

Heating and hot water for the professionals

Installation and Servicing Instructions

THEMA F



THIS IS A CAT II2H3+ APPLIANCE

IN WARRANTY

TECHNICAL HELPLINE

01773 828400

HEATCALL

01773 828100



Sainier Duval

INSTALLATION AND SERVICING INSTRUCTIONS

THEMA F 23 E - THEMA F SB 18 E - THEMA F SB 23 E

Note!

The boiler serial number is marked on the label attached to the inside of the boiler. Refer to the 'Introduction' section page 3 for a description of the basic functions of the boiler. To safely operate the boiler, refer to the Users Instructions.

INSTALLATION SECTION

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Mandatory warning notice for CEE countries

WARNING, this appliance is designed, approved and inspected to meet the requirements of the English market. The identification plate located on the inside of the appliance **certifies the origin** where the product was manufactured and the **country** for which it is intended.

If you see any exception to this rule, please contact your nearest **Saunier Duval** dealer.

Thank you in advance for your assistance.

INTRODUCTION

The **THEMA F 23 E** boiler is a wall mounted modulating combination boiler with electronic ignition providing central heating and instantaneous domestic hot water.

Both the central heating and domestic hot water temperature are user adjustable from the boiler control panel.

Domestic hot water demand always has priority over heating demand.

The **THEMA F SB 18 E and SB 23 E** boilers are wall mounted modulating boilers with electronic ignition providing central heating only.

The central heating temperature is user adjustable from the boiler control panel.

The boilers are of the **II2H3+** category for use with Natural Gas (G20) as distributed in the United Kingdom, or with Butane or Propane gas (G30/G31) with the appropriate conversion kit.

Conversion kits:

Conversion	Part No.
Natural Gas (G20) to G30/G31	86161

Boilers burning LPG or similar gases **MUST NOT** be fitted in basements or below ground level.

The boiler has a fan assisted balanced flue which both discharges the products of combustion to and draws the combustion air from the outside air.

The boiler is supplied for rear outlet flue connection. Alternatively, the boiler is designed to allow the flue system to be connected to the top of the boiler, top outlet flue connection. Refer to the flue fitting instructions.

Electrical components have been tested to meet the equivalent requirements of BEAB.

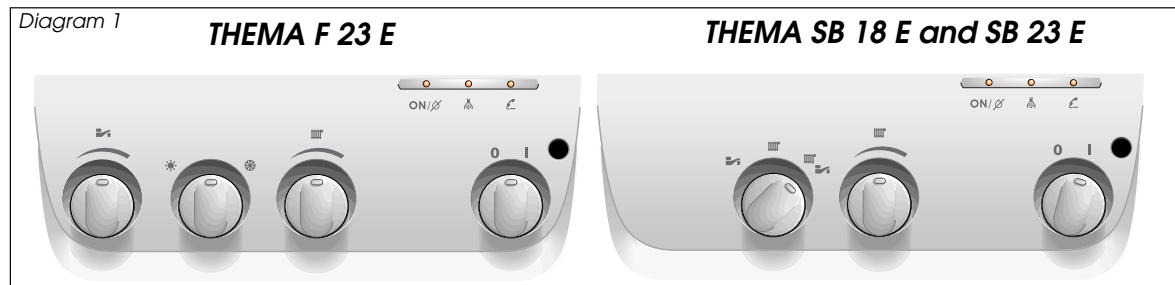
The boiler is designed for use as part of a sealed water central heating system with fully pumped circulation. The pump, expansion vessel and associated safety devices are all fitted within the boiler.

The boiler can be installed against either an external wall or on an adjacent inside wall, that is, the flue system will pass directly to the rear or to either side to the terminal fitted on the outside wall face.

The installation must be carried out by a competent person in accordance with the relevant requirements of The Building Regulations, The Water Byelaws, The Building Standards (Scotland) Regulations and any applicable local regulations.

Ancillary equipment

A range of flue accessories are available including vertical flues, twin-pipe flues, bends etc. For further information contact your supplier.



