



TAURUS



**INSTALLATION, USE
AND MAINTANCE**



IST 04 C 138 - 01

Dear Customer,

Thank you for choosing and buying one of our boilers. Please, carefully read this manual as it provides important instructions concerning installation, use and maintenance.

This boiler must be installed, repaired and serviced by qualified personnel only.

General information for installers, maintenance technicians and users

This INSTRUCTION MANUAL, which is an integral and indispensable part of the product, must be handed over to the user by the installer and must be kept in a safe place for future reference. The manual must be handed over with the boiler should it be sold or transferred.

This boiler must be used for the purpose it has been intended for. Any other use shall be considered incorrect and therefore dangerous.

The boiler must be installed in compliance with applicable laws and standards and according to the manufacturer's instructions given in this manual. Incorrect installation may cause injury to persons and/or animals and damage to property. The manufacturer shall not be held liable for any such injury and/or damage.

Damage or injury caused by incorrect installation or failure to follow the manufacturer's instructions shall relieve the Manufacturer from any and all contractual and extracontractual liability.

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

Check that the boiler is intact and that it has not been damaged during transport and handling. Do not install equipment which is patently damaged and/or faulty.

Only original accessories must be used for all boilers supplied with optionals or kits (including electrical ones).

Dispose of the boiler packaging properly as all the materials can be recycled. The packaging must therefore be sent to specific waste management sites.

Keep the packaging out of the reach of children as it may represent a potential hazard.

In the event of failure and/or faulty functioning, switch off the boiler. Do not attempt to make repairs: contact qualified technicians.

Original parts must be used for all repairs to the boiler.

Non-observance of the above requirement may jeopardise the safety of the boilers and expose people, animals and property to danger.

To guarantee efficiency and correct functioning of the equipment it is legally binding to service the boilers once a year according to the schedule indicated in the relative section of this manual.

If the boiler is not used for long periods, switch off electricity and fuel supply. Place some calcium carbonate inside the heat exchanger to absorb moisture.

Should there be a risk of freezing, add anti-freeze: do not empty the system; use specific anti-freeze products suitable for multi-metal heating systems.

N.B.

For boilers which use gaseous fuel, if you smell gas:

- **do not turn on or off electrical switches and do not turn on electrical appliances;**
- **do not ignite flames and do not smoke;**
- **close the main gas tap;**
- **open all doors and windows wide to ventilate the room.**
- **contact a Service Centre, a qualified installer or the gas supply company.**

It is strictly forbidden to use flames to detect gas leaks.

WARNING

The boiler has been built for installation in the country indicated on the technical data plate: **installation in any other country may be a source of danger for people, animals and property.**

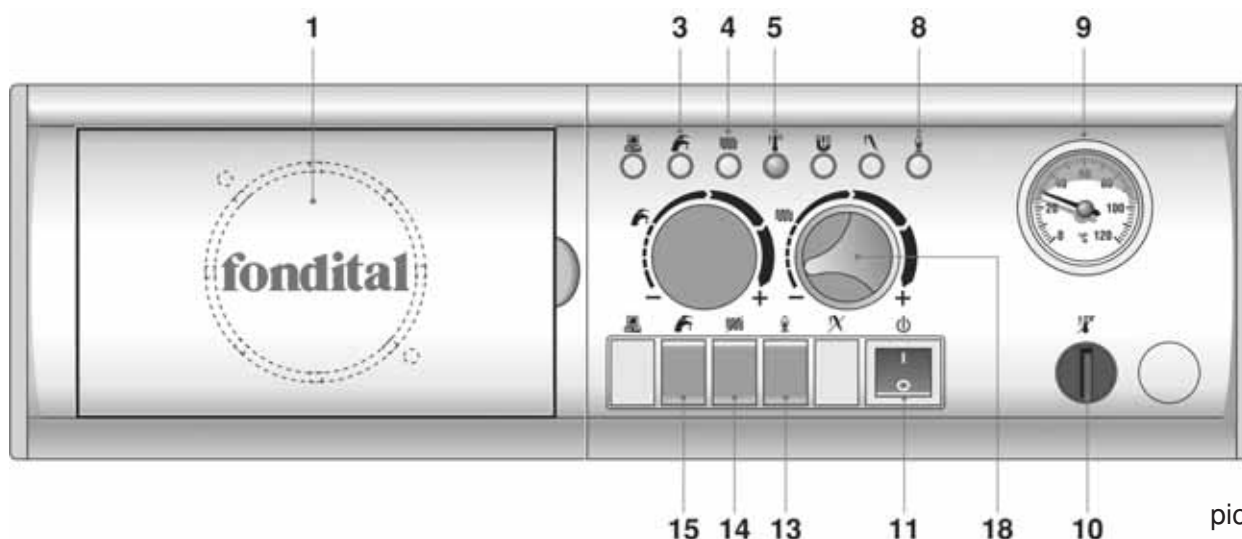
Read the warranty conditions and clauses on the warranty certificate attached to the boiler with care.

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1. Instructions for the user

1.1 Control panel



- | | | |
|--|---|--|
| 1. Temperature control unit (optional) or timer (optional) | 5. Overheating shutdown light (red) | 13. Burner switch |
| 3. Domestic hot water (DHW) on light (yellow) | 8. Burner on light (yellow) | 14. CH circulating pump switch |
| 4. Central heating (CH) on light (yellow) | 9. Thermometer | 15. DHW circulating pump switch |
| | 10. Safety thermostat with manual reset | 18. Two-stage central heating temperature regulator. |
| | 11. Illuminated main switch (green) | |

Illuminated main switch (green) (11)

When the switch is in position 0, the boiler is off and the green power light is off. When the switch is in position I, the boiler is powered on and the light is on.

Two-stage central heating temperature regulator (18)

This knob is used to set the temperature of the water in the boiler, range 60-90°C.

DHW on light (yellow) (3)

This light is on when DHW is required.

CH on light (yellow) (4)

This light is on when CH is required.

Overheating shutdown light (red) (5)

When this light comes on, the safety thermostat with manual reset has switched off the boiler due to a malfunction.

Burner on light (yellow) (8)

This light indicates that the burner is in operation.

Thermometer (9)

This displays the temperature of the water in the boiler.

Safety thermostat with manual reset (10)

The safety thermostat switches the boiler off when there is a malfunction. Remove the black cap and press the reset button.

Burner switch (13)

This is used to switch off the burner.

CH pump switch (14)

This is used to turn off the central heating pumps.

DHW pump switch (15)

This is used to turn off the hot water pump.

1.2 How the boiler operates (pic. 1)

1.2.1 Switching on

IMPORTANT

Refer also to 3.3 and following sections.

- Check the pressure of the water in the system:
 - maximum pressure 5 bar – 500kPa (6 bar – 600 kPa for models S 1200 ÷ 3500),
 - minimum pressure 0.8-1 bar – 80-100 kPa)
- Open the fuel tap.
- Press the master switch **11** to the ON position (light on).
- Press the burner switch **13** to switch on.
- Set the CH temperature on the control knob **18**.
- Set the ambient temperature value on the ambient thermostat (if there is one).
- The yellow central heating light **4** comes on when the system demands heating.
- The burner light **8** is on when the burner is in operation.

The boiler is fitted with a thermometer displaying the water temperature.

1.2.2 Burner shutdown

When there is a system malfunction, the burner switches off automatically and the shutdown light comes on. If this happens, proceed as follows:

- Check the fuel supply first.
- Press the burner reset button. If the boiler does not restart, try to reset the burner three times and then call an authorised Service Centre or qualified maintenance personnel.

If the boiler shuts down frequently, this indicates that there is a recurring anomaly. In this case contact qualified personnel or an authorised Service Centre for maintenance.

1.2.3 Shutdown due to overheating

If the red overheating light **10** comes on, it means the manual reset safety thermostat has activated due to a malfunction. In this case contact qualified personnel or an authorised Service Centre for maintenance.

1.3 Maintenance

It is a legal requirement to have the boiler and burner serviced periodically.

Correct maintenance allows the boiler to work optimally, respect the environment and without endangering people, animals or property.

The boiler must be serviced by qualified personnel.

1.4 Information for the user

The user can access only the parts of the boiler which can be reached without the need for tools: it is therefore forbidden to disassemble the exterior cover of the boiler and tamper with the interior parts.

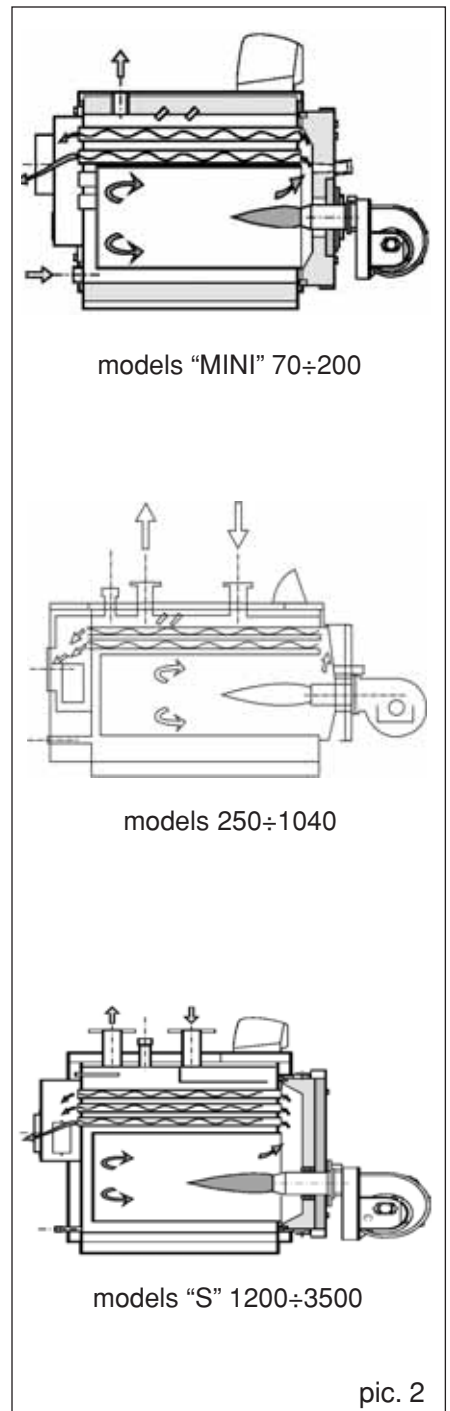
NO-ONE, INCLUDING THE SERVICE ENGINEER, MAY MAKE MODIFICATIONS TO THE BOILER.

The service engineer is only authorised to install original Manufacturer's kits.

The Manufacturer declines all liability for injury to persons and animals and damage to property resulting from attempts to tamper with or misuse of the boiler.

Frost protection can be ensured by adding a specific anti-freeze product suitable for multi-metal systems.

Do not use anti-freeze for car engines and check regularly to make sure the product remains effective.



pic. 2

2. Technical features and dimensions

2.1 Technical features

These boilers are horizontal cylindrical type with flame reversing unit in the furnace and a third combustion gas pass (pic. 2). **They may only be used for heating water to a temperature not exceeding boiling point under the correct installation conditions.**

These boilers meet the requirements of the following EC product Directives.

- Gas Directive 90/396 EEC, 29th June 1992.
- Efficiency Directive 92/42 EEC, 21st May 1992.
- EMC Directive 89/336/EEC, 3rd May 1989, amended by Directive 92/31/EEC on 28th April 1992;
- Low Voltage Directive 73/23/EEC, 19th February 1973, amended by Directive 93/68/EEC on 22nd July 1993.
- EN 303, part 1,

The boiler is also equipped with all the safety devices required by law.

The boilers come in the following models:

Mini 70, heat output 64 kW
Mini 80, heat output 76 kW
Mini 100, heat output 93 kW
Mini 110, heat output 105 kW
Mini 120, heat output 116 kW
Mini 150, heat output 140 kW
Mini 180, heat output 163 kW
Mini 200, heat output 186 kW
250, heat output 200 ÷ 250 kW
300, heat output 234 ÷ 300 kW
360, heat output 280 ÷ 360 kW
420, heat output 315 ÷ 420 kW
500, heat output 375 ÷ 500 kW
600, heat output 477 ÷ 600 kW
730, heat output 580 ÷ 730 kW
820, heat output 655 ÷ 820 kW
1040, heat output 830 ÷ 1040 kW
S 1200, heat output 1000 ÷ 1320 kW
S 1400, heat output 1200 ÷ 1570 kW
S 1850, heat output 1400 ÷ 1850 kW
S 2400, heat output 1700 ÷ 2200 kW
S 3000, heat output 2300 ÷ 3000 kW
S 3500, heat output 2700 ÷ 3500 kW

The components of parts under pressure, such as metal panels and pipes, are made of certified carbon steel according to EURONORM 25 and EURONORM 28 tables.

Welders and welding methods are approved by TÜV (D), UDT (PL), SA (S) and ISPESL (I).

For models more powerful than model 300 the furnace is free to expand – it merely rests on the front tube plate. All the boilers come with a right- or left-hinged door.

The outer shell is lined with a 80-mm layer of glass wool, which is protected by a mineral fibre fabric.

