GB
IE

IMPORTANT

FOLLOW COMMISSIONING INSTRUCTIONS
OBSERVE THE WARRANTY CONDITIONS
READ THE WHOLE MANUAL CAREFULLY
NO SAFETY DISCHARGE TO BE REDUCED IN SIZE.
CONDENSE TO BE 32 mm PVC

INSTALLATION

Presentation
Technical specifications
Operation
Installation
Parameters
Commissioning
Approvals
Warranty

Merite

ZEM 2-17 C

ZEM 5-25 C / ZEM 5-25 SEP

TECHNICAL INSTRUCTIONS

GEMINOX
CHAUDIERES
High fidelity heat

T30.37901.07

CONTENT

I - SAFETY PRECAUTIONS

1 - SYMBOLS

In this document:

Safety recommendations, warnings and recommendations are by a warning-triangle symbol accompanied by bold text.

2 - SAFETY PRECAUTIONS

2.1 - Smell of gas

- Turn off the gas service cock.
- Open doors and windows.
- Do not operate any electrical switches or other elements that cause sparks (telephone, door-bell, etc.).
- Extinguish all nearby naked flames. - Do not smoke.
- Do not use a lighter.
- Immediately contact your installer or your after-sales service from outside the building and warn the neighbours.

2.2 - Smell of flue gas

- Switch off the appliance.
- Open doors and windows.
- Immediately contact your installer or your after-sales service.

2.3 - Explosive or inflammable materials

- Do not store or use any inflammables materials (paper, thinners, paints, etc.) within vicinity of the appliance.
- Respect the minimum distances regard to inflammable materials and fire-proof materials.

2.4 - Fitting, commissioning

- The installation, work on the flues, electrical connection and the first start-up must be carried out by a qualified professional and authorised in accordance with the applicable regulations and rules of good practice.

  Respect the electrical connection plan! (§ 8 - page 34 - INSTALLATION MANUAL)
- Before installation: make sure the appliance is turned-off at all points. Secure against involuntary re-triggering.
- The appliance must not operate without water.
- Carry out the checks listed in § 6 - page 41 - INSTALLATION MANUAL before the first start-up of the system.
- Flue system (air inlets, conduits, etc.) must not be modified in any way (§ 5 - page 20 - INSTALLATION MANUAL).
- **B23 Chimney type system:**
  - Ventilation openings in doors, windows and walls must not be sealed or restricted.

  Intoxication Risk: An insufficient air intake can cause the evacuation of dangerous smokes.
  - If draught-proof windows are installed, measures must be taken to ensure there is an adequate supply of air to the appliance for combustion.
- **Flue type system:**
  - The flue type system (sealed) can be installed in premises with or without a window or ventilation.

2.5 - Servicing

- Recommendations for the user:
  - take out an inspection/maintenance contract with an competent and qualified engineer.
  - have the appliance serviced at regular intervals (annually).
  - ensure that the installation verification has been issued with a certificate of conformity granted by an approved organisation.
- Respect the safety recommendations of chapitre III - MAINTENANCE - page 9 - SERVICING MANUAL.
- Only use original spare parts.

2.6 - Combustion air/Ambient air

- To avoid any corrosion, the combustion/ambient air must be free of corrosive substances (e.g. halogenated hydrocarbons containing chlorines or fluorines compounds).
- Do not install the appliance in a polluted atmosphere.

2.7 - User information from the installer

- Inform the user on the operating modes of the appliance and show him how to use the controls.
- Inform the user that he must never undertake any modifications or repairs of the appliance.
- Inform the user of the various possible operating faults and dangers.
- Give the user instructions to the user.

- This appliance must only be operated by a responsible adult who has been instructed in, understands, and is aware of the appliance's operating conditions and effects.
- Children should be supervised to ensure they do not play with the appliance.

II - PRESENTATION

1 - DESCRIPTION

Standard description: wall mounted condensing boiler for hot water heating, sealed combustion circuit, pre-mixing burner with air-gas supply, and linear power modulation connecting combustion product types B_{23}, C_{13}, C_{33}, following EN 483 (04/00).

The Merite boiler is pre-set in the factory for natural gas H (G20). It can operate on propane (G31) (ZEM 5-25 only) after the gas reducer has been changed and according to the model.

This boiler comprises all the necessary accessories for the correct working of a water based central heating circuit specifically:

- one boiler comprising:
  - a high performance helical fin tube condensation exchanger,
- a pre-mixing burner, with stainless steel refractory grate,
- a variable speed 230 Volt fan controlled by the regulator,
- a 230 Volt two way gas valve controlled by the air pressure,
- electronic regulation which ensures power modulation depending on the demands for heating or DHW (LMU control unit),
- a plate exchanger to ensure DHW (ZEM 5-25 SEP),
- an outside sensor,
- an expansion vessel,
- a circulating pump,
- a 3 bar safety-valve,
- a gas + water valve kit,
- a rear wall spacer,

OPTIONS:

- A rear spacer allowing for the hydraulic connection of the boiler with pipe passage towards the top (ZEM..C/SEP).
- Adaptor enabling the connection to the flue (B_{23}) to be made.
- Horizontal flue kit (C_{13}) allowing the boiler to be connected to a straight horizontal flue + horizontal flue accessories (extensions, elbows, etc.).
- Adaptor enabling the connection to the vertical flue (C_{33}) + vertical flue accessories (terminal, extensions, elbows, etc.).
- Adjustment as a function of the room temperature (REG 54 room unit kit - REG 74 room terminal kit).
- Room sensor (REG 60/REG 151).
- Gas conversion kit allowing the change from natural gas to propane (ZEM 5-25).
- Underfloor heating safety thermostat.
- Internal selector valve kit for connecting ZEM..C/BS.
- External selector valve kit for connecting ZEM..C/BS.
- Domestic hot water production system (type BS).
- Bionibal 1 litre: corrosion inhibitor.
- Bionibal 30 litres: corrosion inhibitor.
- Bionibagel 10 litres: corrosion inhibitor and antifreeze.
- Condensate lift pump.

2 - RANGE

Models	Functions	Combustion products connection
ZEM 2-17 C ZEM 5-25 C	Only heating	Chimney conduit (B_{23}) Horizontal flue (C_{13}) Vertical flue (C_{33})
ZEM 5-25 SEP	Heating and DHW	

III - TECHNICAL SPECIFICATIONS

1 - CHARACTERISTICS

Models			ZEM 2-17 C	ZEM 5-25 C	ZEM 5-25 SEP
Certification			**CE1312BR4644**	**CE1312BR4313**	
Category / Country of destination: GB/IE			**I2H**	**II2H3P**	
Heat output (Heating)	30/50 °C 60/80 °C	kW kW	2.7/18.8 2.3/17.3	5.6/27.4 5.0/25.2	
Heat input (Heating)		kW	2.5/17.6	5.2/25.6	
Heat input (Domestic hot water)		kW	2.5/17.6	5.2/29.0	5.2/29.0
Efficiency on heating PCI	30/50 °C 60/80 °C	% %	108.0/106.8 94.0/99.2	107.7/107.0 96.1/99.0	
Efficiency on heating PCS	30/50 °C 60/80 °C	% %	97.2/96.1 84.6/89.2	96.9/96.3 86.4/89.1	
Efficiency according to 92/42 CEE directive (30%) load		%	109.4	109.3	
Specific flow rate (according to EN 13203) (DHW)		l/min	-	-	13.6
Useable gases (NG: Natural gas / PG: Propane)			NGH	NGH - PG	
Combustion product temperature Heating mode DHW mode	maxi	°C	85 90		
Over-heating safety of combustion products		°C	105		
Flow rate of combustion products (G20, 0°C, 1013 mbar) Heating mode DHW mode	mini/maxi	kg/h	4.9/31.1 4.9/31.1	10.1/45.2 10.1/49.7	
Permitted back pressure (C_{13})	maxi	Pa	100		
Air flow required for combustion (0°C, 1013 mbar) Heating mode DHW mode	mini/maxi	m^3/h	3.4/21.7 3.4/21.7	7.1/31.5 7.1/34.5	
NO_x		mg/kWh	class 5 (EN 483)		
CO (G20 in heating mode)		mg/kWh	27	22.5	
Heating service pressure	mini/maxi	bar	1/3		
Domestic hot water service pressure	mini/maxi	bar	-	-	1/7
Heating circuit water temperature	mini/maxi	°C	20/80		
Domestic hot water temperature	mini/maxi	°C	-	-	10/65
Water overheating safety thermostat		°C	90		
Boiler water capacity		litre	2.4	2.7	3.1
DHW heat exchanger capacity (primary)		litre	-	-	0.2
Primary water flow (ΔT 20 K)	60/80 °C	m^3/h	0.76	1.09	
ΔP water (at nominal flow)		mbar	118	270	
Thermal losses (ΔT 30 K) (ΔT 50 K)		W	77 146		
Total capacity of expansion vessel		litre	8		
Useful capacity (with 5m static height)		litre	5		
Acoustic output at minimum heat output 5.1 kW		dBA		35,6	

Models			ZEM 2-17 C	ZEM 5-25 C	ZEM 5-25 SEP
Power input (pump at maximum speed)		W	125		
Absorbed electrical power in heating mode:					
Control alone (= Electrical power consumption of the auxiliaries)		W	minimum load: 23 maximum load: 45		
Circulating pump speed 1		W	37		
Circulating pump speed 2		W	57		
Circulating pump speed 3		W	76		
Stand By Position		W	18		
Power supply/frequency			230 V (+ 10%, - 15%)/50 Hz		
Class of electrical insulation			1		
Absorbed intensity	max	A	0.54		
Protection factor models B_{23} model C_{13}/C_{33}			IP 24 IP 44		
Tare		kg	37	39	42.3
Weight packaged		kg	43.7	46	49.2

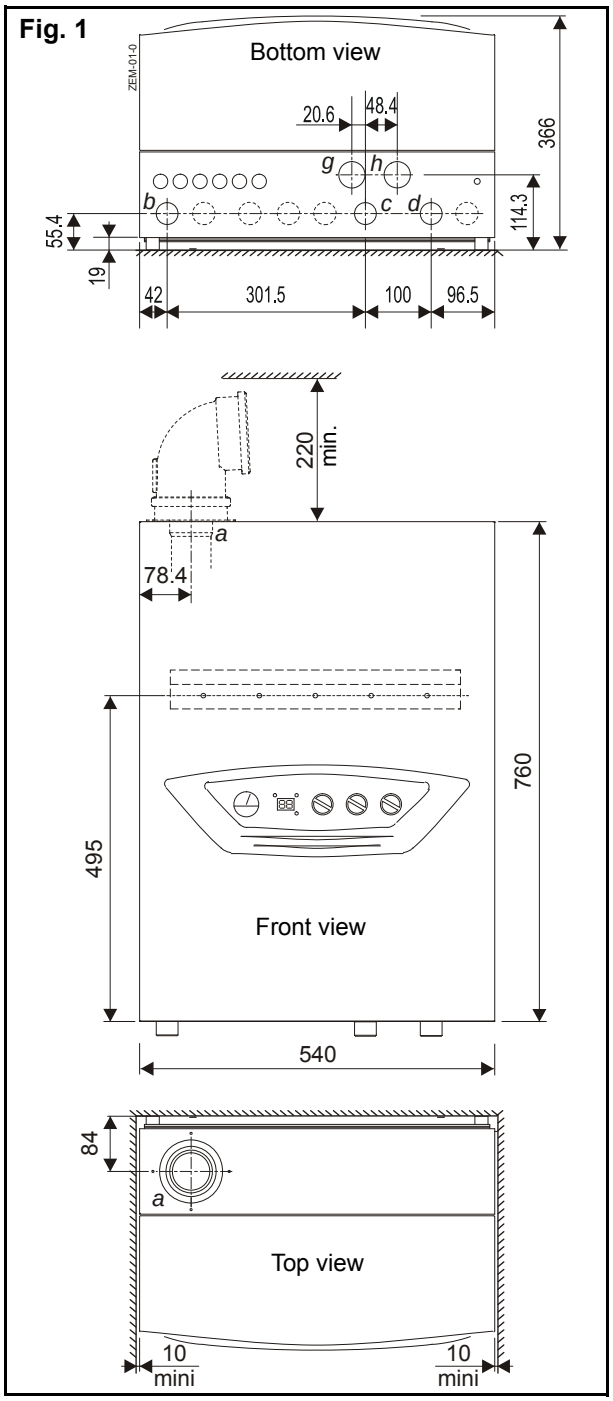
2 - PIPE CONNECTION DIAMETERS

			ZEM 2-17 C	ZEM 5-25 C	ZEM 5-25 SEP
∅ Combustion products		mm	60		
∅ Combustion products conventional flue connection flue connection	B_{23} C_{13} C_{33}	mm mm	80 60/100 80/125		
∅ Gas inlet		inch	1		
∅ Heating flow/return		inch	1		
∅ D.h.w. inlet/outlet		inch	-		3/4
∅ Condensation outlet		mm	25		
∅ Safety valve outlet		inch	3/4		
∅ Drain		inch	1/2		
∅ DHW production system connection (section 2 - or page 16 - chapter V - OPTIONS - SERVICING MANUAL) * 3/4 with coupling		inch	1*		-

3 - DIMENSIONS

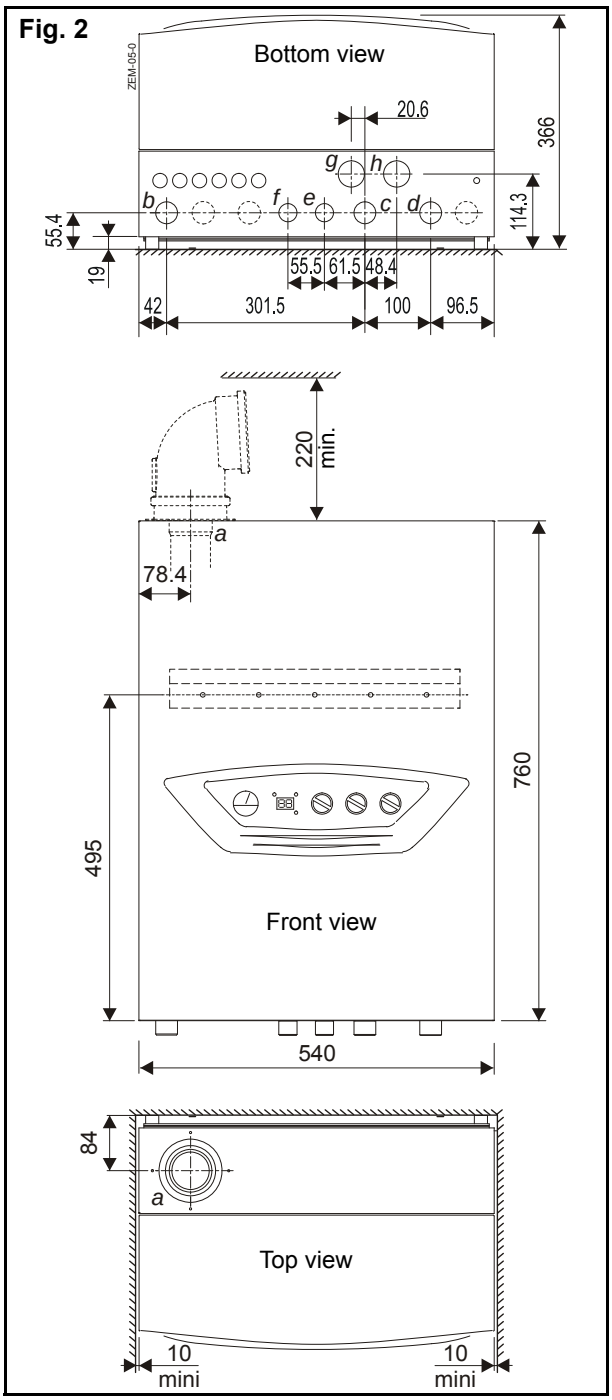
3.1 - ZEM 2-17 C / ZEM 5-25 C

Fig. 1



3.2 - ZEM 5-25 SEP

Fig. 2



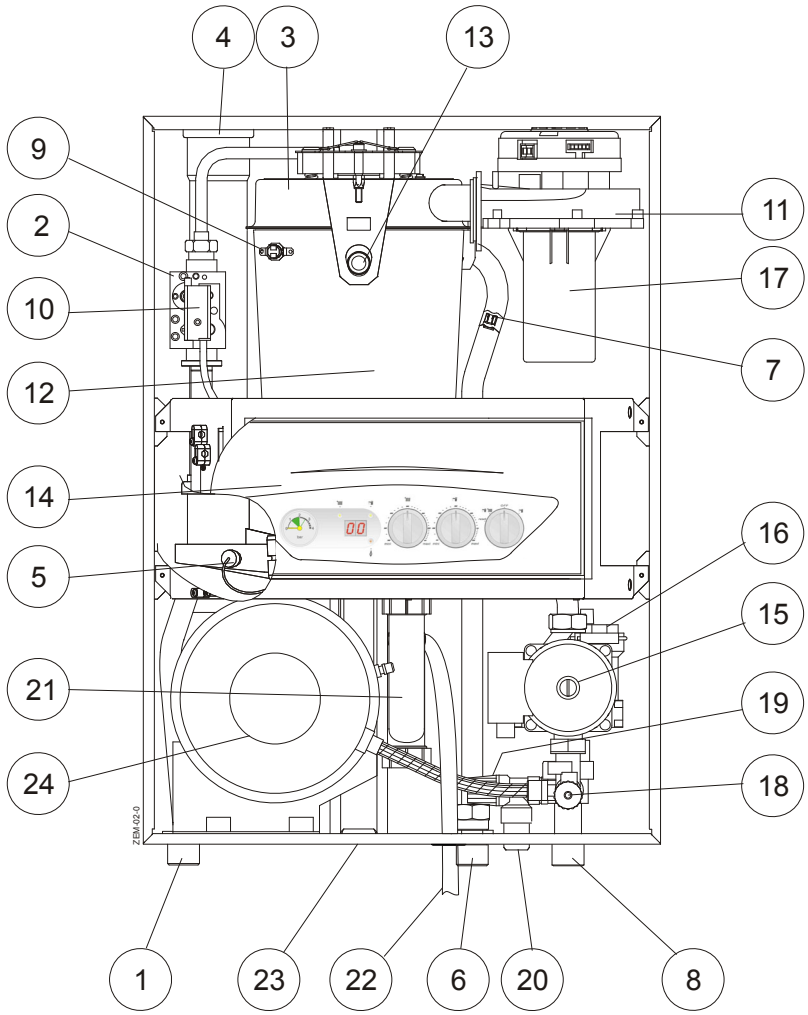
Legend:

a: Combustion products outlet
b: Gas inlet
c: Heating flow
d: Heating return
e: Domestic cold water inlet (ZEM SEP)
f: Domestic hot water outlet (ZEM SEP)
Connection DHW production system (option) (ZEM C)
g: Condensate drain
h: Safety valve drain