DIMENSIONS

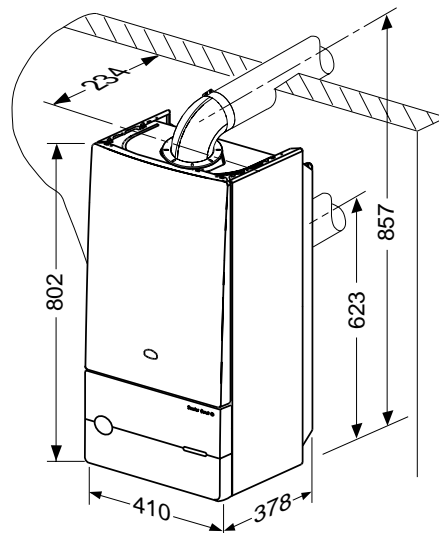
Diagram 2

The boiler is delivered in three separate packages:

- The boiler
- The fixing jig
- The flue system

Net weight: 41 kg

Gross weight: 43 kg



Hab 271 a

TECHNICAL DATA

		THEMA F 23 E	THEMA F SB 18 E	THEMA F SB 23 E
Heating output	automatically variable from (kW)	8,9	8,9	8,9
	(BTU/H)	30,000	30,000	30,000
	to (kW)	23,3	18,5	23,3
	(BTU/H)	80,000	63,000	80,000
Efficiency	(%)	91,5	90,5	91,5
Heating adjustment		38°C to 90°C		
Expansion vessel effective capacity	(l)	6,5	6,5	6,5
Expansion vessel charge pressure	(bar)	0,5	0,5	0,5
Maximum system capacity at 75°C	(l)	160	160	160
Safety valve, maximum service pressure	(bar)	3	3	3
Products outlet diameter	(mm)	60	60	60
Fresh air inlet diameter	(mm)	100	100	100
Hot water output	automatically variable from (kW)	8,9	—	—
	(BTU/H)	30,000	—	—
	to (kW)	23,3	—	—
	(BTU/H)	80,000	—	—
Maximum hot water temperature	(°C)	65	—	—
Specific flow rate (for 30°C temp rise)	(l/min)	9,6	—	—
Threshold flow rate	(l/min)	3	—	—
Nominal water flow rate	(l/min)	12	—	—
Maximum supply pressure	(bar)	10	—	—
Minimum operating pressure	(bar)	0,5	—	—
Electrical supply	(V)	230	230	230
Maximum absorbed power	(W)	150	150	150

Natural Gas (G20)	Burner injector	mm	1,20	1,20	1,20
	Inlet pressure	mbar	20	20	20
	Diaphragme	mm	—	—	—
	Gas rate (maximum)	m ³ /h	2,70	2,17	2,70
	Gas rate (minimum)	m ³ /h	1,13	1,13	1,13
Butane (G30)	Burner injector	mm	0,73	0,73	0,73
	Inlet pressure	mbar	29	29	29
	Diaphragme	mm	4,8	3,2	4,8
	Gas rate (maximum)	kg/h	2,01	1,62	2,01
	Gas rate (minimum)	kg/h	1,13	1,13	1,13
Propane (G31)	Burner injector	mm	0,73	0,73	0,73
	Inlet pressure	mbar	37	37	37
	Diaphragme	mm	4,8	3,2	4,8
	Gas rate (maximum)	kg/h	1,98	1,60	1,98
	Gas rate (minimum)	kg/h	0,97	0,97	0,97

TECHNICAL DATA

Pressure table :

		Heat output															
		(kW)	8,9	10	11	12	13	14	15	16	17	18	19	20	21	22	23,3
		(Btu/h)	30387	34142	37557	40971	44385	47799	51214	54628	58042	61456	64871	68285	71699	75113	79527
		Heat input															
		(kW)	11,9	13,2	14,4	15,7	16,9	18,1	19,2	20,4	21,5	22,7	23,8	24,9	26,0	26,9	28,3
		(Btu/h)	40678	45130	49332	53481	57579	61627	65626	69575	73477	77333	81142	84906	88913	91713	96602
GAS		(mbar)	1,3	2,1	2,6	3,0	3,5	4,0	4,5	5,1	5,7	6,3	6,9	7,6	8,3	8,8	9,8
G 20		(mbar)	3,7	5,3	6,3	7,4	8,6	9,8	11,1	12,5	13,9	15,5	17,0	18,6	20,4	21,7	24,1
G 30		(mbar)	4,0	6,3	7,5	8,8	10,2	11,7	13,3	14,9	17,2	20,1	20,3	22,2	24,4	26,0	28,8
G 31		(mbar)															

Pump :

The performance of the pump varies according to the pump bypass setting, see diagram 3.