Hooks are fitted to the upper part of the casing for lifting the boiler.

The boilers come with a blind cylindrical furnace in which the centre flame of the burner reverses peripherally forwards, from where the combustion gas enters the smoke tubes. From there they collect in the smoke chamber and are sent to the chimney.

While the burner is operating, within the set range of values, the combustion chamber is always pressurised.

The boilers are designed to operate with an ON/OFF burner or a two-stage or modulating burner, **provided that the minimum heat output is not lower than the value indicated on the rating plate for the type of fuel used.**

Standard control panel includes:

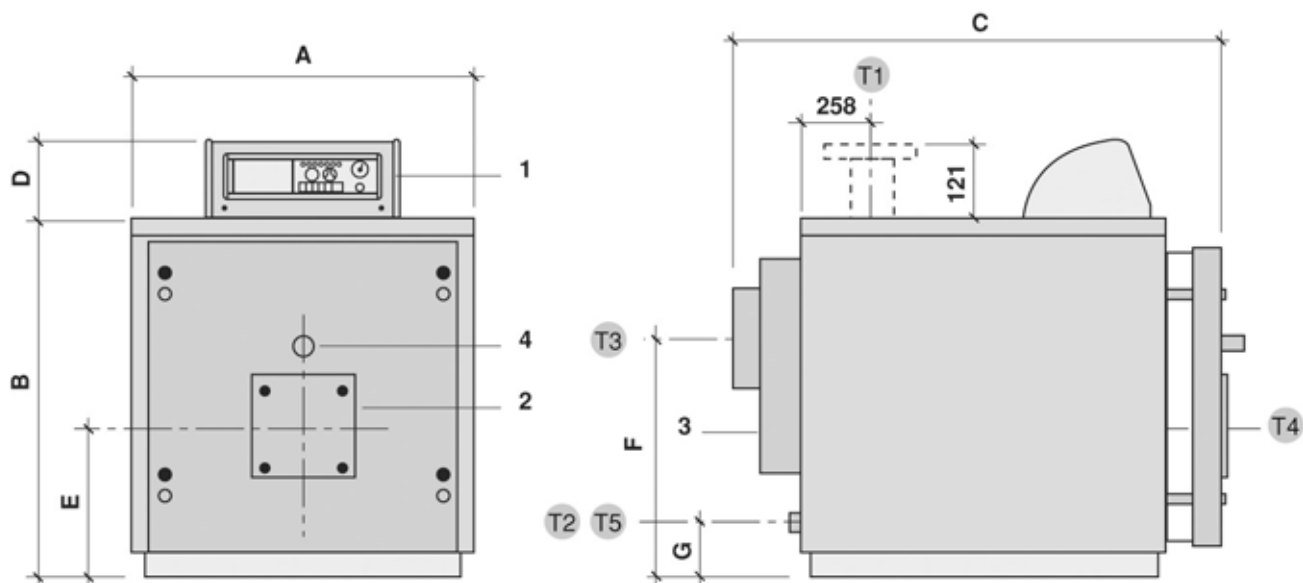
- Main switch with built-in light
- Burner switch
- CH pump switch
- DHW pump switch
- Indicator and warning light:
 - power on
 - CH system on
 - DHW system on
 - burner operation
 - shutdown due to overheating.
- Two-stage boiler water temperature regulator (60-90°C) with 8°C difference between 1st and 2nd stage.
- Safety thermostat (100°C);
- Minimum thermostat (45°C)
- Thermometer

Standard electronic board supports:

- a heating pump and a hot water pump.
- a tank heater priority thermostat.
- a thermoregulation control unit
- a board for handling three heating zones (optional kit).

2.2 Dimensions

2.2.1 Models Mini 70 - 200



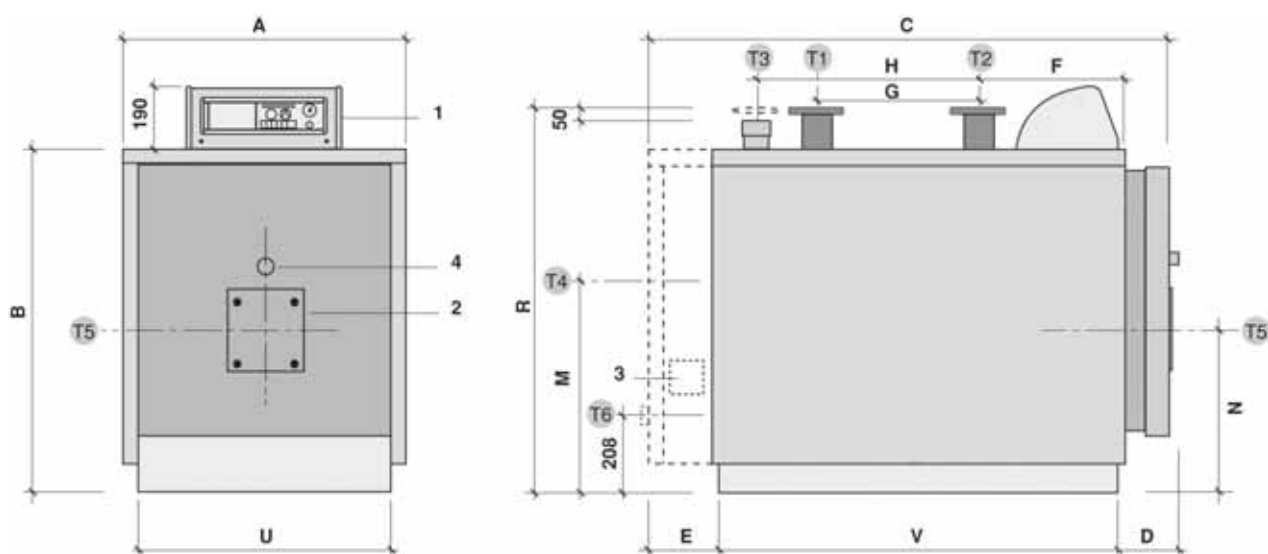
pic. 3

- | | | | |
|----|-------------------------|----|--------------|
| 1 | Control panel | T2 | CH return |
| 2 | Burner flange | T3 | Chimney port |
| 3 | Cleaning door | T4 | Burner port |
| 4 | Flame inspection window | T5 | Boiler drain |
| T1 | CH supply | | |

model	Dimensions (mm)						
MINI	A	B	B	D	E	F	G
70	690	722	990	190	305	480	115
80	690	722	990	190	305	480	115
100	690	722	990	190	305	480	115
110	760	812	1205	190	350	500	130
120	760	812	1205	190	350	500	130
150	760	812	1205	190	350	500	130
180	760	812	1205	190	350	500	130
200	760	812	1205	190	350	500	130

model	Ports			
MINI	T1-T2	T3	T4	T5
	Ø	Ø mm	Ø mm	Ø
70	1"1/2	200	130	3/4"
80	1"1/2	200	130	3/4"
100	1"1/2	200	130	3/4"
110	2"	200	180	3/4"
120	2"	200	180	3/4"
150	2"	200	180	3/4"
180	2"	200	180	3/4"
200	2"	200	180	3/4"

2.2.2 Models 250 ÷ 420



pic. 4

- 1 Control panel
- 2 Burner flange
- 3 Cleaning door
- 4 Flame inspection window

- T1 CH supply
- T2 CH return
- T3 Expansion vessel port
- T4 Chimney port

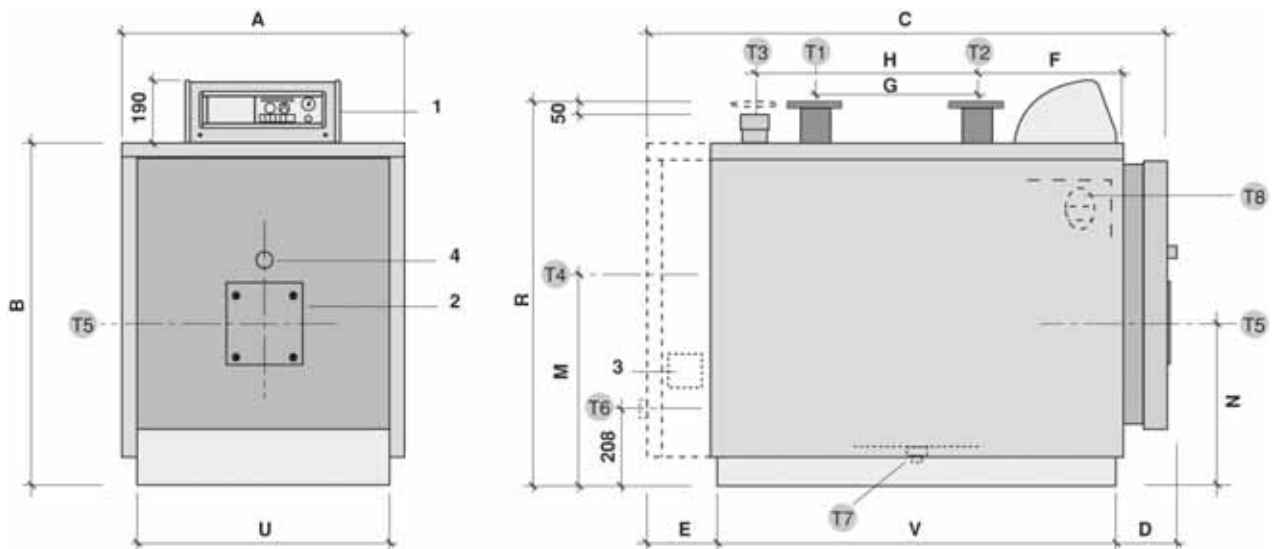
- T5 Burner port
- T6 Boiler drain

model	Dimensions (mm)												
	A	B	C	D	E	F	G	H	M	N	R•	U•	V
250	870	970	1620	185	215	465	495	680	597	457	1095	790	1240
300	870	970	1780	185	215	465	495	680	597	457	1165	790	1400
360	940	1040	1773	205	215	481	540	765	632	477	1165	860	1373
420	940	1040	1973	205	215	481	540	765	632	477	1065	860	1573

• Minimum dimensions for passing the boiler through the boiler room doorway.

model	Ports				
	T1-T2	T3	T4	T5	T6
	Ø mm	Ø	Ø mm	Ø mm	Ø
250	65	1"1/2	250	180	1" 1/4
300	65	1"1/2	250	180	1" 1/4
360	80	2"	250	210	1" 1/4
420	80	2"	250	210	1" 1/4

2.2.3 Models 500 ÷ 1040



pic. 5

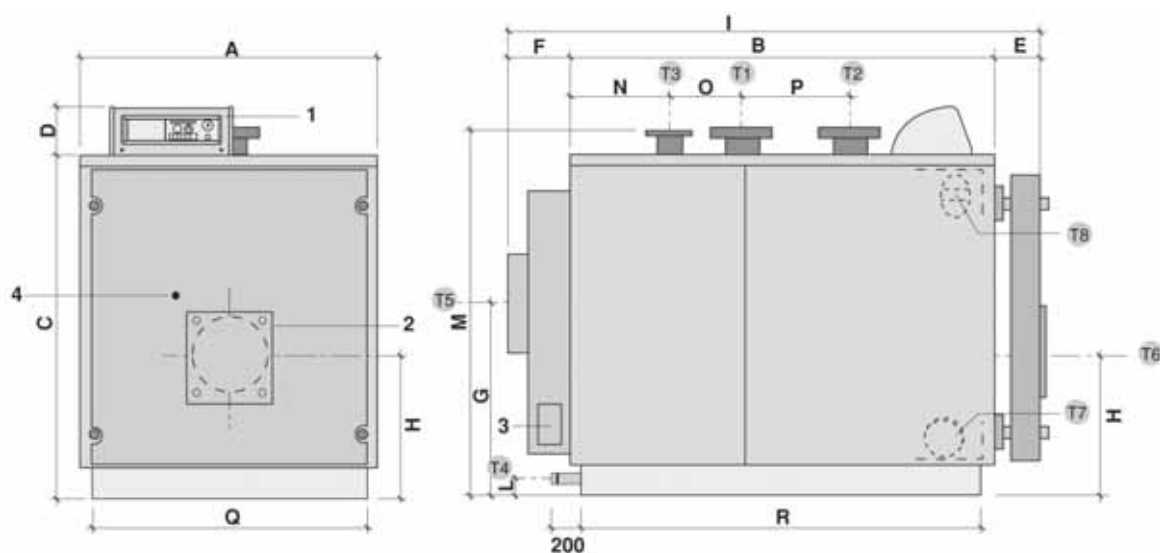
1	Control panel	T2	CH return	T7	G3 Ø boiler bleeder
2	Burner flange	T3	Expansion vessel port	T8	Inspection door
3	Cleaning door	T4	Chimney port		
4	Flame inspection window	T5	Burner port		
T1	CH supply	T6	Boiler drain		

model	Dimensions (mm)												
	A	B	C	D	E	F	G	H	M	N	R•	U•	V
500	1030	1130	1913	205	215	491	450	815	662	507	1255	950	1503
600	1030	1130	2163	205	215	491	450	815	662	507	1255	950	1753
730	1140	1240	2130	225	215	507	620	970	727	547	1365	1060	1700
820	1140	1240	2330	225	215	507	620	970	727	547	1365	1060	1900
1040	1250	1350	2390	225	215	507	620	1215	797	592	1475	1170	1960

