the lower part).
- Ensure that a suitable material discharge pipe is supplied for relieving the 3-bar safety valve.
- Hang the boiler on the L shaped fixings fixed onto the wall
- Connect the boiler to the mains pipes using the kit supplied with the boiler (refer to subsections 4.5.4.).
- Drill and secure the bottom of the boiler to the wall through the holes in the base of the side panels.
- Connect the boiler to the air intake and flue gas exhaust system (refer to subsections 4.5.5; 4.6.1; 4.6.2).
- Connect the power supply, room thermostat (optional) and other accessories (refer to subsections 4.7.; 4.8. and 4.9.).

4.5.3. Gas main connection

The gas installation should be in accordance with the relevant standards. In GB this is BS 6891.

Gas supply pipe cross-section must be equal or greater than boiler gas pipe.

Cross-section gas pipe size calculation depends on its length, layout pattern, gas flow rate. Gas pipe size is to be dimensioned accordingly.



Comply with installation standards BS 6891 enforced in the installation country which are considered as fully transcribed in this booklet.

Remember that before operating an indoor gas distribution system and before connecting it to a meter, it must be tightness tested checked for leaks.

Adhere to the following leak test instructions:

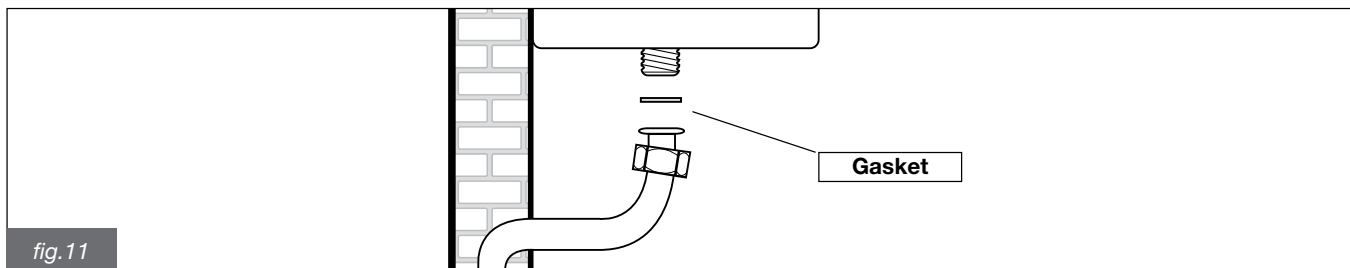
- **tightness test is to be carried out before pipes are covered.**
- **tightness test is not to be carried out employing flammable gas: use air or nitrogen for this purpose.**
- **when gas is already in the pipes supplying the boiler, leak testing by naked flame is forbidden, use specific products available on the market.**



To prevent the main exchanger pipes from getting clogged with any material accumulated in the system it is necessary to install a filter which can be inspected (Y-shaped type) with Ø 0.4mm-mesh span, on the heating return pipe, before the boiler.



When connecting the boiler to gas supply network, install an appropriately sized and made gasket (fig. 11). The boiler gas inlet thread configuration is not appropriate for hemp, plastic tape or similarly made gaskets.



4.5.4. Hydraulic connections

Prior to installing the boiler, the hydraulic system is to be cleaned in order to remove impurities; they could be present in system components and damage the pump and the heat exchanger (refer to 4.5.2 paragraph).

CENTRAL HEATING

CH flow and CH return pipes must be connected to the relevant 3/4" **F** and **R** couplings on the boiler (fig. 4).

When calculating the cross section of CH system pipes, bear in mind load losses induced by radiators, thermostatic valves, radiator gate valves, and the configuration of the system itself.



The discharge pipe from the safety valve must terminate in a safe position to atmosphere. Should the above precaution not be implemented and the safety valve be activated, boiler room flooding may occur. Manufacturer shall not be held responsible for any damage resulting as failure in observing the above mentioned technical precaution.

DOMESTIC HOT WATER

DHW flow and water mains inlet pipes are to be connected to the relevant 1/2" **CWI** and **DHW** couplings on the boiler (fig. 4).

Hardness of water supplied to the boiler may increase the plate heat exchanger cleaning/replacement frequency.

All DHW circuits, connections, fittings, etc. should be fully in accordance with relevant standards and water supply regulations.



Depending on hardness level of the water supplied, it might be necessary installing a suitable water treatment device for domestic use and in compliance with applicable laws and standards. Water treatment is always advisable when water supplied to the boiler is more than 20°F hard. Water treated by commonly marketed water softeners, due to PH level induced in water, may not be compatible with some components in system.

CONDENSATE DRAIN

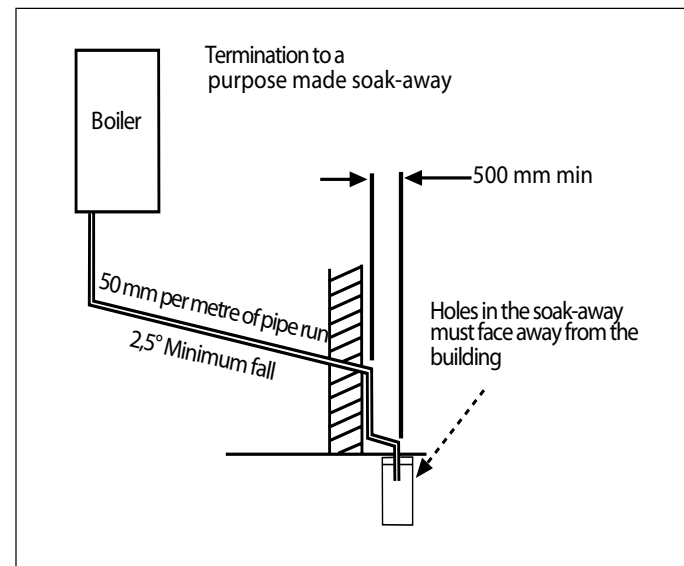
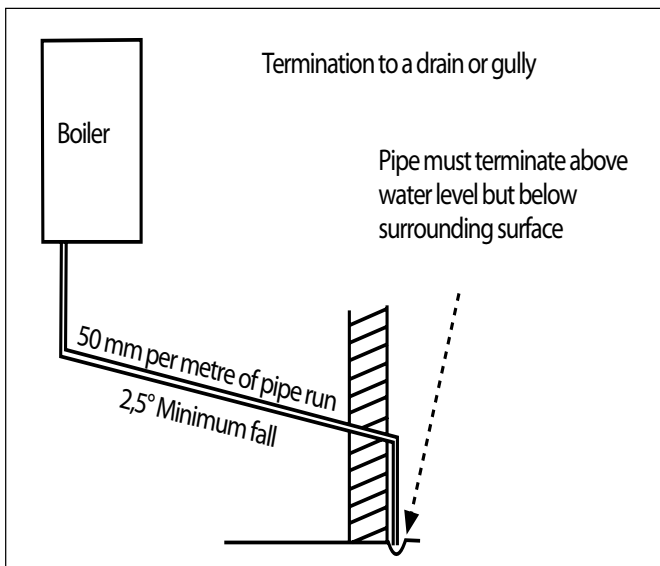
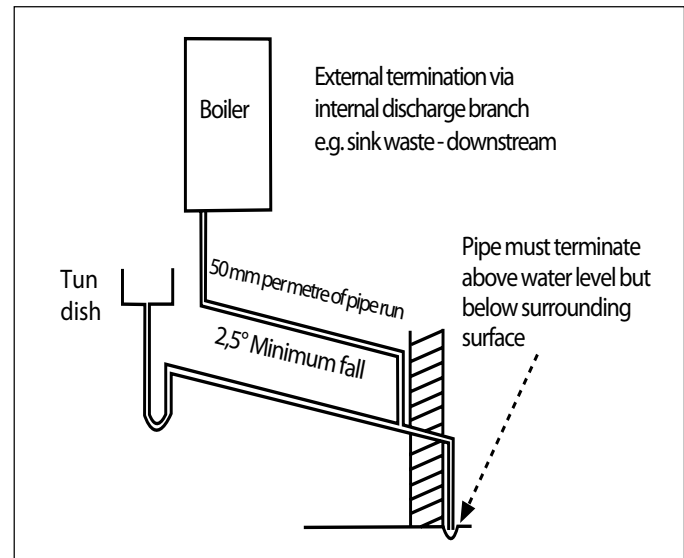
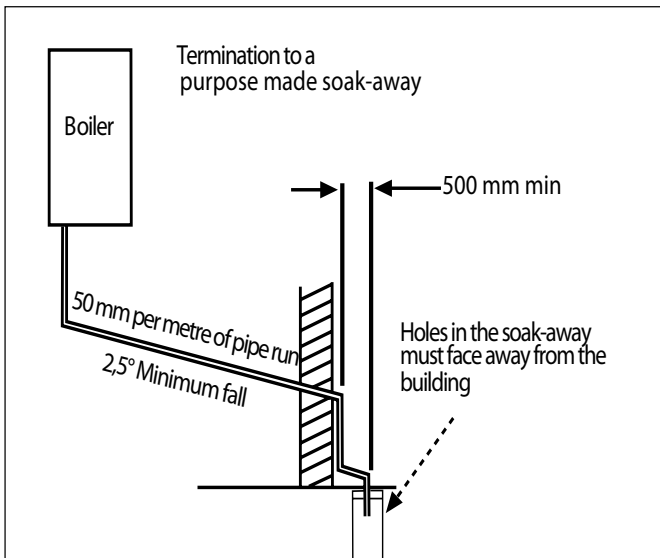
Comply with condensate drain laws and standards applicable in the country of installation and which are considered herein integrally transcribed.

When the law is not stating differently, the condensate produced by combustion, is to be routed (via the condensate drain **S** in fig. 4) through a discharge system connected to the domestic sewer, which due to its basicity, counteracts flue gas condensate acidity.

In order to avoid domestic sewer odour to reach the premises, it is advisable to install an appropriate device between the discharge system and the domestic sewer.

The condensate drain system and the domestic discharge system is to be made of adequate condensate resistant material.

Manufacturer shall not be held responsible for any damage to people, animals or objects, resulting as failure in observing the above mentioned technical precaution.



FAILURE TO INSTALL THE CONDENSATE DISCHARGE PIPEWORK CORRECTLY WILL AFFECT THE RELIABLE OPERATION OF THE BOILER

The condensate discharge pipe **MUST NOT RISE** at any point along its length. There **MUST** be a fall of **AT LEAST 2.5°** (50mm per metre) along the entire run.

1. The condensate outlet will accept 21.5 mm (3/4 in) plastic overflow pipe which should generally discharge internally into the house hold drainage system. If this is not possible, discharge into an outside drain is acceptable.
2. Ensure the discharge of condensate complies with any national or local regulations in force. BS 6798:2000 & Part H1 of the Building Regulations give further guidance.
3. The discharge pipe should be run in a proprietary drain pipe material e.g. PVC, PVC-U, ABS, PVC-C or PP.
4. Metal pipework is **NOT** suitable for use in condensate discharge systems.
5. The pipe should be a minimum of 21.5 mm diameter and must be supported using suitably spaced clips to prevent sagging.
6. It is advisable to keep the condensate pipe internal.
7. External runs greater than 3 metres or runs in cold areas should use 32 mm waste pipe.
8. If the boiler is fitted in an unheated location the entire condensate discharge pipe should be treated as an external run.
9. In all cases discharge pipe must be installed to aid disposal of the condensate. To reduce the risk of condensate being trapped, as few bends and fittings as possible should be used.
10. When discharging condensate into a soil stack or waste pipe the effects of existing plumbing must be considered. If soil pipes or waste pipes are subjected to internal pressure fluctuations when WC's are flushed or sinks emptied then back-pressure may force water out of the boiler trap and cause appliance lockout.

Examples are shown of the following methods of termination:

- i) to an internal soil & vent pipe
- ii) via an internal discharge branch (e.g. sink waste)
- iii) to a drain or gully
- iv) to a purpose made soakaway

4.5.5. Air intake and flue gas discharge system

Flue gas discharge into the atmosphere and air intake/flue gas discharge systems must comply with applicable laws and standards in the country of installation that are considered as fully referred to herein.



In accordance with BS 5440 Part 1 and BS 5440 Part 2 the boiler is equipped with safety devices checking correct flue gas discharge.
Should an air/flue gas system malfunction occur, the safety devices shut down the boiler and the LCD will display the E03 code flashing.
It is strictly forbidden to tamper with and/or prevent operation of such safety devices.
Should the boiler repeatedly shut down, it is necessary to have air/flue gas system ducts inspected, as they might be obstructed or inadequate to flue gas discharge into the atmosphere.