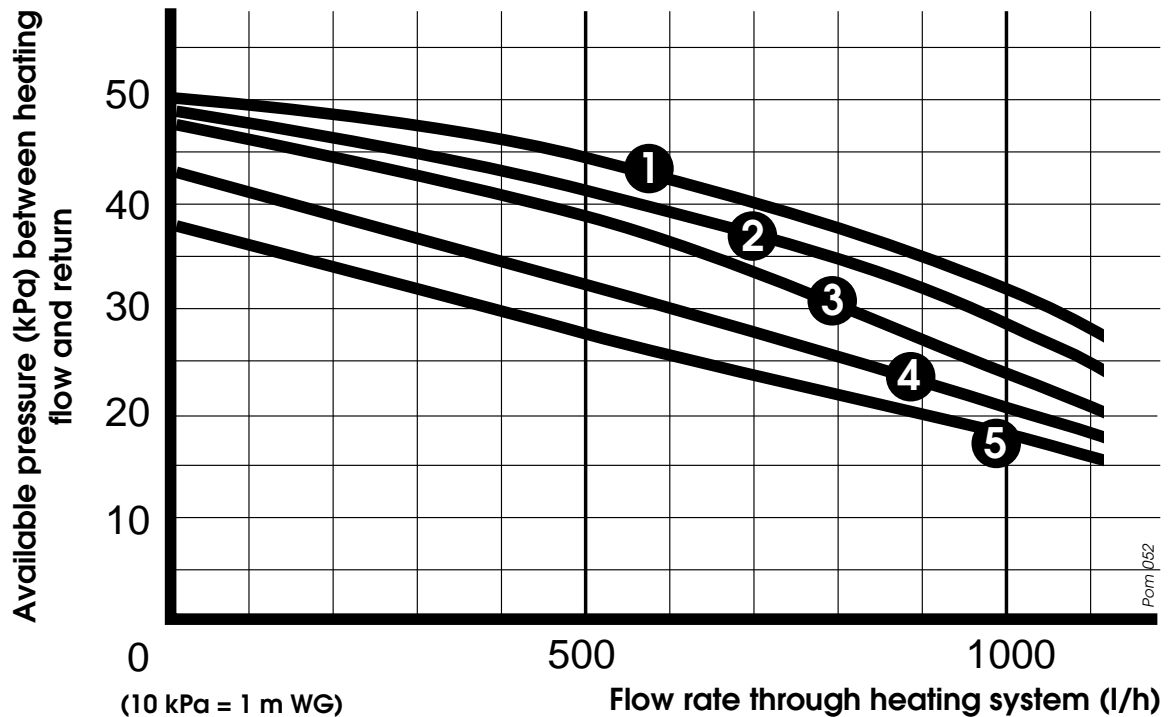
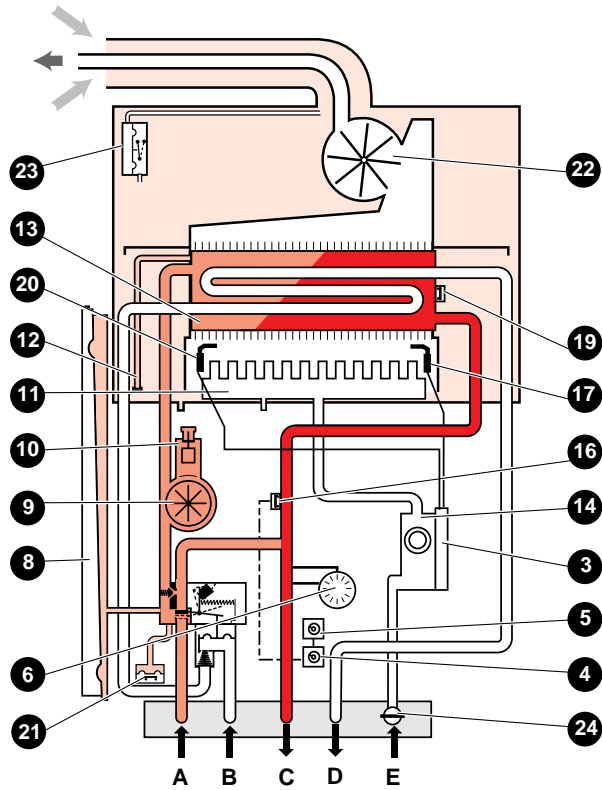