• Minimum dimensions for passing the boiler through the boiler room doorway.

model	Port				
	T1-T2	T3	T4	T5	T6
	Ø mm	Ø	Ø mm	Ø mm	Ø
500	100	2"	300	210	1" 1/4
600	100	2"	300	210	1" 1/4
730	125	65	350	265	1" 1/4
820	125	65	350	265	1" 1/4
1040	125	80	350	310	1" 1/4

2.2.4 Models S 1200 ÷ 3500



pic. 6

1	Control panel	T2	CH return	T7	Spurgo caldaia
2	Burner flange	T3	Expansion vessel port	T8	Inspection door
3	Cleaning door	T4	Scarico caldaia		
4	Flame inspection window	T5	Attacco camino		
T1	CH supply	T6	Attacco bruciatore		

N.B. In models S 3000 and S 3500, ports T1 and T3 are inverted. Port T4 is on the front of the boiler.

model	Dimensions (mm)															
S	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R
1200 S	1352	2292	1432	190	207	287	810	595	2786	75	1540	461	670	500	1250	2186
1400 S	1462	2282	1542	190	227	287	880	640	2796	75	1650	561	510	550	1360	2176
1850 S	1462	2652	1542	190	227	287	880	640	3166	75	1650	561	880	550	1360	2546
2400 S	1622	2692	1702	190	259	289	950	690	3240	75	1810	661	670	700	1520	2590
3000 S	1670	3246	1890	190	247	317	1315	772	3810	206	1990	333	1100	1180	1600	3200
3500 S	1920	3216	2150	190	294	364	1535	915	3874	135	2270	390	1060	1130	1850	3164

• Minimum dimensions for passing the boiler through the boiler room doorway.

model	Port				
S	T1-T2	T3	T4	T5	T6
	Ø mm	Ø mm	Ø	Ø mm	Ø mm
1200	150	80	1" 1/2	400	320
1400	175	100	1" 1/2	450	320
1850	175	100	1" 1/2	450	320
2400	200	125	1" 1/2	520	380
3000	200	125	1" 1/2	570	380
3500	200	125	1" 1/2	620	380

2.3 Technical data

MOD.	HEAT OUTPUT min/max	HEAT INPUT min/max	WATER CONTENT	WATER PRESSURE DROP (AT 15 K)	EXAUSTS PRESSURE DROP	MAXIMUM WORKING PRESSURE	WEIGH
	KW	KW	litri	mbar	mbar	bar	Kg

model MINI

70	64	71	86	10	0,15	5	200
80	76	84	86	13	0,18	5	200
100	93	102	86	16	0,25	5	200
110	105	115	126	10	0,3	5	286
120	116	128	126	10	0,3	5	286
150	140	155	126	14	0,5	5	286
180	163	180	151	20	0,8	5	324
200	186	206	151	25	1,4	5	324

models

250	200 ÷ 250	216 ÷ 274	233	24 ÷ 37	1,0 ÷ 1,5	5	559
300	234 ÷ 300	253 ÷ 329	262	32 ÷ 53	1,2 ÷ 1,8	5	608
360	280 ÷ 360	302 ÷ 393	323	19 ÷ 31	1,7 ÷ 2,9	5	742
420	315 ÷ 420	340 ÷ 459	367	24 ÷ 42	1,9 ÷ 3,4	5	824
500	375 ÷ 500	404 ÷ 546	434	13 ÷ 23	1,4 ÷ 2,7	5	975
600	477 ÷ 600	514 ÷ 655	502	21 ÷ 33	1,8 ÷ 3,2	5	1065
730	580 ÷ 730	624 ÷ 795	607	15 ÷ 23	2,5 ÷ 4,5	5	1314
820	655 ÷ 820	705 ÷ 893	675	19 ÷ 29	2,8 ÷ 5,1	5	1410
1040	830 ÷ 1040	898 ÷ 1140	822	30 ÷ 47	3,2 ÷ 5,7	5	1724

models S

1200	1000 ÷ 1320	1087 ÷ 1442	1242	20 ÷ 35	3,5 ÷ 6,0	6	2030
1400	1200 ÷ 1570	1304 ÷ 1715	1418	19 ÷ 33	2,9 ÷ 4,9	6	2780
1850	1400 ÷ 1850	1520 ÷ 2020	1617	26 ÷ 45	3,9 ÷ 6,8	6	3280
2400	1700 ÷ 2200	1845 ÷ 2400	2086	21 ÷ 34	3,1 ÷ 5,2	6	4145
3000	2300 ÷ 3000	2492 ÷ 3280	2667	36 ÷ 62	3,5 ÷ 6,0	6	5110
3500	2700 ÷ 3500	2930 ÷ 3825	4142	54 ÷ 84	4,7 ÷ 7,8	6	6700

NOTE

In compliance with current laws (CE marking as per Directives 73/23/CEE –89/336/CEE–90/396/CEE; standard EN 267- EN 303 part 2), blown-air burners must be installed according to the manufacturer's instructions. The burner must be regulated so that the parameters for the products of combustion are as follows:

FUEL	ALL MODELS			
	CO ₂	Flue gas temperature		Bacharach
		max	min	
	%	°C	°C	
Natural gas G 20	9 ÷ 10	190 ÷ 210	160	/
Diesel oil (viscosity max 1,5°E at 20°C)	12 ÷ 13	180 ÷ 200	160	0,5 ÷ 1,0

3. Instructions for the fitter

3.1 Installation rules

The boiler must be installed pursuant to applicable standards and laws, which should be taken as incorporated in full in this manual.

3.2 Installation

3.2.1 Packaging

These boilers are supplied complete with the door and smoke chamber ready mounted. The case and insulation come in separated cardboard boxes.

The control panel and accessories are delivered inside the combustion chamber.

Before unpacking the boiler, check that the length and width of the body of the boiler correspond to the values for the boiler ordered, as shown in the relevant tables. Check that the cardboard boxes containing the case or any part thereof show the same model code.

Besides the control panel, which comes in its own box, you will find the following accessories inside the combustion chamber:

- a box containing the plumbing flanges, seals and bolts;
- a cylindrical brush for cleaning the tubes;
- a seal and bolts for the chimney counterflange.

Keep all the packaging materials out of the reach of children as they are a hazard.

The Manufacturer declines all liability for injury to persons and animals or damage to property resulting from failure to observe these rules.

3.2.2 Rating plate

The rating plate for the boiler comes in an envelope together with the documents. It bears the serial number marked on an aluminium plate riveted in the top right hand corner of the front tube plate.

Degrease and clean the surface of the side panel and fix the rating plate onto it.

3.2.3 Mounting the boiler case

Important

Before doing this, make sure the boiler is in its final position and has correct plumbing connections.

Before opening the boxes, make sure they show the correct model of boiler.

The same model number is marked on the box.

N.B.: The box containing the electrical units is inside the furnace, as are the documents and the warranty certificate.

With the following models (pic. 9), the case and insulation come in a single box marked as follows:

- 12825 (mod. 250)
- 13299 (mod. 300)
- 2826 (mod. 360)
- 13300 (mod. 420)
- 12827 (mod. 500)

With the following models (pic. 9 and 10), the case and insulation come in three boxes marked as follows:

- 13301 (front panel mod. 600)
- 13527 (rear panel mod. 600)
- 13528 (upper panel mod. 600)
- 13197 (front panel mod. 730)
- 13529 (rear panel mod. 730)
- 13530 (upper panel mod. 730)
- 13302 (front panel mod. 820)
- 13531 (rear panel mod. 820)
- 13532 (upper panel mod. 820)
- 13247 (front panel mod. 1040)
- 13533 (rear panel mod. 1040)
- 13534 (upper panel mod. 1040)
- 13498 (front panel mod. S 1200)
- 13535 (rear panel mod. S 1200)
- 13536 (upper panel mod. S 1200)

For model **S 1400** (pic. 10), come in three boxes marked as follows:

- 13846 (front panel mod. S 1400)
- 13847 (rear panel mod. S 1400)
- 13848 (upper panel mod. S 1400).

For models from **S 1850 and S 3500** (pics. 10 and 11), the case and insulation come in four boxes marked as follows:

- 13849 (front panel mod. S 1850)
- 13850 (central panel mod. S 1850)
- 13851 (rear panel mod. S 1850)
- 13852 (upper panel mod. S 1850)
- 13853 (front panel mod. S 2400)
- 13854 (central panel mod. S 2400)
- 13855 (rear panel mod. S 2400)
- 13856 (upper panel mod. S 2400)
- 13857 (front panel mod. S 3000)
- 13858 (central panel mod. S 3000)
- 13859 (rear panel mod. S 3000)
- 13860 (upper panel mod. S 3000)
- 18677 (front panel mod. S 3500)
- 18678 (central panel mod. S 3500)
- 18679 (rear panel mod. S 3500)
- 18680 (upper panel mod. S 3500)

3.2.4 Mounting mod. Mini casing

Assembly sequence:

before beginning, make sure the boiler is in its final position and has correct plumbing connections.

Before opening the boxes, make sure they show the correct model of boiler.

The model number is marked on the box.

N.B.: The box containing the electrical units is inside the furnace, as are the documents and the warranty certificate.

See pics. 7 and 8

A) Fix the insulation (1) on the boiler body and secure the two joining edges with the spring clips (2) coupling them to the outer insulation part made of cloth.

B) Position the side panels on the boiler body (3 and 4).

The lower section of the side panels must be inserted in the L-shaped section welded onto the lower part of the body.

During assembly check that the plastic cable clamps are positioned at the front of the boiler.

C) Unscrew the two side screws and lift the cover of the electrical unit up and forwards.

Fix the instrument panel onto the upper panel of the case (5), feeding the cables on the side panels (supply, ambient thermostat, burner cable(s)) and output terminals of the sensors through the cable guides on the side panels, and then feeding the input cables through the holes in the panel. Fix the upper panel onto the two side panels, laying the sensor terminals towards the sheath.

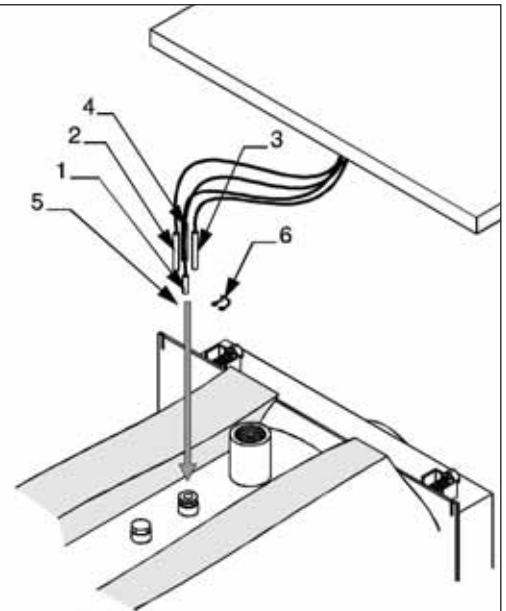
D) Make a cut in the mineral wool insulation and insert the instrument bulbs as shown in pic. 7.

Connect the instrument panel to the mains supply.

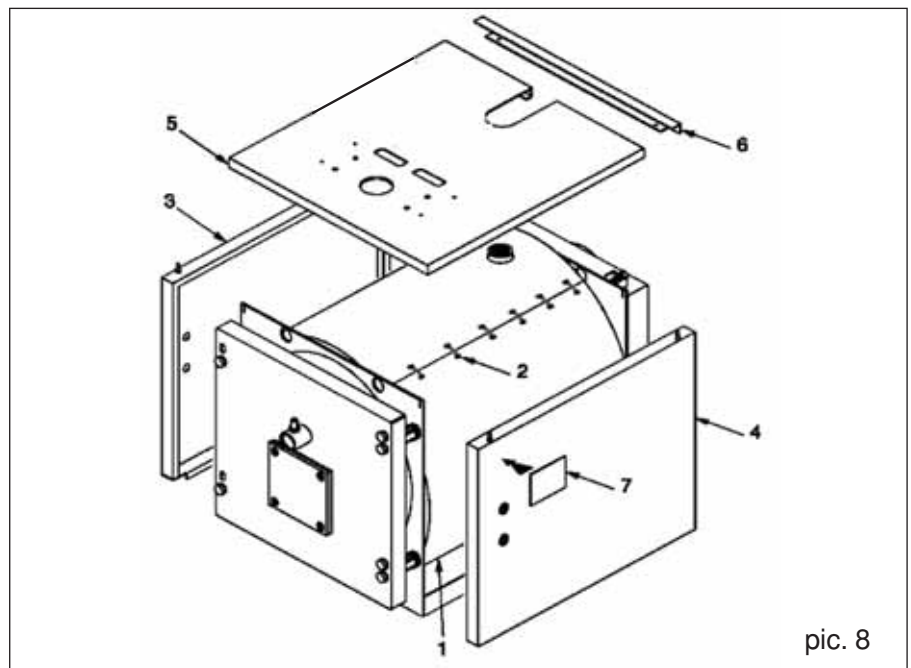
E) Mount the rear reinforcement (6) on the upper panel.