4 - LIST OF COMPONENTS

4.1 - ZEM 2-17C / ZEM 5-25 C

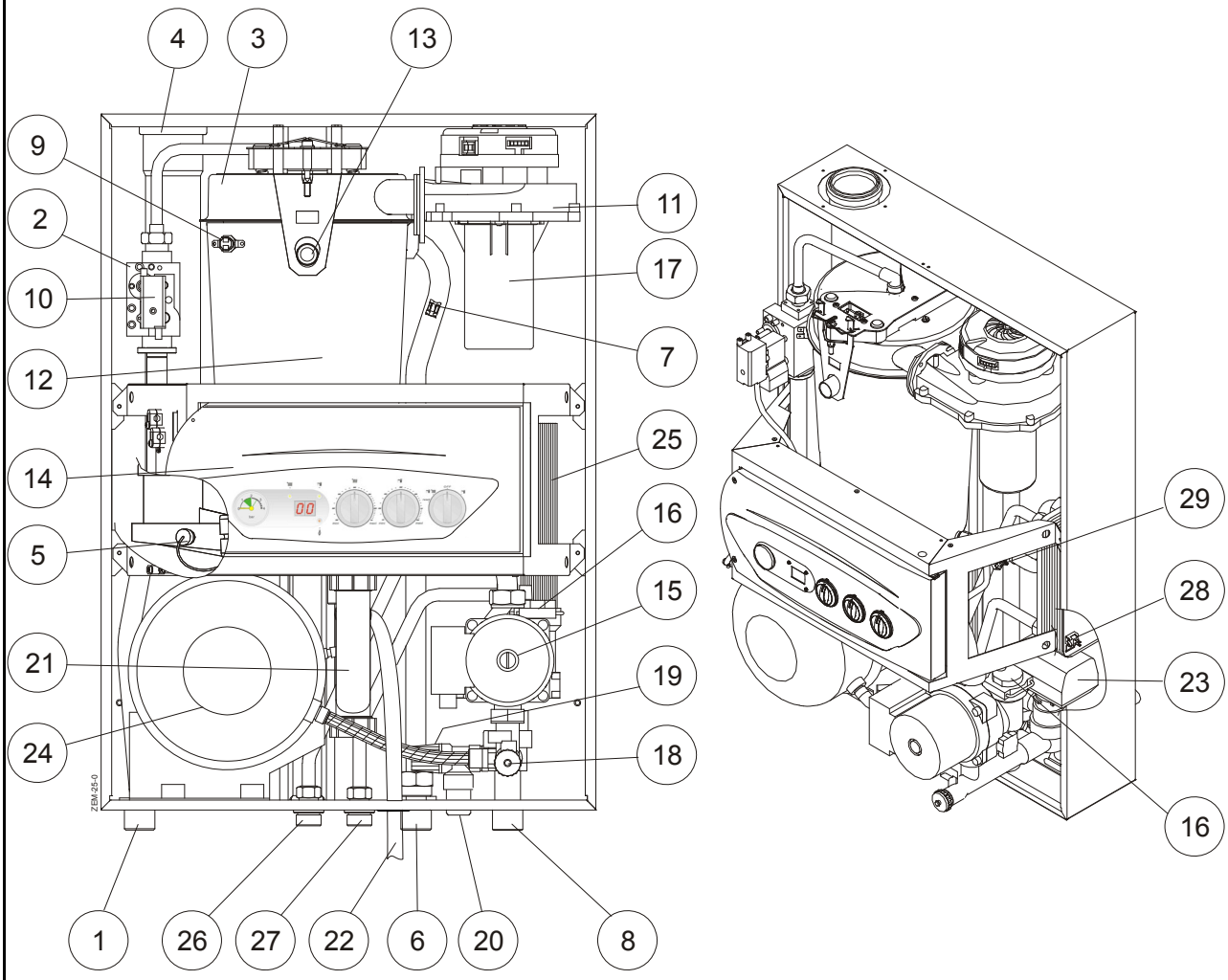
Fig. 3



1) Gas inlet
2) Gas valve (solenoids and regulator) 230 V
3) Gas burner
4) Combustion products outlet (flue)
5) Flue gas sensor
6) Heating flow
7) Boiler flow sensor
8) Heating return manifold
9) Water overheat safety
10) Ignition transformer 230 V
11) Fan 230 V
12) Boiler shell
13) Sight-glass
14) Microprocessor control panel
15) 3 speed circulating pump 230 V
16) Air bleed
17) Silencer
18) Drain tap
19) Safety valve 3 bar
20) Safety valve outlet
21) Siphon trap
22) Condensate drain
23) Opening for domestic hot water production system (option)
24) Expansion vessel

4.2 - ZEM 5-25 SEP

Fig. 4



1) *Gas inlet*
2) *Gas valve (solenoids and regulator) 230 V*
3) *Gas burner*
4) *Combustion products outlet (flue)*
5) *Flue gas sensor*
6) *Heating flow*
7) *Boiler flow sensor*
8) *Heating return manifold with selector valve*
9) *Water overheat safety*
10) *Ignition transformer 230 V*
11) *Fan 230 V*
12) *Boiler shell*
13) *Sight-glass*
14) *Microprocessor control panel*
15) *3 speed circulating pump 230 V*
16) *Air bleed*
17) *Silencer*
18) *Drain tap*
19) *Safety valve 3 bar*
20) *Safety valve outlet*
21) *Siphon trap*
22) *Condensate drain*
23) *Selector valve motor*
24) *Expansion vessel*
25) *Plate exchanger*
26) *Domestic hot water outlet*
27) *Domestic cold water inlet with filter and flow limiter*
28) *Domestic hot water sensor (detection of the tap)*
29) *Domestic hot water adjustment sensor*

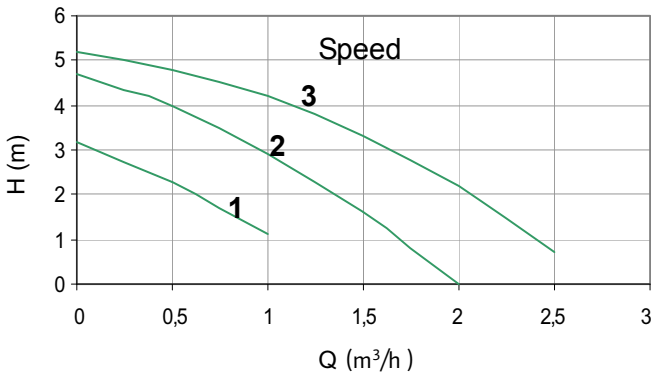
5 - CIRCULATING PUMP CHARACTERISTICS

The circulating pump incorporated into the boiler is fitted with a 3-speed motor (see section 1 - page 8 - chapter III - TECH NICAL SPECIFICATIONS - INSTALLATION MANUAL).

The heating pump's power consumption can be significantly optimised by adapting its speed to the requirements of the installation.

Fig. 5

RSL 15/5-3 Ku



6 - AVAILABLE PRESSURES

Fig. 6

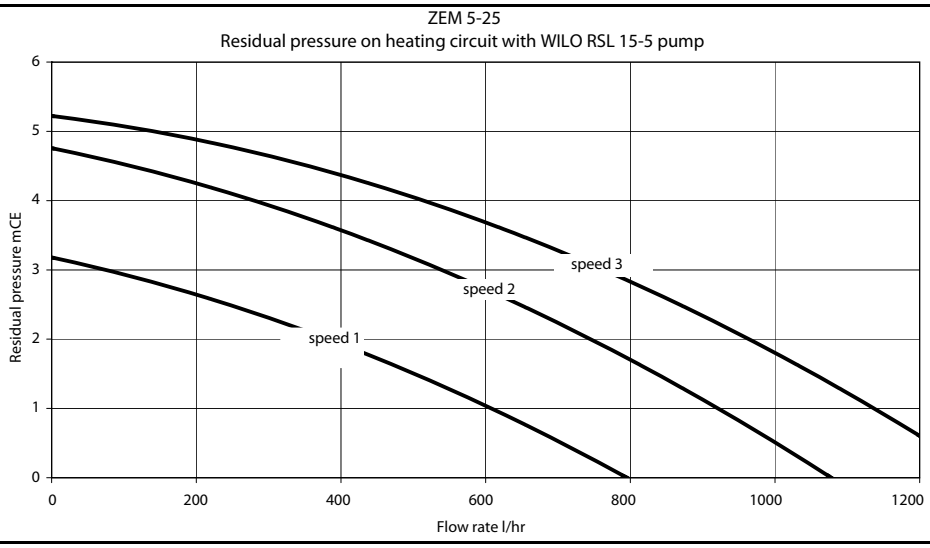
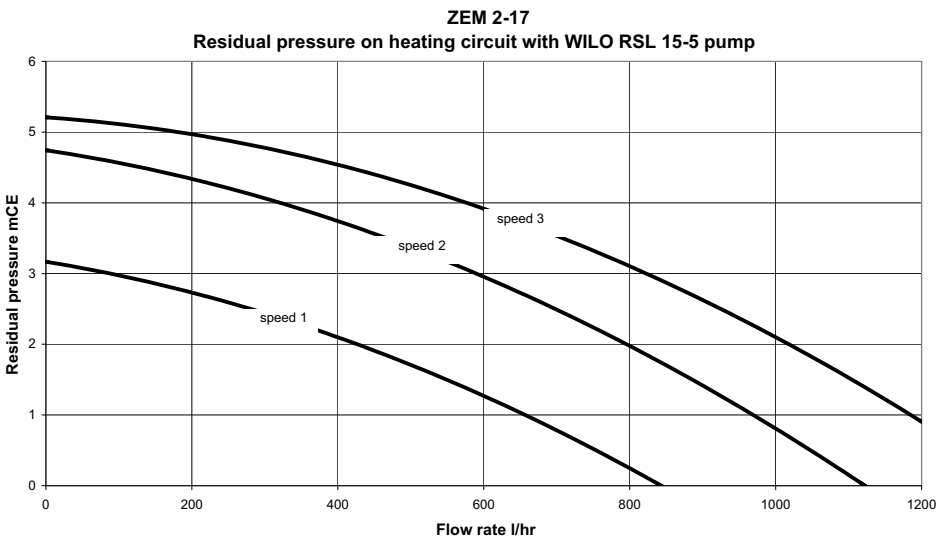


Fig. 7

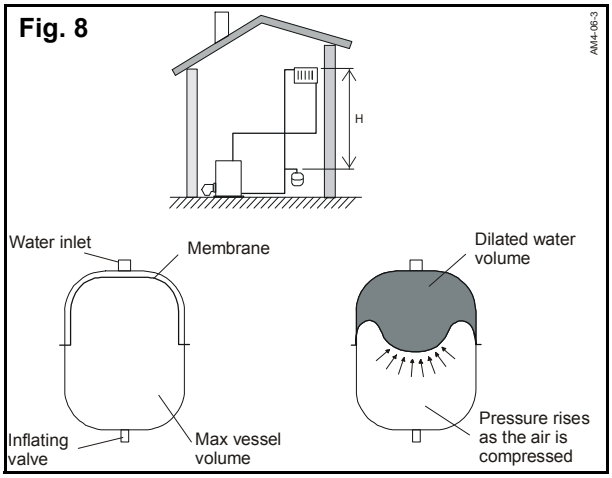


7 - EXPANSION VESSEL CHARACTERISTICS

Merite boilers are pre-equipped with an expansion vessel for an installation water capacity of approximately 80 litres (section 6.2 - page 30 - chapter V - INSTALLATION - INSTALLATION MANUAL).

The expansion vessel absorbs the increase in the water volume in the installation produced by the increase in temperature. The pre-inflation of the vessel sends the internal membrane to the side of the connection and the water dilation pushes on this membrane. Optimum efficiency is obtained when the inflation pressure is equal to the water pressure.

Fig. 8



8 - DOMESTIC HOT WATER EFFICIENCY

Models	Heat output at DT 30 °K	Continuous flow rate at 40 °C (*3))	Specific flow rate (*1)	Pre-heating time at 60 °C (*2)	Load time at 60 °C	Volume drawn at 40 °C in 10 minutes	Volume drawn at 40 °C in 1 hour
						storage 65°C	
	kW	l/min	l/min	min	min	litres	litres
ZEM 2-17 C + BS 100	17.3	8.3	16.0	15	27	160	573
ZEM 2-17 C + BS 150	17.3	8.3	20.4	23	41	241	655
ZEM 2-17 C + BS 200	17.3	8.3	23.9	30	53	313	727
ZEM 2-17 C + BS 300	17.3	8.3	31.9	45	80	476	889
ZEM 5-25 C + BS 100	28.4	13.6	19.8	9	16	198	877
ZEM 5-25 C + BS 150	28.4	13.6	24.1	14	25	241	920
ZEM 5-25 C + BS 200	28.4	13.6	30.4	18	32	313	992
ZEM 5-25 C + BS 300	28.4	13.6	37.4	27	49	476	1155
ZEM 5-25 SEP	28.4	13.6	13.6	-	/	136	815

Cold water temperature = 10°C

Storage temperature = 80°C

(*1): According to EN 625

(*2): Pre-heating time following drawing that corresponds to the specific flow rate.

(*3): Drawing flow rate to be set on the safety control box at start-up (for models ZEM SEP).

IV - OPERATION

1 - GENERAL OPERATING PRINCIPLE

The Merite boilers combine a fully stainless steel boiler shell, guarantee of longevity, and a premixing burner with proven technology and efficiency.

Digital control continuously optimizes the operating rate by using information sent to the microprocessor by the sensors fitted on the boiler:

- boiler flow sensor,
- outside temperature sensor,
- flue gas temperature sensor,
- room sensor (optional),
- fan speed control (pneumatic air/gas control),

Each of the sensors is allocated to an algorithm that optimizes the operation and generates information or fault codes that can be read from the display of the control panel.

Characteristics of the ZEM SEP boiler:

- To avoid the problems of in inertia and immediately obtain hot water, the plate exchanger is kept hot.

1.1 - Air pressure variation procedure

Linear pressure modulation is carried out by a 230 V variable-speed fan controlled by the LMU which calculates the speed needed at any given time to produce the required pressure.

1.2 - Emission of pollutants

This air/gas control combined with high efficiency pre-mixing burner enables CO and nitrogen oxide (NOx) emissions to be obtained that lie within the values laid down by the most demanding of quality standards.

2 - FUNCTIONS COMMON TO THE DIFFERENT VERSIONS

2.1 - Anti-freeze function

- Boiler anti-freeze protection: When the boiler temperature is below 5°C, the burner and the heating circuit pump are switched on. When the temperature increases and exceeds 15°C, the burner stops and the pump continues to circulate for 3 minutes.

2.2 - Anti-legionnella function (except for ZEM SEP)

To provide a substantial degree of protection against the development of pathogenic bacteria in the domestic hot water tank during prolonged shutdowns, the domestic hot water must be heated once a week to a temperature above 60°C.