Diagram 3

- ① Bypass fully shut
- ② Open 1/4 turn
- ③ Open 1/2 turn
- ④ Open 1 turn
- ⑤ Open 2 turns

THEMA F 23 E

- 3 - Ignition module
 - 4 - Heating temperature adjuster
 - 5 - Hot water temperature adjuster
 - 6 - Temperature/pressure gauge
 - 8 - Expansion vessel
 - 9 - Pump
 - 10 - Automatic air vent
 - 11 - Burner
 - 12 - Heat exchanger bleed pipe
 - 13 - Heatexchanger
 - 14 - Gas valve
 - 16 - Heating and hot water thermistor
 - 17 - Ignition electrode
 - 19 - Overheat thermostat
 - 20 - Flame sense electrode
 - 21 - Loss of water pressure switch
 - 22 - Fan
 - 23 - Air pressure switch
 - 24 - Gas cock
-
- A - Heating return
 - B - Cold water inlet
 - C - Heating flow
 - D - Domestic hot water flow
 - E - Gas supply



THEMA F SB 18 E - THEMA F SB 23 E

- 3 - Ignition module
 - 4 - Heating temperature adjuster
 - 6 - Temperature/pressure gauge
 - 8 - Expansion vessel
 - 9 - Pump
 - 10 - Automatic air vent
 - 11 - Burner
 - 12 - Heat exchanger bleed pipe
 - 13 - Heatexchanger
 - 14 - Gas valve
 - 16 - Heating and hot water thermistor
 - 17 - Ignition electrode
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 - E - Gas supply