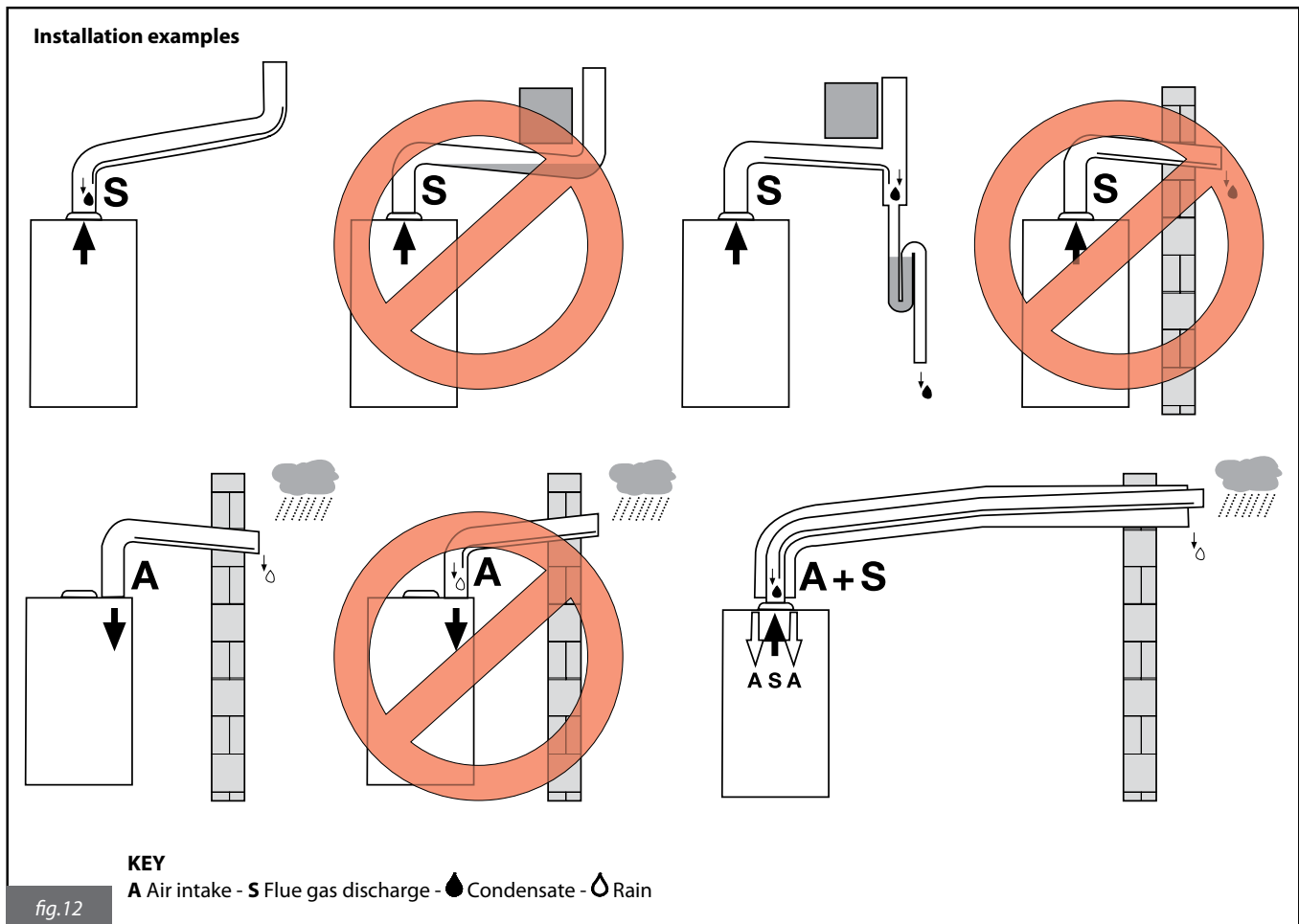


For the air intake/flue gas discharge systems, only specific, Fondital approved, condensate acid-resistant pipes and systems must be used, suitable for condensing boilers.



Flue gas discharge pipes are to be installed tilted toward the boiler so that condensate runs toward the combustion chamber, which is designed for condensate collection and drainage.
Should the above procedure not be possible, it is necessary to install, in condensate stagnation areas, devices designed for condensate collection and conveying to the condensate drain system.
It is necessary to avoid formation of condensate stagnation areas in the flue gas discharge system, with the exception of the condensate trap possibly connected to the discharge system itself.

The manufacturer cannot be held responsible for any damage caused by inappropriate boiler installation or operation, modification to the boiler, or due to non-observance of the instructions provided by the manufacturer or of legislation and standards applicable for the materials installed.



4.6. Configuration of air intake and flue gas discharge ducts

Type B23

Boiler intended for connection to an existing flue system external to the boiler room. Combustion air is taken directly from the boiler room itself while flue gas is conveyed to the outside.

The boiler does not require any cowl while it must be equipped with a fan mounted before the combustion chamber/heat exchanger.

Type B53

Boiler intended for connection, via an independent duct, to the flue gas discharge terminal. Combustion air is taken directly from the boiler room itself while flue gas is conveyed to the outside.

The boiler does not require any cowl while it must be equipped with a fan mounted before the combustion chamber/heat exchanger.

Type C13

Boiler intended for connection to horizontal air intake / flue gas discharge ducts connected to the outside by means of coaxial or split ducts.

The minimum distance between the air intake duct and the flue gas discharge duct must be at least 250 mm, whereas both terminals must be contained within a square measuring 500 x 500 mm.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

Type C33

Boiler intended for connection to vertical air intake / flue gas discharge ducts connected to the outside by means of coaxial or split ducts.

The minimum distance between the air intake duct and the flue gas discharge duct must be at least 250 mm, whereas both terminals must be contained within a square measuring 500 x 500 mm.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

Type C43

Boiler intended for connection to collective chimney pipe system that includes two ducts, one for air intake and one for flue gas exhaustion. These ducts may be coaxial or split.

The chimney must be compliant with applicable legislation and standards.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

Type C53

Boiler with separate pipes for air intake and flue gas discharge.

These flues may discharge in areas at a different pressure.

The terminals may not face each other from opposed walls.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

Type C83

Boiler intended to be connected to combustion air terminal and to a single flue gas discharge terminal or collective chimney.

The chimney must be compliant with applicable legislation and standards.

The boiler is to be equipped with a fan mounted before the combustion chamber/heat exchanger.

4.6.1. Ø 100/60 mm or Ø 125/80 mm air intake/flue gas discharge via coaxial ducts



The information given is with reference to air intake/flue gas discharge ducts made from smooth, rigid pipes approved and supplied by the manufacturer.

Type C13

KC 24

Minimum permissible length of horizontal coaxial pipes is 1 meter, not including the first elbow connected to the boiler.

Maximum permissible length of Ø 100/60 mm horizontal coaxial pipes is 10 meters not including the first elbow connected to the boiler.

Maximum permissible length of Ø 125/80 mm horizontal coaxial pipes is 14.5 meter not including the first elbow connected to the boiler.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The wall terminal reduces maximum permissible length by 1.5 meters.

The air intake duct is to be tilted down by 1% toward its exit, in order to avoid rain water to enter it.

KC 28

Minimum permissible length of horizontal coaxial pipes is 1 meter, not including the first elbow connected to the boiler.

Maximum permissible length of Ø 100/60 mm horizontal coaxial pipes is 9 meter not including the first elbow connected to the boiler.

Maximum permissible length of Ø 125/80 mm horizontal coaxial pipes is 13.5 meter not including the first elbow connected to the boiler.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The wall terminal reduces maximum permissible length by 1.5 meters.

The air intake duct is to be tilted down by 1% toward its exit, in order to avoid rain water to enter it.

Type C33

KC 24

Minimum permissible length of vertical coaxial pipes is 1 meter, not including the first elbow connected to the boiler.

Maximum permissible length of \varnothing 100/60 mm vertical coaxial pipes is 10 meters not including the first elbow connected to the boiler.

Maximum permissible length of \varnothing 125/80 mm vertical coaxial pipes is 14.5 meters not including the first elbow connected to the boiler.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The 100/60 mm roof coaxial terminal reduces maximum permissible length by 1.5 meters.

KC 28

Minimum permissible length of vertical coaxial pipes is 1 meter, not including the first elbow connected to the boiler.

Maximum permissible length of \varnothing 100/60 mm vertical coaxial pipes is 9 meters not including the first elbow connected to the boiler.

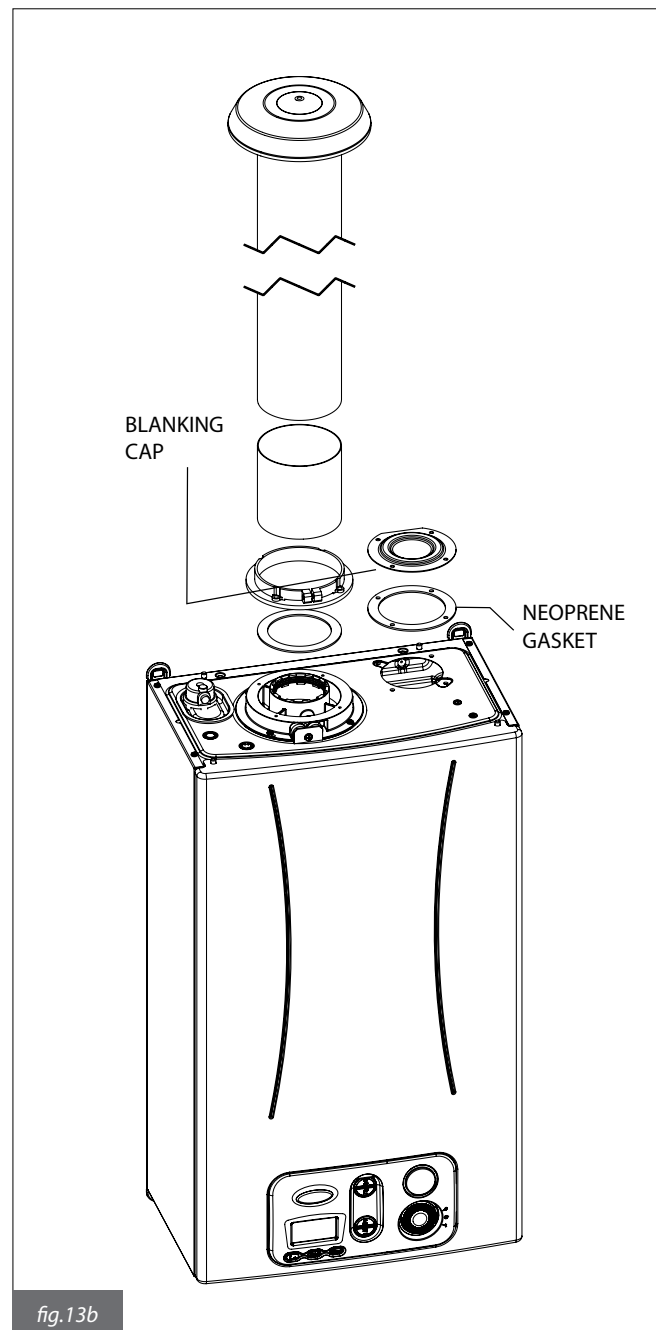
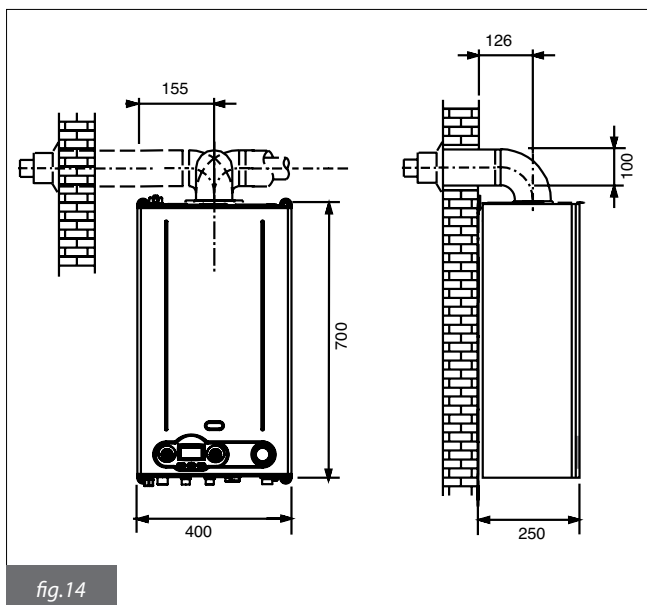
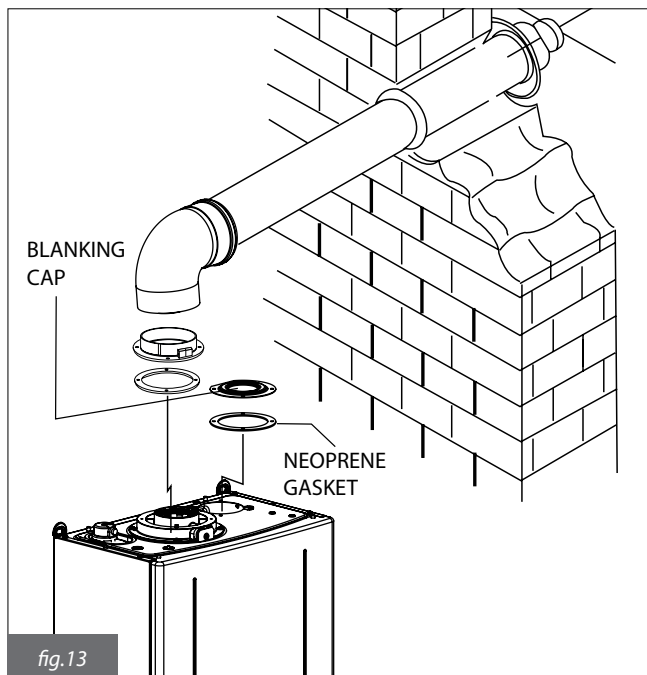
Maximum permissible length of \varnothing 125/80 mm vertical coaxial pipes is 13.5 meters not including the first elbow connected to the boiler.

For each additional 1 meter of straight pipe maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The 100/60 mm roof coaxial terminal reduces maximum permissible length by 1.5 meters.



The illustrations are indicative only. When installing accessories, refer to the instructions supplied with the accessories themselves.

4.6.2. Ø 80 mm air intake/flue gas discharge via split ducts



The information given is with reference to air intake/flue gas discharge ducts made from smooth, rigid pipes approved and supplied by the manufacturer.

Installation types C43 - C53 - C83

KC 24

Minimum permissible length of air intake duct is 1 meter.

Minimum permissible length of flue gas discharge duct is 1 meter.

Maximum permissible length of air intake/flue gas discharge ducts is 84 meters (combined length of air intake and flue gas discharge pipe length).

For each additional 1 meter of straight duct maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 0.5 meter.

The roof terminal reduces maximum permissible length by 5.5 meters.

The wall terminal reduces maximum permissible length by 5 meters.

KC 28

Minimum permissible length of air intake duct is 1 meter.

Minimum permissible length of flue gas discharge duct is 1 meter.

Maximum permissible length of air intake/flue gas discharge ducts is 91 meters (combined length of air intake and flue gas discharge pipe length).