The anti-legionnella function is used for this purpose. It heats the hot water storage tank once a week to a 65°C “anti-legionnella” temperature.

After powering up, the anti-legionnella function is started after approximately 1 hour. After this first loading of DHW, the anti-legionella function is run every 7 days.

2.3 - Pump kick or selector valve kick

If the heating circuit pump has not operated or if the selector valve has not been activated for more than about 24 hours, these elements are activated during operating stops for approximately 5 seconds.

2.4 - Monitoring of flue gas temperature

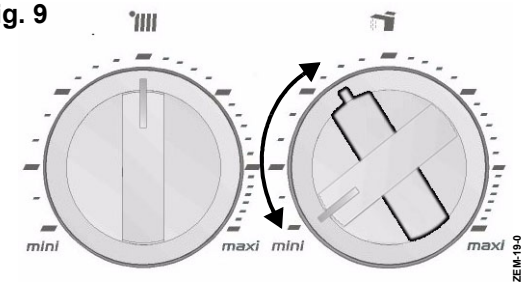
The boiler is shut down if the flue gas temperature reaches 105 °C.

The boiler can only be restarted automatically if the flue gas temperature reaches 60 °C.

2.5 - Safety test and regulator shutdown function

The purpose of the safety test function is to bring the boiler to maximum heating power and subsequently access the regulator shutdown function to carry out combustion tests.

Fig. 9



2.5.1 - Safety test function

To enable this func tion, **perform both of the actions** described below **twice and very rapidly**:

- set the domestic hot water temperature setting button (2) to “min.”

The button must be fully turned to mini for the electronic board to be able to detect the function.

- then turn it a quarter turn to the right and bring it back again to the “mini” position (fully turned).
- “SF” appears on the display.

Final state:

- the safety test function is now activated,
- the display alternately flashes the signalling code “SF” and the “boiler flow temperature” (“SF” = 1 second then boiler temperature = 5 seconds),
- the boiler operates at the maximum heating power, (the hot water setting button remains at the “mini” position, with the button fully turned:
  - minimum value:
    - ZEM C = 10 °C / ZEM SEP = 40 °C.
- the “heating and DHW” LEDs flash alternately,
- the “burner on” LED lights up,
- these states remain active as long as no action is performed on the heating setting button and the boiler temperature does not reach its maximum value (80°C).

2.5.2 - Regulator shutdown button

The regulator shutdown function enables the combustion tests to be carried out by operating the boiler at the maximum hot water power then at the minimum hot water power using the heating setting button. (the safety test function (section 2.5.1 - page 15 - INSTALLATION MANUAL must be enabled for you to access it).

The combustion tests must always be gin with the power set to maximum before changing this power from minimum to maximum.

Final state:

- the regulator shutdown function is enabled as soon as the position of the heating setting button is changed (3),
- the boiler operates at maximum power then at minimum power according to the position of the heating setting button (3):
  - the % (0 to 100%) of the power selected appears on the display,
    (display: 80 = 0% / 00 = 100%).
- the display alternately shows the signalling code “P” (1 sec) and the “boiler flow temp erature” (5 sec).

2.5.3 - Disabling the safety test and regulator shutdown functions

The functions are disabled:

- automatically after:
  - 10 minutes (safety test function)
  - 20 minutes (regulator shutdown function),
- if the boiler flow temperature reaches 80°C.
- immediately if the position of the hot water setting button (2) is changed.

Display:

- the signalling code “P” (1 sec) and the “boiler flow temperature” (5 sec) flash alternately.
  This display is active as long as the hot water setting button (2) remains on the minimum position.

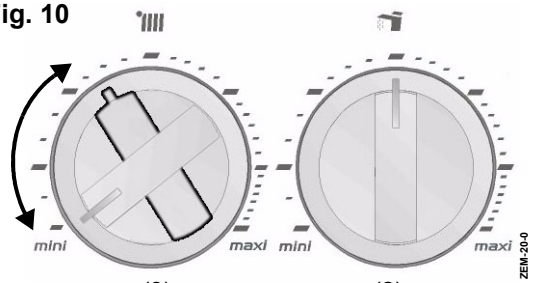
  The display reminds you that the setpoint of the hot water setting button is still at its minimum value.

After these procedures, the hot water setting button (2) must be reset to return to the hot water setpoint chosen by the customer.

2.6 - "INFO" function: displaying parameters on the boiler display

The "INFO" function is used to display some of the information on the operation of the boiler on the display.

Fig. 10



2.6.1 - "INFO" function activated

To enable this func tion, **perform both of the actions** described below **twice and very rapidly**:

- set the heating temperature setting button (3) to "min."

  The button must be fully turned to mini for the electronic board to be able to detect the function.

  -then turn it a quarter turn to the right and bring it back again to the "mini" position (fully turned),
- "A.." and its value appear on the display.

Final state:

- The "INFO" function is now enabled,
- the display alternately flashes the signalling code "A.." (1 sec) and the "parameter value" (3 sec):
  - the value of this parameter corresponds to the position of the hot water temperature setting button (2) before it is used to select one of the 10 parameters.
- The DHW setpoint chosen by the customer is memorised so that hot water requests can be carried out according to this setpoint,
- the heating setting button (3) remains at the "mini" position, with the button fully turned:
  - minimum value 20°C

2.6.2 - Reading the 10 "A.." parameters

10 parameters can be displayed according to the position of the hot water temperature setting button (2). For each parameter selected, the display will alternately show the name of the parameter and its value.

- A0: Domestic hot water temperature (°C)
- A1: Outside temperature (°C)
- A2: PWM signal of the fan (%)
- A3: Fan speed (rpm - multiply by 100)
- A4: Boiler flow temperature setpoint (°C)
- A5: Flue gas temperature
- A6: Internal diagnostic code
- A7: Blank
- A8: Manufacturer information
- A9: Manufacturer information

2.6.3 - "INFO" function disabled

This function can be disabled in two ways.

2.6.3.1 - 1st solution

The INFO function is disabled when the activation procedure is repeated (section 2.6.1 - page 16 - INSTALLATION MANUAL).

Display:

- The "A.." display disappears and the boiler flow temperature "20" appears.

  This display is active as long as the hot water setting button (3) remains on the minimum position.

After these procedures, the heating setting button (3) must be reset to return to the heating setpoint chosen by the customer.

2.6.3.2 - 2nd solution

The INFO function is deactivated if there is no activity on the settings buttons for 3 minutes.

Display after 3 minutes:

- the display alternately flashes the signalling code "d" (1 sec) an d the "boiler flow temperature" (5 sec).

  This display is active as long as the hot water setting button (3) remains on the minimum position.

  The display reminds you that the setpoint of the heating setting button is still at its minimum value.

After these procedures, the heating setting button (3) must be reset to return to the heating setpoint chosen by the customer.

Note:

- When the "INFO" function is disabled, the "d" display disappears and the boiler flow temperature appears.

V - INSTALLATION

1 - GENERAL

Installing a wall-mounted gas boiler presents no particular difficulty.

The installation of the boiler must be carried out by a competent person in accordance with the relevant requirements of the Gas Safety (Installation and Use) Regulations, Building Regulations, Model Water Byelaws and the Building Standards (Scotland) Regulations. It must also comply with the current I.E.E. Wiring Regulations and the relevant recommendations of the following British Standard Codes.

Regulations and the relevant recommendations of the following British Standard Codes of Practice.

CR331.3	Low pressure installation pipes.
BS.5449.1	Forced circulation hot water systems.
BS.5546	Installation of gas hot water supplies for domestic purposes.
BS.5440.1	Flues (for gas appliances of rated input not exceeding 60 kW).
BS.5440.2	Air supply (for gas appliances of rated input not exceeding 60 kW).
BS.6798	Boilers of rated input not exceeding 60 kW.

Note:

- The boiler is only suitable for installation in a sealed system and must not be used with an open vented system.

LOCATION OF BOILER

The boiler can be installed on the inner face of an external wall - and some internal walls - providing they are flat, vertical and capable of adequately supporting the weight of the boiler and any ancillary equipment.

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current I.E.E. Wiring Regulations and, in Scotland, the electrical provisions of the Building Regulations applicable in Scotland with respect to the installation of the boiler in a room or internal space containing a bath or shower. Where installation is in a room containing a bath or shower, any electrical switch or boiler control utilising mains electricity should be situated so that it cannot be touched by a person using the bath or shower.

Where installation will be in an unusual location, special procedures may be necessary and BS.6798 gives detailed guidance on this subject.

A compartment used to enclose the boiler **MUST** be designed and constructed specially for this purpose.

An existing cupboard or compartment may be used provided it is modified for the purpose. Details of essential features of cupboard/compartment design, including airing cupboard installations, are given in BS.6798.

In siting the boiler, the following limitations **MUST** be observed:

1) *The position selected for installation **MUST** allow adequate space for servicing in front of the boiler and for air circulation around the boiler.*
2) *This position **MUST** also permit the provision of a satisfactory balanced flue termination.*

Note:

- If the boiler is to be fitted in a timber framed building, it should be fitted in accordance with the British Gas publication "Guide for Gas Installations in Timber Frame Housing". Reference DM2. If in doubt, advice must be sought from the Local Gas Region of British Gas.

When siting the boiler, provision must be made for the disposal of the condensate, see Section 4 - Condensate drain.

The pressure relief valve connection should be routed to an external, visible point where the discharge of steam or water cannot create a hazard to persons or property. BS.5449: 1 refers.

GAS SUPPLY

Installation pipes should be fitted in accordance with CP.331.3.

The complete installation must be tested for soundness and purged in accordance with CR331.3.

FLUEING

Detailed recommendations for flueing are given in BS.5440.1. The following notes are intended for general guidance.

AIR SUPPLY

a) - For room-sealed systems

Detailed recommendations for air supply are given in BS.5440.2. The following notes are intended for general guidance.

Where the boiler is to be installed in a room or internal space, the boiler does not require the room or internal space containing it to have a permanent air vent.

b) - For natural draught system:

Detailed requirements are given in BS 5440.2

WATER CIRCULATION SYSTEM

The expansion vessel is suitable for systems up to **80 litres** water content. For systems in excess of this capacity an additional pressurised expansion vessel will be required. BS7074 and "British Gas Specifications for Domestic Wet Central Heating Systems' Part 3 gives guidance in this subject.

The central heating system should be in accordance with the relevant recommendations given in BS.6798 and, in addition, for small bore and micro-bore systems - BS.5449.1. The domestic hot water system, if applicable, should be in accordance with the relevant recommendations of BS.5546.

Copper tubing, to BS. 287 1. 1, is recommended for water carrying pipework.

ELECTRICAL SUPPLY

Wiring external to the boiler must be in accordance with the I.E.E. Wiring Regulations and any local regulations.

2 - VENTILATION

2.1 - Merite models with conventional flue connection

- All fuel burning devices consume a quantity of air that is proportional to their power. Efficient ventilation of the installation 's premises is therefore necessary (according to installation standards).
  - High ventilation, with a free section of at least 100 cm², should be placed at least 1.80 m above the ground, as well as an air inlet, in the lower part, of a cross-section of 100 cm².
- To avoid any form of corrosion, the combustion air must be free of any harmful agents. They are thought to encourage the corrosion of halogenated hydrocarbons, containing combinations of chlorine or fluorine, which can be found in solvents, paints, glues, gas propellants and domestic cleaning products, etc.

2.2 - Merite models with balanced flue connection

When the Merite boiler is installed with the horizontal or vertical balanced flue kits that are supplied as options, the combustion circuit is sealed in relation to the installation premises.

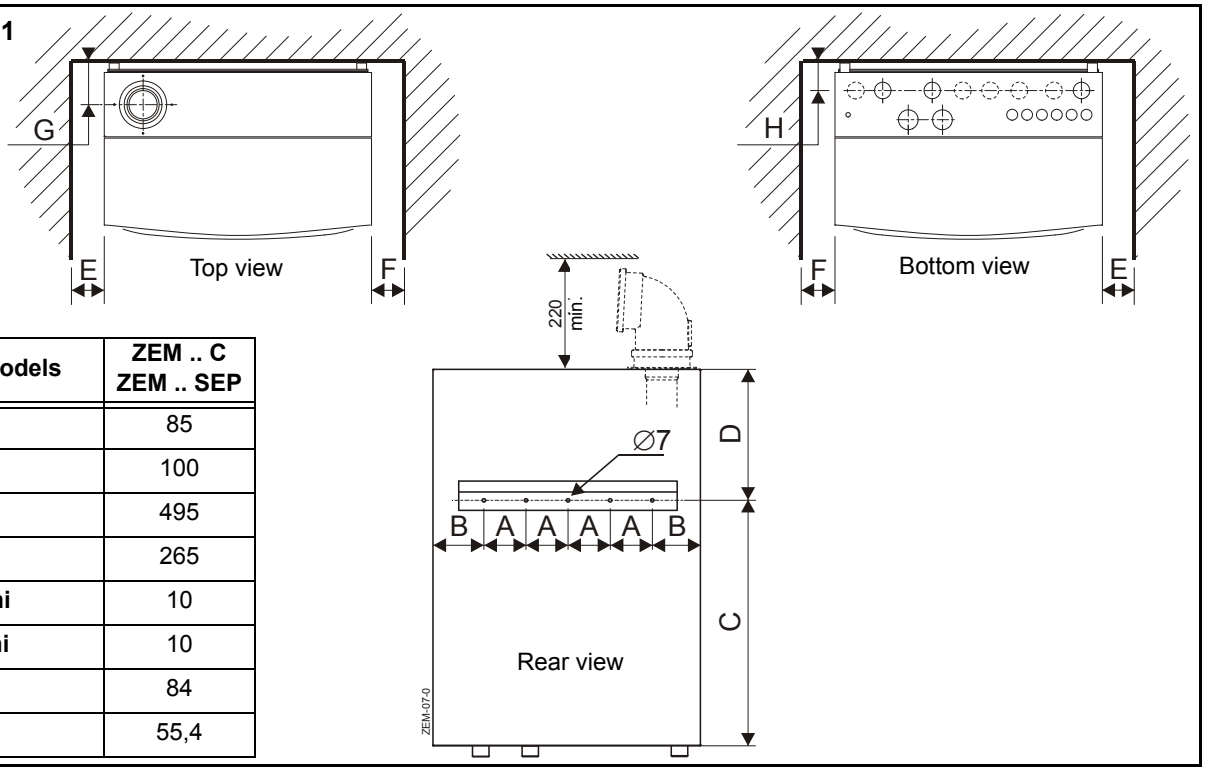
These sealed units can be installed on premises that either have or do not have windows or air inlets. However, all measures must be taken to ensure that the temperature of the installation room does not exceed 45°C (ventilation).

3 - POSITION OF THE BOILER

Define the location of the boiler by taking into account various conditions: environment, accesses to the boiler, etc.

3.1 - Rear wall spacer / fitting dimensions

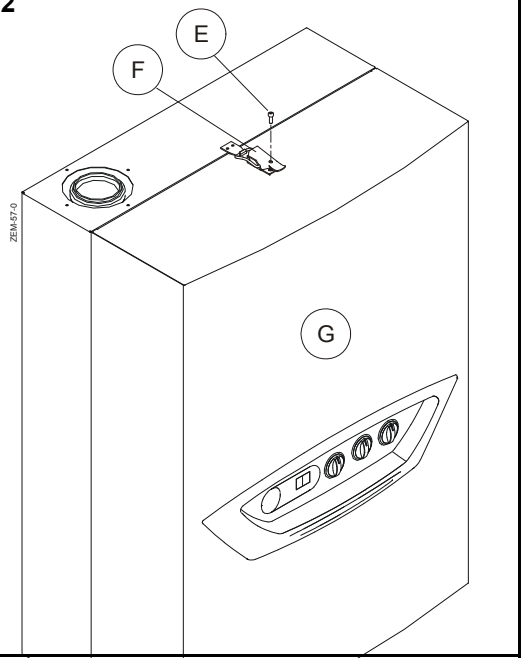
Fig. 11



Models	ZEM .. C ZEM .. SEP
A	85
B	100
C	495
D	265
Emini	10
Fmini	10
G	84
H	55,4

4 - DISASSEMBLING THE COVER

Fig. 12



To open the front panel of the boiler:

- loosen the 2 screws (E) on each latch (F) (one above the cover and one below),
- unlock the 2 latches (F),
- open the front panel (G) of the boiler.

5 - COMBUSTION PRODUCT FLUEING

The combustion product outlet systems described in this manual are systems normally used on the European market. However, some of them cannot be used in all the countries of the EEC. The installer or client must ensure that the flue system chosen complies with local installation regulations.

Please note that these are only samples of our standard flue configurations. For flue lengths in excess of the standard lengths shown please see our website at www.evinox.co.uk <http://www.evinox.co.uk> for details of our other flue systems including the twin pipe flue system, chimney liner systems, and our horizontal and vertical cascade systems. Or contact our technical department for design of special applications.