F) Clean with solvent the part of the side panel where you intend to put the rating plate (7) and then fix on the plate.

- 1 Thermometer probe
- 2 Operating thermostat probe
- 3 Safety thermostat probe
- 4 Min. temperature probe
- 5 Probe sheath
- 6 Capillary tube clip



pic. 7



pic. 8

Remove the backing from the plate and fix it in position using a plastic spatula.

Do not remove the plate as the adhesive effect would be lost.

The rating plate can be found in the envelope with the documents.

3.2.5 Mounting mod. 250 to 1040 casing (pic. 9)

A) Fix the insulation (1) of the boiler body and fix the two joining edges with the spring clips (2 – in the box of accessories) coupling them to the outer insulation part made of cloth **(from model 360, insulation comes in two parts).**

B) Position the side panels (5 and 6) with the upper and lower folds in the L-shaped sections on the side of the boiler body **(from model 600, the side panels come in two parts).**

To distinguish right from left, **refer to the cable guides which must face the front of the boiler.**

C) Remove the cable guides (7) from the side panel through which the cable are to pass, and insert the power, burner and pump cables, and secure them with the cable clamps (8) provided.

D) Unscrew the front and rear screws and lift up the cover of the electrical unit. Feed the input cables and the output terminals of the sensors through the holes.

Fix the control panel onto the upper panel (4).

E) Align the upper panel (4), complete with the control panel, with the front edge of the side panels, and fix it onto them.

F) Insert the instrument bulbs into the bulb holder and connect the wires from the control panel to the mains, the burner and any pumps. Replace the cover of the control panel.

G) Mount the upper panels (9 and 10) and secure them in position with the rear reinforcement (11) and screws (12).

H) Mount the lower rear panel (13).

I) Clean with solvent the part of the side panel where you intend to put the rating plate (14) and then fix on the plate.

The rating plate can be found in the envelope with the documents.

3.2.6 Mounting mod. S 1200 to 2400 casing (pic. 10)

A) Fix the insulation (1) of the boiler body and secure the two joining edges with the spring clips (2) coupling them to the outer insulation part made of cloth.

Make a cut in the top near the sensor seats.

B) Position the side panels (3a, 3b and 4a, 4b) with the lower fold in the L-shaped sections on the side of the boiler body and coupling the upper part to the joining edges of the plates.

To distinguish right from left, refer to the cable guides on the front panels (5): they must face the front of the boiler.

C) Open the boiler door and apply the front insulation (6), inserting the hinges in the cuts.

Tuck the side edges of the insulation under the fold in the two sides (3a and 4a).

D) Mount the rear upper panel (7). Fix the cable clamps (8) onto the panel.

E) Unscrew the two side screws and lift up the cover of the electrical unit. Feed the input cables and the output terminals of the sensors through the holes in the base.

Fix the control panel to the upper boiler casing (9).

Place the upper panel 9, complete with the control panel, on the two panels of the case.

F) Insert the instrument bulbs into their slots and connect the wires from the control panel to the mains, the burner and any pumps as indicated in pic. 7.

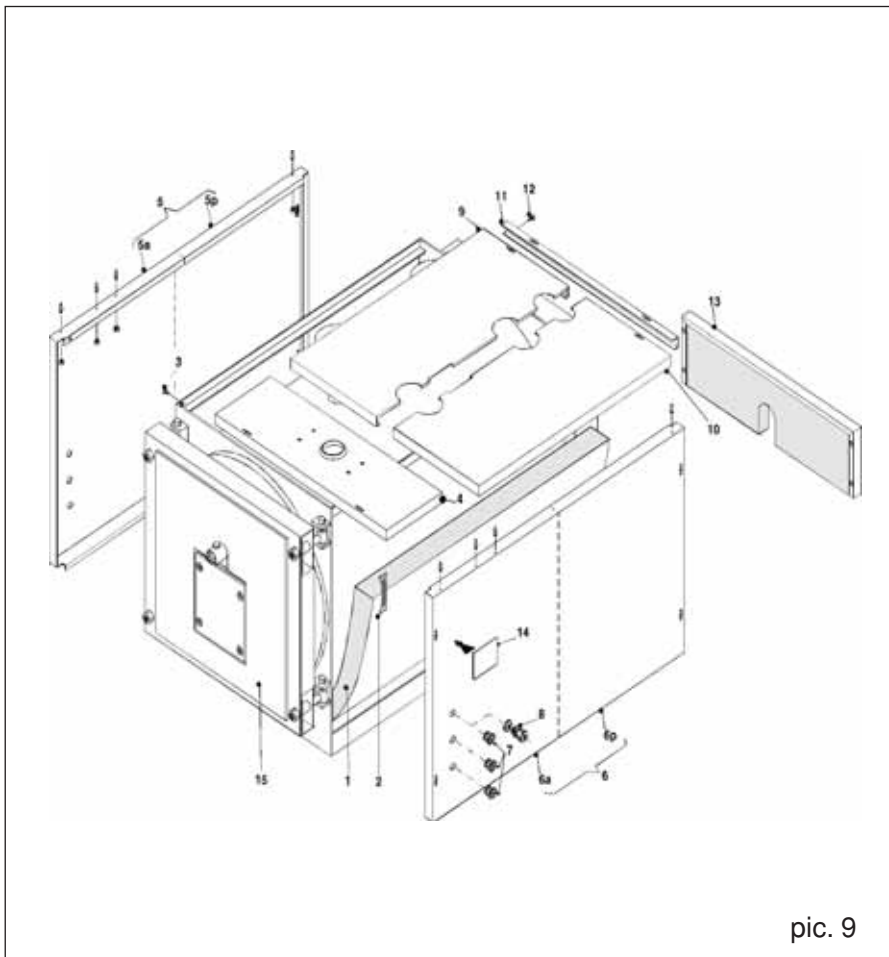
Replace the cover of the control panel.

Feed the burner plug through the side plate (5) from the exit side and secure the cable using the cable clamp provided. Fix the plates (5) to the sides of the case. Secure the cables coming out of the back of the boiler using the cable clamps, without overtightening.

G) Mount the upper panels (10 and 11) coupling them with the sides.

H) Clean with solvent the part of the side panel where you intend to put the rating plate (12) and then fix on the plate.

The rating plate can be found in the envelope with the documents.



pic. 9

3.2.6.1 Mounting mod. S 3000 and 3500 casing (pic. 11)

A) Install the insulation (1) on the boiler body and secure the two joining edges with the spring clips (2), supplied with the accessories, coupling them to the outer insulation part made of cloth.

Make a cut in the top near the sensor seats.

B) Position the side panels (3a, 3b, 3c and 4a, 4b, 4c) with the lower fold in the L-shaped sections on the side of the boiler body and coupling the upper part to the joining edges of the plates.

To distinguish right from left, refer to the cable guides on the front panels (5): they must face the front of the boiler.

C) Mount the front (6) and the rear panel (10) with the self-tapping screws.

D) Remove the cable guides from the side panel through which the cables are to pass, and insert the power, burner and pump cables, and secure them with the cable clamps provided.

E) Fix the upper elements (8 and 9).

F) Unscrew the two side screws and lift up the cover of the electrical unit. Feed the input cables and the output terminals of the sensors through the holes in the base.

Fix the control panel to the upper panel of the case (11).

Place the upper panel 11, complete with the control panel, on the two panels of the case.

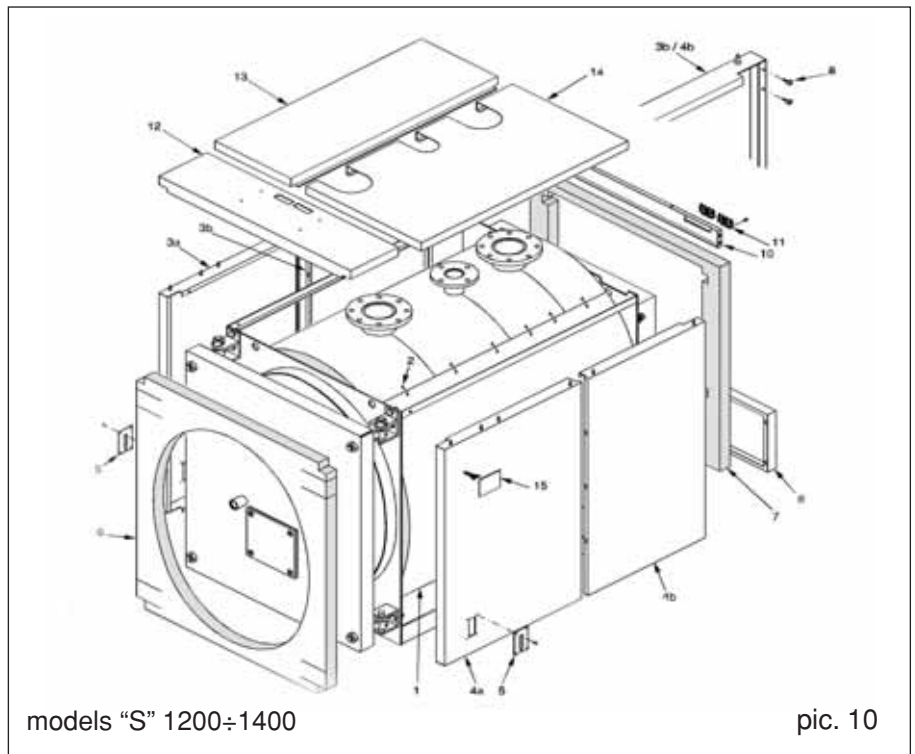
G) Fit the bulbs of the thermostatic sensors into their seats (as shown in pic. 7) and connect the wires of the control panel to the mains, to the burner and to any pumps.

Replace the cover of the control panel.

H) Mount the upper panels (12 and 13).

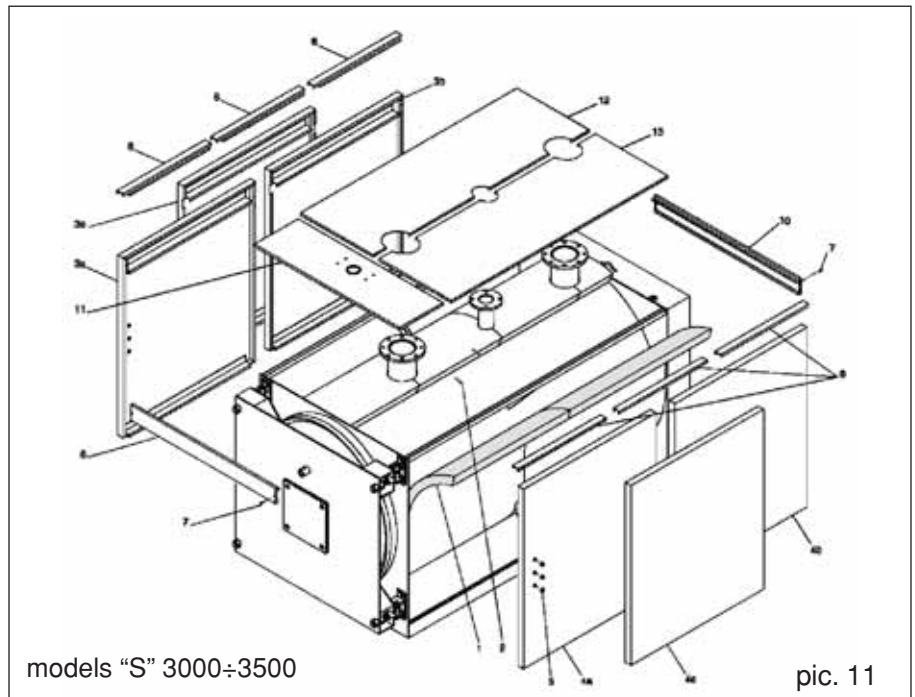
I) Clean with solvent the part of the side panel where you intend to put the rating plate and then fix on the plate.