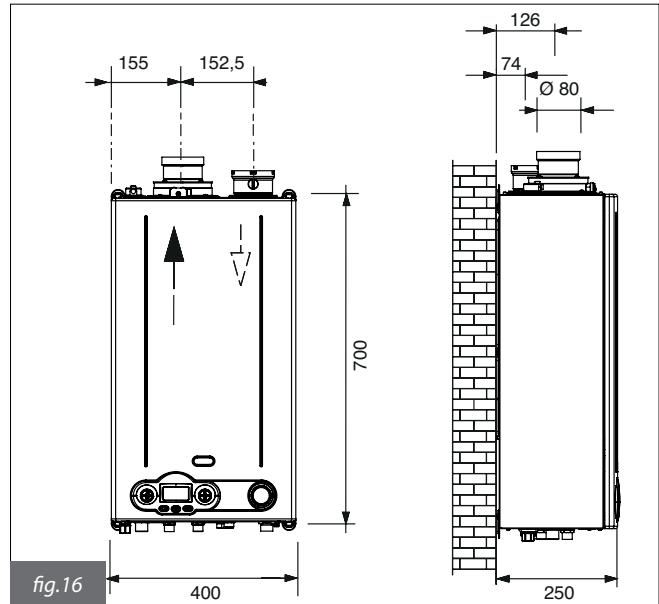
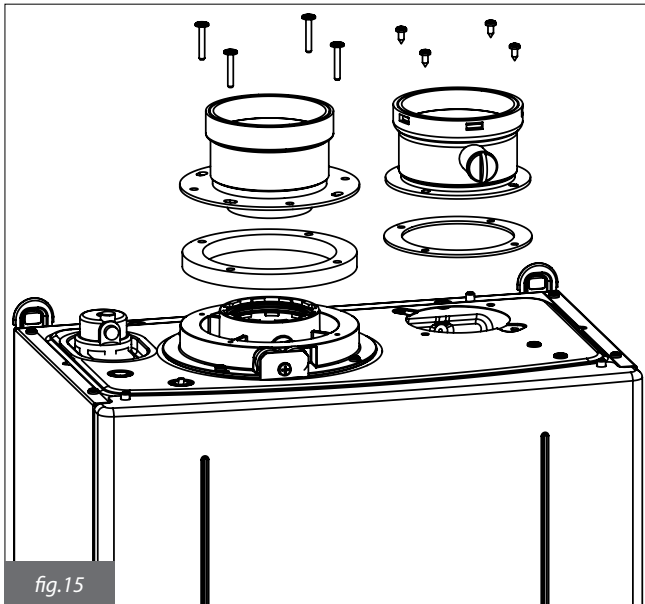
For each additional 1 meter of straight duct maximum permissible length is to be reduced by 1 meter.

For each additional 90° elbow, maximum permissible length is to be reduced by 1.5 meter.

For each additional 45° elbow, maximum permissible length is to be reduced by 1 meter.

The roof terminal reduces maximum permissible length by 5.5 meters.

The wall terminal reduces maximum permissible length by 5.5 meters.



4.7. Connection to electrical mains

The boiler is supplied with a three-core power cable, already connected to the electronic board and it is provided with a safety clamp.

The boiler is to be connected to a 230V-50Hz electrical power supply.

When connecting the boiler to power mains, follow correct phase / neutral polarity sequence.

Installation standards must be complied with and they are considered as an integral part of this booklet.

An easily accessible two-poled switch, with a minimum 3 mm distance between contacts, is to be installed adjacent to the boiler. The switch is to allow power supply cut-off in order to safely perform maintenance and service procedures.

Power supply to the boiler must be fitted with a residual-current circuit breaker having suitable disconnection capacity.

Electric power supply must be properly earthed.

The above mentioned safety measure must be verified. If in doubt, ask a qualified technician to thoroughly check the power network.



WARNING

The manufacturer cannot be held responsible for any damage caused by failure to earth the system correctly: gas, water, or CH system pipes are not suitable for earthing power networks.

4.8. Connection to room thermostat (optional)

The boiler is designed to be connected to a room thermostat (not supplied with the boiler).

Room thermostat contacts must be properly sized in compliance with a load of 5 mA load at 24 Vdc.

Room thermostat wiring must be connected to the relevant terminal (see wiring diagram, fig. 23), after removing the jumper supplied as standard with the boiler.

The room thermostat wirings are NOT to be grouped together in the same sheath as power mains supply cables.

4.9. Installation and operation with Open Therm remote control (optional)

The boiler may be connected to an Open Therm remote control (part number 0CREMOTO04, non-compulsory optional accessory supplied by manufacturer).

The remote control must only be installed by qualified personnel.



Only use original remote control units supplied by the manufacturer.

If non-original remote controls are used, correct operation of the boiler, or of the remote control, cannot be guaranteed.

To install the remote control, refer to the instructions provided with the remote control itself.

Please note the following precautions when installing the remote control:

- **the remote control wiring must not be grouped together in the same sheath as the power cables:** if the cables are sheathed together, electrical interference from the power cables may compromise the functions of the remote control;
- the remote control must be installed on an indoor wall at a height of approximately 1.5 m from the floor and in a suitable location for measuring ambient temperature: do not install in recess or corners, behind doors or curtains, and install away from heat sources, direct sunlight, air draughts and water sprays.

The remote control connector is protected against inverted polarity, and the connections may be inverted.



Do not connect the remote control to mains electrical power (230 V ~ 50 Hz).

Central heating and DHW functions are activated and deactivated directly from the remote control. Once the remote control has been installed, the boiler LCD will display the following page:



For complete instructions on how to programme the remote control, refer to the instruction manual included in the remote control kit.

The remote control may be used to view and set a number of special parameters denominated TSP parameters and reserved solely for qualified technicians (table 8).

TPS0 parameter sets default data table and restores all factory settings, cancelling all preceding modifications on single parameters.

If a single parameter is found to be incorrect, the value given in the default value table is restored.

If the user attempts to set a value not within the permissible range for the parameter, the new value is rejected and the existing value is maintained.

Parameter	Configurable value range	default values for TSP0 = 1 KC 24 Natural gas	default values for TSP0 = 2 KC 28 Natural gas	default values for TSP0 = 3 KC 24 Propane	default values for TSP0 = 4 KC 28 Propane
TSP0 Boiler type and default data chart	0 - 5	1	2	3	4
TSP4 Fan speed at burner maximum power (DHW)	P5 ÷ 250 Hz	199 Hz	201 Hz	192 Hz	198 Hz
TSP5 Fan speed at burner minimum power (DHW and CH)	25 ÷ 120 Hz	42 Hz	40 Hz	42 Hz	40 Hz
TSP6 Fan speed at burner ignition power and flame propagation	25 ÷ 160 Hz	58 Hz	60 Hz	58 Hz	60 Hz
TSP7 Upper limit for maximum CH output can be set via parameter TSP7	10 ÷ 100 %	88%	88%	88%	88%
TSP10 Heating output curves	0 ÷ 3	1,5	1,5	1,5	1,5

Table 8 - Limits to be set for TSP parameters and default values in relation to boiler type (TSP0)

4.10. Installation of the (optional) external probe and "Weather compensation" operation

The boiler can be connected to an (optional) external temperature probe for for "weather compensation" operation.



Only original external temperature probes supplied by the manufacturer must be used. If non-original external temperature probes are used, correct operation of the boiler and external probe cannot be guaranteed.

The external temperature probe must be connected by means of a double insulated wire, minimum cross-section 0.35 sq.mm. The external probe must be connected to pins 5-6 of boiler electronic board (fig. 23).

The temperature probe cables must NOT be routed together with power cables.

The temperature probe must be installed on an outside wall facing north or north-east, in a position protected from weather. Do not install near a window, ventilation openings or sources of heat.

The external temperature probe automatically modifies the CH flow temperature in relation to:

- the outdoor temperature measured
- the thermoregulation curve selected
- the calculated room temperature selected.

The thermoregulation curve is selected via parameter **P10**.

During adjustment, the set value will flash on LCD. Such value can also be read as parameter **TSP10** on the Remote Control (when installed). The relation between parameter TSP10 setting and the thermoregulation curve coefficient is the following:

$$\text{coefficient} = \text{TSP10 value} / 84.67$$

The calculated room temperature is set using buttons **6** (fig.1) that, with external temperature probe installed, no longer work to set the heating water temperature. Fig. 17 shows the curves for a calculated room temperature of 20°C.

Increasing or decreasing this value using buttons **6**, the curves shift up or down, respectively, by the same amount.

With a temperature setting of 20°C, for example, if you select the curve corresponding to parameter 1 and the outdoor temperature is -4°C, the CH flow temperature will be 50°C.

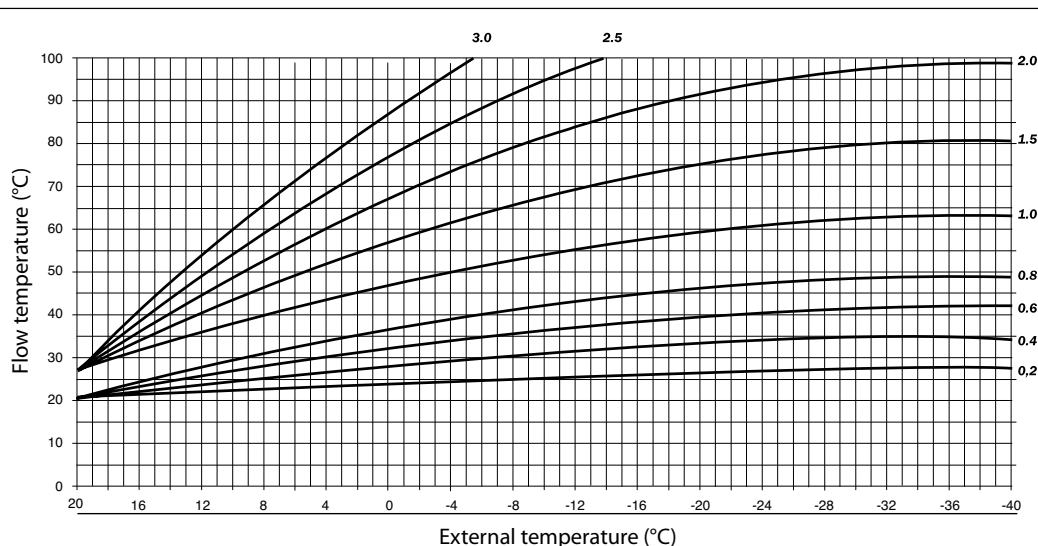


fig.17

4.11 Setting parameters

Parameter	Configurable value range	Factory set	Notes
P0 Boiler output selection	0 to 4	f/s	1 = 24 kW natural gas; 2 = 28 kW natural gas; 3 = 24 kW propane; 4 = 28 kW propane
P3 Boiler type selection	1 to 3	f/s	1= combi boiler with plate heat exchanger for DHW
P4 Fan speed at burner maximum output	Value P5 ÷ 250 Hz	f/s	
P5 Fan speed at burner minimum output	25 to 120 Hz	f/s	
P6 Fan speed at burner ignition output	25 to 160 Hz	58 (24 kW) 60 (28 kW)	
P7 Maximum CH output setting	10 to 100 %	88 %	
P8 Minimum starting speed of negative ramp start	Value P5 ÷ Value P6	f/s	
P9 Negative ramp time	0 to 300 s	f/s	18 (180 s) : 24 kW natural gas/propane 25 (250 s) : 28 kW natural gas/propane
P10 Heating output curves	0 to 3	f/s	
P11 CH thermostat timer	0 to 10 min	4 minutes	
P12 CH power increase ramp timer	0 to 10 min	1 minute	
P13 Timer for CH post-circulation, freeze protection and flue cleaning function	30 to 180 s	30 s	
P15 Water hammer protection delay, configurable	0 to 3 s	0 s	
P16 Ambient thermostat / OpenTherm reading delay	0 to 199 s	f/s	
P17 Multifunction relay settings	0 to 4	f/s	0 = shutdown and fault, 1 = remote relay/TA1, 3 = request TA2
P18 Selection of solar plant type	0, 1		0 = deviating valve, 1 = solar pump
P27 CH timer reset temperature	20 to 78 °C	40°C	
P28 Hydraulic selection for deviating valve relay control	0 to 1	f/s	0 = recirculating pump and deviating valve, 1 = double pump
P29 Default parameters set except for P0-P1-P2-P17-P28	0 to 1	f/s	0 = off
P30 Display of external temperature			
P31 Display of flow temperature			

P32 Display of max calculated flow temperature (with thermoregulation only)			
P33 Display of flow temperature setpoint for zone 2			
P34 Display of current flow temperature for zone 2			
P36 Display of flow temperature setpoint for zone 3			
P37 Display of current flow temperature for zone 3			
P39 Display of flow temperature setpoint for zone 4			
P40 Display of current flow temperature for zone 4			
P42 Display of DHW plate heat exchanger temperature			
P43 Display of boiler return temperature			
P44 Display of boiler temperature			
P45 Display of flue gas temperature (temp. probe)			
P50 Display of boiler type	X, Y, Z		X = value P0, Y = value P2, Z = value P18
P51 Display of most recent boiler shutdown/fault	Fault code		
P52 Display of second last boiler shutdown/fault	Fault code		
P53 Display of third last boiler shutdown/fault	Fault code		
P54 Display of fourth last boiler shutdown/fault	Fault code		
P55 Display of fifth last boiler shutdown/fault	Fault code		

Table 9 - Configurable limits for parameters and default values

4.12. Filling the system

Once all boiler connections have been completed, CH system can be filled.

The procedure is to be cautiously carried out, following each step:

- open the air purging valves on all radiators and verify the boiler automatic valve operation;
- Gradually open the relevant filling loop connection, checking any automatic bleeding valves installed in the system properly work;
- close all radiator air purging valves as soon as water starts coming out;
- check boiler water pressure gauge not to exceed 1÷1.3 bars reading;
- shut the filling loop and bleed any air out again, by opening the air bleeding valves on radiators;
- start the boiler and bring the system to working temperature, stop the boiler and wait for the pump to stop, then repeat the air bleeding procedures;
- allow the system to cool and restore water pressure to 1÷1.3 bars.

WARNING

As regards treating water in domestic heating systems, it is advisable to use propriety branded products that are suitable for multi-metal plants, in order to optimize performance and safety, preserve these conditions over time, ensure regular operation of auxiliary equipment as well, and minimize energy consumption, in compliance with the applicable laws and standards.

WARNING

The safety low water flow switch protecting the heating system will not electrically enable the burner ignition when water flow rate is too low.

The low water safety pressure switch will not electrically enable the burner ignition when water pressure is below 0.4÷0.6 bar.

CH water pressure is not to be less than 1 bar. Restore proper value as needed, via the external filling loop of the boiler.

The procedure is to be followed while the system is cold. The pressure gauge fitted on the boiler control panel indicates the pressure in the CH system.

WARNING

After long inactivity of the boiler, its pump may be stuck. Before starting up the boiler, make sure that the pump is operating, by the following procedure:

- unscrew the protective cap at the centre of the pump motor;
- put a screwdriver into the hole and manually rotate the circulation pump shaft clockwise;
- once the unblocking operation is completed, screw the protective cap back on and check for water leaks.