For the installation of the combustion product evacuation system, C13/C33 accessories supplied as an option or an authorized B_{23}/C_{33} type combustion product system must be used.

The optional polypropylene combustion product evacuation tubes are exclusively reserved for assembly with a condensation boiler, maximum temperature 120 °C. The combustion products of the unit are evacuated at low temperature (50 to 100°C) and saturated in humidity.

Only flue products supplied by the distributor are to be used for any flue installation. Our full flue product range is available as well as our flue design service.

The suitable materials certified as combustion product systems are:

- **316 L stainless steel,**
- **PP, PPtl polypropylene,**
- **PVDF**

Refer imperatively to the CSTB technical notice or to the technical documentation of application (DTA) for fitting flues.

Irrespective of the connection type B_{23}/ C_{13} /C_{33}:

- **To avoid accidental dislocation:**
  - **Check that the air inlet and combustion product extraction outlet tube and bend joints are properly sealed after mounting.**
  - **Ensure that sealing joints have been fitted.**
  - **Use fastening collars (supplied as an option) or clamps to solidly secure to the wall the elements of the flue - at least one collar clamp per female fitting of each flue element.**
- **All vertical flues to be supported every 2m or otherwise instructed for special applications.**
- **All horizontal flues to be supported every 1m.**
- **To make assembly easier, apply our lubricant over 5 cm of the section of the tube to be fitted.**
- **The tubing connections are arranged so that no condensate is retained and to ensure that they are transferred up to evacuation (descending slope of 3% between the base of the flue and the boiler).**

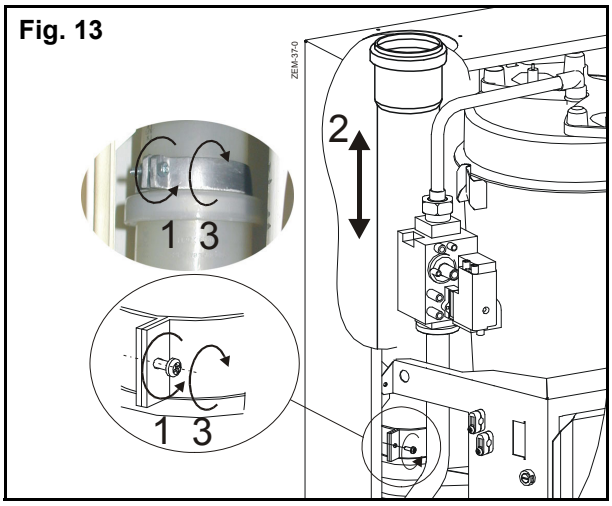
5.1 - The boiler flue tube positioning

According to the type of combustion product connection, the chimney flue tube must be repositioned to ensure the seal between the flue tube and the a air/flue gas adaptation parts (chimney/flue):
To do this:

- Loosen the screw securing the collar (1),
- slide the flue tube (2) upwards to fit it into one of the combustion product outlet parts (chimney or flue),
- tighten the screw (3) securing the collar to hold the flue tube,

The fixing collar must sit directly on top of the socket of the sump outlet elbow to prevent it slipping down.

Fig. 13



5.2 - Evacuation by chimney flue (B_{23}/C_{33})

An existing chimney flue can be used provided that it is cleaned before the lining is fitted.

It is advisable to connect the boiler to the vertical flue by means of a condensate evacuation T-bracket to prevent too large a volume of con densates being transferred by the boiler.

Only the 3 adapters specified below are supplied as options by t he distributor. Please contact your distributor for the supply of other parts of the combustion product evacuation systems.

5.2.1 - Accessories

- order separately -

5.2.1.1 - PPtl adaptors for flues (B_{23})

The adaptor for chimneys is used to connect combustion products in chimney versions of B_{23}.

Fig. 14

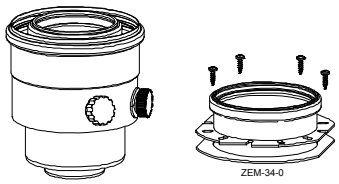
Reference	∅ (mm)
N40.37138	60/80

5.3 - Adaptor C_{33}

Adaptor used to connect a Ø 80/125 sealed connection of type C_{33}.

See kit assembly guide for the part.

Fig. 15



Reference	∅ int. (mm)	∅ ext. (mm)
N40.36622	60-80	100-125

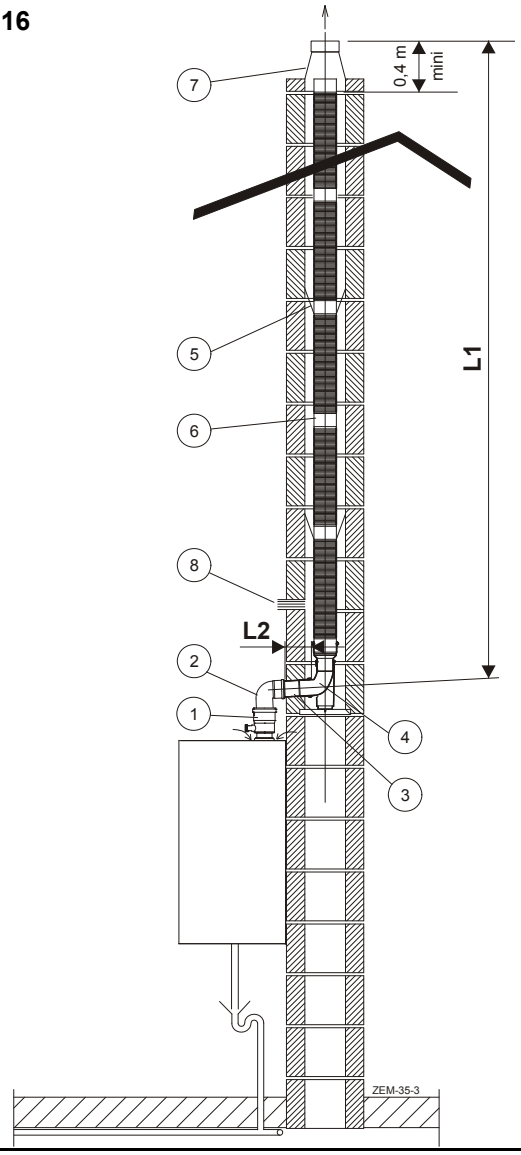
5.3.1 - Configuration with pressurized lining (B_{23})

Definition : Lining of an existing chimney flue by a corrugated PP flue conduit of Ø 80 according to the height.

- The termination, specific to this configuration and specified in the DTA, must have its outlet above the roof (comply with the specification of the decree of 22 October 1969),
- **Do not use the hose for a horizontal assembly: condensate may be retained.**
- **Ventilation for the flue (8) and the heating system (section 2 - page 18 - chapter V - INSTALLATION - INSTALLATION MANUAL) must be provided.**
- If the boiler is installed in premises that have mechanical air extraction, ensure that this does not cause negative pressure.
- The premises must never be fitted with other appliances using natural draft to operate.
- The air is sucked in by the burner directly from the room in which the boiler is fitted.

5.3.1.1 - Installation example (B_{23})

Fig. 16



Accessories :

1) PPtl sealed flue adaptor Ø 60/80,
2) PPtl 90° elbow ∅80,*
3) PPtl tube ∅80 (cut to the length required),*
4) 80 mm support elbow set,*
5) Chimney spacers.*
6) PP corrugated flue ∅80,*
7) Termination (above the roof),*
8) Lining ventilation (according to installation standards)

* accessories not supplied

Maximum length allowed:
Lmax ≤ 1 m + L2 + 1m + L1 ≤ 20 m

Note :

- The diameters are calculed according to the standard CE EN 13 384-1.
- For greater distances please contact our technical department for flue sizing.

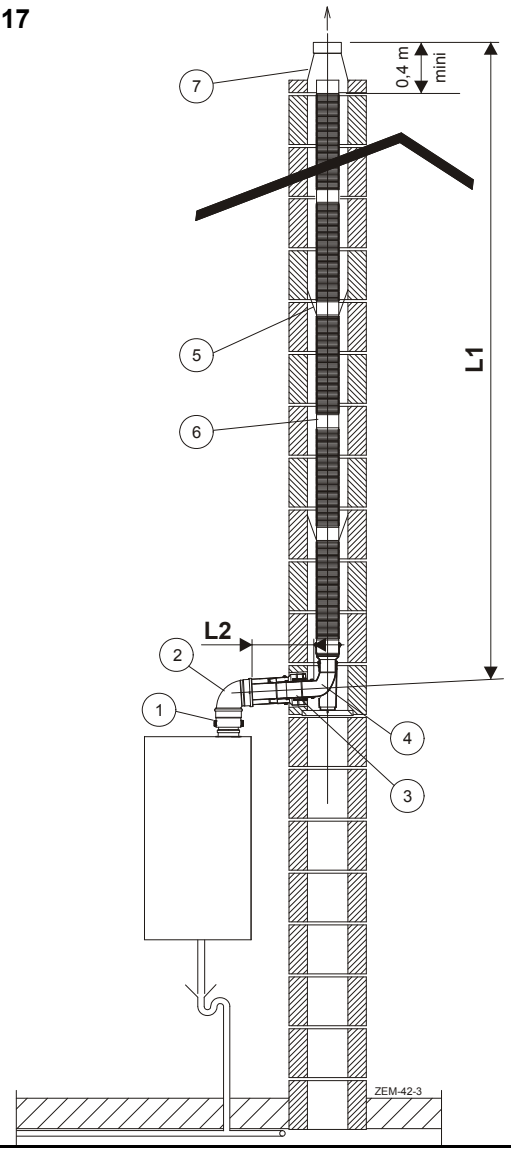
5.3.2 - Sealed configuration (C_{33})

Definition: Lining of an existing chimney flue, sealed with respect to the installation room by a PP corrugated flue of Ø 80 (in this case the air inlet is obtained by the chimney flue around the combustion product outlet Ø 80) - (no ventilation constraints for the boiler).

- The roof termination specific to this configuration can have an outlet **below** the roof,
- **Do not use the hose for a horizontal assembly: condensate may be retained.**
- The air is sucked in by the burner from outside the room through the concentric terminal,
- **Refer to the CSTB technical notice for installing flues.**

5.3.2.1 - Installation example (C_{33}) in a chimney

Fig. 17



Accessories:

1) PP vertical flue adaptor Ø 80/125,
2) 90° concentric elbow Ø 80/125
3) PPtl tube Ø 80/125 (cut to the length required),*
4) 80 mm support elbow set,*
5) Chimney spacers.*
6) PP corrugated flue Ø 80,*
7) Termination (outlet possible below the roof),*

* accessories not supplied

Maximum length allowed:
Lmax ≤ 1 m + L2 + 1m + L1 ≤ 20 m

Note :

- For greater distances please contact our technical department for flue sizing.

5.4 - Balanced flue outlet (C_{13}/C_{33})

5.4.1 - Balanced flue system installation requirements:

The three statutory clearance distances according to the installation standards are:

- **A = 0.40 m:** minimum clearance distance of the combustion production extraction outlet axis to any opening or of the ventilation outlet,
- **B = 0.60 m:**

  minimum distance from the axis of the combustion production extraction outlet to any other ventilation air inlet,

  Two balanced flue terminals from two separate boilers, positioned side by side, must be separated by a minimum distance of 0.6 metres.
- **C = 1.80 m:**

  combustion product extraction outlet and air inlet of sealed circuit units with openings at less than 1.80m from the ground must be efficiently tamper-proof so as to prevent any intervention that could affect correct functioning.

  Combustion product extraction outlets that open out directly onto an outside route (public or private road) less than 1.80m from the ground, except for condensation installations, must have a fixed defector that redirects discharged gas more or less parallel to the wall.

Recommended distances:

- **D / F = 0.30 m:**

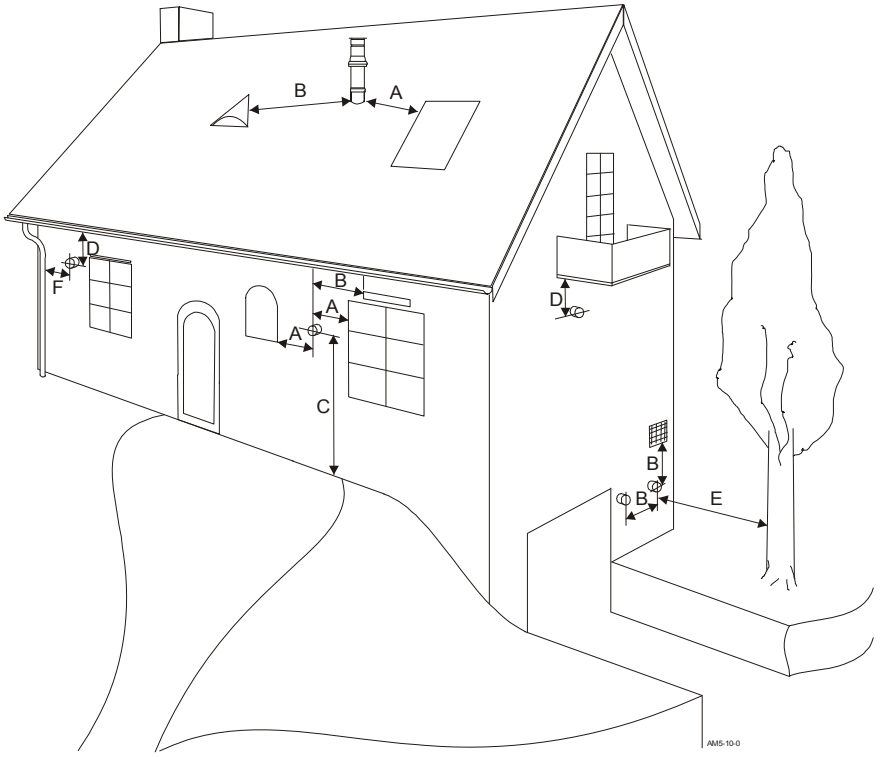
  centre distance from the combustion product extraction outlet to the ground, from a roof overhanging or above a balcony,

  space between the combustion product extraction outlet and a gutter or drainpipe.
- **E = 2.00 m:**

  distance of a combustion product extraction outlet from a hedge, plant, boundary or fence,

  Please refer to current CORGI legislation regarding fences, boundaries and the need to take into consideration the possibility of a future building on the boundary. In all cases you should assume that a future building can be built up to the boundary or fence.

Fig. 18



Air intake by the burner and extraction of combustion product is carried outside the premises by using concentric tubes.

5.4.2 - Drainage by horizontal balanced flue (C_{13})

Distributor recommendations

Horizontal balanced flue installation is possible when the wall next to the boiler leads to a well-ventilated area on the outside.

The flue terminal must be horizontal to avoid water dripping (the flue tube is set over).

Do not place the flue terminal :

- **within 2m of a ventilation outlet or opening window,**
- **at the front of the building or in an access area (possible obstruction). combustion products odour, presence of a cloud of vapour of a size that will vary in accordance with the weather conditions.**
- **within 2 m of the ground or directly accessible to a small child (risk of obstruction, the chimney terminal can be protected with a protection device - not supplied).**

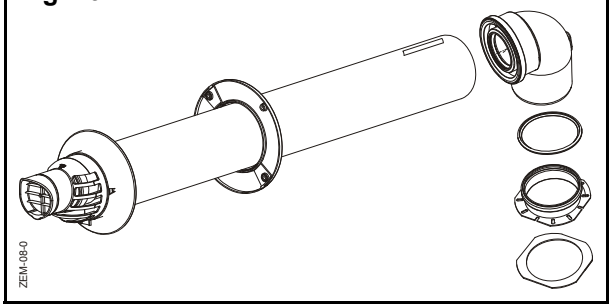
The horizontal balanced flue kit can be fitted to the right or left-hand side or directly to the rear of the boiler and can cross a wall-thickness of 0.6 metre maximum.

- Standard balanced flue length: **L = 0.83 m**
- Maximum linear length of horizontal flue: **Lmax = 8 m**

5.4.2.1 - PP/PVC 0,83 m horizontal balanced flue kit (optional)

See kit assembly guide

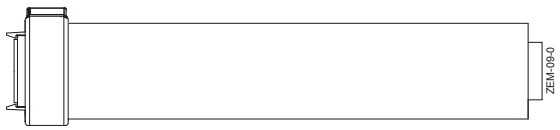
Fig. 19



Reference	Length mm	∅ int. mm	∅ ext. mm
N40.36616	830	60	100

5.4.2.2 - 1 m PPtl/PVC concentric flue extensions (option)

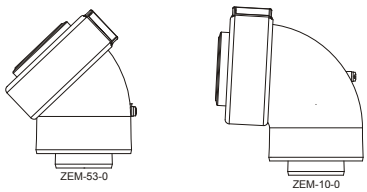
Fig. 20



Reference	Length mm	∅ int. mm	∅ ext. mm
N40.36912	1000	60	100
N40.36913	2000	60	100

5.4.2.3 - PPtl/PVC concentric bends (option)

Fig. 21



Reference	Type of elbow	∅ int. mm	∅ ext. mm
N40.36915	45	60	100
N40.36914	90°	60	100

Note:

- Each 45° bend added reduces the total permitted length by 1 m.
- Each 90° bend added reduces the total permitted length by 2 m.