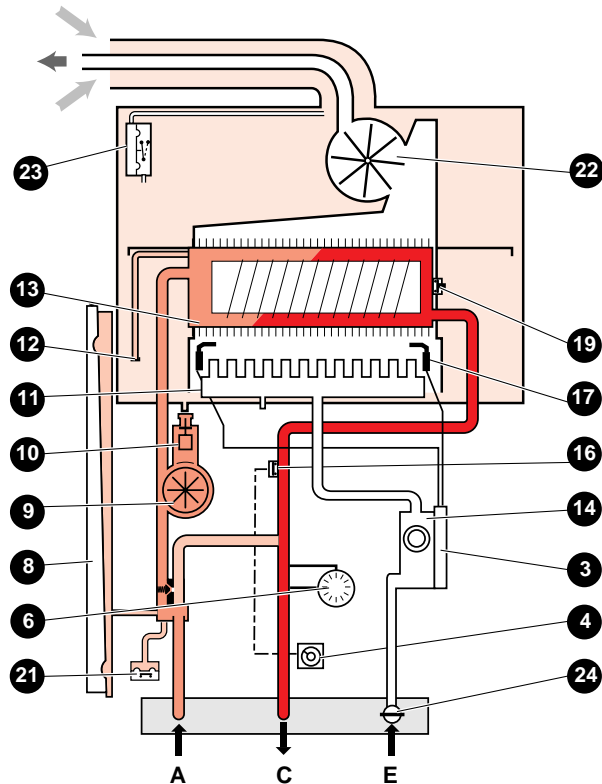


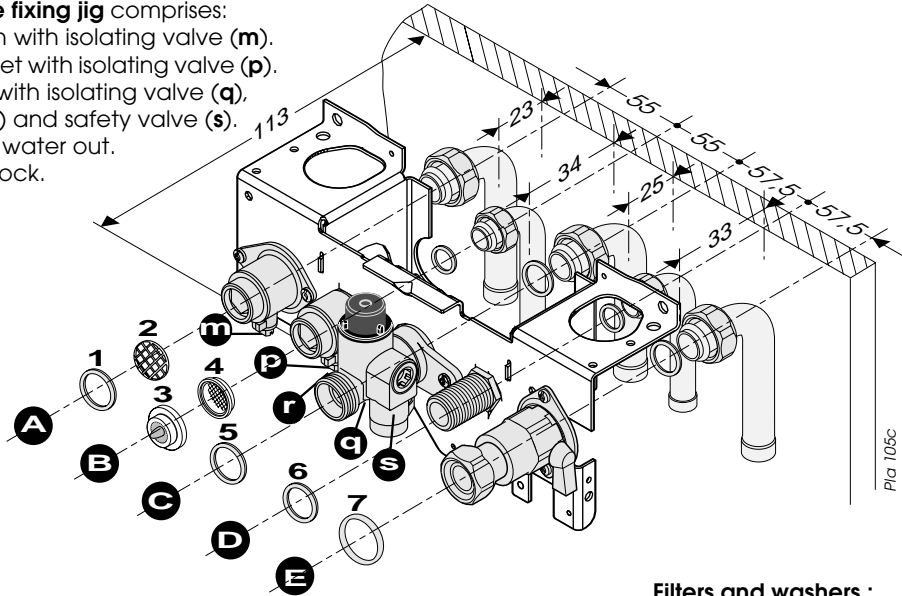
Diagram 4

Shy 131

THEMA F 23 E

From left to right, **the fixing jig** comprises:

- A** - Heating return with isolating valve (m).
- B** - Cold water inlet with isolating valve (p).
- C** - Heating flow with isolating valve (q),
drain screw (r) and safety valve (s).
- D** - Domestic hot water out.
- E** - Gas service cock.



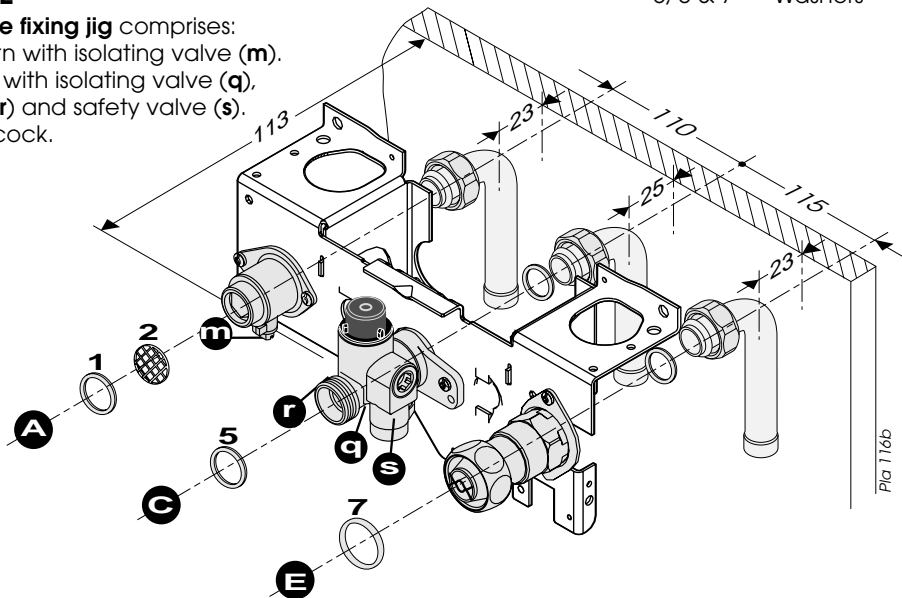
Pla 105c

THEMA F SB 18

THEMA F SB 23 E

From left to right, **the fixing jig** comprises:

- A** - Heating return with isolating valve (m).
- C** - Heating flow with isolating valve (q),
drain screw (r) and safety valve (s).
- E** - Gas service cock.



Pla 116b

Diagram 5

DOMESTIC HOT WATER SYSTEM DESIGN

- Copper tubing or plastic Hep₂O may be used for the domestic hot water system. Unnecessary pressure losses should be avoided.