When the protection cap is removed, some water may flow out. Before refitting the boiler casing ensure that all surfaces are properly dried.

4.13. Starting up the boiler



During first ignition of the boiler pour a glass of water in the flue gas tower so that the condensate trap is filled with water. This is a guarantee for the boiler's tightness.

4.13.1. Preliminary checks

Before starting the boiler, check that:

- the flue gas discharge duct and the relative terminal are installed in conformity with the instructions: **with the boiler operating there must be no leakage of combustion by-products from any of the gaskets;**
- the supply power to the boiler must be 230 V – 50 Hz.
- the system is correctly filled with water (pressure gauge reading 1 to 1.3 bar);
- any shut-off cocks in the system pipes are open;
- the gas supplied to the boiler must be of the type for which the boiler is designed. If necessary, convert the boiler following the instructions in subsection 4.14. *Conversion to other gases types and burner adjustment*. This operation must be carried out by a qualified service engineer;
- the gas supply cock is open;
- **the gas tightness test shows there are no gas leaks;**
- the main switch installed adjacent to the boiler is turned on;
- the 3-bar safety valve is not stuck;
- there are no water leaks;
- the pump has not seized.
- the condensate trap installed on the boiler is discharging condensate correctly and is not stuck.

WARNING

The boiler is equipped with a three-speed pump; three different residual head values correspond to each speed, according to the curves shown in figures 24 and 25.

It is delivered with the circulation pump set at the third speed setting.

If you wish to set a different speed, taking into account the water circulation requirements in the boiler (confirmed by the main water flow switch) and the resistance properties of the system, check operation of the boiler in all the conditions dictated by the features of the system (e.g. closure of one or more heating zones or of thermostat-controlled valves).

4.13.2. Switching on and switching off

To switch the boiler on and off, refer to the *Instructions for the User*.

4.14. Conversion to other gas types and burner adjustment



This boiler is built to run on the type of gas specified on the order, which is shown on the packaging and on the boiler rating plate.

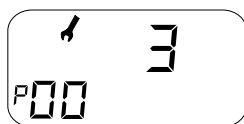
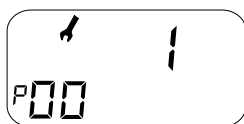
Any later conversion is to be exclusively carried out by qualified personnel, using only manufacturer-approved accessories and following the procedure and adjustment instructions for an accurate boiler setting-up.

4.14.1. Switching from NATURAL GAS to PROPANE

- To open boiler front door, proceed as follows:
 - Loosen the two cover retaining screws (see fig. 18a).
 - Open cover.
 - Lift front cover, pulling it towards you, and release it from the pins positioned on boiler upper side (see fig. 18b).
- Open mixer (A in fig. 21).
- Replace the nozzles in the mixer (fig. 20) with the nozzles for PROPANE (see tables 3, 4).
- Restore the mixer and change the value of parameter P00 from 1 to 3.
- See par. 4.14.3.

4.14.2. Switching from PROPANE to NATURAL GAS

- Open the boiler front panel, as described in par. 4.14.1.
- Open mixer (A in fig. 21).
- Replace the nozzles in the mixer (fig. 20) with the nozzles for **NATURAL GAS** (see tables 3, 4).
- Restore the mixer and change the value of parameter P00 from 3 to 1.
- See par. 4.14.3.



4.14.3. Burner adjustment

Maximum heat output adjustment

- start boiler in flue cleaning mode (see paragraph 6.3.1);
- set fan speed according to the type of gas (see table 11).
- Set flue gas CO₂ rate by turning the ratio adjuster B (fig. 19) and ensure that reading falls within the limits of table 12.
- Let boiler flue cleaning function on and continue with the next point "Minimum heat output adjustment".

	Fan speed
24 kW Natural gas	199 Hz
24 kW Propane	192 Hz
28 kW Natural gas	201 Hz
28 kW Propane	198 Hz

Table 11 - Fan speeds

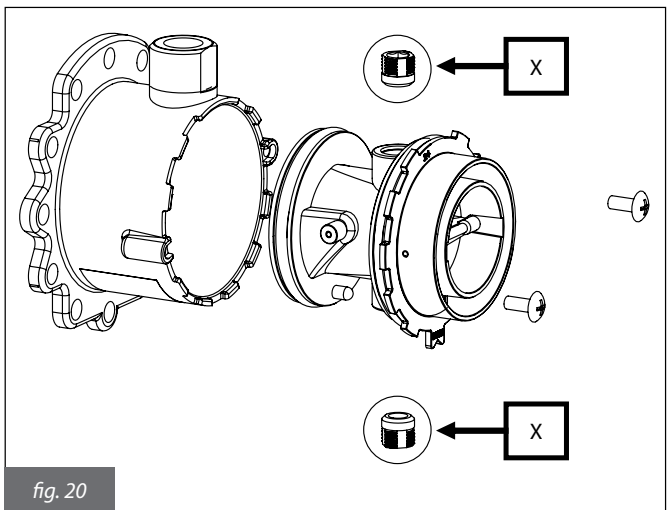
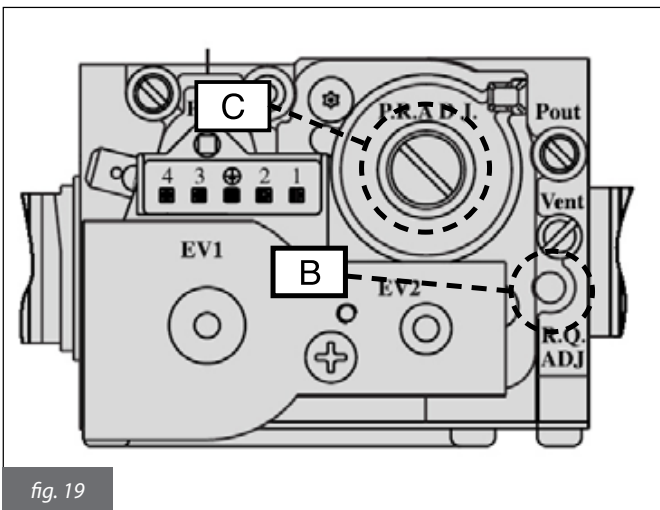
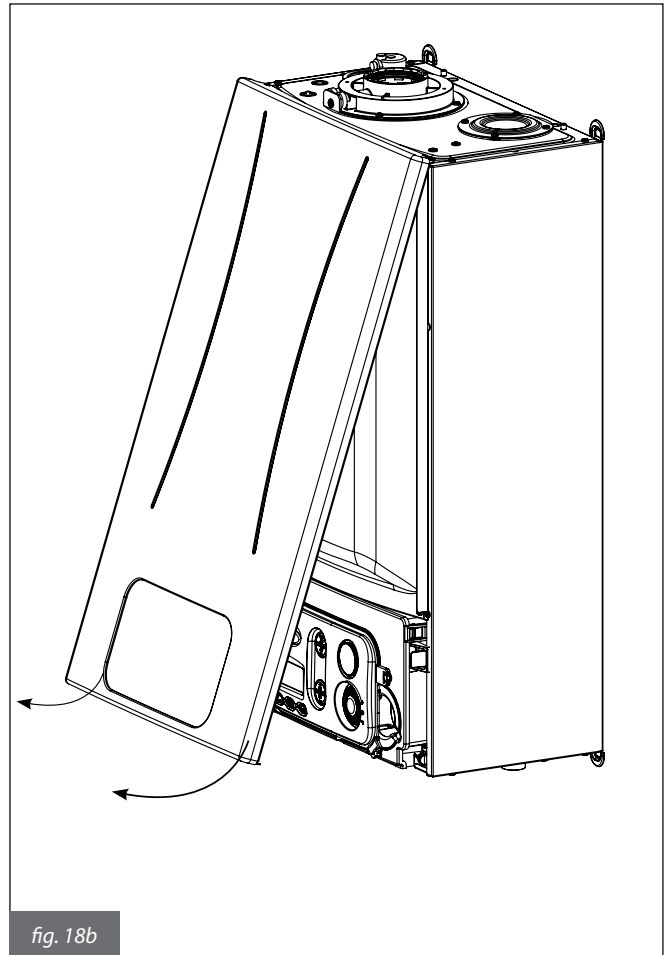
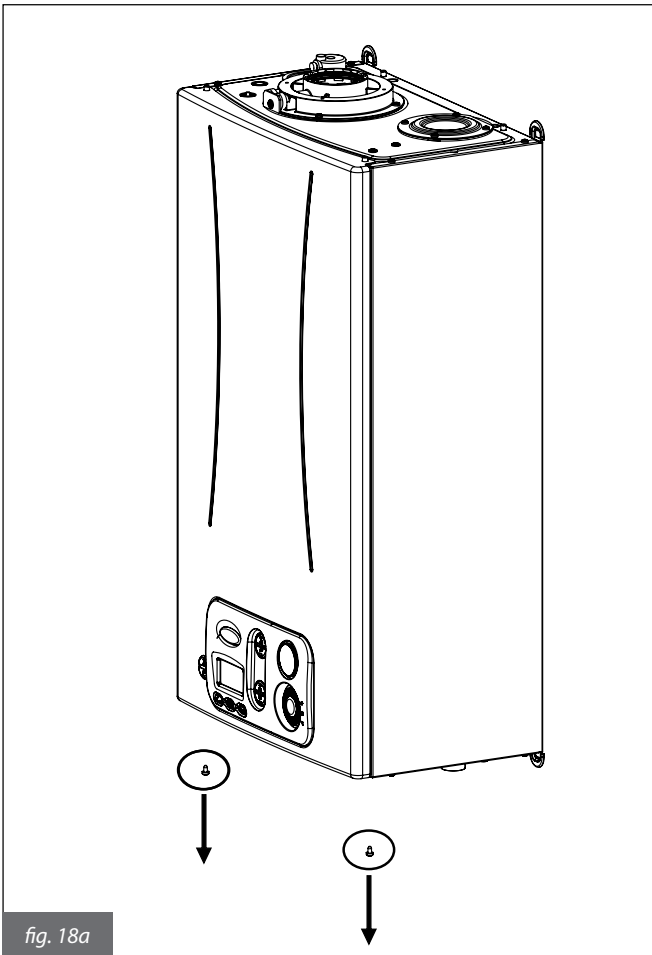
Minimum heat output adjustment

- Press button "+ DHW";
- Set flue gas CO₂ rate by turning the offset adjuster C (fig. 19) and ensure that reading falls within the limits of table 12.
- To turn off the flue cleaning function press "Reset" or select another boiler operating mode.

Flue gas CO₂

Fuel	CO ₂ (%)
Natural gas (24 kW)	9.0 ÷ 9.3
Propane (24 kW)	9.8 ÷ 10.2
Natural gas (28 kW)	9.0 ÷ 9.3
Propane (28 kW)	10.0 ÷ 10.3

Table 12 - CO₂ rates



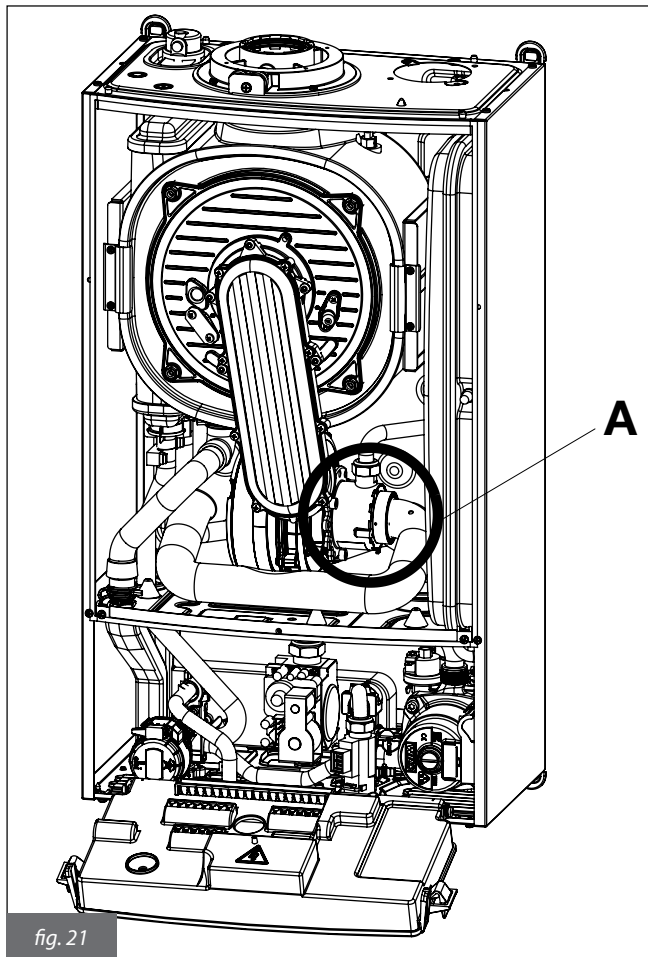


fig. 21

5. TESTING THE BOILER

5.1. Preliminary checks

Before testing the boiler, it is recommended to check the following:

- the flue gas discharge duct and the relative terminal are installed in conformity with the instructions: **with the boiler operating there must be no leakage of combustion by-products from any of the gaskets;**
- the boiler is powered by a 230 V - 50 Hz mains supply;
- the system is correctly filled with water (pressure gauge reading 1 to 1.3 bar);
- any shut-off cocks in the system pipes are open;
- the gas supplied to the boiler must be of the type for which the boiler is designed. If necessary, convert the boiler following the instructions in subsection 4.14. *Conversion to other gases types and burner adjustment*. This operation must be carried out by a qualified service engineer;
- the gas supply cock is open;
- **there are no gas leaks;**
- the main switch installed ahead of the boiler is turned on;
- the 3 bar safety valve is not stuck;
- there are no water leaks;
- the pump has not seized;
- the condensate trap installed on the boiler is discharging condensate correctly and is not stuck.



If the boiler not be installed in compliance with these installation instructions, current laws and standards, notify the responsible person for the system and do not test the boiler.

6. MAINTENANCE

Any maintenance and repair work must only be carried out by qualified personnel.

The manufacturer recommends Customers to contact the **Fondital Helpline UK** for maintenance and repairs, they are best trained for that procedure.

Appropriate boiler maintenance ensures efficient operation, environment preservation, and safety for people, animals and objects.