5.4.2.4 - Installation examples

Please refer to the guide when installing the kit.

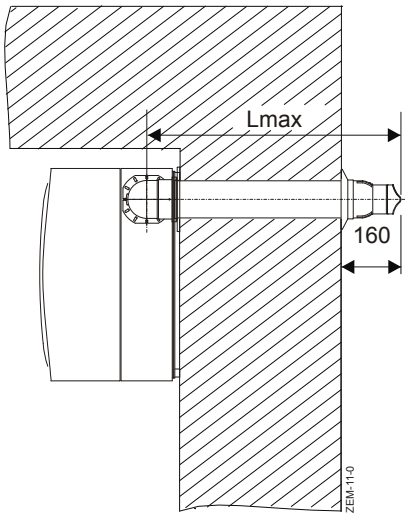
Note:

- For lengths greater than 0.83 m (standard horizontal flue kit) use the extensions and bends supplied as an option.

Lmax ≤ 8 m

5.4.2.4.1 - Straight horizontal balanced flue

Fig. 22

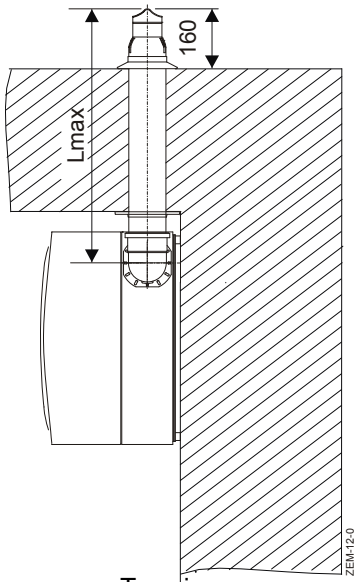


Top view
- Rear extraction -

Accessory:

- 1 horizontal balanced flue kit - **l = 0.83 m**.

Fig. 23

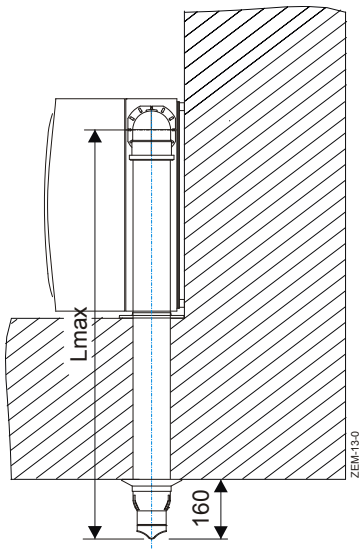


Top view
- Left hand extraction -

Accessory:

- 1 horizontal balanced flue kit - **l = 0.83 m**.

Fig. 24



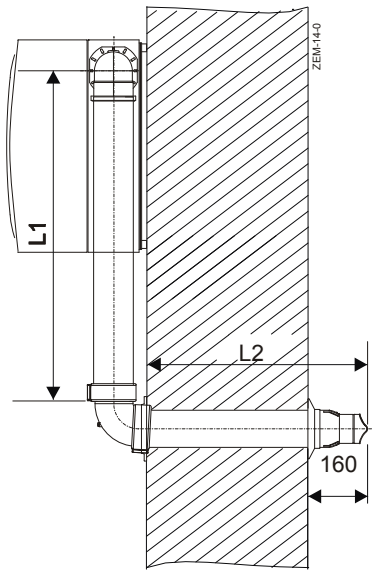
Top view
- Right-hand extraction -

Accessory:

- 1 horizontal balanced flue kit - **l = 0.83 m**.

5.4.2.4.2 - Flue with bend:

Fig. 25



Accessories:

- 1 horizontal balanced flue kit - **l = 0.83 m**.
- 1 concentric extension Ø 60/100 - **l = 1m**,
- 1 x 90° concentric bend Ø 60/100.

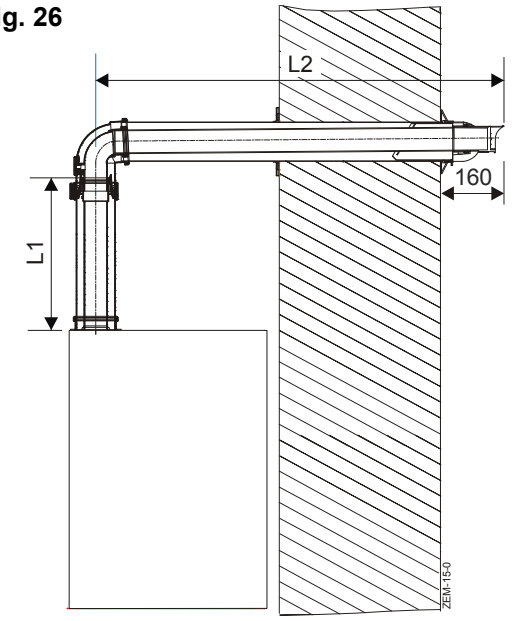
Lmax = L1 +2 m + L2 ≤ 8 m

Note:

- Each 90° bend added reduces the total permitted length by 2 m.

5.4.2.4.3 - Straight horizontal balanced flue with collar

Fig. 26



Accessories:

- 1 horizontal balanced flue kit - **l = 0.83 m**,
- 1 concentric extension Ø 60/100 - **l = 1m**,
- 1 x 90° concentric bend Ø 60/100.

Lmax = L1 + L2 ≤ 8 m

Note:

- The concentric extension can be cut to adapt to the required collar height.

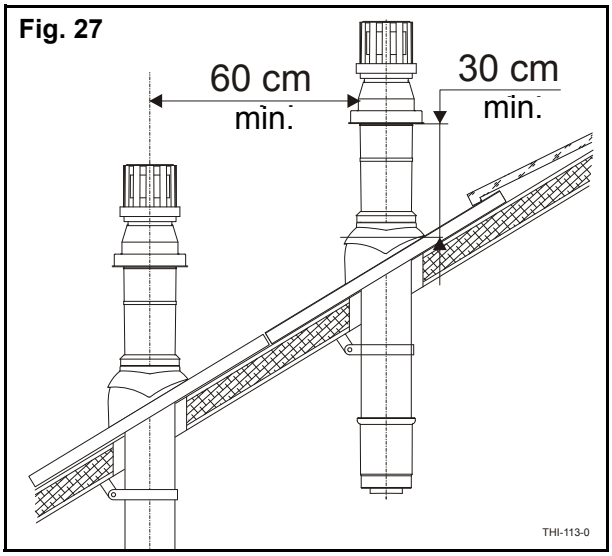
5.4.3 - Extraction by vertical balanced flue (C_{33})

Besides the previously mentioned installation regulations pertaining to flues, the vertical flue terminal must allow a minimum distance of 30 cm between the roof level (sloping or flat) and the air intake zone.

The proximity of two terminals is also regulated: it is recommended that two adjoining terminals should be placed in the same horizontal plane. If this cannot be applied, the axis of the lower terminal must be at a distance of at least 0.60 m from the closest point of the air intake hole of the highest terminal.

Maximum length of vertical flue = **20 m**

Fig. 27



Distributor recommendations

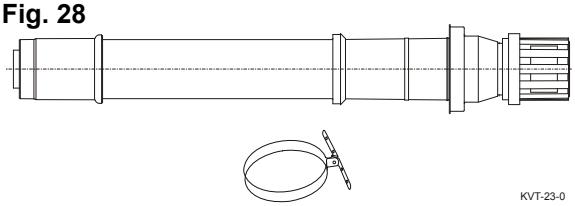
It is re commended to us e 45° bends rather than 90° bends.

Position the terminal at least 1 me tre from a vertical wall (end walls).

5.4.3.1 - PPtl/PVC concentric vertical terminal (option)

For sloping roofs.

Fig. 28

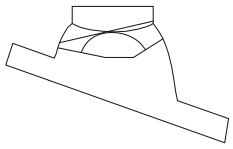


Reference	Colour	Length (*) mm	∅ int. mm	∅ ext. mm
N40.33615	Tile	1130	80	125
N40.33714	Black	1130	80	125

(*) Useful length under sleeve tile - l = 0.63 m

5.4.3.2 - Sleeve tile with adaptive coupling (option)

Fig. 29



Reference	Slope	Type of covering	Colour
N40.12165	25° - 45°	Tile*	Tile
N40.12166	35° - 55°	Tile*	Tile
N40.12167	35° - 55°	Slate - Shingle	Black

*Suitable for all types of tiles, for flat tiles < 8 mm use the Slate model

If accessories of any other brand are used, our guarantee of watertightness will be automatically void.

5.4.3.3 - PPtl/PVC concentric extensions (option)

Joint fitting.

Fig. 30

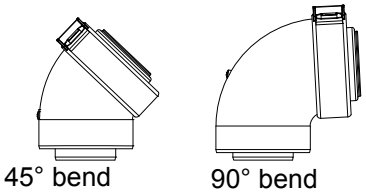
Reference	Length mm	∅ int. mm	∅ ext. mm
N40.28397	500	80	125
N40.28398	1000	80	125

(*) Useful length after assembly - l = 0.45 m or 0.95 m

5.4.3.4 - PPtl/PVC concentric bends (option)

Joint fitting.

Fig. 31



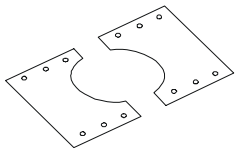
Reference	Type of bend	∅ int. mm	∅ ext. mm
N40.28395	45°	80	125
N40.28396	90°	80	125

Each 45° bend added reduces the total permitted length by 0.5m.

Each 90° bend added reduces the total permitted length by 1m.

5.4.3.5 - Polypropylene roof plate (option)

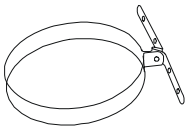
Fig. 32



Reference	Colour
A90.12172	black

5.4.3.6 - Fastening collar (option)

Fig. 33



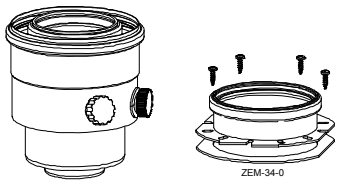
Reference	Quantity	∅ mm
B00.29727	3	125

These collars are essential to fix the vertically positioned extensions so that the boiler outlet does not bear the weight of the conduits.

5.4.3.7 - Adaptor for the vertical balanced flue

See assembly instructions for the part.

Fig. 34

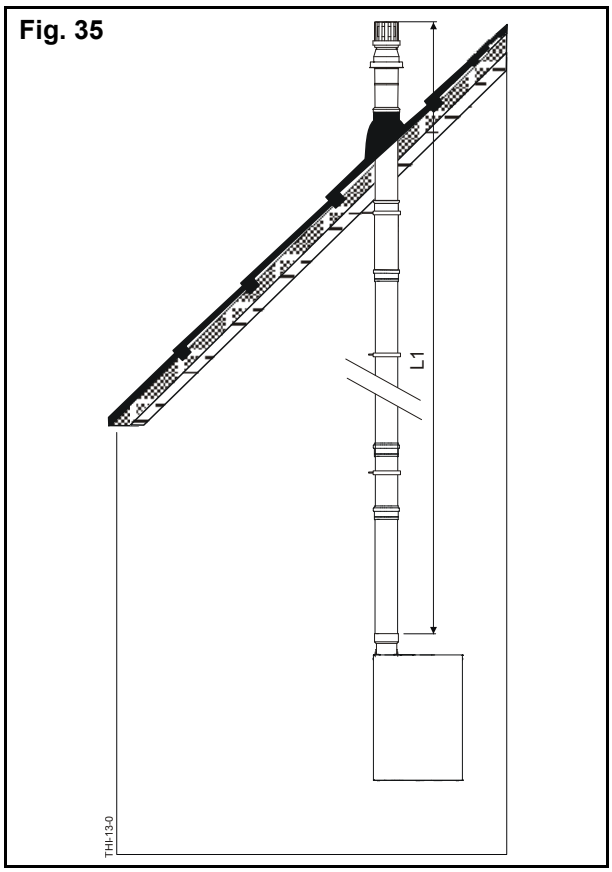


Reference	N40.36622

5.4.3.8 - Examples of installation

5.4.3.8.1 - Straight configuration

Fig. 35



Accessories:
- Vertical balanced flue adaptor,
- Concentric extensions Ø 80/125,
- 1 concentric vertical terminal Ø 80/125,
- 1 vertical terminal fastening collar (delivered with vertical terminal),
- 1 sleeve tile with adaptive coupling depending on the type of roofing and roof slope,
- 1 roof plate,
- 3 fastening collars Ø 125,

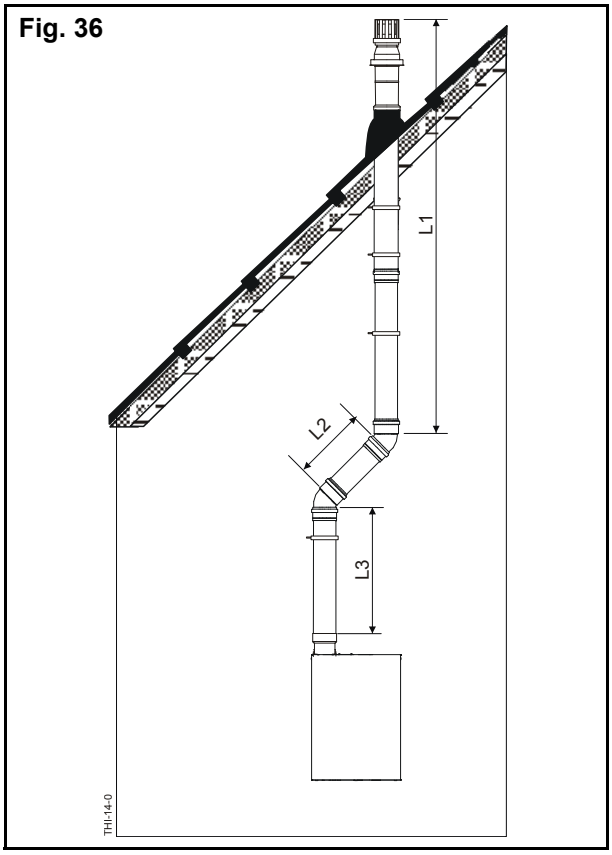
Lmax = L1 ≤ 20 m

5.4.3.8.2 - Configuration with bends

Avoid fitting 90° bends for this configuration.

If fitting 90° bends can be avoided:
- **never use more than 2,**
- **maintain a slope to the boiler for the horizontal section. This will prevent any risk of condensate retention.**

Fig. 36



Accessories:
- Vertical balanced flue adaptor,
- 3 concentric extensions Ø 80/125,
- 2 x 45° concentric bends Ø 80/125
- 1 concentric vertical terminal Ø 80/125,
- 1 vertical terminal fastening collar (delivered with vertical terminal),
- 1 sleeve tile with adaptive coupling depending on the type of roofing and roof slope,
- 1 roof plate,
- 3 fastening collars Ø 125,

Lmax = L1 + 0,5 m + L2 + 0,5 m + L3 ≤ 20 m

Note:
- Each 45° bend added reduces the total permitted length by 0.5m.

6 - HYDRAULIC CONNECTION

6.1 - Distributor recommendations

When the boiler is assembled on an old installation, make sure that the installation is rinsed with fresh water, so as to clear any sediment stagnating in areas where the flow is slow. (Decantation should be provided).

If the boiler is connected to a hard water supply, install a limescale treatment system on the main cold water inlet of the installation (ZEM..SEP only).

To prevent circulation noises in an installation featuring temperature controls, the following is recommended:

- **Do not fit all the radiators with temperature controls,**
- **Fit a differential valve,**

In accordance with the decree of the Ministry of Health for the protection of the drinking water supply, the filling system must be fitted with a disconnecter of type CB (non-controllable pressure zone).

When required by Building control or local bylaws, a thermostat mixing tap must be provided on the domestic hot water supply so as to limit the temperature at the tap connection (50°C).

Never position the isolation valve between the safety control box and the hot water tank (ZEM..C + hot water tank).

6.2 - Accessories to connect, install or adjust

- *Bleed:*

  The bleed of the circulating pump features a flexible tube that can be connected to the outlet (condensate extraction funnel).

- *Safety control box (for hot water production models):*

  The safety control box must be installed at a low point (0.25 m from the floor) to allow the domestic hot water tank to be emptied by siphoning. Otherwise provide a connection weld for a valve at a low point.

  To prevent a rapid drop in pressure in the tank when hot water is being drawn, thus prematurely ageing the seals and the domestic hot water system itself, please ensure the following:

  - properly size the cold water inlet tube to a diameter at least equal to or greater than the diameter of the hot water distribution,
  - do not create large pressure losses on the cold water inlet by ins talling different accessories (various valves, etc.).

  It is normal that the domestic hot water safety box lets a little water escape when heating the hot water tank.