The rating plate can be found in the envelope with the documents.



models "S" 1200÷1400

pic. 10

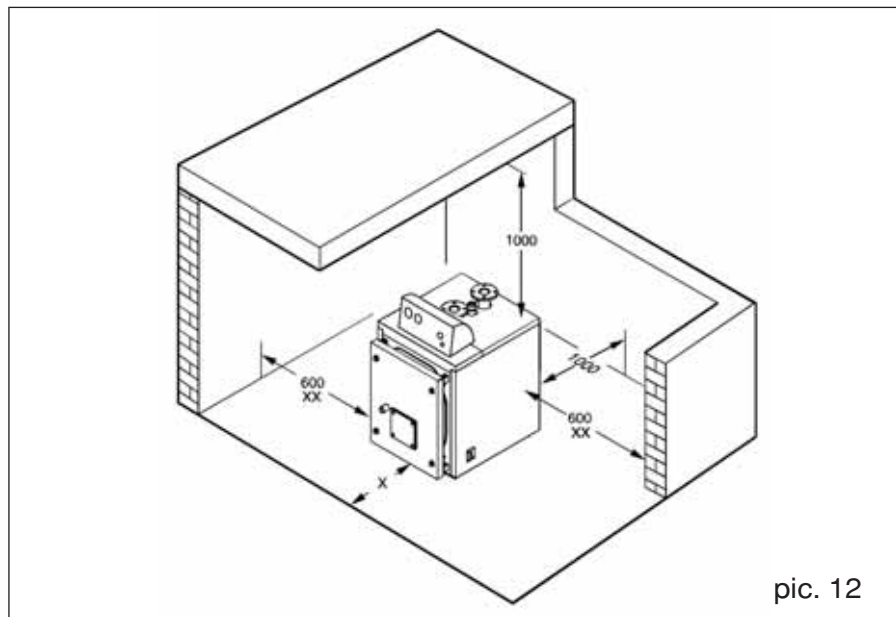


models "S" 3000÷3500

pic. 11

3.2.7 Choosing where to install the boiler (pic. 12)

The entrance to the boiler room must



When choosing where to position the boiler, take the following into account:

- The boiler should be positioned as close as possible to the chimney connection.
- To make it easier to clean the smoke circuit, leave in front of the boiler a space at least as long as the boiler body and in no case no less than 1300 mm. Check that with the door 90° open the distance between the door and adjacent wall is at least the length of the burner.
- The boiler can stand on the floor because it comes with a base. It is however good practice to place it on a flat levelled concrete plinth, able to withstand the weight of the boiler when full of water. When the boiler is positioned on a plinth, the latter must have at least the dimensions of the boiler base (see point 2.2).
- When installed, the boiler must be perfectly horizontal and stable to prevent vibration and noise.
- Avoid installation in a damp or dusty environment.
- The boiler room must be accessible to authorized personnel only.

The boiler room must be kept clean and free of dust.
The boiler room must not be treated as a storage room. Do not fill it with other items.

be kept clear and accessible at all times.

Emergency lights must be provided in the boiler room and checked regularly.

3.2.8 Handling the boiler

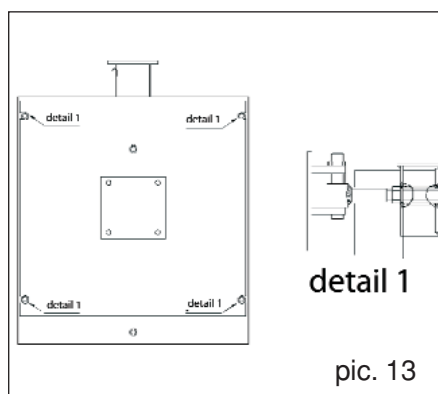
All these boilers can be lifted by means of the hook(s) at the top or moved on rollers positioned below the side frame of the base.

The front door and the rear smoke chamber can be removed if necessary to allow the boiler to enter the boiler room.

3.2.9 Adjusting, opening and closing the furnace door

Mod. 250 to 1040 and mod. S 1200

The above models have furnace door hinged and attached as shown in pic. 13.



The door is mounted with four identical hinges. The two on the right, with firmly tightened nuts and counter-nuts, are normally used for rotation (from left to right); the two on the left are used as closing bolts and the counternut is kept loose.

The exact opposite occurs when the door opens from right to left (hinge on the left and closing bolts on the right).

With these models of boiler, only the possible adjustments are possible:

- vertical adjustment: to do this, it is necessary to fit washers of suitable thickness under the female hinge on the hinged side.

- axial adjustment: this can be done by adjusting the securing nuts. On the hinge side, it is also necessary to adjust the counternuts.

Transversal adjustment is not possible as this has already been done in the factory using a special template.

Mod. S 1400 to S 3500

The above models have furnace door hinged and fixed according to pic. 14.

In this case the two hinges on the left are normally used for rotation (from right to left); the two on the right are used as closing bolts.

The exact opposite occurs when the door opens from left to right.

To invert rotation, merely move the door supporting bushes.

With these models of boiler, the possible adjustments are possible:

a) **Vertical adjustment:** adjust the nut on the upper pin of the door hinge.

b) **Transversal adjustment:** loosen the hinges on the front plate of the boiler and move them sideways.

c) **Axial adjustment:** adjust the locking nuts.

3.2.10 Plumbing system

The plumbing system must include all safety elements, such as safety valve, water pressure switch, relief valve and pressure gauge.

On the connector (pics. 4, 5 and 6) or on the delivery pipe not farther than 50 cm from the front supply flange, it is necessary to mount a safety valve of a suitable capacity for the particular model of boiler, in compliance with safety regulations in the country of installation.

Remember that no type of on/off valve must be positioned between the boiler and the safety valve. Valves regulated to operate up to the maximum operating pressure of 5 bar (6 bar for S models) must be used.

These boilers are designed for forced water circulation with either an open or sealed expansion vessel.

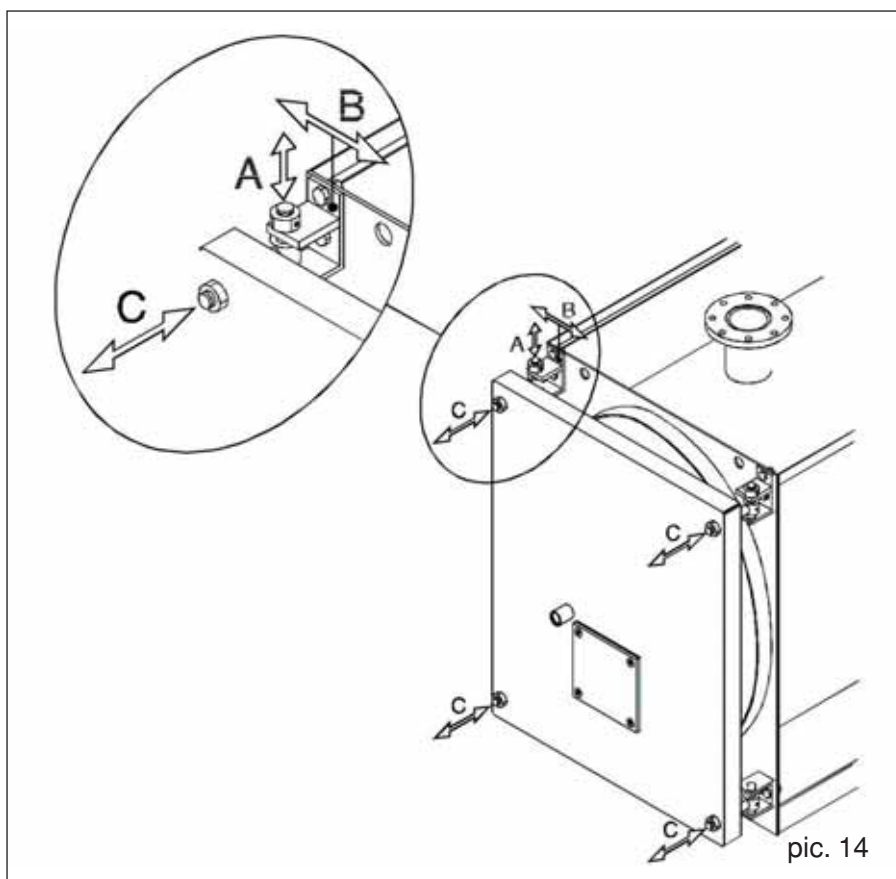
It is always necessary to install an expansion vessel to compensate for the increased volume of water due to heating.

With open expansion vessels, the height of the water column must be at least 3 metres above the boiler case, and the expansion vessel itself must be large enough to contain the increased volume of water for the entire system between the surface of the water and the overflow pipe.

Tall narrow vessels are preferable so as to expose the least possible surface of water to the air, and thus reduce water evaporation.

With closed expansion vessels, the following must be taken into account when calculating the capacity:

- Total volume of water in the system.
 - Maximum operating pressure of the system.
 - Maximum operating pressure of the expansion vessel.
 - Initial precharging pressure of the expansion vessel
 - Maximum working temperature of the boiler. The maximum temperature of the thermostat on the panel is 90°C; for calculation purposes, it is advisable to consider 100°C.
- The expansion vessel is connected



to the system by means of an expansion pipe.

This pipe, connected to the boiler, **must not have an on/off valve.**

IMPORTANT

Before connecting the boiler to the CH system, clean the pipe carefully to remove any metal residue from welding, etc., and any oil and grease present, which would damage or affect operation of the boiler.

Important: Do not use solvents, as they would damage the components.

The CH supply and return pipes must be connected to the relevant boiler fittings. The dimensions are shown in pics. 3, 4, 5 and 6.

Avoid causing mechanical stress to the boiler flanges when connecting the boiler.

The boiler is not designed to support the water pipes, therefore specific supports must be provided.

The correct connection must be used for filling and emptying the boiler (pics. 3, 4, 5 and 6).

Any system requires topping up of water due to evaporation, minor or

major leaks or maintenance. It is therefore necessary to know exactly how much water needs to be added. It is advisable to provide topping-up pipes with a small capacity litre counter.

The chemical and physical features of supply and refilling water are fundamental for safe boiler operation.

Among the various inconveniences caused by bad quality of the supply water the most serious and frequent one is the formation of scale on the heat exchanger surfaces.

A less frequent though equally serious inconvenience is corrosion of the surfaces of the entire circuit water side.

Scale is known to reduce heat exchange due to their low heat conductivity, which means that even with a few millimetres of scale, serious overheating may occur locally.

It is always good practice to treat the boiler water using specific products for multi-metal systems.

For the treatment of supply waters in heating systems it is advisable to contact specialised water treatment experts, who may also de-scale the boilers, if necessary after prolonged use.

The Manufacturer cannot be held liable for injury to persons and animals or damage to property resulting from failure to observe the above rules.

3.2.11 Circulating pump

Between the boiler delivery and return pipes it is necessary to install a circulating pump to ensure minimum circulation of water in the boiler, according to the following formula:

$$Q = P \times 22$$

where:

Q = flow rate in litres/hour

P = actual thermal capacity of the boiler expressed in kW.

THIS REQUIREMENT IS COMPULSORY.

IF THE CIRCULATING PUMP IS NOT USED, THIS MAY CAUSE IRREPARABLE DAMAGE TO THE BOILER, FOR WHICH THE MANUFACTURER CANNOT BE HELD LIABLE IN ANY WAY.

3.2.12 Ventilation of the boiler room

These boilers have an open flue and are designed for connection to a chimney, which means that the combustion air is taken **straight from the boiler room.**

The burner needs air for the combustion of oil or gas.

There are openings in the boilers to ventilate it. These openings must never be obstructed.

The boiler must be installed in a suitable room meeting current legal requirements, **which are intended as incorporated in full in this manual.**

3.12.13 Flue system

These boilers come with a flue port designed for connection to a duct having diameters as indicated in pics 3, 4, 5 and 6.

It is mandatory to comply with all applicable standards and laws relating to the emission of flue gas, **which should be taken as incorporated in full in this manual.**

The flue pipes from the boiler must be connected to a chimney made in compliance with all applicable standards and laws, **which are intended as incorporated in full in this manual.**

The height of the chimney must be calculated to ensure that there is no positive pressure at the base.

Since this is a high-performance boiler, the temperature of the flue gas is low.

This means that condensate may form inside the chimney, particularly with a two-stage burner.

The chimney must therefore comply with the following requirements:

* The diameter must not be less than the diameter of the boiler flue pipe.

* The pipes must be made of water-proof material that is resistant to flue gas temperature and acid condensate.

* They must have low thermal conductivity, good mechanical resistance, perfect seal and correctly calculated height and cross section.

* The flue must be positioned vertically, with a constant cross section, without any chokes.

* The end section must ensure constant, efficient discharge of flue gases in any atmospheric conditions.

Provision must be made for a special flue gas sampling point to allow regulation of the burner and measurement of the boiler efficiency.

It is a legal requirement to have a special section installed allowing the collection and discharge of acid condensate before it reaches the boiler.

IMPORTANT

Use the counterflange provided to help you disconnect the smoke chamber from the chimney flue port.

3.2.14 Choosing and installing the burner.

The burner must bear the CE mark.

The control panel of the boiler is designed to operate a two-stage burner.

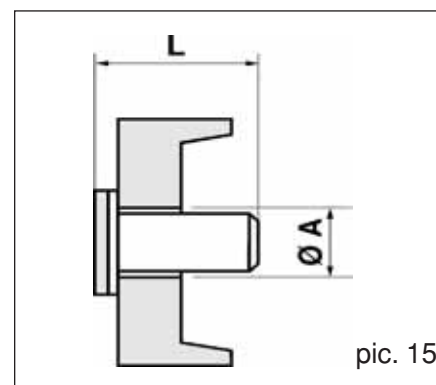
The correct choice of burner and regulation are of fundamental importance if the boiler is to run efficiently. This must never be underestimated. When choosing a burner, check that the operating range (fuel flow rate and combustion chamber pressure) is compatible with the features of the boiler.

Remember that any load loss on the flue gas side of the boiler or back pressure in the combustion chamber, refers to zero pressure at the base of the chimney.