6.1. Maintenance schedule

The boiler must be serviced at least once every year.



Isolate the appliance from the electric power supply before starting any maintenance procedure, involving replacement of components and/or cleaning inside parts of boiler.

The combustion chamber internal insulating material contains aluminium silicate wool (RCF/ASW).

Tests on animals have shown that the inhalation of RCF/ASW powder can cause the cancer.

Avoid inhaling the powder released by such material.

Use the personal protection equipment as recommended.

Read the ECFIA code of conduct as well as the safety sheets before using the products.

For further information, please visit the website www.label.ecfia.eu

Only skilled personnel is allowed to handle this material.

Routine maintenance schedule are to include the following:

Inspections and checks:

- check visually general integrity of the boiler;
- check boiler and network gas supply for leakage;
- check inlet gas supply pressure to boiler;
- check boiler ignition sequence;
- check boiler combustion parameters by flue gas analysis;
- check the condition and seal integrity of the flue gas discharge pipes;
- check the state of combustion fan;
- check integrity of safety devices of the boiler in general;
- check for water leaks and oxidised areas on the boiler's couplings;
- check efficiency of the system safety valve;
- check expansion vessel loading pressure;
- check safety flow switch, preventing low water pressure operation;
- check correct draining of condensate from the condensate trap installed on the boiler;
- check visually the flue discharge pipe throughout the flue length.

The following cleaning is to be done:

- clean the general interior of the boiler;
- clean the gas injectors;
- clean the air intake and flue gas discharge circuits;
- clean the heat exchanger (burner side);
- condensate trap and discharge ducts.

When checking the boiler for the very first time, also verify:

- boiler room suitability;
- diameter and length of flue gas system ducts;
- boiler installation in accordance to this "*Installation use and maintenance*" manual instructions.

Should the boiler not correctly operate, while not creating any danger to people, animals or property, inform the Fondital helpline UK both verbally and in writing.


After servicing, complete the relevant Service Interval Record section of the Benchmark Checklist located on the inside back pages of this document.

6.2. Combustion analysis

The combustion parameters of the boiler, which have to be checked in order to determine efficiency and emissions, must be measured in compliance with applicable legislation and standards, which are considered as fully transcribed in this manual.

6.3. Checking combustion efficiency

6.3.1. Flue cleaning function

The boiler features a flue cleaning function which must be used to measure in situ combustion efficiency and to set the burner. To activate the flue cleaning function, press and hold the buttons "info" and "Reset" simultaneously for 3 seconds. The flow temperature and the symbol  are shown on the LCD.

When the flue cleaning function is activated, with the boiler in **WINTER**  or **SUMMER**  mode, the boiler performs the ignition sequence and then operates at a fixed power output predetermined by the parameter P1 (maximum CH output). To exit the flue cleaning mode, press "Reset" or wait 15 minutes.

6.3.2. Measurement procedure

The boiler is equipped with a tower allowing for air intake/flue gas discharge duct connection (fig. 22 and 22a).

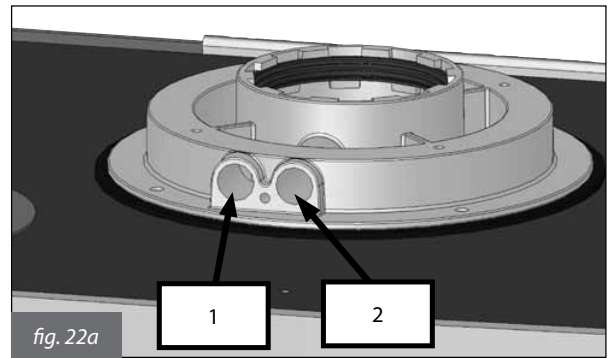
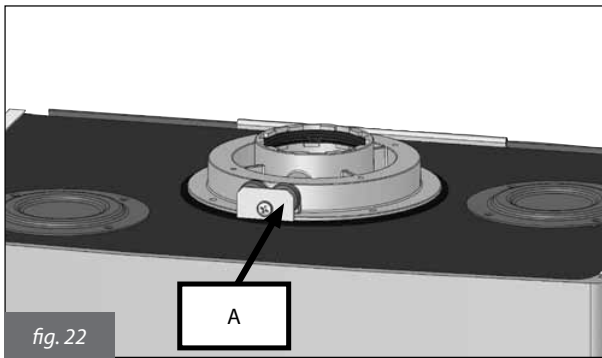
The tower is designed with two pre-arranged openings directly accessing air and flue gas ducts.

Remove cap A from the pre-arranged openings on the tower, before starting combustion checking procedure (fig. 22).

In order to verify combustion efficiency the following measurements must be implemented:

- assess combustion air from no. 1 opening (fig. 22a).
- assess flue gas temperature and CO₂ from no. 2 opening (fig. 22a).

Allow boiler to reach working temperature before taking any measurement.



Fuel	CO ₂	O ₂
Natural gas	9.0 to 9.3	
Propane	9.7 to 10.3	

Table 13 – CO₂ - O₂ rates

6.4. Wiring diagram

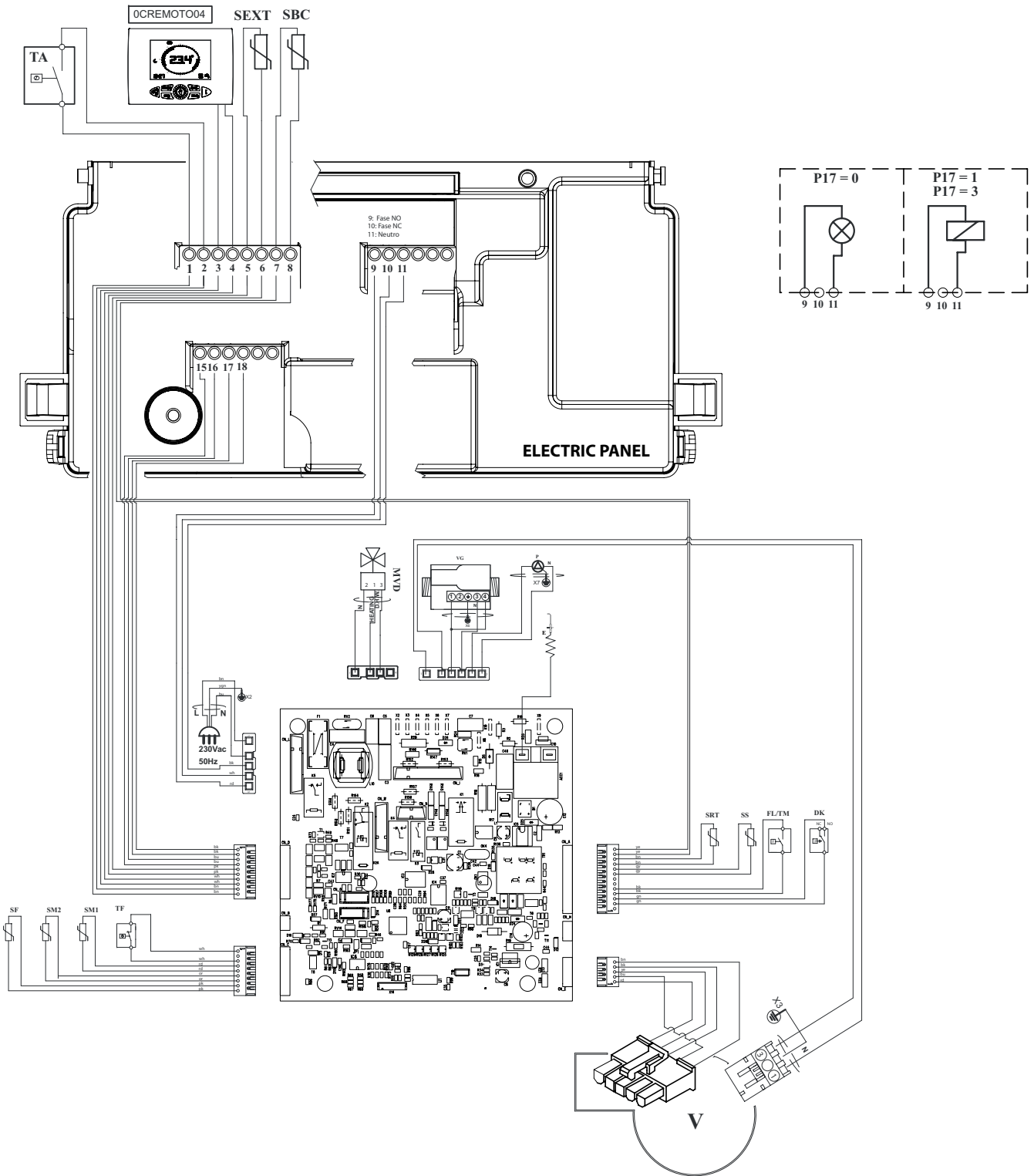


fig. 23

Key

DK: water pressure switch
FL/TM: flow switch/timer
SS: DHW NTC probe 10K Ohm at 25 °C B=3435
STR: return NTC probe 10K Ohm at 25 °C B=3435
SR1-SR2: CH NTC probe 10K Ohm at 25 °C B=3435
SF: flue gas NTC probe 10K Ohm at 25 °C B=3435 or thermal fuse

VG: gas valve
P: boiler pump
MDV: electric deviating valve
E: ignition/flame detection electrode
V: brushless fan
OSCHEMOD22: electronic board
CN_A-CN_M: signal/load connectors
X2-X7: ground connectors
TA (PIN 1 and 2): room thermostat (use a no load contact)

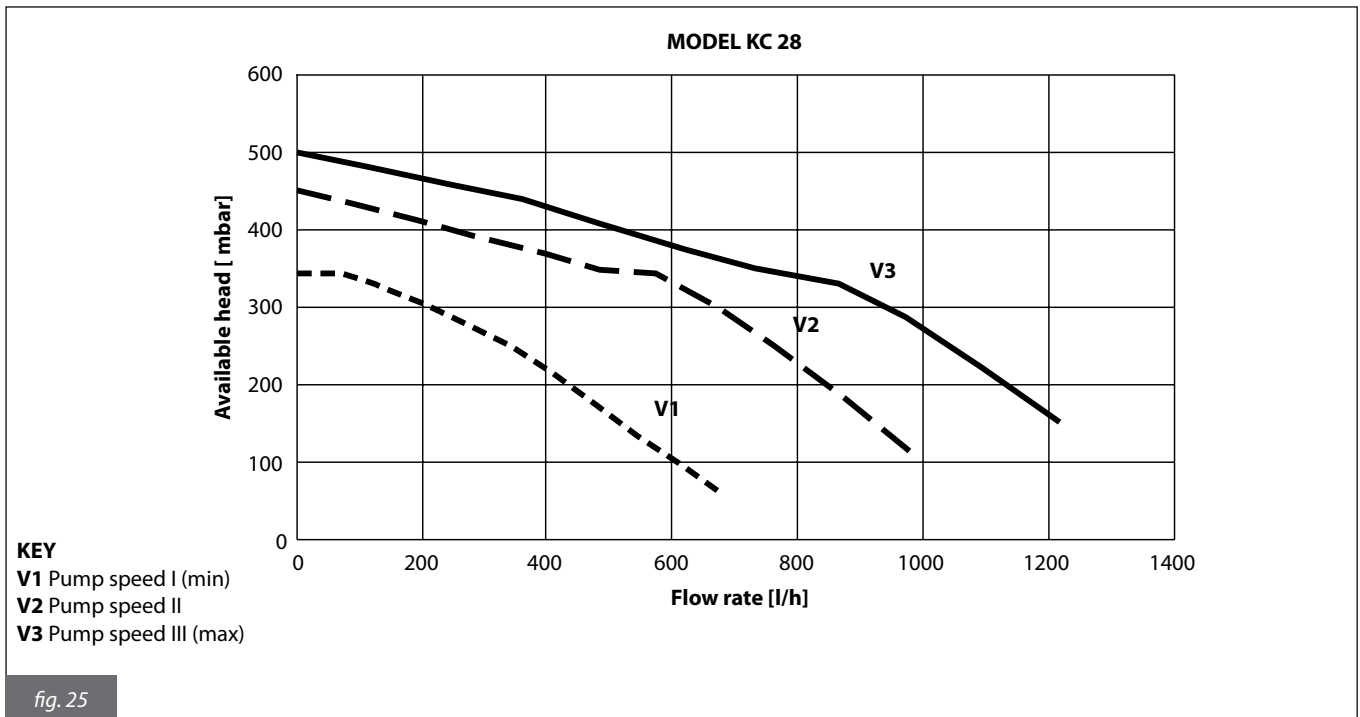
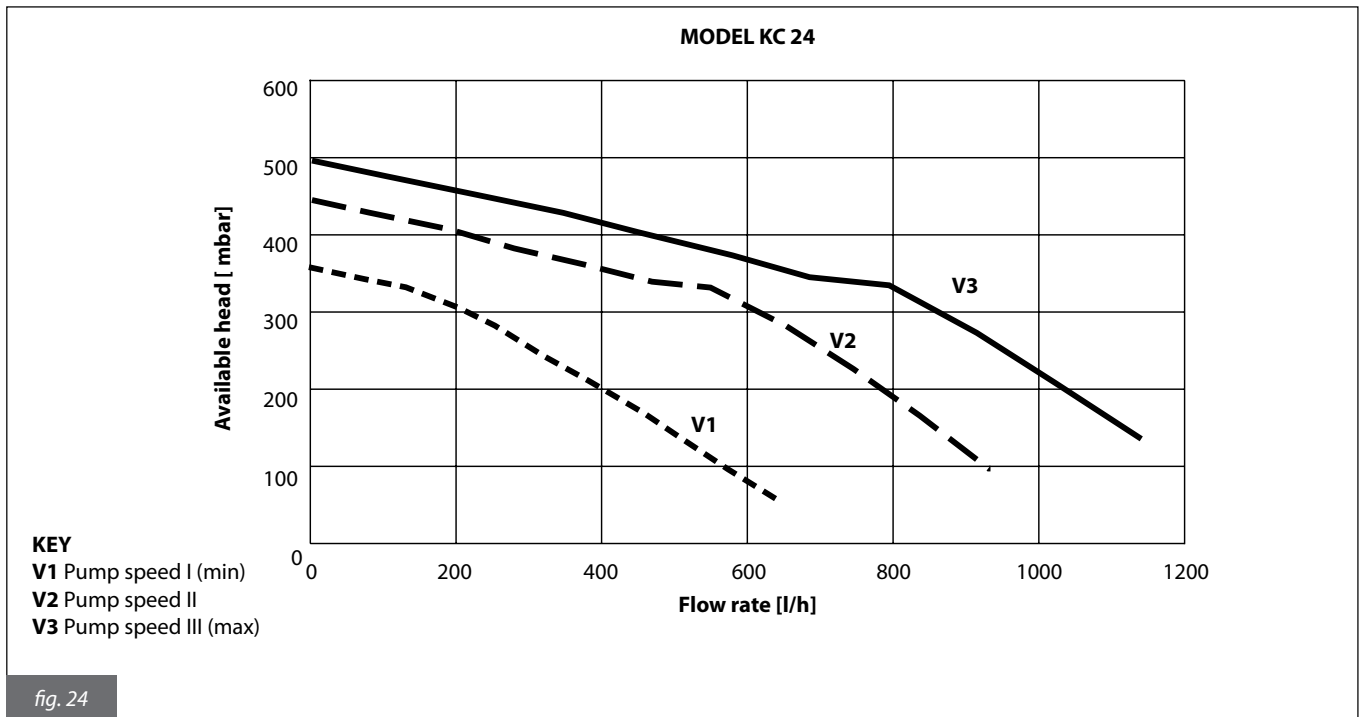
OCREMOTO04 (PIN 3 and 4): OpenTherm remote control
SEXT (PIN 5 and 6): external NTC probe 10K Ohm at 25 °C B=3977
SBC: water heater probe, boiler side, NTC 10K Ohm at 25 °C B=3435
MULTIFUNCTION RELAY 230 Vac 5A cosφ=1:
 PIN 15: phase, normally open
 PIN 16: phase, normally closed
 PIN 17: neutral

Relationship between temperature (°C) and nominal resistance (Ohm) of the central heating probe (SR), of the DHW probe (SS) and of the return probe (SRT).