  However, to prevent these water flows from the safety box and if the cold water pressure exceeds 4 bars, it is advisable to:

  - fit a pressure reducing valve on the cold water inlet.
  - fit a d.h.w. expansion vessel at the cold water inlet between the safety box and the tank (refer to the instructions of the d.h.w. vessel for its size and the initial pre ssure according to the volume of the tank and the domestic cold water pressure).

- *Safety valve:*

  This must be connected to the used water drain via a siphon funnel.

- *Condensate outlet:*

  The condensate outlet must be connected to a trap with access for servicing

- *Expansion vessel:*

  If the installation capacity is over 80 litres, an extra expansion vessel to the boiler expansion vessel will be added.

  The correct operation of the boiler requires an installation pressure of at least 1 bar.

  If the installation is a re novation and uses an open vessel, this must be removed and replaced with a closed vessel to seal the circuit.

  The vessel should be able to support an expansion of 6% of the total water capacity of the heating circuits. But it is important to note, in order to guarantee this expansion, that the useful capacity of a vessel does not equal its actual capacity.

Example:

- Installation: 100 litres
- Domestic hot water tank: 5 litres
- Boiler: 2.7 litres
- Total water capacity: 107.7 litres

Conditions: Using a vessel pre-loaded to 0.6 bar (under floor boiler = ground floor heating + 1 floor), heating safety valve calibrated at 3 bars, installation filled cold at 1 bar.

- Vessel efficiency calculation (R):

$$R = \frac{(\text{Safety Pressure} - \text{Filling pressure})}{\text{Safety Pressure}}$$

$$R = \frac{(3+1)-(1+0,6)}{(3+1)} = 0,6$$

+ 1) = the transformation of relative pressures into absolute pressures

- Calculation of the useful capacity of the vessel (Cu):

$$Cu = \text{volume total} \times \text{expansion}$$

$$Cu = 107,7 \times 0,06 = 6,46\,dm^3$$

- Calculation of the real capacity of the vessel (Cr):

$$Cr = \frac{Cu}{R}$$

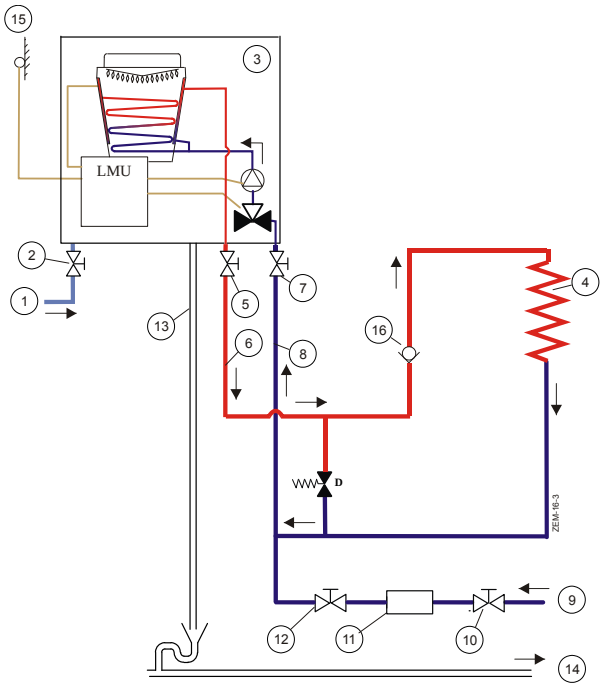
$$Cr = \frac{6,46}{0,6} = 10\,\text{litres}$$

6.3 - Hydraulic connection for models ZEM 2-17 C and ZEM 5-25 C

Fig. 37

1) Gas inlet
2) Gas cock
3) Boiler
*4) Radiator**
5) Heating flow isolation valve
6) Heating flow
7) Heating return isolation valve
8) Heating return
9) Cold water inlet
*10) Filling valve**
*11) Removable filling loop**
*12) Isolation valve**
13) Drain for condensates, valve, bleed
14) Removal towards drain
15) Outside sensor
*16) Non-return valve**

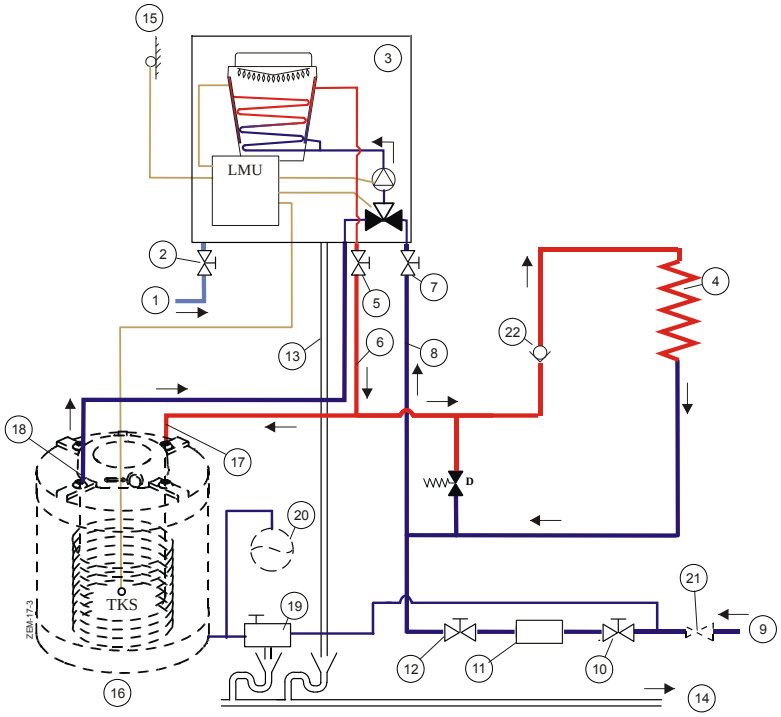
**Accessories not supplied*



6.4 - Hydraulic connection for models ZEM C + DHW production system of type BS with internal selector valve kit

Fig. 38

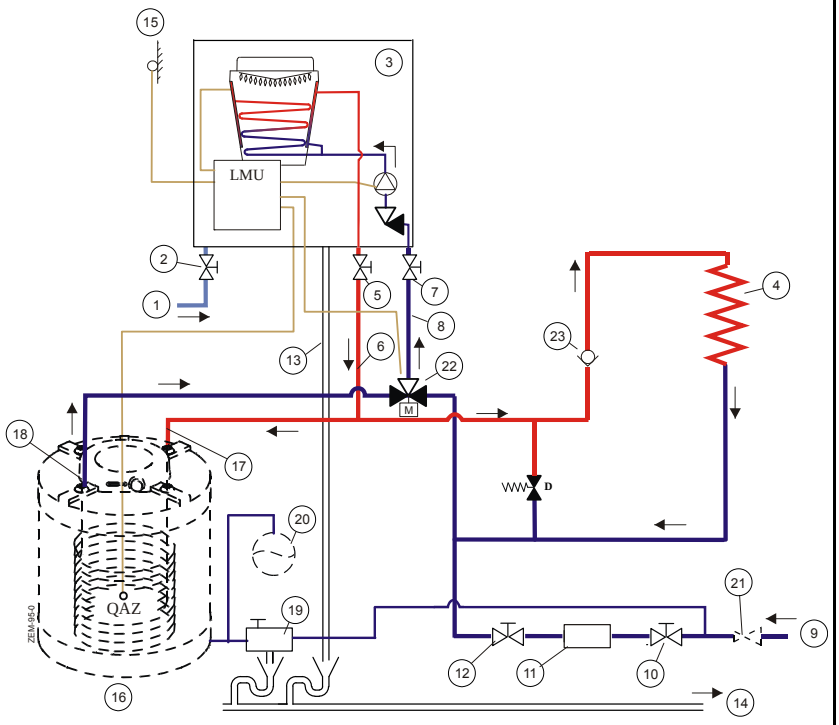
1) Gas inlet
2) Gas cock
3) Boiler
*4) Radiator**
5) Heating flow isolation valve
6) Heating flow
7) Heating return isolation valve
8) Heating return
9) Cold water inlet
*10) Filling valve**
*11) Removable filling loop**
*12) Isolation valve**
13) Drain for condensates, valve, bleed
14) Removal towards drain
15) Outside sensor
*16) DHW production system of type BS***
17) Primary inlet
18) Primary outlet
*19) Safety control box**
*20) DHW expansion vessel**
*21) Pressure reducer**
*22) Non-return valve**
**Accessories not supplied* ***Option*



6.5 - Hydraulic connection for models ZEM C + DHW production system of type BS with external selector valve kit

Fig. 39

1) Gas inlet
2) Gas cock
3) Boiler
*4) Radiator**
5) Heating flow isolation valve
6) Heating flow
7) Heating return isolation valve
8) Heating return
9) Cold water inlet
*10) Filling valve**
*11) Removable filling loop**
*12) Isolation valve**
13) Drain for condensates, valve, bleed
14) Removal towards drain
15) Outside sensor
*16) DHW production system of type BS***
17) Primary inlet
18) Primary outlet
*19) Safety control box**
*20) DHW expansion vessel**
*21) Pressure reducer**
*22) External motorized selector valve***
*23) Non-return valve**
**Accessories not supplied*
***Option*

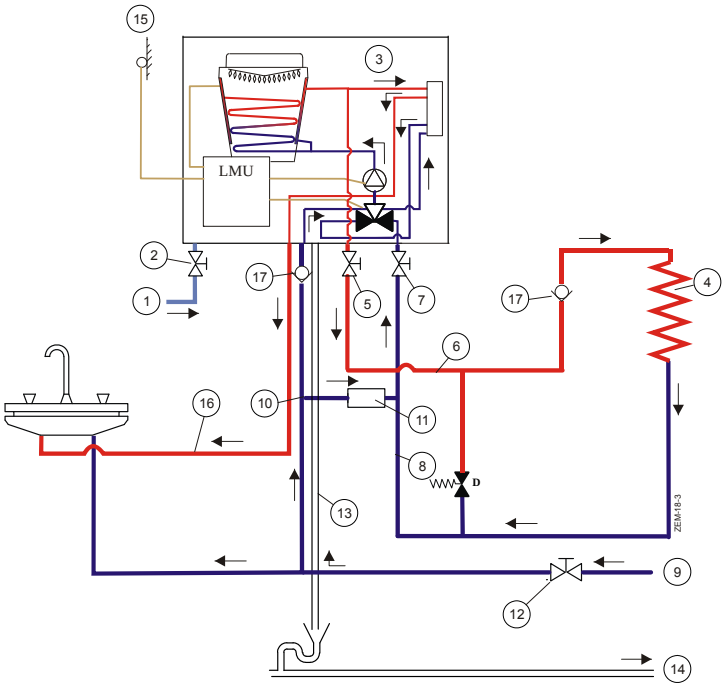


6.6 - Hydraulic connection for models ZEM 5-25 SEP

Fig. 40

1) Gas inlet
2) Gas cock
3) Boiler
*4) Radiator**
5) Heating flow isolation valve
6) Heating flow
7) Heating return isolation valve
8) Heating return
9) Cold water inlet
10) Domestic cold water inlet
11) Removable filling loop with filling valve
*12) Isolation valve**
13) Drain for condensates, valve, bleed
14) Removal towards drain
15) Outside sensor
16) Domestic hot water flow
*17) Non-return valve**

**Accessories not supplied*



7 - GAS CONNECTION

The boiler is pre-set in the factory for natural gas. For operation on propane, see chapter II - GAS CONVERSION - page 5 - SERVICING MANUAL.

- The inlet diameter of the boiler gas pipe is 1".
- In natural gas operational mode, a gas stopcock complying to gas regulations must be installed on the gas inlet close to the boiler and within easy access.
- For operation on propane (for the ZEM 5-25 models), the 37 mbar pressure-reducing valve-trigger used as a gas cock must also remain accessible.
- Make sure that the gas inlet connections are correctly tightened on the boiler.
- Only use connections and gaskets that are approved for gas installation use.
- The gas pipe should be flushed before putting the boiler into operation. This is to evacuate any particles created by welding or fitting connections.
- Never flush the gas pipe whilst the boiler is operational (Max Gas Pressure = 100 mbar).
- The gas pipe to the boiler should not cause load losses in excess of 1 mbar (10 mmCE).

  Example: For natural gas type G20, 20 mbar for 10 metres of piping and 4 bends: minimum diameter 20/22.

8 - ELECTRICAL CONNECTION

- The electrical connection and all the equipment used to make this connection must be in conformity with the codes of practise in force (according to the installation standards),
- the premises must be suitable in terms of boiler protection IP 44 (model C_{13} - C_{33}) - IP 24 (model - B_{23}),

8.1 - Mains connection

- Electrical connection of the boiler to the mains using the supply cable.
- Power supply: 230 V - 50 Hz (single phase),
- Respect the Live-Neutral polarities,
- Earth connection compulsory.
- According to the EN 60335-1 standard, a separator device with at least a 3 mm contact gap between each pole is to be taken into account in the fixed installation.
- The boiler has a 2 A fuse

8.2 - Connection of the sensors to the LMU management unit

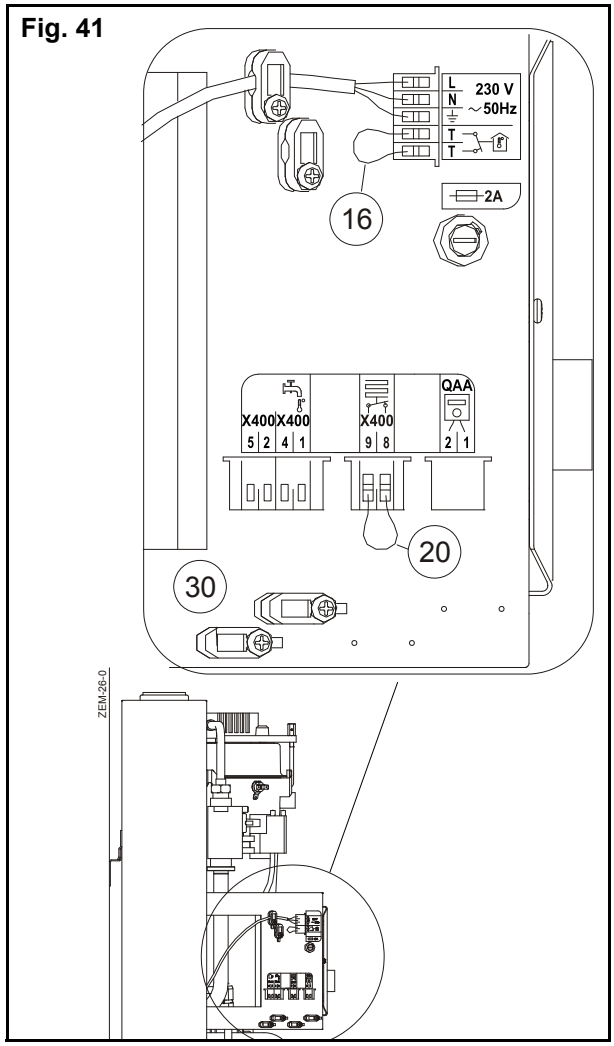
The sensor cables must not pass through the same grommet and cable gland as the 230 V cables.
If a fault code is displayed when fitting the sensor to the LMU management unit please refer to chapter IV - OPERATING FAULTS - page 14 - SERVICING MANUAL.

When connecting the sensors, the cables must run through one of the cable glands (item 30, fig. 41 - page 34 - chapter V - INSTALLATION - INSTALLATION MANUAL) on the left-hand side of the control panel then through one of the grommets at the base of the boiler.

- X400 terminal - marking 5/2 (fig. 41): connection of the outside sensor.
- X400 terminal - marking 4/1 (fig. 41): connection of the DHW sensor (ZEM C + BS/ZEM SEP).
- X400 terminal - marking 9/8 (fig. 41) : connection of the underfloor heating system safety thermostat - delivered as an option.
- Terminal 1-2 (fig. 41): connection of the room sensor (QAA 53 = REG 54 or QAA 73 = REG 74 - delivered as an option).

In this case, remove the shunt (16) from the TT terminal.

Fig. 41



8.3 - REG 60/REG 151 room thermostat (option)

When the room thermostat is not the one recommended by the distributor, Check the characteristics:

- 230V, 5 mA,
- max. capacitance between the live and the thermostat input: Cp<4000pF.

and carry out the connection to the TT terminal as indicated below.