- The boiler may operate with a minimum supply pressure of 0,3 bar but under a reduced flow rate. Optimum performance will be obtained from a supply pressure of 1 bar.

- The flow restrictor must be fitted in the cold water inlet during installation. This limits the flow through the boiler to a maximum of 12 l/min.

HEATING SYSTEM DESIGN

- The **THEMA F** boiler is compatible with any type of installation.
- Heating surfaces may consist of radiators, convectors or fan assisted convectors.
- Pipe sectional areas shall be determined in accordance with normal practices, using the output/pressure curve (**diagram 3**). The distribution system shall be calculated in accordance with the output requirements of the actual system, not the maximum output of the boiler. However, provision shall be made to ensure sufficient flow so that the temperature difference between the flow and return pipes be less than or equal to 20°C. The minimum flow is 500 l/h.
- The piping system shall be routed so as to avoid any air pockets and facilitate permanent venting of the installation. Bleed fittings shall be provided at every high point of the system and on all radiators.
- The total volume of water permitted for the heating system depends, amongst other things, on the static head in the cold condition.

The expansion vessel on the boiler is pressurised at 1 bar (corresponding to a static head of 5 m w.g.) and allows a maximum system volume of 140 litres for an average temperature of 75°C and a maximum service pressure of 3 bar. This pressure setting can be modified at commissioning stage if the static head differs.

An additional expansion vessel can be fitted to the system if required, see **diagram 6**.

- Provision shall be made for a drain valve at the lowest point of the system.
- Where thermostatic radiator valves are fitted, not all radiators must be fitted with this type of valve, and in particular, where the room thermostat is installed.
- In the case of an existing installation, it is **ESSENTIAL** that the system is thoroughly flushed prior to installing the new boiler using a proprietary product such as **Fernox** or **Sentinel**. Contact the product manufacturers for specific details.

Filling the system

Provision must be made for filling the system at low level. The use of a WRC approved filling loop is strongly recommended, connected as shown in **diagram 6**.

PIPING SYSTEM INSTALLATION

- Heating system connections - Pipe diam 22 mm
- Hot water system connections - Pipe diam 15 mm
- Gas connection - Pipe diam 22 mm
- Safety valve discharge - Pipe diam 15 mm

Water connection

Connect the water pipes to the fixing jig using the copper tails supplied, see **diagram 5**.

Warning: To prevent damage to the isolating cocks, do not solder joints or fittings with the copper tails connected.

Connect the system pipework to the boiler observing the correct flow and return format as shown in **diagram 6**.

Safety valve discharge

WARNING. It must not discharge above an entrance or window or any type of public access area.

Connect the safety valve discharge pipe to the boiler, the discharge must be extended using not less than 15 m o.d. pipe, to discharge in a visible position outside the building, facing downward preferably over a drain. The pipe must have a continuous fall and be routed to a position so that any discharge of water, possibly boiling or steam, cannot create any danger to persons, damage to property or external electrical components and wiring. Tighten all pipe connection joints.

Gas connection

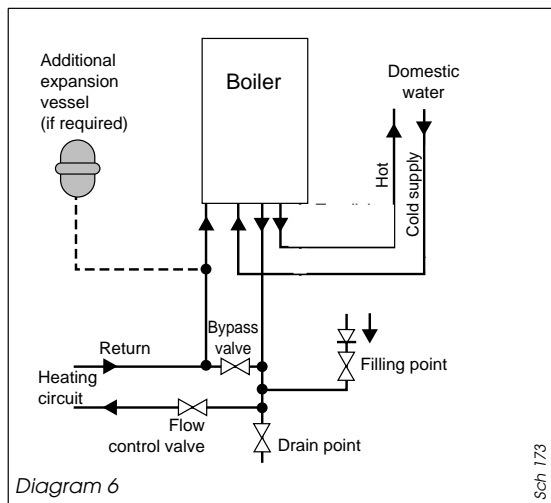
• The supply from the governed gas meter must be of adequate size to provide a constant inlet working pressure of 20 mbar (8 in w.g.).

To avoid low gas pressure problems, it is recommended that the gas supply is connected using 22 mm pipe.