It is also advisable the length of the burner sleeve to be not less than that shown in the following table (pic. 15), and that the flame suits the features of the combustion chamber.

In order to make best use of the heat exchange surfaces of the closed-bottom furnace, it is important to use burners that can provide a long thin flame under all conditions, even with minimum power in the case of two- or more-stage or modulated regulation.

Model	Φ A mm	L mm
Mini 70 ÷ 100	130	150
Mini 110 ÷ 200	180	170
250 ÷ 300	180	250
360 ÷ 600	210	280
730 ÷ 820	265	300
1040	310	300
S 1200	350	320
S 1400	320	380
S 1850	320	400
S 2400 ÷ 3500	380	400



Short flames cause localised overheating at the front of the furnace. The products of combustion, which are not cooled sufficiently, are too hot when they enter the flue gas pipes and may cause serious damage to the boiler.

Burner manufacturers can give you the dimensions of the flames generated, meeting the EC standards.

IMPORTANT

Before installing the burner, check the position of the flue gas agitators inside the pipes. Each pipe must have its own flue gas agitator, which must be pushed in until it comes into contact with the rear smoke chamber.

In this position, the flue gas agitator is 50-150 mm from the edge of the pipe, depending of the model of boiler.

When the burner is mounted on the door of the boiler, it must not allow any product of combustion to escape.

The piece of ceramic fibre cord provided must be put around the opening of the burner to completely seal the space between it and the door.

Make sure there are no gaps between the opening and the refractory material lining the door.

When mounting a cone with a diameter greater than the opening in the burner, it must be removed before mounting the burner on the plate, and then re-mounted. With the burner mounted, ensure that the liquid fuel pipes and the cables are long enough to allow the door to open 90 degrees.

Flexible pipes must not be used with gas burners, and a threaded flanged joint on the end section of the gas supply pipe must be provided, so that it can be removed.

The flame inspection window has a 1/8" threaded seat (pic. 16, 1) with a 9-mm pressure coupling for a silicon pipe, measuring back pressure in the combustion chamber (2).

Remove the coupling (which must be kept) and mount a suitable fitting to connect the flame inspection window to the pressurised chamber, downstream of the burner fan, using a copper pipe.

The air from the fan will cool the window glass and prevent it from losing transparency.

Connection 2 (pic. 16) shall always be in place to prevent glass deterioration.

IMPORTANT

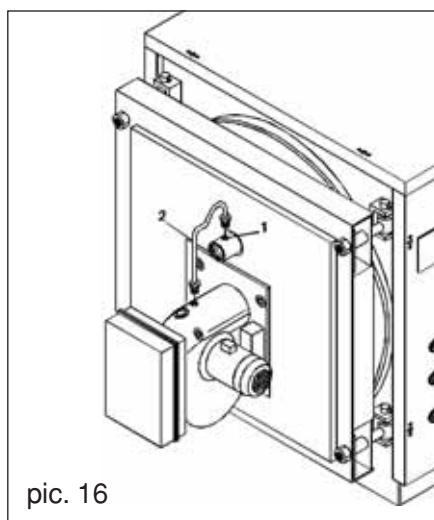
Glass window may be very hot.

3.2.15 Measuring combustion efficiency

Perform the following measurements to determine combustion efficiency.

- Measure the combustion air temperature.
- Measure the temperature of the flue gas and the percentage of CO₂ taken through the holes in the flue gas duct, after measuring the Bacharach index (for oil burners only).

Make these measurements with the boiler running.



pic. 16

3.2.16 Connecting to the gas mains (for boilers with a gas burner)

The diameter of the gas supply pipe must be no less than that of the burner gas ramp.

It is important to comply with the applicable standards and laws, which are intended as incorporated in full in this manual.

Remember that before running a gas supply system, and before connecting it to the meter, it is important to check for leaks.

The leak test must not be done with combustible gas. Use air or nitrogen.

When there is gas in the pipe, never use a flame to detect leaks. Use a gas leak detector.

3.2.17 Connecting to the oil supply (for boilers with a diesel oil burner)

The oil supply pipe must be perfectly airtight. Air must not enter the fuel line from the diesel tank. It is advisable to feed burners using a twin-pipe system.

The installation of the tank must comply with the burner manufacturer's instructions.

With gravity flow tanks or oil systems with ancillary pumps, it is mandatory to install an automatic solenoid valve to cut off fuel supply when the burner switches off.

If the boiler is installed in a particularly cold climate, use diesel oil with low paraffin content. If necessary, the burner should be equipped with a diesel oil pre-heater.

It is also highly recommended to install an oil filter.

3.2.18 Connecting to the power mains and utilities

The boilers come with a terminal for connecting three-poled wires and fairlead.

The boiler must be connected to a **230V-50Hz** single-phase power supply.

Make sure all the wires are connected properly.

It is important to comply with the applicable standards and laws, which are intended as incorporated in full in this manual.

A two-poled switch must be fitted before the boiler to allow maintenance to be carried out in safety.

The power line must be protected by a differential magnetothermal switch with a suitable breaking capacity.

The mains supply must be properly earthed.

The above-mentioned precautions are mandatory. In case of doubt, have the whole system checked carefully by a qualified electrician.

The Manufacturer cannot be held liable for damage or injury caused by failure to earth the system properly. The DHW, CH and gas pipes are not suitable for earthing purposes.

The maximum power that can be handled by the control panel is 575 VA.

If the sum of the power of the burner, pump and zone valves exceeds this value, it is necessary to use contactors.

3.2.19 Installing original kits

The Manufacturer supplies original kits for installing the programming clock, the board for controlling three pumps or three zone valves, and a central thermoregulator.

All kits must be installed according to the accompanying instructions.

3.3 Start-up, operate and switch off of the boiler

3.3.1 Preliminary checks

After completing the plumbing, wiring and fuel connections, and before starting up the boiler, carry out the following checks:

- Make sure the mains voltage and frequency are compatible with the burner and the electrical equipment of the boiler.
- Check that the expansion tank and safety valve are properly connected and cannot be cut off.
- Make sure any other device is in proper working order.
- Make sure the bulbs of all the thermostats and thermometers are properly secured.
- Make sure the operating and safety thermostats work properly.
- Make sure the flue gas agitators are correctly positioned in the pipes. They must be pushed in to the smoke chamber wall.
- Make sure the water system is perfectly clean, rinsed and free from solid particles.
- Check the system to be full of water with no air in it.

- Check for water leaks.
- Make sure all the air relief valves are open.
- **Make sure the recirculating pump is fitted as set out in section 3.2.11 and works properly.**
- Check operation of all the pumps,
- Make sure the burner is installed according to the manufacturer's instructions.
- Check that the burner is suitable for the type of fuel, as shown on the rating plate.
- Make sure all the plumbing, electrical, safety and fuel connections have been made in compliance with the applicable standards and laws.
- **Check the system capability to absorb the quantity of heat produced when the burner is ignited for the start-up testing.**

3.3.2 Regulating the burner

These boilers are designed to be used within a set power range in order to improve seasonal performance and enable them to be used in any type of heating system.

The burner (with fixed, multi-stage or modulated thermal output) must be regulated the first time it is ignited as indicated by the designer of the system, **and in any case fall within the working field shown for each boiler in the technical data sheet. UNDER NO CIRCUMSTANCES MUST THE VALUES FALL OUTSIDE THIS RANGE.**

It is always good practice to regulate the flow of fuel to meet the actual requirements of the system.

With the burner properly regulated, the average CO₂ value and flue gas temperature (with the boiler clean and operating normally) measured at the chimney, must coincide with those shown on the data sheet.

The above checks **must be performed by a fully qualified service engineer approved by the burner manufacturer.**

After opening the fuel valve and checking for leaks in the supply circuit, turn all the switches to ON. During the first ignition, check the seal of the door, the burner flange and the chimney connections, and make sure there is a slight depres-

sion at the base of the chimney (at least 2-4 mm of water column).

IMPORTANT

The person performing the first ignition and burner regulation **must** check that the shape of the flame meets the condition in paragraph **3.2.14.**

If it is prescribed by the regulations current in the country of installation, he must also make a complete report of the performance of the burner and fill in the official service booklet.

IMPORTANT

Before leaving, the person performing the first start up must run the boiler for at least one complete cycle.

3.3.3 Checks after start-up

In order to check the shape and size of the burner flame, which is very important for the boiler to run efficiently, it is necessary to perform a visual inspection of the furnace at least once, a month after start-up.

The furnace must have the same colour along the wall surfaces, showing that the flame reverses near the end. If there is a clear difference in colour between the two areas (front lighter than the rear), this means the flame is the wrong length.

If this happens, the burner must be regulated immediately to prevent localised overheating and the risk of serious damage.

Similarly, where possible, it is necessary to inspect the heat exchange surfaces on the water side, i.e. in boilers from models **mod. 500** onwards which are equipped with inspection doors. This must be done during the first few months of operation and compulsorily when the system is shut down for the first time when no longer needed or for other unscheduled maintenance.

If the inspection reveals the presence of scale, sludge or other deposits, they must be removed and the cause eliminated.

3.3.4 Operating the boiler

These boilers are designed to operate by forced circulation, which means there must be a supply of water while the burner is in operation.

The burner must not start up unless the main or recirculating pump has been activated, otherwise the safety thermostat may cut in.

The return temperature must not drop below 55°C to avoid – or limit – smoke condensation which would cause the boiler to deteriorate quickly.

The operating thermostat must be set to 75-80°C, and the ambient temperature regulated by means of a mixer valve.

The system must be operated so as to prevent the CH return to be less than 55°C, and particularly when the CH has connection to secondary circuits.

If the temperature drops to less than 55°C, acid condensate might corrode the heat exchanging surfaces. It is therefore very important to check the system efficiency.

IMPORTANT

Corrosion caused by condensate from the products of combustion is not covered by the warranty as it is due entirely to the way the system is operated.

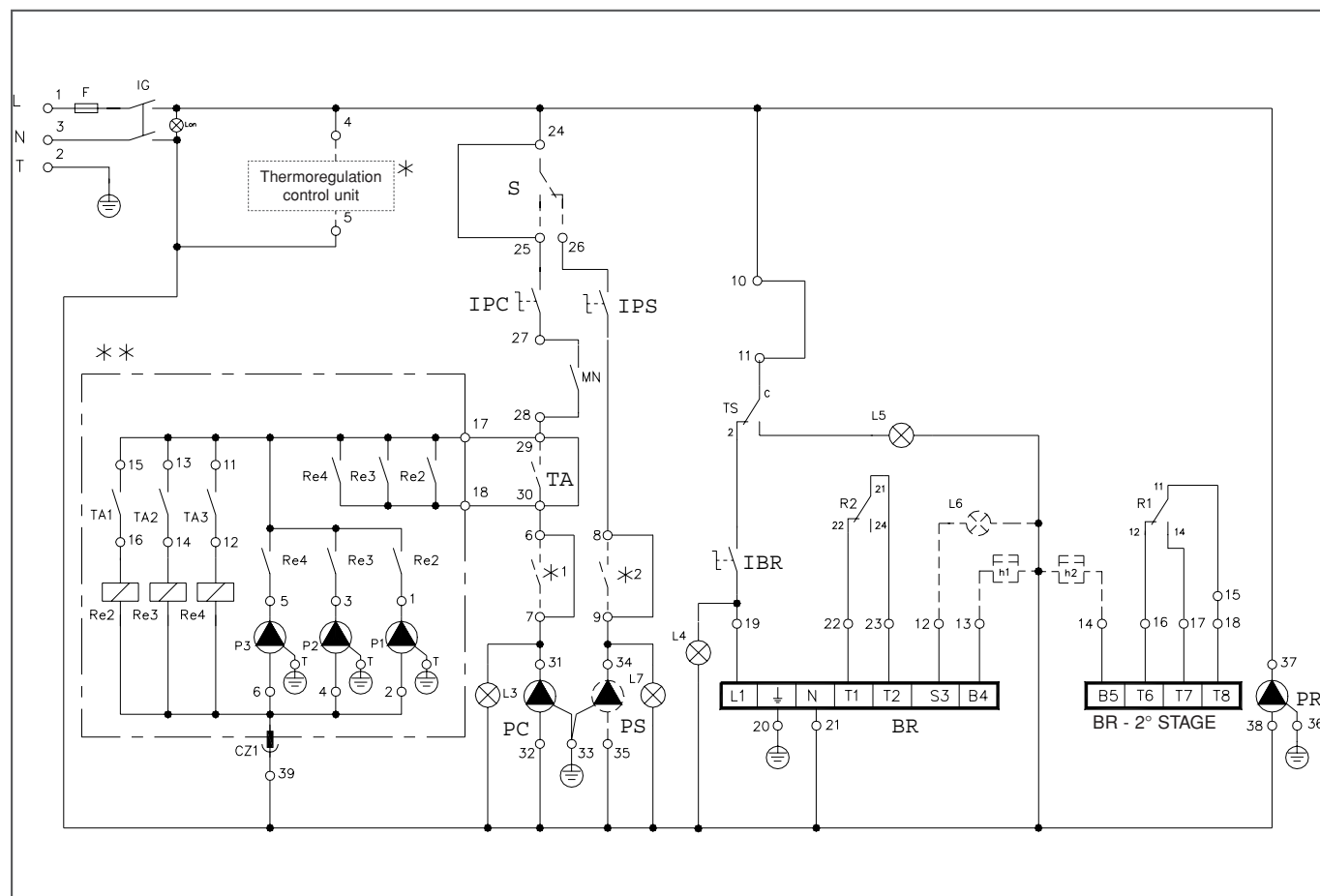
3.3.5 Switching off the boiler

How to switch off the boiler:

- Set the heating thermostat to the minimum value.
- Switch off the burner and cut off the fuel supply.
- Allow the pumps to operate until they are stopped by the thermostat.
- Switch off the electrical unit.