T (°C)	0	2	4	6	8
0	27203	24979	22959	21122	19451
10	17928	16539	15271	14113	13054
20	12084	11196	10382	9634	8948
30	8317	7736	7202	6709	6254
40	5835	5448	5090	4758	4452
50	4168	3904	3660	3433	3222
60	3026	2844	2674	2516	2369
70	2232	2104	1984	1872	1767
80	1670	1578	1492	1412	1336
90	1266	1199	1137	1079	1023

Table 14 - Relationship between Temperature and Nominal resistance for temperature probes

6.5. Available head



7. ROUTINE SERVICING

7.1. Checks before servicing

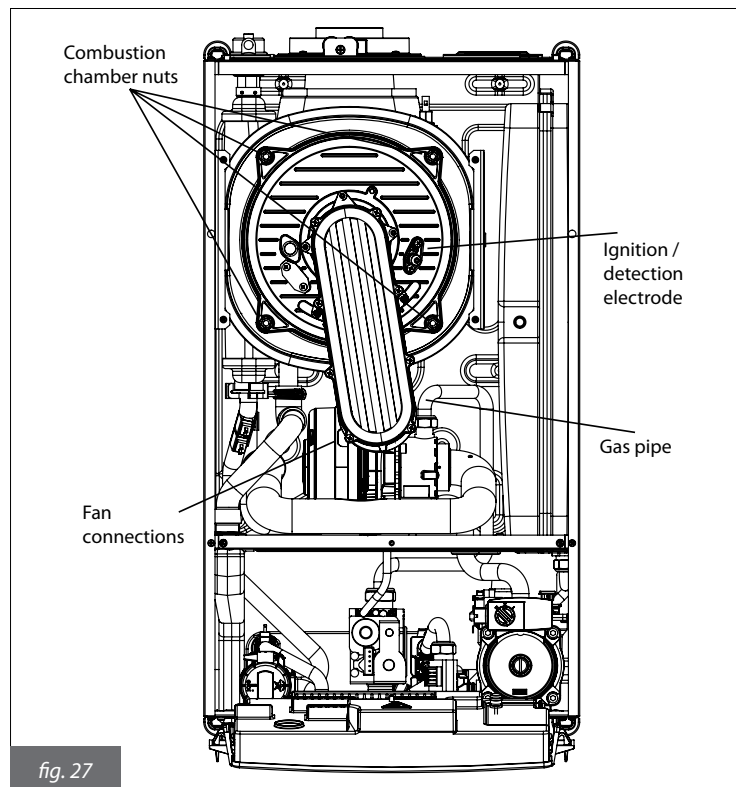
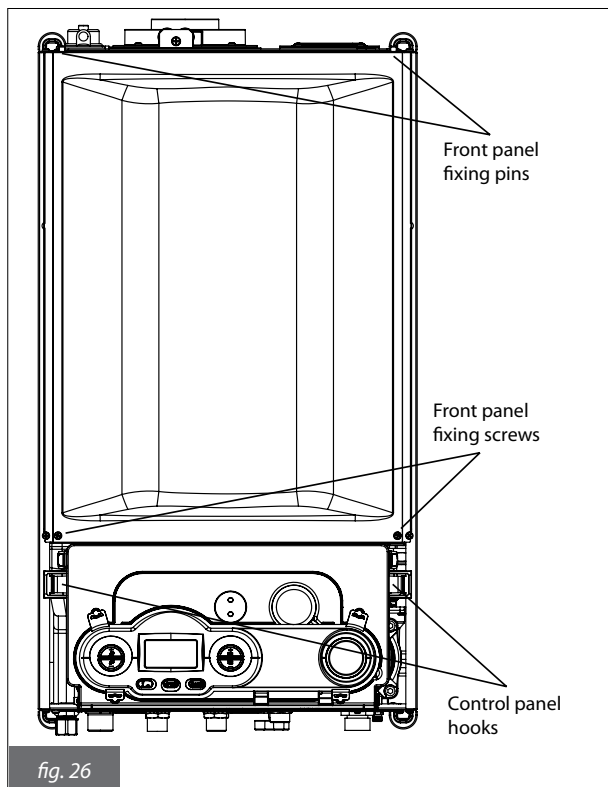
Before servicing the boiler, always check the following:

- Check the entire flue system, including joints and the flue terminal. Be sure that all of the assembly is correct and there are no blockages
- Ensure that all connections and fittings are ok. In case of leaking, remake the joints or check the tightness of the fittings
- If necessary, refill, vent and re pressurise the system
- Check the expansion vessel charge (only when the system is empty)
- Check that the condensate drain pipe is connected and all joints are ok

7.2. Prepare for servicing (figs. 26 and 27)

These are the preliminary steps to boiler cleaning:

- Be sure that the boiler is isolated from power supply and that gas supply is off
- Unscrew the two screws holding the front panel. Lift it up and forwards to remove it
- Unlock the upper part of the control panel and rotate it forwards
- Unscrew the two screws holding the combustion chamber cover. Lift it up and forwards to remove it
- Disconnect the gas pipe from the mixer
- Disconnect the two electric connections from the fan
- Remove the ignition/detection electrode from the combustion chamber front panel, unscrewing the two screws
- Unscrew the four nuts holding the combustion chamber front panel, and remove the burner/panel/fan assembly



7.3. Boiler cleaning

- Remove any deposits from heat exchanger, using a suitable soft brush. Never use brushes with metallic bristles
- Check all combustion chamber insulation panels and gaskets. Replace any damaged panel or gasket
- Remove any deposit from the exchanger coils, by suction or spraying water onto the coils themselves. Before using water, ensure that any electric component is suitably protected. Any water used to clean the coils will drain through the condensate trap
- Check the condition of the electrode and, if necessary, clean or replace it
- Open the condensate trap cap to remove any deposits. Note: before opening the cap, be sure that the released water can be contained

7.4. Reassemble the boiler

- Before reassembling the burner/panel/fan assembly, pour some water into the coils of the heat exchanger, to ensure the condensate trap is full of water when operating the boiler
- Reassemble the burner/panel/fan assembly, using its four nuts, and check it is positioned correctly
- Reconnect the electrode, the electric fan connections and the gas pipe
- Test the tightness of the gas pipe connection
- Put the control panel to its original position, and reassemble the two front panels
- Operate the boiler to check everything works correctly

8. COMPONENT REPLACEMENT

Note: any servicing activity must be carried out by qualified personnel only.

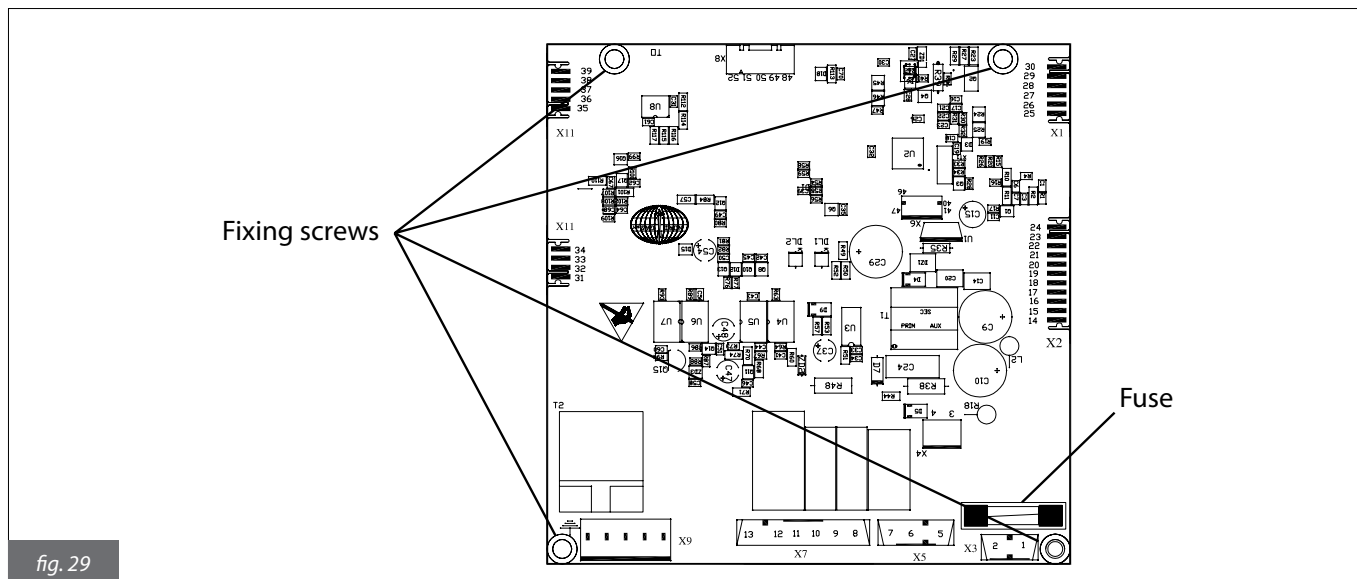
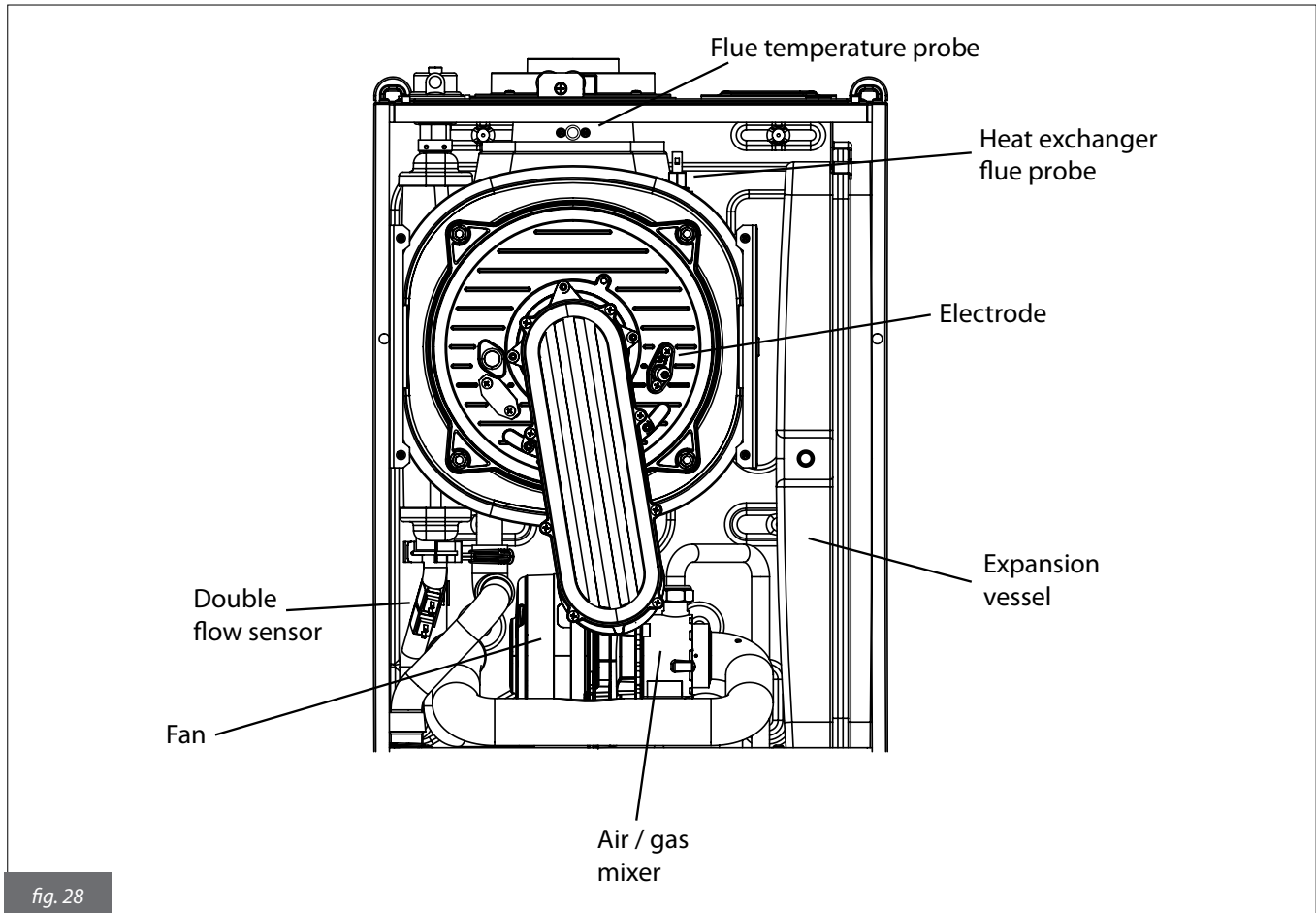
Before replacing any boiler component, be sure the boiler is isolated from electric supply and the gas cock is closed. Always ensure that the boiler is cool.