• On completion, the gas installation must be tested using the pressure drop method and purged in accordance with the current issue of BS6891.

Gas Safety (Installation and Use) Regulations

In your interests and that of gas safety, it is the law that ALL gas appliances are installed and serviced by a competent person in accordance with the above regulations.



BOILER LOCATION

Clearances

The position of the boiler must be such that there is adequate space for servicing.

The recommended clearances are:
 40 mm either side of the boiler.
 600 mm at the front of the boiler.
 300 mm below the boiler.

Fixing jig

The fixing jig comprises three parts:

- 1) The connecting plate which allows the connection and soundness testing of all the pipework before the boiler is fitted and helps support the weight of the boiler.
- 2) The hook which supports the weight of the boiler.
- 3) The template which ensures the hook and connecting plate are correctly fitted relative to one another.

- Place template on wall in required position, making allowances for the necessary clearances etc., see diagram 7.

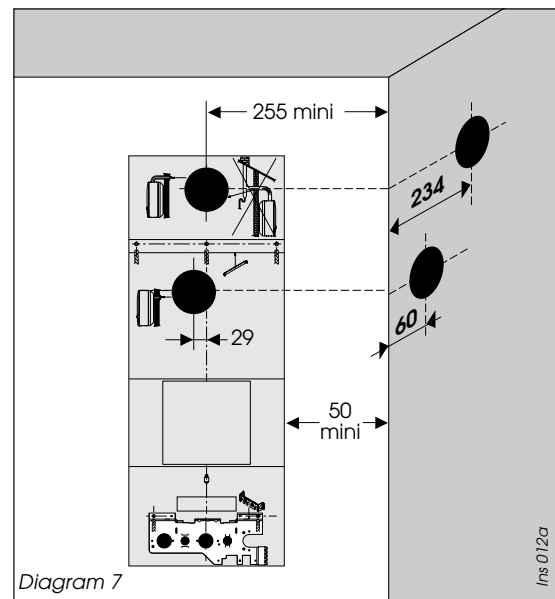
Note: It is permissible to install the boiler with reduced clearances at the bottom and sides of the boiler PROVIDING that adequate consideration is given for Servicing/Repairs at a later date. If any doubt exists, contact the **Saunier Duval Technical Helpline 01773 828400**.

- Mark the position of the holes for the hook and connecting plate.
- Drill, plug and fix the connecting plate and hook to the wall using suitable screws.
- Check that both the hook and connecting plate are level.

If the boiler is not installed immediately, protect the various couplings to prevent any ingress of foreign materials e.g. plaster, paint etc.

Terminal position

The minimum acceptable spacings from the terminal to obstructions and ventilation openings are shown in **diagram 8**.



The boiler must be installed so that the terminal is exposed to the external air.

Note: Under certain weather conditions the flue may produce a plume of condensation, this is quite normal.

If the terminal is fitted within 850mm of a plastic or painted gutter or 450mm of painted eaves, an aluminium shield of a minimum length of 750mm should be fitted to the underside of the gutter or painted surface.

Should any doubt exist as to the permissible position of the terminal, contact the **Saunier Duval Technical Helpline 01773 828400**.

Cupboard or compartment ventilation

The boiler can be fitted in a cupboard or compartment without need for permanent ventilation.

Minimum dimensions (in mm) for the positioning of flue terminals

A - Under a window	300
B - Under an air vent	300
C - Under a gutter	75
D - Under a balcony	300
E - From an adjacent window	300
F - From an adjacent air vent	300
G - From vertical drain pipes or soil pipes	75
H - From an external corner of the building	300
I - From an internal corner of the building	300
L - From the ground or from another floor	300
M - Between two terminals vertically	1500
N - Between two terminals horizontally	300