8.3.1 - REG 60

When connecting the room thermostat to the control panel of the boiler:

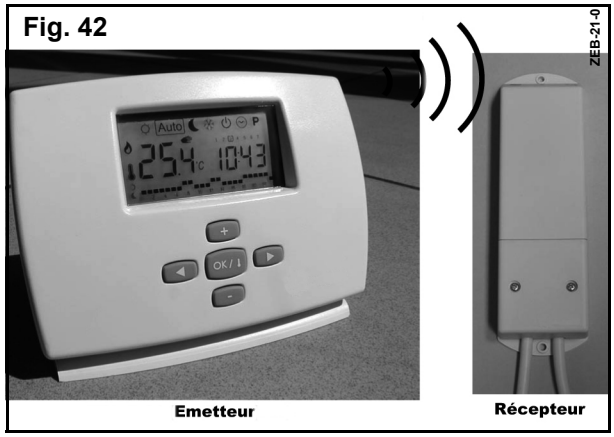
- remove the 2-pin connector (terminal TT, fig. 41 - - page 34 - chapter V - INSTALLATION - INSTALLATION MANUAL) from the control panel,
- replace the 2-pin connector shunt (16, fig. 41 - page 34 - chapter V - INSTALLATION - INSTALLATION MANUAL) by the 2 wires of the room thermostat cable,
- reposition the connector on the terminal TT.

Note:

- The 2 wires must be connected to terminals 4 and 5 of the thermostat. Refer to the instructions provided with the thermostat.

8.3.2 - REG 151

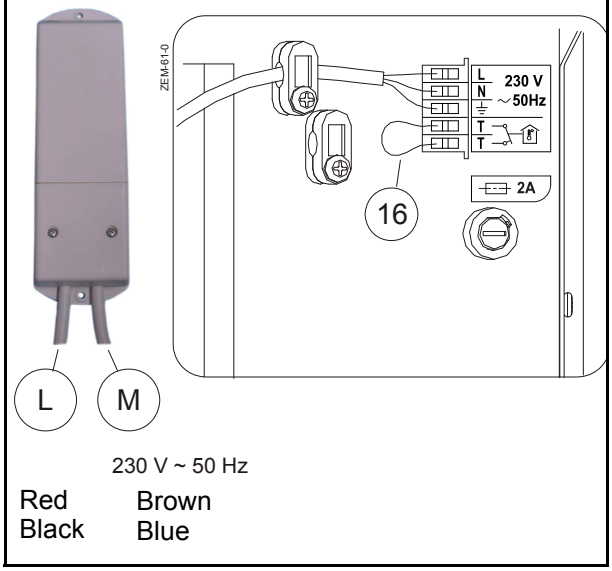
Fig. 42



The room thermostat communicates by radio signals with the receiver connected to the system.

Refer to the technical instructions supplied with the thermostat for its technical characteristics, installation and use.

Fig. 43



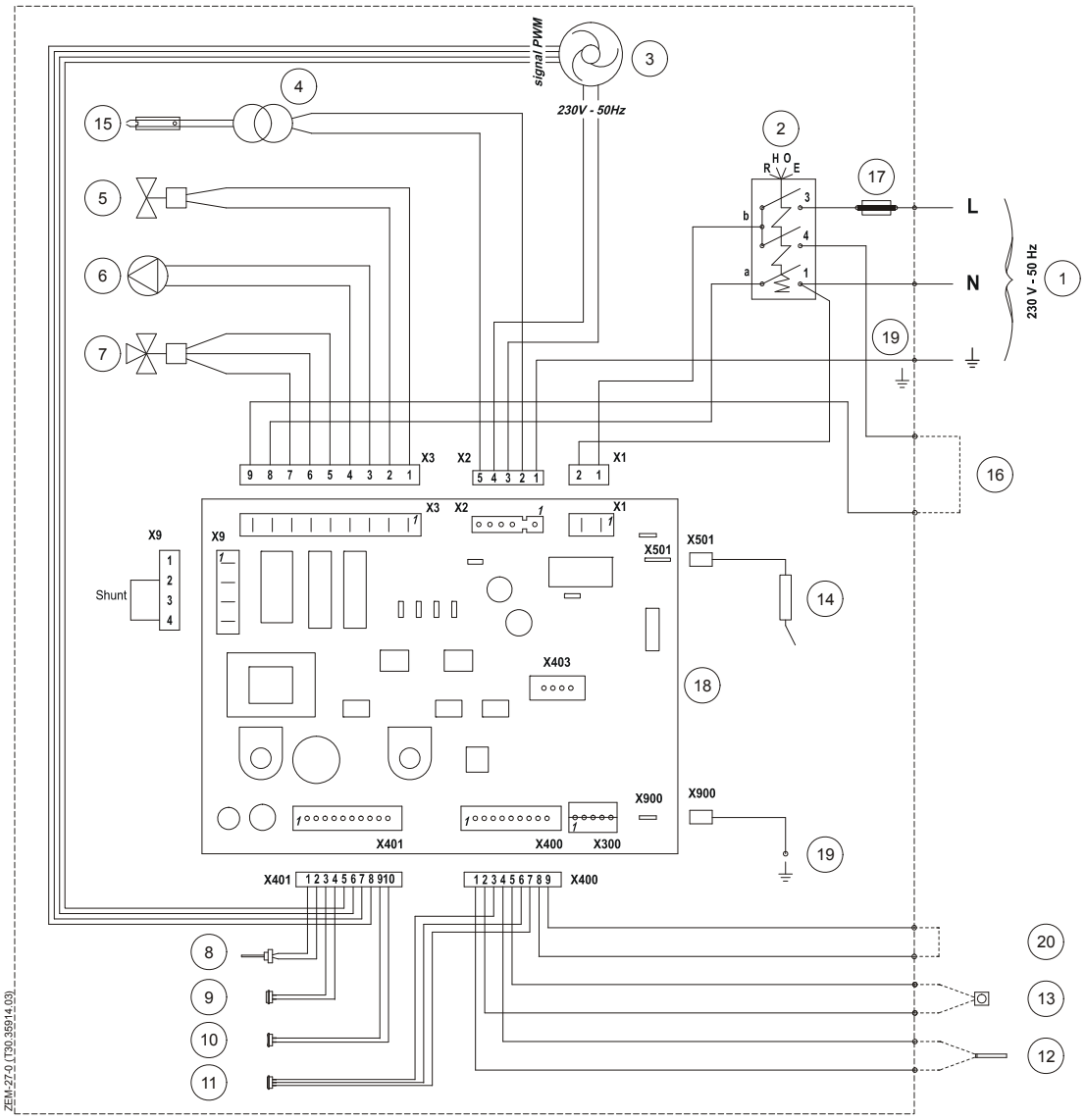
To connect the receiver to the boiler:

- remove the 2-pin connector (TT terminal, fig. 43) of the control panel of the boiler,
- replace the shunt (16, fig. 43) of the 2 pin connector by the two wires (red and black) of the cable (L) from the receiver,
- reposition the connector on the TT terminal.
- connect the receiver to the mains (230 V ~ 50 Hz) using the 2nd cable (M) (brown and blue wires).

The power supply of the receiver must not be made on the boiler (no terminal available).

8.4 - Wiring diagram

Fig. 44



1) Power supply 230 V - 50 Hz
2) Mode selector (Reset/Winter/Off/Summer)
3) Fan 230 V~
4) Ignition transformer 230 V~
5) Gas valve 230 V~
6) Heating circulating pump
7) Selector valve (ZEM SEP)
8) Flue gas sensor
9) Water overheating safety
10) Boiler flow sensor
11) DHW sensor (detection of the tap) (ZEM SEP)
12) Domestic hot water adjustment sensor (ZEM SEP/ ZEM C + BS)
13) Outside sensor
14) Ionization electrode
15) Ignition electrode
16) Shunt to be removed for room thermostat or room sensor (QAA53/QAA73) connection
17) Removable fuse
18) LMU control plate
19) Earth
20) Shunt to be removed if an underfloor heating safety thermostat is connected

1 - PARAMETER LIST

1.1 - Parameters available for possible adjustment

Line	Display	Function	Range	Factory setting: boiler version		
				2-17 C	5-25 C	5-25 SEP
501	TrSollMin	Minimum room temperautre setpoint	5...20°C	17°C	17°C	17°C
502	TrSollMax	Maximum room temperautre setpoint	20...35°C	23°C	23°C	23°C
503	TkSollMin	Minimum boiler setpoint temperature heating	0...80°C	20°C	20°C	20°C
504	TkSmax	Maximum boiler setpoint temperature in heating mode	c8_TKSollMin...90	80 °C	80 °C	80 °C
516	THG	Summer / winter changeover temperature	10...30 °C	19 °C	19 °C	19 °C
532	Sth1	Heating curve slope heating circuit 1	2...33	15	15	15
534	DtR1	Room setpoint readjustment heating circuit 1	-4,5...4,5 K	0 K	0 K	0 K
536	NhzMax	Maximum speed of rotation in heating mode	0...4900/0...4450	4900	4450	4450
544	ZqNach	Pump shutdown timer	0...65535 s	180 s	180 s	180 s
545	ZBreMinP	Minimum waiting time of the burner (antishortcycle)	0...13107 s	0 s	0 s	0 s
555(*)	KonfigRg1	Setting flags	0...255	00000010		
651	BoilerTyp	Selection of the boiler type	0...3	2	0	1
652	BoilerID	Boiler identification	0...65535	0	0	0
678	ParamID	Setting identification number	0...65535	0	0	0
679	TnKamin	Drying function period	0...13107 s	60	60	60

(*) If the AGU2.002 supply a low consumption heating pump (Class A), the line 555.4 of the KonfigRg1 parameter, must be set to "On" (i.e the byte 4 will be changed from "0" to "1").

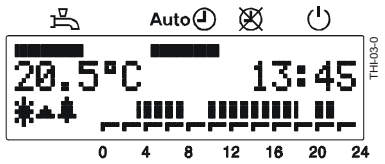
1.2 - Read only available parameters (Service data)

Line	Display	Function	Unit
700	Stoer1	1st past value of lockout code counter	-
702	StrDia1	1st past value of internal diagnostic code	-
703	Stoer2	2nd past value of lockout code counter	-
705	StrDia2	2nd past value of internal diagnostic code	-
706	Stoer3	3rd past value of lockout code counter	-
708	StrDia3	3rd past value of internal diagnostic code	-
709	Stoer4	4th past value of lockout code counter	-
711	StrDia4	4th past value of internal diagnostic code	-
712	Stoer5	5th past value of lockout code counter	-
714	StrDia5	5th past value of internal diagnostic code	-
715	Stoer-akt	Current value of lockout code counter	-
722	InbetrSetz	Start counter	-
725	SwVersion-LMU	SW version of LMU for presentation on the OT parameter setting level	-
728	StrAlba1	1st past value of ALBATROS error code	-
729	StrAlba2	2nd past value of ALBATROS error code	-
730	StrAlba3	3rd past value of ALBATROS error code	-
731	StrAlba4	4th past value of ALBATROS error code	-
732	StrAlba5	5th past value of ALBATROS error code	-
733	StrAlba_akt	Current value of ALBATROS error code	-
750	Status_Eingang1	Status input signals LMU	-

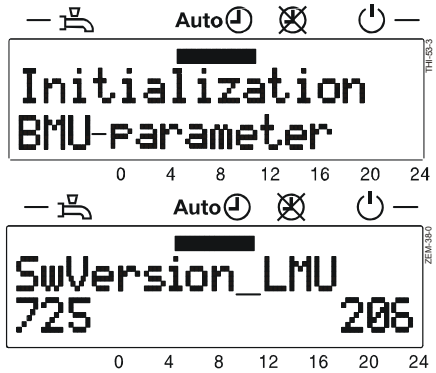
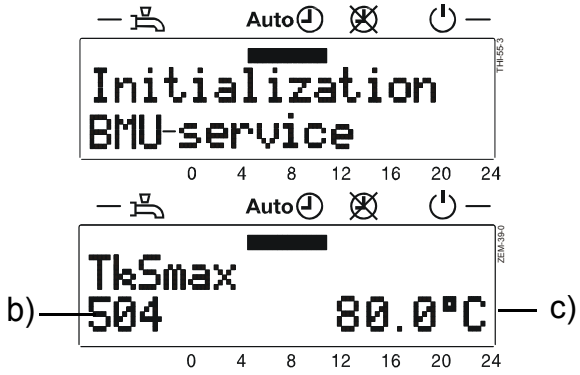
Line	Display	Function	Unit
750.2		Room thermostat on demand = 1; no demand = 0	
752	Status_Ausgang1	Status output signals LMU	-
752.0		Heating pump on = 1; pump off = 0	
752.1		3-way valve for heating = 1; 3-way valve for DHW = 0	

2 - ACCESS THE SETTINGS VIA THE QAA 73 ROOM SENSOR

Initial display of the Q AA 73 room sen - sor before the settings are entered:



2.1 - Access the lines 504 to 755

	Buttons	Explanation	Line
1	PROG et – +	Press on the both line selection buttons and setting buttons beginning with the button - This will take you to the first programming mode “LMU”(4. level) Successive display: 	725
2	PROG	Press both line selection buttons for at least 3 seconds. - This will take you to the second programming mode “LMU” (5. level) Successive display: 	504
3	PROG	Press the line selection buttons to select the required line.(item. b).	504 . . . 755
4	– +	Press the plus or minus button to enter the required value (item. c). The setting will be stored as soon as you leave the programming mode (by pressing the Info button) or change to another line.	

VII - COMMISSIONING

1 - PROTECTION OF THE INSTALLATION

FINAL WARRANTY VALIDATION INSPECTION IS ONLY TO BE CARRIED OUT BY A DISTRIBUTOR ENGINEER - SEE WARRANTY CONDITIONS WITHIN THIS MANUAL

Note : Our technical personnel, who will visit when the boiler has been installed to arrange for its final warranty validation inspection and calibration, do not perform the role of inspector and/or approval officer for the system. Its compliance with standards and instructions remains the exclusive responsibility of the installation company.

Geminox insists the use of the following heating system water conditioning products:
- **BIONIBAL corrosion inhibitor (or equivalent products),**
- **BIONIBAGEL antifreeze and corrosion inhibitor (or equivalent products).**

1.1 - Bionibal

BIONIBAL is a non-toxic, traceable corrosion inhibitor specially designed to protect multi-metal heating circuits.

Through its efficie nt means of acting against all types of corrosion BIONIBAL:

- Prolongs the lifetime of the entire system,
- Prevents the fo rmation of rust and metallic sludge,
- Also suitable for under-floor heating systems,
- Prevents hydrogen build up,
- Contains an internal marker so that doses can be easily controlled.
- Long-lasting: more than 5 years effectiveness owing to its highly stable, fully organic formula.

BIONIBAL DOSAGE:

- Without under-floor heating: or connection using reinforced polyethylene type pipes:
  1% (1 litre of BIONIBAL for 100 litres of water).
- With under-floor heating or radiators connected in reinforced polyethylene type pipes:
  2% (2 litres of BIONIBAL for 100 litres of water).

1.2 - Bionibagel

BIONIBAGEL is the antifreeze version of BIONIBAL.

BIONIBAGEL is a non-toxic antifreeze with a monopropylene glycol base that also protects the installation from corrosion. It contains an internal marker that allows you to control the dosage easily to guarantee the antifreeze protection temperature that you require.

In addition to the anti-corrosion characteristics of BIONIBAL, BIONIBAGEL protects the installation from frost for residences that are not inhabited all the year round or that are in the coldest regions.

BIONIBAGEL DOSAGE:

The number of litres of BIONIBAGEL to p ut in the circuit depends on the volume of your installation and the extreme temperature of your region.

Protection limit temperature	Dosage	Installation capacity (litres) (litres)			
		50	100	150	200
- 5°C	14 %	7	15	22	30
- 10 °C	24 %	12	25	37	50
- 15 °C	31 %	17	35	50	70
- 20 °C	38 %	20	40	60	80
- 30 °C	42 %	22	45	67	90

1.3 - Products equivalent to Bion ibal or Bionibagel

Scrupulously refer to the recommended use and implementation of the manufacturer's products.

Important warning

Bionibal or Bionibagel must only be put in a clean installation that has been checked. It is therefore imperative to fill the entire system one or more times with clean water as required. In some cases, the system may need washing by a suitable product:

Example:
- **In a new installation: To detect any leaks and eliminate any traces of welding, weld solder or other residues.**
- **On an old installation: To eliminate any trace of sludge and other products in the radiators, under-floor heating system and the boiler.**

Bionibal or Bionibagel will not clean dirt or corrosion left behind from the installation, it is not sufficient to believe that adding our chemicals will clean the system. The system should be clean and then our chemicals will keep it clean.

2 - FILLING THE INSTALLATION WITH WATER

- The installation will have to be rinsed before the boiler is filled with water.
- To ensure proper boiler bleeding during the installation's filling stage:
  - Filling the DHW tank for the ZEM C+BS models:
    - . Fill the tank with water by using the safety control box of th e installation (item. 19, fig. 38 - page 32 - chapter V - INSTALLATION - INSTALLATION MANUAL), taking care to open a hot water tap,
    - . After filling, check that the tank access flap is tightened correctly.
  - Filling the installation for all models:
    - . Open the heating flow/return isolation valves,
    - . Open the cold water inlet valve,
    - . Fill the installation slowly (to make degassing easier) by using the valve of the filling system,
    - . check the leaktightness of the circuit,
    - . Bleed the entire installation, particularly the radiators. Continue to fill the system until a pressure of app roximately 1.5 ba r is reached,
      Read the pressure on the p ressure gauge (8, fig. 46 - page 42 - chapter VII - COMMISSIONING - INSTALLATION MANUAL) located on the front of the boiler.
    - . turn off the filling valve.