After replacing any gas carrying components, or opening any gas connections, always check for gas tightness.

After servicing, check the operation of the boiler and restore all boiler controls to their original settings.

8.1. Electrode (fig. 28)

- Open the sealed chamber and the control panel as described in 7.2
- Disconnect the lead from the electronic board, noting its position
- Unscrew the two screws holding the electrode to the combustion chamber front panel and withdraw the electrode with care
- Reassemble in reverse order



8.2. Gas injectors

See 4.14 (Conversion to other gas types and burner adjustment)

8.3. Fan (fig. 28)

- Remove the burner/panel/fan assembly as described in 7.2
- Remove the mixer from the fan, unscrewing the three socket head capscrews with a 5 mm Allen key
- Remove the fan, unscrewing the four 8 mm bolts
- Replace with a new fan and reassemble in reverse order

8.4. Flue temperature probe (fig. 28)

- Access behind the front panel as described in 7.2
- Disconnect the wiring from the flue temperature probe
- Unscrew the two holding screws and remove the probe
- Replace the probe and reassemble in reverse order

8.5. Gas valve (fig. 30)

- Access behind the front panel as described in 7.2
- Disconnect the compensation silicon pipe from the gas valve
- Disconnect the electrical plug
- Disconnect the gas inlet and gas output pipe, and remove the valve
- Fit the new valve, assembling it in reverse order, and check for gas tightness
- Operate the boiler and adjust the gas valve as described in 3.7
- Complete reassembly

8.6. Fuse (fig. 29)

The fuse is located on the electronic board.

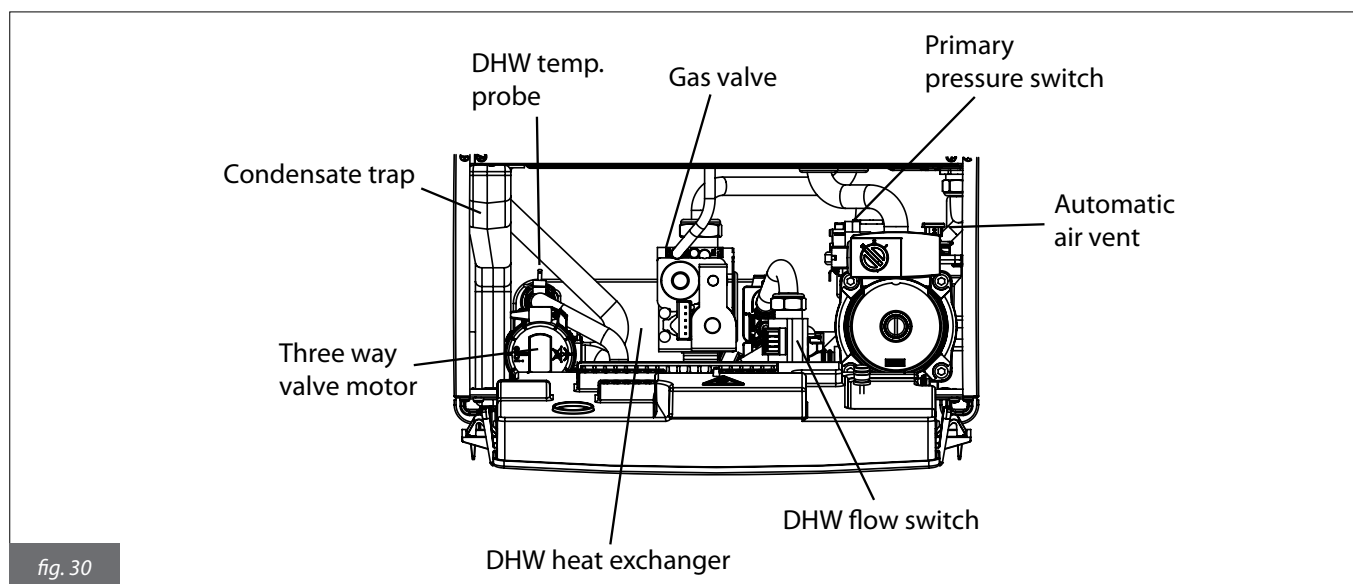
Note: before accessing the electronic board, ensure the boiler is isolated from power supply

- Access the control panel as described in 7.2
- Open the control panel case
- Remove the fuse and fit in a new one
- Reassemble in reverse order

8.7. Electronic board (fig. 29)

Note: before accessing the electronic board, ensure the boiler is isolated from power supply

- Access the control panel as described in 7.2
- Open the control panel case
- Disconnect all connections to the electronic board
- Remove the four fixing screws and carefully withdraw the electronic board
- Reassemble in reverse order, referring to the wiring diagram (6.4)
- Start the boiler and adjust the electronic board, according to the instructions accompanying the replacement board



8.8. Three-way valve motor (fig. 30)

- Access behind the front casing, as described in 7.2
- Remove the three-way valve motor by unplugging the electrical connection and removing the holding clip upwards
- Remove the motor pulling it forwards
- Reassemble with a new motor in reverse order

8.9. DHW temperature probe (fig. 30)

- The DHW temperature probe is positioned on the hot water outlet pipe, just above the three way valve
- Disconnect the two electric connections and unclip the probe from the pipe
- Reassemble with a new probe in reverse order

8.10. Heat exchanger flue probe (fig. 28)

Note: if the heat exchanger flue probe generates an E90 or E91 error code, check carefully the integrity of the heat exchanger itself, and if necessary, replace it. If the error code is E89, proceed with the probe replacement.

- Access behind the front casing, as described in 7.2
- Disconnect the wires from the probe and remove it
- Fit in a new probe and reassemble in reverse order

8.11. DHW flow switch (fig. 30)

- Remove the front cover and access behind the control panel, as described in 7.2
- Isolate the boiler from the mains water supply, and open any hot water tap, in order to drain the boiler
- Disconnect the wires from the flow switch
- Undo the union nut at the top of the flow switch
- Remove the fixing clip at the bottom of the flow switch and then remove the switch itself
- Fit the new switch and reassemble in reverse order, opening the mains water supply

8.12. Primary heat exchanger

- Drain the boiler heating circuit, connecting the drain point to a suitable container and opening it
- Access the room sealed chamber and remove the burner/panel/fan assembly as described in 7.2
- Disconnect the condensate drain pipe
- Disconnect the heat exchanger flue sensor as described in 8.11
- Disconnect the flow and return pipes from the left side of the heat exchanger, removing the holding clips and pulling the pipes downwards
- Also disconnect the flow pipe from the three way valve and remove it
- Unscrew the four screws from the two brackets holding the heat exchanger
- Slightly widening the two brackets, slide the exchanger downwards and forwards, in order to disconnect it from the flue connection and to withdraw it from the boiler
- Replace with a new exchanger and carefully reassemble in reverse order
- Refill, pressurise the system and carefully vent air from the exchanger, opening the manual air vent on the top of the exchanger itself

8.13. Double flow temperature probe and return probe (fig. 28)

- Access the room sealed chamber as described in 7.2
- Disconnect the wiring and unclip the probe from the water flow or return pipe
- Replace with a new probe and reassemble

8.14. Automatic air vent (fig. 30)

- Access behind the control panel as described in 7.2 and drain the boiler heating circuit
- Extract the retaining clip and lift the vent out of the pump housing
- Insert the new air vent and lock it with the clip
- Reassemble in reverse order
- Refill and pressurize the system

8.15. Primary pressure switch (fig. 30)

- Access behind the control panel as described in 7.2 and drain the boiler heating circuit
- Disconnect the wiring from the pressure switch
- Remove the holding clip and lift the switch upwards to extract it
- Replace with a new switch and reassemble in reverse order
- Refill and pressurize the system

8.16. Pressure relief valve

- Access behind the control panel as described in 7.2 and drain the boiler heating circuit
- Disconnect the pressure relief valve outlet pipe
- Extract the retaining clip and lift the valve out of the pump housing
- Replace with the new valve and reassemble in reverse order
- Refill and pressurize the system

8.17. DHW heat exchanger (fig. 30)

- Access behind the front panel as described in 7.2 and drain both heating and DHW circuits
- Remove the condensate trap, as described in 8.20 to gain more space for extracting the heat exchanger
- Unscrew the two socket head capscrews holding the DHW heat exchanger with a 4 mm Allen key
- Rotate the heat exchanger counterclockwise and extract it from the lower part of the boiler. Be careful not to allow water to drip on any electrical component
- Reassemble with a new heat exchanger in reverse order
- Refill and pressurize the system

8.18. Three-way valve cartridge

- Access behind the control panel, as described in 7.2, and drain the heating circuit
- Remove the three way valve motor, as described in 8.8
- Unscrew the two screws holding the cartridge and remove it, taking care non to drip water onto any electrical component
- Insert the new cartridge in place and reassemble in reverse order
- Refill and pressurize the system

8.19. Expansion vessel (fig. 28)

Note: check the pressure of the new vessel, which must be about 1 bar, before installing it. If necessary, pressurize it.

- Access the room sealed chamber, as described in 7.2, and drain the heating circuit
- Disconnect the pipe from the bottom of the expansion vessel
- Unscrew the two screws holding the top support bracket
- Extract the expansion vessel from the boiler and replace it
- Reassemble in reverse order
- Refill and pressurize the system

8.20. Condensate trap (fig. 30)

- Access the room sealed chamber as described in 7.2
- Place a container under the boiler and remove the condensate trap cap, in order to empty the condensate trap
- Disconnect the top and drain connections of the condensate trap
- Unscrew the threaded washer holding the condensate trap to the bottom of the sealed chamber, and remove the condensate trap
- Fit the new trap and assemble in reverse order

Note: fill the new trap with water once installed and before operating the boiler