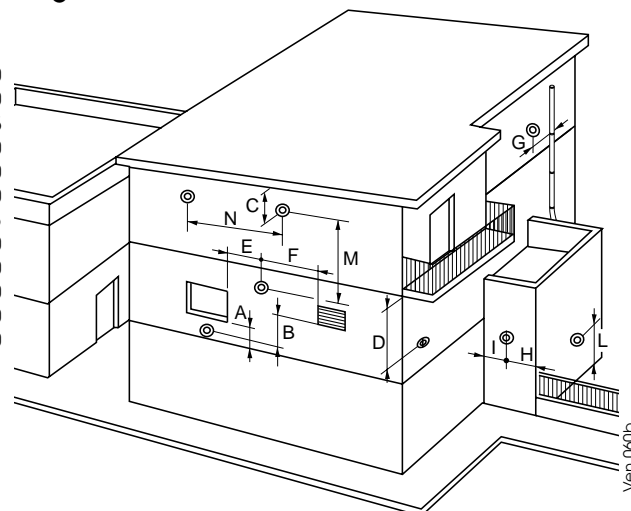


Diagram. 8

BOILER INSTALLATION

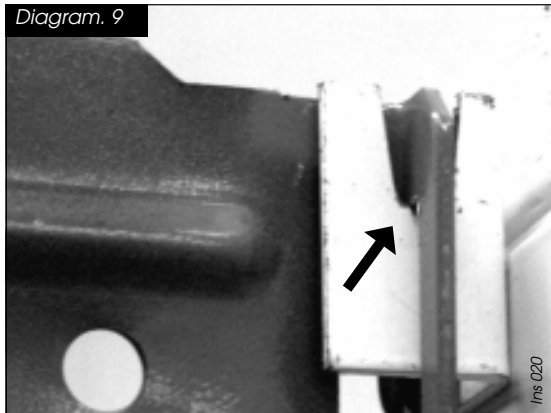
Statutory requirements

The installation of this boiler must be carried out by a competent person in accordance with the relevant requirements of the current issue of:

- The Gas Safety (Installation and Use) Regulations
- The Building Regulations
- The local water company Byelaws
- The Building Standards Regulations (Scotland)
- The Health and Safety at Work Act

Sheet metal parts

WARNING. When installing or servicing this boiler, care should be taken when handling the edges of sheet metal parts to avoid the possibility of personal injury.



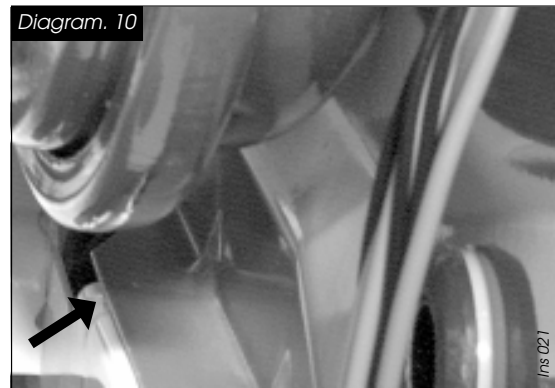
Installing the boiler

Prior to starting work, the system must be thoroughly flushed so as to eliminate any foreign bodies and contaminants such as filings, solder particles, oil, grease etc.

Note. Solvent products could cause damage to the system.

Note. If using a rear outlet flue system, follow the instructions in 'Rear outlet flue installation' section prior to hanging the boiler.

- Engage boiler upper part onto the hook, **see diagram 9.**
- Allow the boiler to seat down onto support plate, **see diagram 10.**
- Fit filter and washers, strictly adhering to the sequential order and directions shown on **diagram 5.**
- Connect the various couplings between the boiler and the connection plate.



REAR OUTLET FLUE INSTALLATION

The boiler is supplied for rear outlet flue connection.

Alternatively, the boiler is designed to allow the flue system to be connected to the top of the boiler, top outlet flue connection.

For top outlet flue connection, refer to 'Top outlet flue installation'

Rear outlet flue - kit 86151

The rear outlet flue system consists of two parts, a white painted outer pipe and an aluminium inner, they are positively locked together when assembled.

The flue kit 86151, **see diagram 11**, is 1000 mm long and comprises:

- Outer pipe **A**
- Inner pipe **B**
- External rubber sealing collar **C**
- Flue elbow **D**
- Internal flange **E**
- 'O' rings **F**
- Screws **G**
- Rubber collar **H**
- Clamp and seal **I**
- Gasket **J**

A - Direct rear outlet flue

Mark correct position of hole from template using hole between hook and connecting plate.