3.4 Wiring diagrams and indications for the plumbing system

3.4.1 General wiring layout - V-2 version



ELECTRICAL FEATURES

POWER SUPPLY: 230VAC +10% - 15%
 FREQUENCY: 50Hz
 MAX TOTAL CURRENT: 4(4) A

a =	light blue	gn =	green
bl =	dark blue	r =	red
bk =	black	v =	purple
br =	brown	y =	yellow
g =	grey	ygn =	yellow/green

IMPORTANT: If the sum of the currents for all the loads connected is greater than 4A (inductive), control one or more loads via contactors.

KEY CHART:

IG: Main switch
IPC: CH pump switch
IPS: DHW pump switch
IBR: Burner switch
L3: Main pump light
L4: Burner ON light
L5: Safety thermostat light
L6: Burner shutdown light (not supplied)
L7: DHW re-circulation pump light
TA: Room thermostat
R1: CH thermostat: 1st contact
R2: CH thermostat: 2nd contact
TS: Safety thermostat
F: F4A 250V fuse
BR: Burner

BR - 2° stadio: burner 2nd stage control

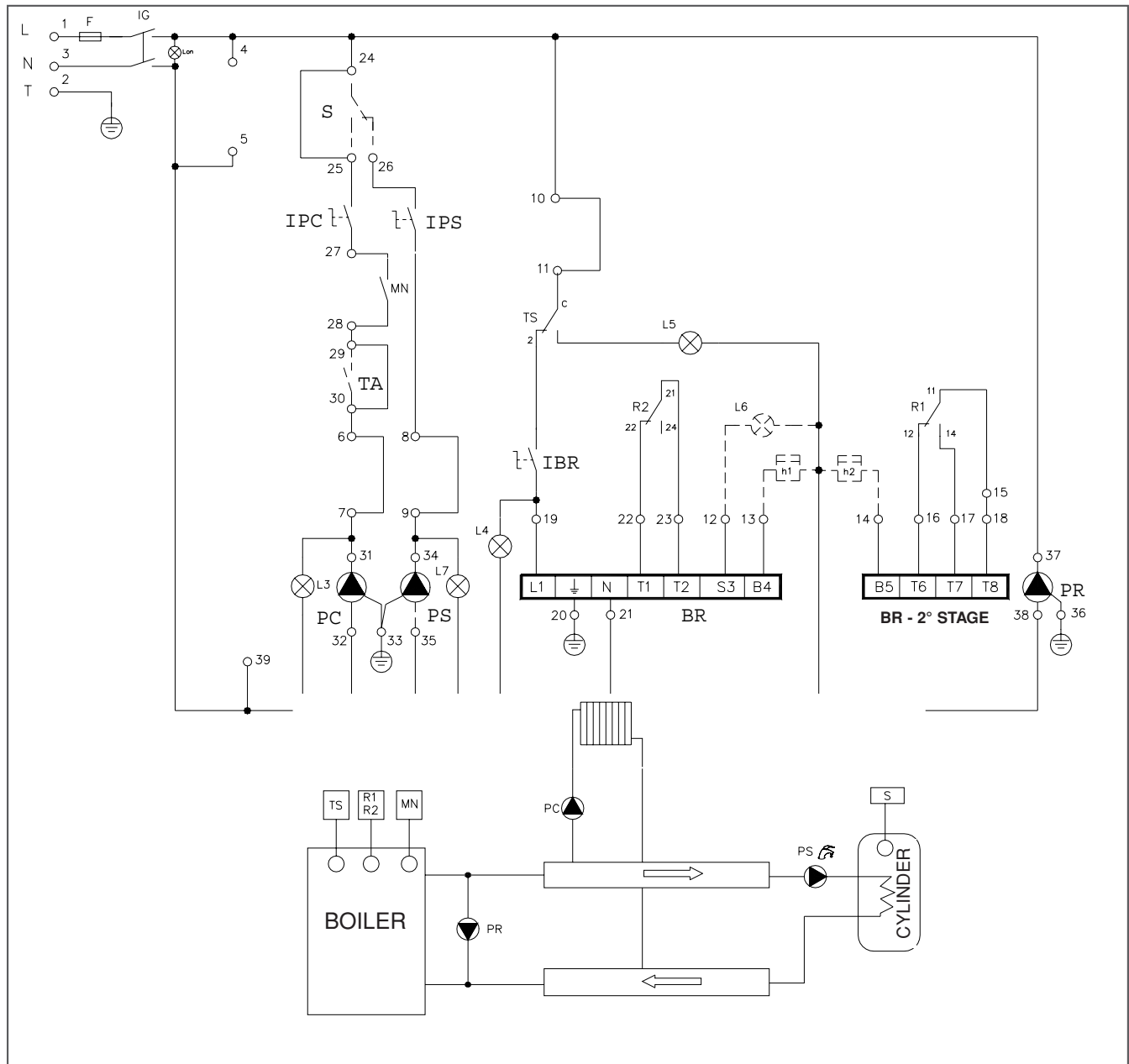
PC: CH pump
PS: DHW re-circulating pump
PR: Boiler re-circulating pump
P1: Zone 1 pump
P2: Zone 2 pump
P3: Zone 3 pump
TA1: Zone 1 room thermostat
TA2: Zone 2 room thermostat
TA3: Zone 3 room thermostat
S: DHW priority thermostat (not supplied)
h1: Burner 1st stage hour counter (not supplied)
h2: Burner 2nd stage hour counter (not supplied)

* Thermoregulation control unit and contacts (not supplied)

** Zone pump module (only for version P control panels)

3.4.2 Wiring layout for management of one high-temperature zone + water cylinder system

The following examples are solely intended as a practical indication in implementing the electrical and plumbing connections. They should not be considered as exhaustive description of a central heating system.

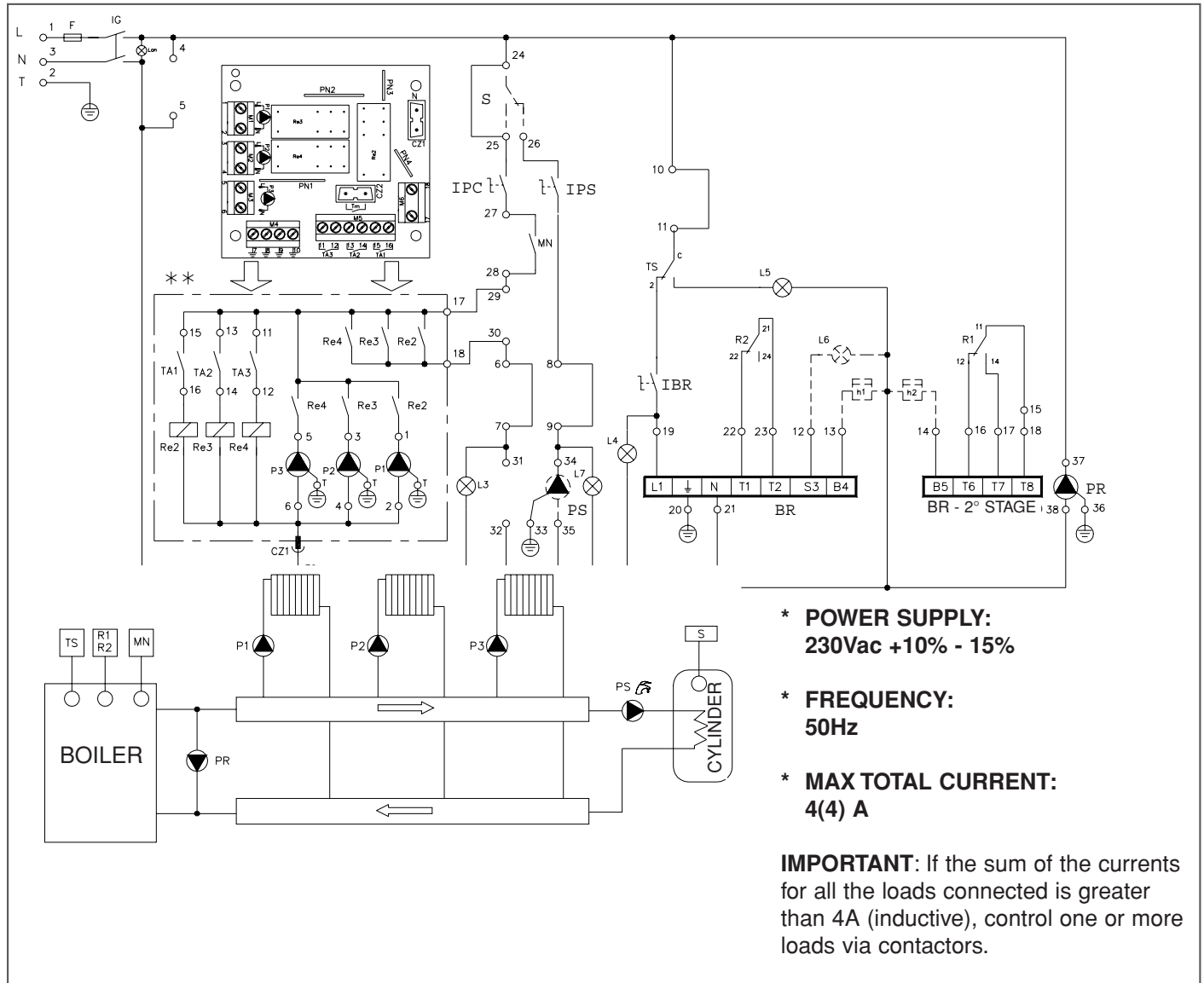


The control panel supplied as standard is designed for central heating and it can also host the following:

- * **room thermostat** (remove jumper and connect to no. 29 and no. 30 terminals);
- * **burner shutdown light** (connect to no. 12 and no. 21 terminals);
- * **burner 1st stage hour counter** (connect to no. 13 and no. 21 terminals);
- * **burner 2nd stage hour counter** (connect to no. 14 and no. 21 terminals);
- * **DHW priority thermostat** (remove jumper and connect to no. 24, no. 25 and no. 26 terminals)
In this case, thermostat (S) switches off CH pump (PC) and turns on water cylinder pump whenever there is a request of CH water to the water cylinder.
- * **DHW priority thermostat** (do not remove the jumper between no. 24 and no. 25 terminals and connect to no. 24 and no. 26 terminals)
In this case, thermostat (S) **DOES NOT** switch off CH pump (PC) and turns on water cylinder re-circulation pump (PS) whenever there is a request of CH water to the water cylinder.
- * **DHW re-circulation pump** (connect to no. 33, no. 34 and no. 35 terminals).

3.4.3 Wiring layout for management of three high-temperature zones + water cylinder system

The following examples are solely intended as a practical indication in implementing the electrical and plumbing connections. They should not be considered as exhaustive description of a central heating system.