9. SPARE PART LIST

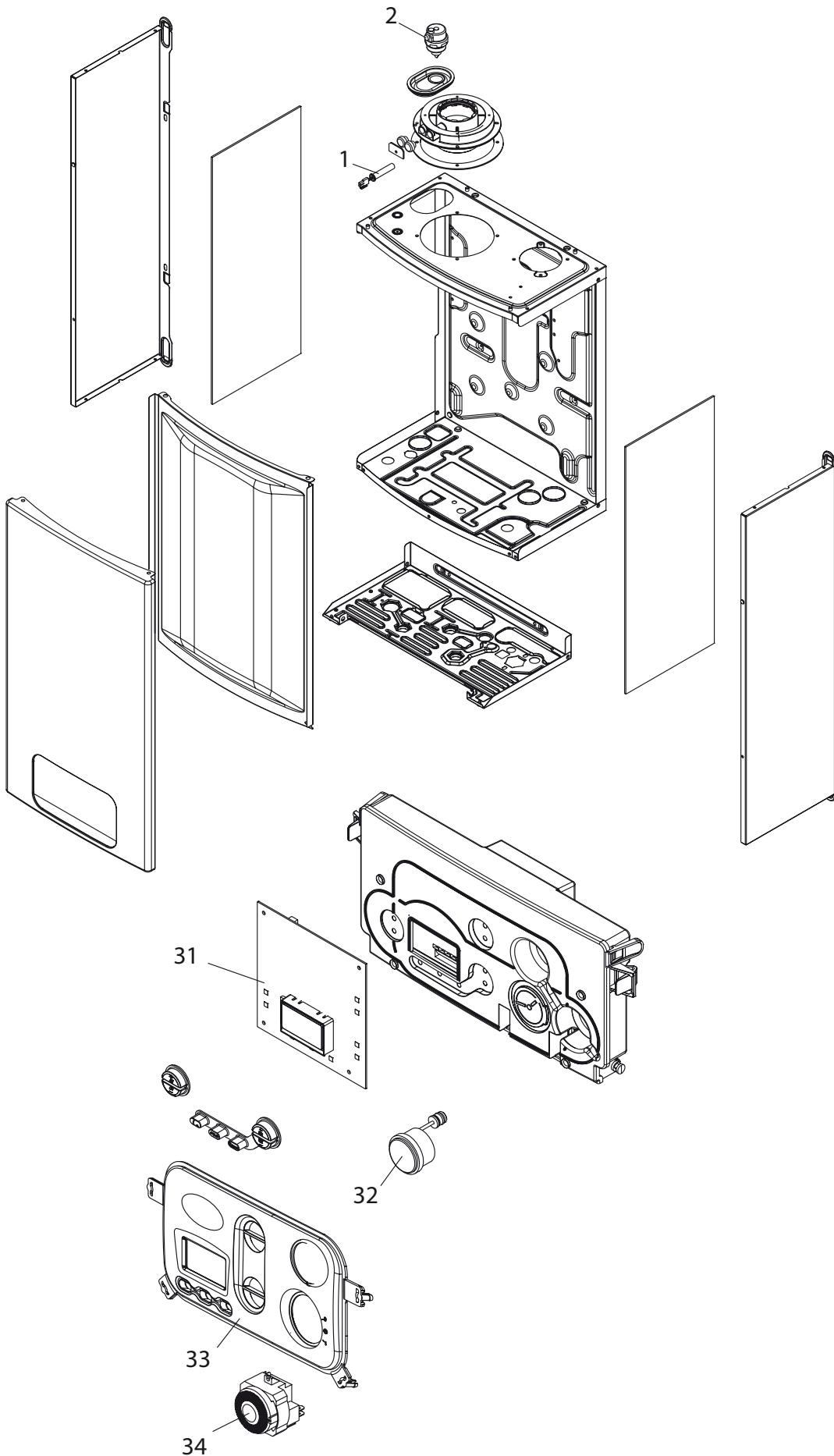


fig. 31

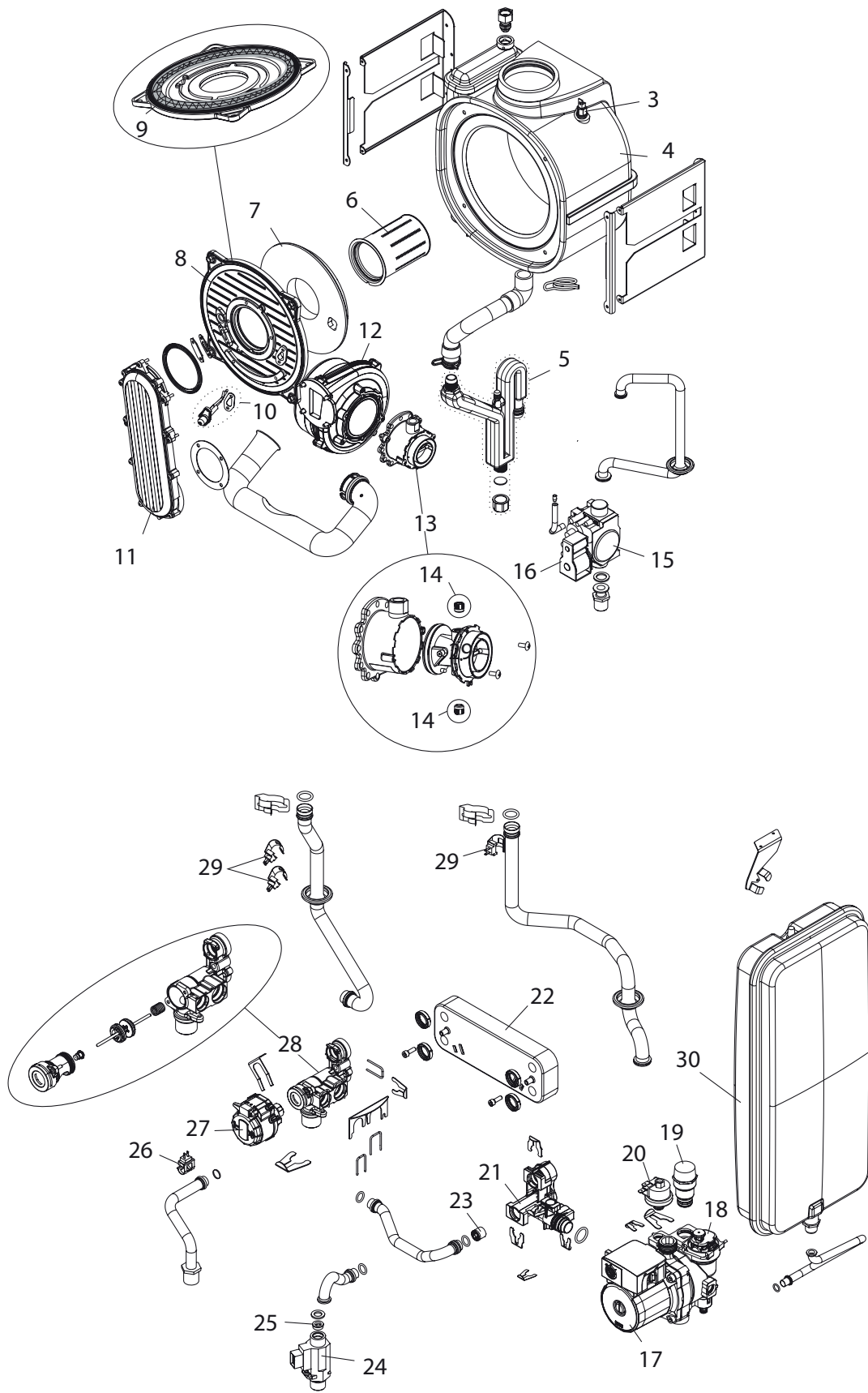
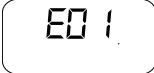




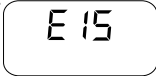

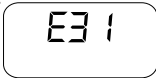


fig. 32

Item	Code	Description	No. of pieces per pack
1	6INSETER00	Insert for thermostat with o-ring	1
2	6VALSFAU01	Automatic relief valve	1
3	6SONDNTC08	Bayonet NTC flue gas probe	1
4	6SCAMCON06	Heat exchanger condensing 24 kW	1
	6SCAMCON08	Heat exchanger condensing 28 kW	1
5	6SIFRACO04	Compact condensate trap	1
6	6BRUCOND02	Condensing burner 24 kW	1
	6BRUCOND03	Condensing burner 28 kW	1
7	6ISOLBRU00	Burner holder insulation	1
8	6PORTBRU00	Heat exchanger door	1
9	6TRECPOR00	Glass braid high temperature	1
10	6CANDELA03	Igniter plug with gasket	1
11	6MANARGA02	Air/gas sleeve	1
12	6VENTILA17	MVL NRG118 ventilator	1
13	6MISCMET00	Natural gas air mixing device for 24 kW	1
	6MISCGPL00	Propane air mixing device for 24 kW	1
	6MISCMET01	Natural gas air mixing device for 28 kW	1
	6MISCGPL01	Propane air mixing device for 28 kW	1
14	OTRASMET13	Natural gas conversion kit for 24 kW	2
	OTRASGPL13	Propane conversion kit for 24 kW	2
	OTRASMET15	Natural gas conversion kit for 28 kW	2
	OTRASGPL14	Propane conversion kit for 28 kW	2
15	6VALVGAS14	SIT 848_135 gas valve	1
16	6YBOBINA00	840 845-848 sit gas valve coil	1
17	6CIRCOLA24	MLS 12/6-3 K robust design circulating pump GB	1
18	6DEGASAT00	Degasser for wall-hung boilers	1
19	6VALSIBA09	3 bar snap-on safety valve	1
20	6PRESSAC05	Push-In water pressure switch	1
21	6COLLEGB00	GB hydraulic group collector	1
22	6SCAMPIA07	12 plate heat exchanger with gaskets and screws	1
	6SCAMPIA08	14 plate heat exchanger with gaskets and screws	1
23	6VALVBYP03	400 mbar by-pass valve	1
24	6FLUSSOS07	Raised base flow switch	1
25	6REGOFU04	Flow regulator, 13 l/min (24 kW)	3
	6REGOFU07	Flow regulator, 14 l/min (28 kW)	3
26	6SONDNTC07	NTC probe D13,5	1
27	6ATTCOMP00	Compact engine	1
28	6CORPVAL07	Complete three-way valve	1
29	6SONDNTC06	NTC probe D18	1
30	6VASOESP24	9 litres expansion tank	1
31	6SCHEMOD22	Compact condensing electronic board	1
32	6MANOMET09	Pressure gauge 1,5 m d.37	1
33	6PANNCOM04	Condensing control panel GB	1
34	6TIMERGB01	GB condensing timer	1

10. TABLE OF FAULT CODES

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	SOLUTION
Boiler in shutdown state, fault code E01 shown on LCD display. Press the Reset button to restore operation. 	Burner does not ignite	Gas supply failure	Check gas supply Check gas supply cock or gas network safety valve intervention
		Gas valve is disconnected	Reconnect it
		Gas valve is faulty	Replace it
		PCB is faulty	Replace it
	Burner does not ignite: there is no spark	Ignition/detection electrode faulty	Replace the electrode
		Ignition transformer faulty.	Replace the ignition transformer.
		Electronic board does not switch on: it is faulty	Replace PCB
	Burner ignites for a few seconds and goes off	Electronic board does not detect flame: inverted phase and neutral	Verify correct neutral and phase connection
		Ignition/detection electrode wire is interrupted	Reconnect or replace wire
		Ignition/detection electrode faulty	Replace the electrode
		Electronic board does not detect flame: it is faulty	Replace PCB
		Ignition heat output setting is too low	Increase it
		Minimum heat output is not set correctly	Check burner setting
Boiler in shutdown state, fault code E03 shown on LCD display. Press the Reset button to restore operation. 	One of the flue gas thermostats has tripped.	Poor flue draught	Check the chimney and ambient air suction openings.
		Flue gas thermostat is faulty	Replace it
Fault code E04 shown on LCD display. Normal operation is restored automatically when the faults causing the alarm state are rectified. 	CH system water pressure is low	There are leaks in the heating system	Check system for leaks
		Water pressure switch is disconnected	Reconnect it
		Water pressure switch is not operating: it is faulty	Replace it
Fault code E05 shown on LCD display. Normal operation is restored automatically when the faults causing the alarm state are rectified. 	Flow probe not working.	Flow probe disconnected.	Reconnect it
		Flow probe faulty.	Replace it

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	SOLUTION
Fault code E06 shown on LCD display. Normal operation is restored automatically when the faults causing the alarm state are rectified. 	DHW probe is not working	DHW probe is disconnected	Reconnect it
		DHW probe is faulty	Replace it
Fault code E15 shown on LCD display. Normal operation is restored automatically when the faults causing the alarm state are rectified. 	Return probe not working.	Return probe disconnected	Reconnect it
		Return probe faulty	Replace it
Boiler is not supplying DHW	DHW flow switch is not working	System insufficient pressure or flow rate.	Check DHW system
			Check DHW flow switch filter
		DHW flow switch probe is faulty or disconnected	Replace or reconnect it
		DHW flow switch is blocked	Replace it
Fault code E40 shown on LCD display. Normal operation is restored automatically when the faults causing the alarm state are rectified. 	Combustion fan not working.	Fan disconnected.	Reconnect it
		Fan faulty.	Replace it
Fault code E31 shown on remote control display. Normal operation is restored automatically when the faults causing the shutdown state are rectified. 	No communication possible with Remote Control	Connector cable between boiler and remote control disconnected	Reconnect it
		Remote control faulty	Replace it

GAS BOILER SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the boiler as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission according to the manufacturer's instructions and complete this Benchmark Commissioning Checklist will invalidate the warranty. This does not affect the customer's statutory rights.

Customer Name _____ Telephone Number _____

Address _____

Boiler Make and Model _____

Boiler Serial Number _____

Commissioned by (print name) _____ Gas Safe Register Number _____

Company Name _____ Telephone Number _____

Company Address _____

Commissioning Date _____

To be completed by the customer on receipt of a Building Regulations Compliance Certificate*:

Building Regulations Notification Number (if applicable) _____

CONTROLS Tick the appropriate boxes

Time and Temperature Control to Heating	Room Thermostat and Programmer/Timer	<input type="checkbox"/>	Programmable Room Thermostat	<input type="checkbox"/>	Load/Weather Compensation	<input type="checkbox"/>	Optimum Start Control	<input type="checkbox"/>
Time and Temperature Control to Hot Water	Cylinder Thermostat and Programmer/Timer				<input type="checkbox"/>	Combination Boiler	<input type="checkbox"/>	
Heating Zone Valves					Fitted	<input type="checkbox"/>	Not Required	<input type="checkbox"/>
Hot Water Zone Valves					Fitted	<input type="checkbox"/>	Not Required	<input type="checkbox"/>
Thermostatic Radiator Valves					Fitted	<input type="checkbox"/>	Not Required	<input type="checkbox"/>
Automatic Bypass to System					Fitted	<input type="checkbox"/>	Not Required	<input type="checkbox"/>
Boiler Interlock							Provided	<input type="checkbox"/>

ALL SYSTEMS

The system has been flushed and cleaned in accordance with BS7593 and boiler manufacturer's instructions Yes

What system cleaner was used? _____

What inhibitor was used? _____ Quantity litres

CENTRAL HEATING MODE Measure and Record:

Gas Rate _____ m³/hr OR _____ ft³/hr

Burner Operating Pressure (if applicable) _____ mbar OR Gas Inlet Pressure _____ mbar

Central Heating Flow Temperature _____ °C

Central Heating Return Temperature _____ °C

COMBINATION BOILERS ONLY

Is the installation in a hard water area (above 200ppm)? Yes No

If yes, and if required by the manufacturer, has a water scale reducer been fitted? Yes No

What type of scale reducer has been fitted? _____

DOMESTIC HOT WATER MODE Measure and Record:

Gas Rate _____ m³/hr OR _____ ft³/hr

Burner Operating Pressure (at maximum rate) _____ mbar OR Gas Inlet Pressure (at maximum rate) _____ mbar

Cold Water Inlet Temperature _____ °C

Hot water has been checked at all outlets Yes Temperature _____ °C

Water Flow Rate _____ l/min

CONDENSING BOILERS ONLY

The condensate drain has been installed in accordance with the manufacturer's instructions and/or BS5546/BS6798 Yes

If the condensate pipe terminates externally has the pipe diameter been increased and weatherproof insulation fitted? Yes

ALL INSTALLATIONS

If required by the manufacturer, record the following CO₂ % OR CO ppm OR CO/CO₂ Ratio

The heating and hot water system complies with the appropriate Building Regulations Yes

The boiler and associated products have been installed and commissioned in accordance with the manufacturer's instructions Yes

The operation of the boiler and system controls have been demonstrated to and understood by the customer Yes

The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer Yes

Commissioning Engineer's Signature _____

Customer's Signature _____

(To confirm satisfactory demonstration and receipt of manufacturer's literature)

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



Service Record

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

Service Provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

Always use the manufacturer's specified spare part when replacing controls.

Service 1 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Gas Safe Register No. _____
Comments: _____
Signature: _____

Service 2 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Gas Safe Register No. _____
Comments: _____
Signature: _____

Service 3 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Gas Safe Register No. _____
Comments: _____
Signature: _____

Service 4 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Gas Safe Register No. _____
Comments: _____
Signature: _____

Service 5 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Gas Safe Register No. _____
Comments: _____
Signature: _____

Service 6 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Operative ID No. _____
Comments: _____
Signature: _____

Service 7 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Gas Safe Register No. _____
Comments: _____
Signature: _____

Service 8 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Gas Safe Register No. _____
Comments: _____
Signature: _____

Service 9 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Gas Safe Register No. _____
Comments: _____
Signature: _____

Service 10 Date: _____
Engineer Name: _____
Company Name: _____
Telephone No. _____
Gas Safe Register No. _____
Comments: _____
Signature: _____

Affix your analyser print out here



0LIBMCGB02

fondital

Fondital S.p.A.

25079 VOBARNO (Brescia) Italy - Via Cerreto, 40
Tel. +39 0365/878.31 - Fax +39 0365/878.576
e mail: fondital@fondital.it - www.fondital.it

Fondital Helpline UK

unit 1, Spurlings Industrial estate, - Fareham
Hants~ P017 6AB
e mail: admin@fondital.co.uk

The manufacturer reserves the right to implement any necessary and/or useful variation to products, without modifying fundamental characteristics.

Uff. Pubblicità Fondital IST 03 C 469 - 01 Marzo 2012 (03/2012)

Fondital UK Helpline 01329 828555