3 - GAS SUPPLY

- Open the gas cock (item. 2, fig. 37 to fig. 40 - page 31 to page 33 - chapter V - INSTALLATION - INSTALLATION MANUAL).
- Carefully bleed the gas piping. If the installation is new, the bleed evacuates the air that is contained in the piping so that the boiler has an adequate fuel.

  The presence of air in the gas prevents the ignition of the burner and leads to safety shut-down by the flame monitoring unit.

  This is the case both with a na tural gas and a LPG new installation. With a LPG installation the storage tank must also be bled properly before commissioning.

  The external discharge of the gas bleed must be car ried out with all necessary safety measures.
- Check the tightness of the connectors and the airtightness of the gas circuit using a foaming product or a water column pressure gauge.

4 - SETTING THE DOMESTIC HOT WATER FLOW RATE

4.1 - ZEM 5-25 SEP

The boiler is originally fitted with a flow limiter of 12 l/min for an installation pressure of 2.5 bars.

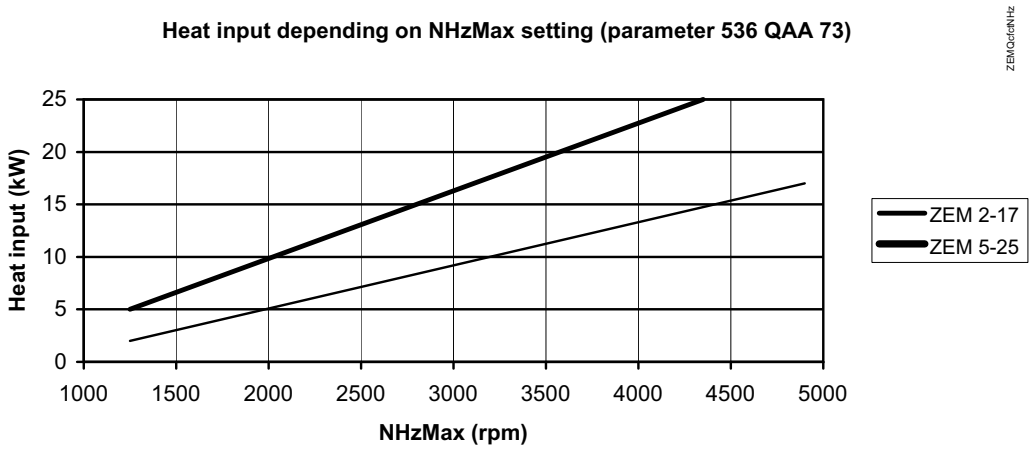
5 - SETTING THE MAXIMUM POWER IN HEATING MODE

The maximum power of the boiler in heating mode can be limited. This operation requires modification of the NHz parameter in the boiler's LMU management unit.

Access to the NHz parameter is possible via the QAA 73 ambient temperature sensor (line 536) following the access mode defined in section 2 - page 38 - chapter VI - PARAMETERS - INSTALLATION MANUAL.

The NHz value should be selected by following the diagram below. Adapting the boiler's maximum heating power to the maximum power of the installation helps avoid heavy loads during reheating phases and thus reduces the maximum sound output of the boiler.

Fig. 45



6 - VERIFICATIONS PRIOR TO COMMISSIONING

- Ensure that the installation has been issued with a certificate of conformity granted by an approved organisation (according to the installation standards),
- Check that there are no leaks on the various seals and connections of the system,
- Check that the boiler is adequately adapted to the gas used and that there are no gas leaks.
- Check that the boiler is filled with water and under pressure (1.5 bar) and that there are no leaks,

Never let the pressure drop below 1 bar

- Check that the electrical connections of the boiler are correct: 230 V, 50 Hz, earth connection compliant, polarities correct,
- Check that the combustion products outlet is correctly assembled, that there are no leaks and no obstruction,
- Check that the heating system ventilations are not obstructed,
- Check that the condensate siphons of the flues are filled with water,
- Check that the condensate outlet is connected properly and that there are no leaks.
- Check the system is totally cleaned and had been cleaned and flushed in accordance with BS 7593. Failure to do this may invalidate the warranty.

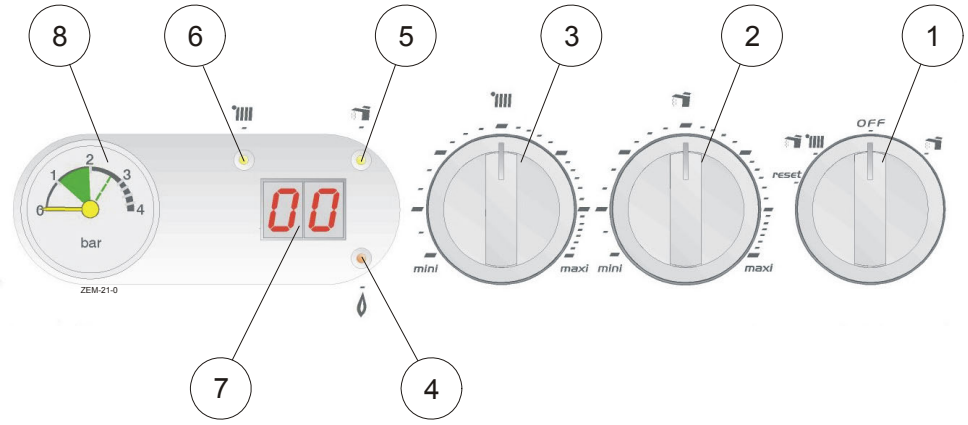
7 - USER INFORMATION

The heating engineer must inform the user about the unit's operating mode. In particular the user must be informed about the function and the operation of the safety systems and the need for regular servicing by a qualified person.

The end user demonstration and provision of the correct documentation is the responsibility of the installer in accordance with the latest Building Regulations.

8 - COMMISSIONING

Fig. 46



1) *Mode selector: used to access 4 operating modes simply by turning the button*
   - *RESET: hold the button for at least 1 second in this position then release it to return to the initial mode*
   - *Winter :*
     . *DHW - LED (5) on or heating mode - LED (6) on*
   - *Off OFF*
   - *Summer : DHW mode - LED (5) on - (See section 8.2 - page 42)*
2) *Domestic hot water temperature adjustment*
3) *Heating temperature mode*
4) *Flame presence indicator light: burner operating - LED (4) on*
5) *DHW operating mode indicator light*
6) *Heating operating mode indicator light*
7) *Digital display: displays the normal operation state (boiler flow temperature) or the current fault code.*
8) *Pressure gauge*

- Check that all the water stop valves and the gas cock are open,
- Open the gas cock and the heating flow/return valves,
- operate the electric circuit breaker outside the boiler,
- select the operating mode required using the selector (1).

  23 (= boiler flow temperature) are displayed (7)
  - LED (5) or LED (6) is on according to the demand (DHW or heating).
  - LED (4) is on if the burner is in use.
- the LMU management unit then takes into account all the accessories connected (sensors, pumps, etc.) and automatically checks the values and parameters.

8.1 - Boiler with outside sensor only

The correction of the room temperature setpoint can be calculated automatically according to the outside temperature, on the boiler control panel, by using the heating temperature setting button (item 3). The room temperature setpoint can be modified by + or - 3°C depending on the setting.

The domestic hot water temperature setpoint is set manually on the boiler control panel using the setting button (item. 2).

8.2 - Boiler with room sensor and outside sensor

with QAA 53	with QAA 73
The Domestic Hot Water setting is made on the control panel of the boiler (setting button (item 2). The room temperature setpoint is set on the QAA 53 (white golf ball dial).	The assembly of the room sensor QAA73 cancels the functions of the heating temperature (item 3) and DHW temperature (item 2) setting buttons on the boiler control panel. All the temperatures required and the heating programmes are set on the QAA 73 (refer to the sensor guide).

When a room sensor is connected the flashing of the heating or DHW led (6 or 5 fig. 46 - page 42 - INSTALLATION MANUAL) indicates that the LMU management unit of the boiler recognises the QAA setting and not the value set on the boiler control panel.

In summer mode: Stop t he heating mode by pressing the heating circuit operation button on th e room se nsor (QAA 53/QAA73). ⏻: stand-by.

8.3 - Faults during operation

If a problem occurs:

- a fault code appears on the display (item 7)
  - . e.g. E8 and 33 alternating.
- to reset and return to the in itial operating mode:
  - . hold the selector (otem 1) in RESET mode for at least one second at the minimum
  - . then reposition it o n the initial operating mode,
- if the fault code persists, consult the list of operating faults in chapter IV - OPERATING FAULTS - page 14 - SERVICING MANUAL.

9 - COMBUSTION PRODUCT CHECKING

The boiler is preset in the factory to operate with natural gas H (G20).

If the gas type is changes at the first commissioning, check the comb ustion products according to the procedure described in section 2 - page 6 - chapter II - GAS CONVERSION - SERVICING MANUAL.

10 - ASSEMBLING THE COVER

After the commissioning and performing all the checks, put back the front panel of the boiler.

- fit the front panel (item G) to the frame of the boiler and support it with the latch (item F),
- connect the terminal of the earth wire (item O) positioned in the boiler to the tab on the front panel (item G),
- shut the front panel using the latch (item F) on the top of the boiler,
- lock both latches (item F) using the 2 s crews (item E).

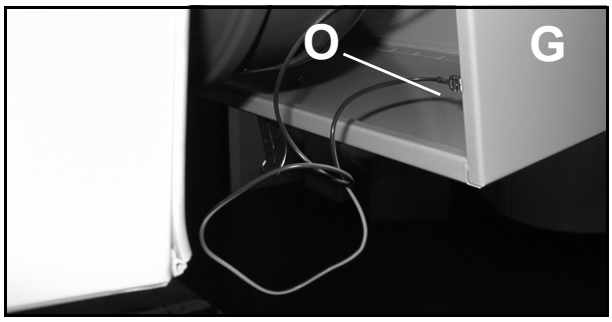
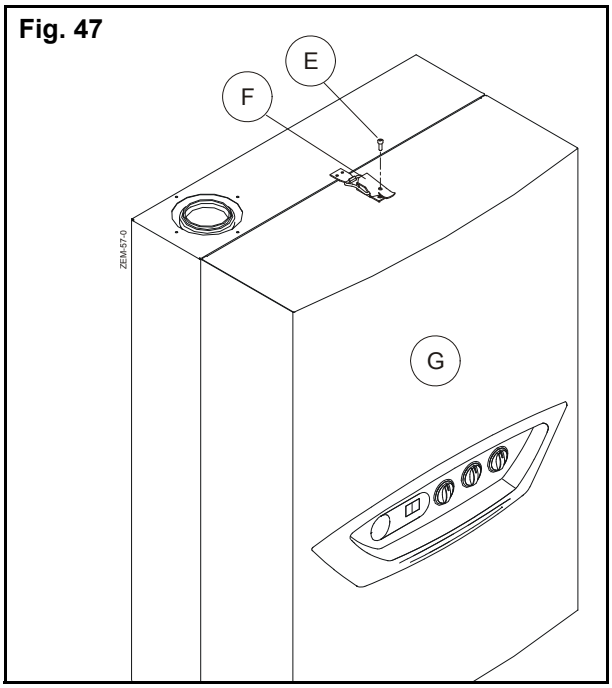


Fig. 47



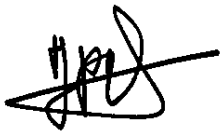
VIII - APPROVALS

1 - DECLARATION OF CONFORMITY

Appendix II article 3.1 of 90/396/EEC directive
Appendix IV module D of 92/42/EEC directive

SERIES :	**ZEM RANGE**
MANUFACTURER :	**GEMINOX SAS** 16 rue des Ecoles 29410 SAINT THEGONNEC
PRODUCT CATEGORY :	**GAS CONDENSING WALL-HUNG BOILER RANGE** **only heating or with DHW production**
NOTIFIED BODY :	**CERTIgaz (1312)** 62 rue de Courcelles 75008 PARIS
TYPE/NO. EXAMINATION :	ZEM 2-17 : CE1312BR4644 ZEM 5-25 : CE1312BR4313
TEST LABORATORY :	**CETIAT** BP 2042 25 avenue des arts 69603 VILLEURBANNE
EC DIRECTIVES :	90/396 CEE, 92/42 CEE, 2006/95 CE, 2004/108 CE 97/23 CEE article 3.3
BASIS OF EXAMINATION :	EN 437, EN 483, EN 677, EN 60335.1, EN 55014, EN 55104
SURVEILLANCE PROCEDURE :	**Manufacturing quality assurance**
DECLARATION :	**The a.m. products are manufactured true to the a.m. directives as well as to the approved models.** **The manufacturing is examined true to the a.m. surveillance procedure.** **The ZEM boilers comply with the requirements relating to the condensing heating boilers.**

Saint-Thégonnec 12.2011 :



IX - WARRANTY

All ZEM Merite boilers come from the manufacturer, Geminox France, with a 5-year warranty on the heat exchanger and 5 years on the burner. All other parts are covered by a 2-year parts warranty. All replacement parts are covered by a further 1-year parts warranty. The manufacturer's warranty covers only the parts, labour costs are excluded.

Specific conditions in Great Britain (Distributor Evinox) :

In addition to the factory warranty, the distributor Evinox can also provide a further 5-year warranty on the heat exchanger. Labour warranty applies for the 1st year only. To validate the extended warranty, the boiler must have a Warranty Validation Inspection carried out by Evinox and the Geminox Bionibal water treatment must be used at all times.

The warranty commences from the date of the Warranty Validation Inspection (WVI), provided it is carried out within 3 months of the initial boiler purchase. Should the Warranty Validation date be outside of the 3 months, the warranty will commence from the date of the purchase – subject to the WVI being successful.

The boiler should be fired and the gas rate checked prior to final Warranty Validation Inspection by our engineers. Operating the boiler outside the Warranty Validation parameters will invalidate the warranty. If the boiler is validated and regularly serviced by distributor the labour warranty will be in force. Failure to have the boiler validated and regularly serviced by the distributor or a CORGI/Gas Safe Register approved boiler service engineer will invalidate any warranty claims.

It is a condition of the warranty that the boiler is serviced annually within 4 weeks of the due date, this being calculated from the time of sale.

The log book within the boiler should be filled in at the time of the Warranty Validation Inspection and servicing and should be supported by a copy of the engineer's Service Report and print out of combustion settings to validate the warranty. Failure to complete this logbook correctly will invalidate the warranty.

Failure to comply with our installation instructions, the relevant installation requirements of the Gas Safety Regulations, Building Regulations, Local Water Bylaws and Building Standards will invalidate any warranty claim. If a gas boiler is installed by a non-CORGI/Gas Safe Register registered installer or DIY person the warranty will be invalid.

All boilers to be fitted with isolation valves for servicing and warranty work. Warranty calls that include draining the system will be chargeable if isolation valves have not been fitted.

It is imperative that the level of Bionibal corrosion protector within the boiler is kept within Geminox stipulations at all times, which is 1% for radiators and 2% for UFH. Special attention should be given to ensure that, after any decoration or building works where radiators might be removed, the system is replenished with Bionibal. Non-use of BIONIBAL will invalidate the warranty.

We will register the warranty when we carry out the Warranty Validation Inspection of the boiler.

Any warranty claims that are a result of user error, poor installation or lack of servicing will be chargeable. Please note that all replacement parts provided under warranty are subject to factory inspection to determine cause of failure. Replacement parts are chargeable until passed as faulty by the Factory, when a credit will be provided. Any parts that have failed as a result of poor servicing or mis-use will not be covered by our warranty.

Any modifications to the appliance will invalidate the warranty.

EXCLUSIONS FROM THE WARRANTY

The following are not covered by the warranty:

- the electrical indicator lights
- damage to electrical parts resulting from installations and connections to the mains where the measured input voltage to the equipment is 10% lower or greater than the rated voltage of 230 volts
- damage to parts originating from elements external to the appliance (storm effect, interference, humidity, flashback, frost etc.)
- the heating element and domestic water tank if the recommended conditioning products or equivalent have not been used in them
- the seals
- the automatic drain valves
- all incidents resulting from failure to check safety elements
- scale formation and its consequences
- corrosion due to chloride concentrations in domestic hot water greater than 60 mg/L or a pH below 7 (ZEM SEP models)
- damage to parts resulting from silting in the heating circuits
- the heating element if installed in a chlorinated environment
- damage which may result from use of the equipment with a fuel other than that stated in the manual
- ionising electrodes, ignition electrodes.

Your Geminox appliance is one of the most reliable and technically advanced products available. However, it is imperative that it is installed correctly, validated and serviced in accordance with Geminox installation and servicing manuals to ensure long life, reliability and fuel savings.

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