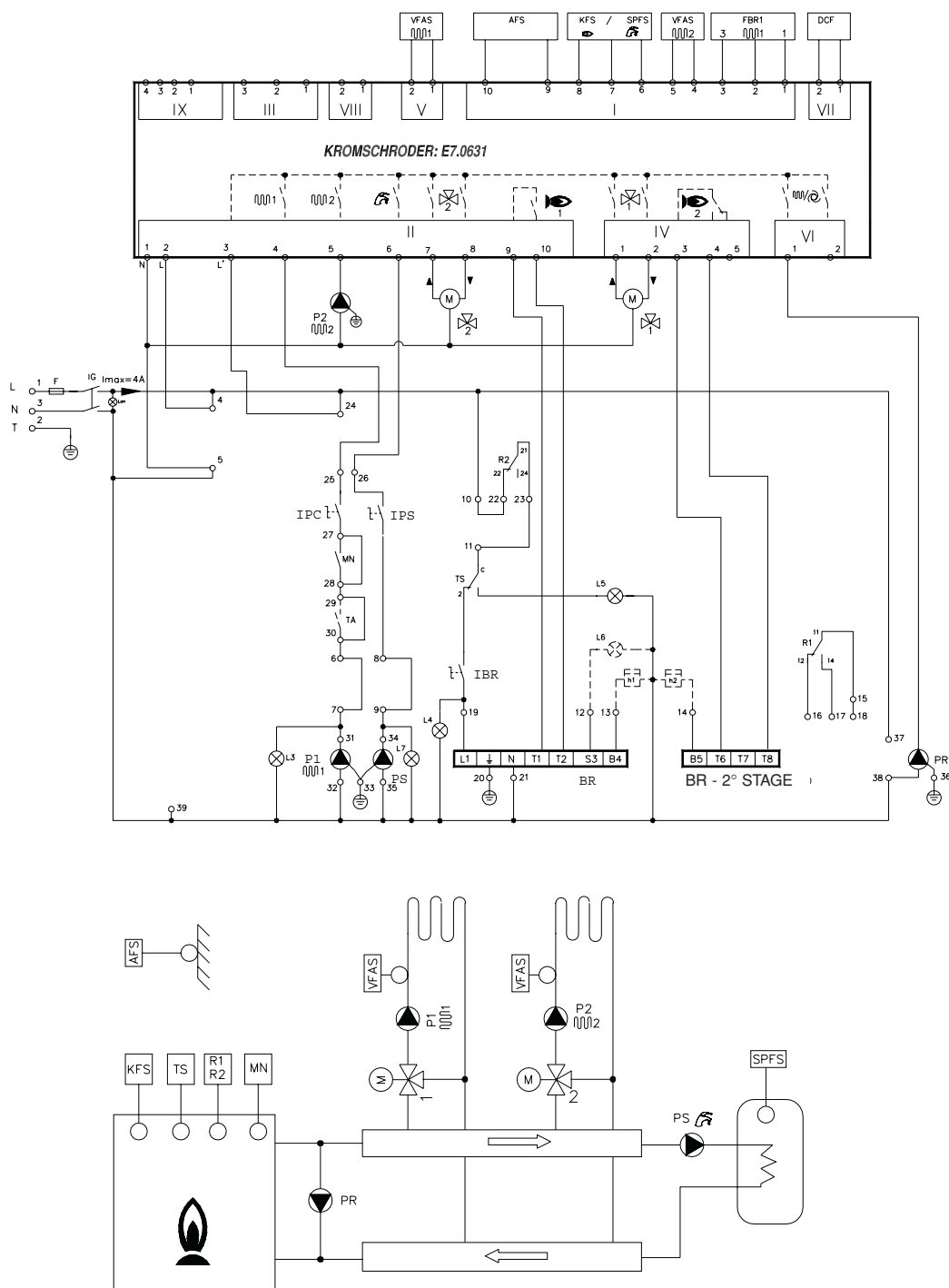
The control panel supplied as standard is designed for central heating and it can also host the following:

- * **burner shutdown light** (connect to no. 12 and no. 21 terminals);
- * **burner 1st stage hour counter** (connect to no. 13 and no. 21 terminals);
- * **burner 2nd stage hour counter** (connect to no. 14 and no. 21 terminals);
- * **DHW priority thermostat** (remove jumper and connect to no. 24, no. 25 and no. 26 terminals)
In this case, thermostat "S" switches off CH pumps P1, P2 and P3 and turns on water cylinder pump whenever there is a request of CH water to the water cylinder.
- * **DHW priority thermostat** (do not remove the jumper between no. 24 and no. 25 terminals and connect to no. 24 and no. 26 terminals)
In this case, thermostat (S) **DOES NOT** switch off CH pumps P1, P2 and P3 and it turns on water cylinder re-circulation pump (PS) whenever there is a request of CH water to the water cylinder.
- * **DHW re-circulation pump** (connect to no. 33, no. 34 and no. 35 terminals);
- * **module for zone pumps** (remove jumper and connect to no. 29 and no. 30 terminals) including
- * **thermostats and zone pumps:**
 1. **zone 1:** connect zone 1 thermostat (TA1) to no. 15 and no. 16 terminals on the module and connect zone 1 pump (P1) to no. 1 and no. 2 terminals.
 2. **zone 2:** connect zone 2 thermostat (TA2) to no. 13 and no. 14 terminals on the module and connect zone 2 pump (P2) to no. 3 and no. 4 terminals.
 3. **zone 3:** connect zone 3 thermostat (TA3) to no. 11 and no. 12 terminals on the module and connect zone 3 pump (P3) to no. 5 and no. 6 terminals.

Earth connections of zone pumps must be screwed onto the control panel metallic plate.

3.4.4 Wiring layout for management of thermoregulation control unit equipped boiler and two low-temperature zones + water cylinder system

The following examples are solely intended as a practical indication in implementing electrical and plumbing connections. They should not be considered as exhaustive description of a central heating system.

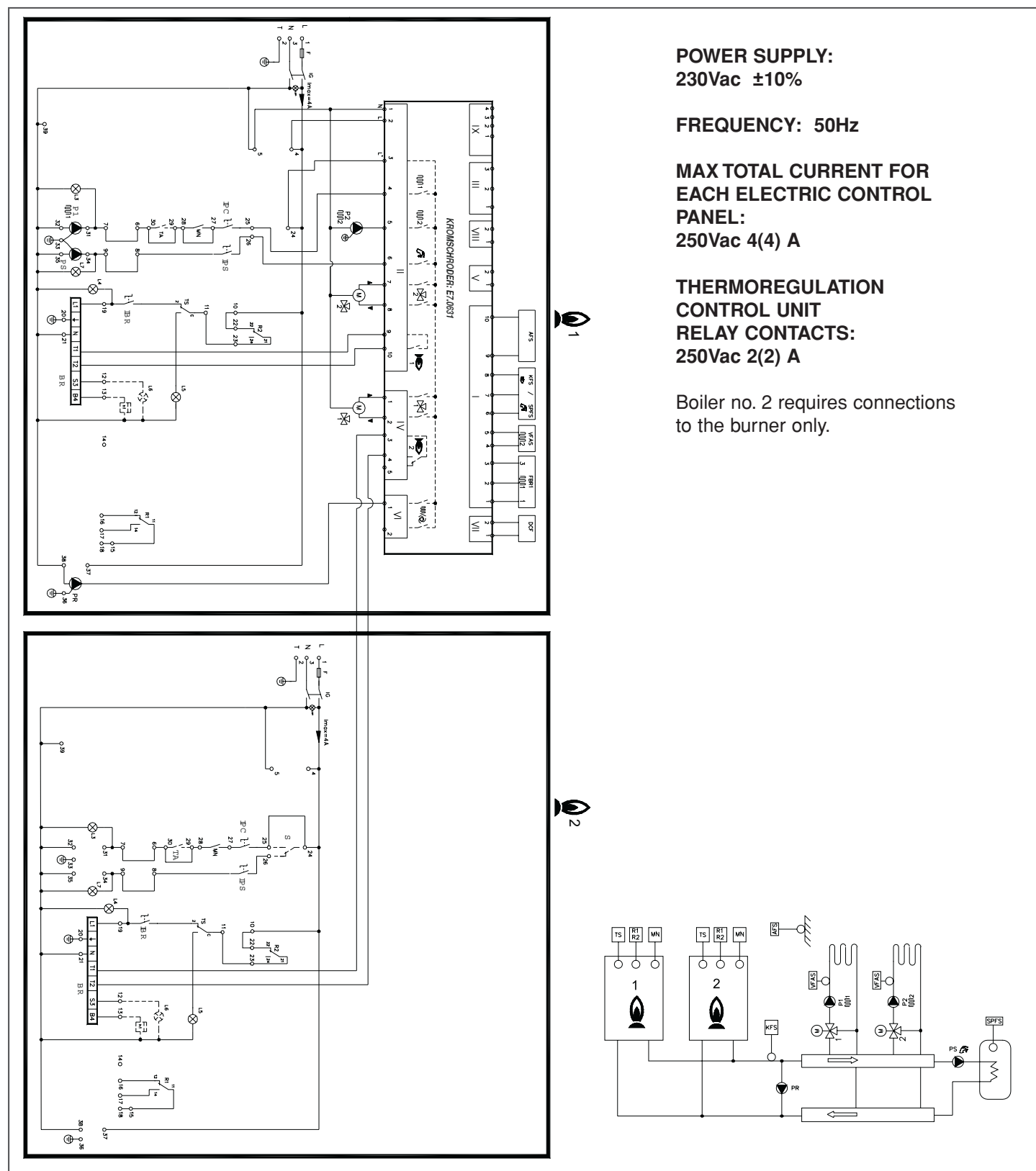


POWER SUPPLY: 230Vac $\pm 10\%$
FREQUENCY: 50Hz
MAX TOTAL CURRENT: 250Vac 4(4) A
THERMOREGULATION CONTROL UNIT RELAY CONTACTS: 250Vac 2(2) A

For more information on how to install the thermoregulation control unit, please refer to the instruction handbook supplied with our optional kit, code 0KITCEEL05.

3.4.5 Wiring layout with two boilers installed in cascade (one-stage burners only)

The following examples are solely intended as a practical indication in implementing electrical and plumbing connections. They should not be considered as exhaustive description of a central heating system.



A two boiler system can be implemented if both boilers are equipped with one-stage burners.

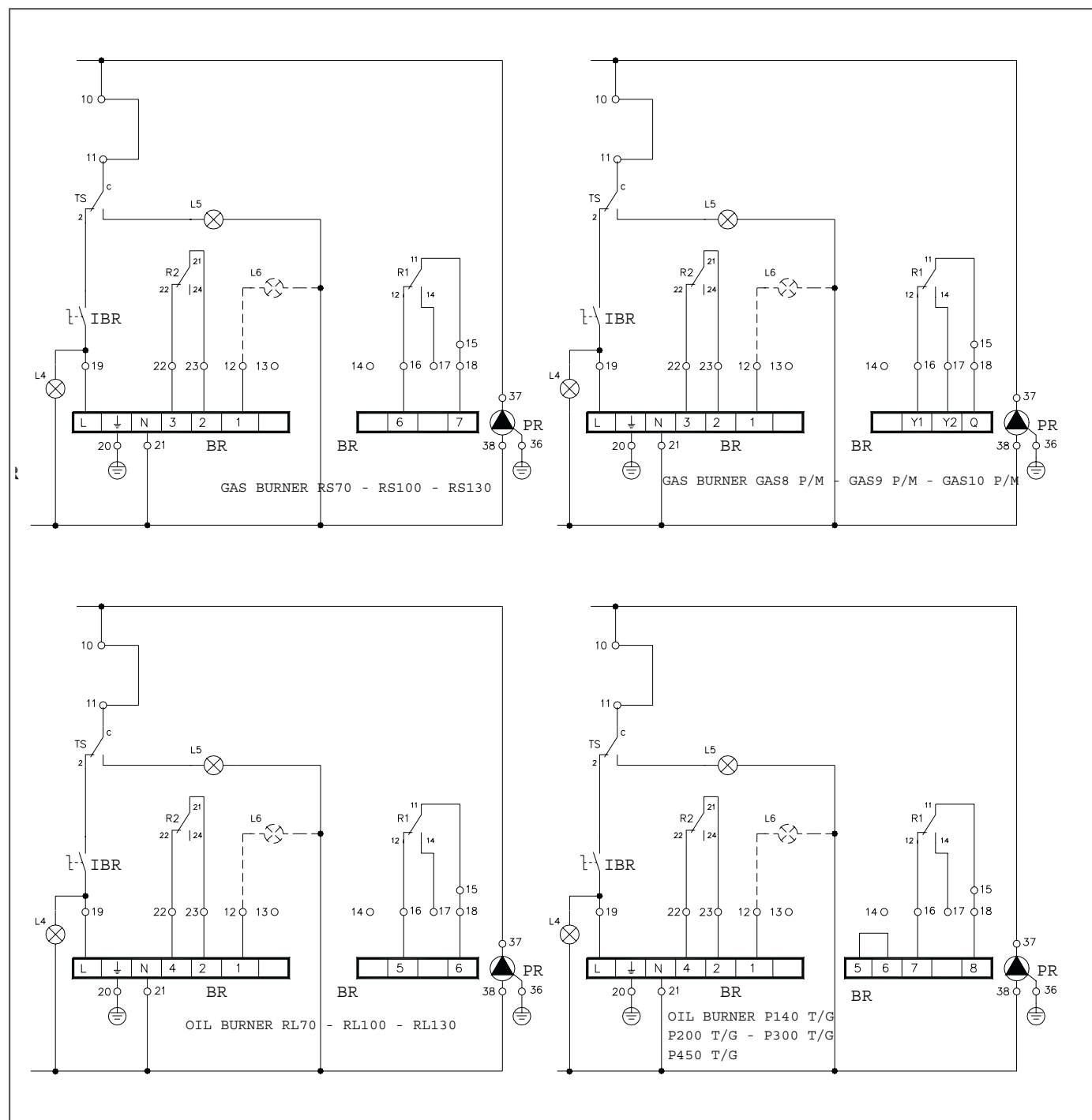
For more information on how to install the thermoregulation control unit managing a two boiler system, please refer to the instruction handbook supplied with our optional kit, code 0KITCEEL05.

KEY CHART (§ 3.4.4 and 3.4.5)

P1-P2:	Zone pumps
PS:	DHW re-circulation pump
M1-M2:	Motorized zone valves
PR:	Re-circulation pump
VFAS:	Flow probe
AFS:	External probe
KFS:	Boiler probe
SPFS:	Cylinder probe
TS:	Safety thermostat
R1:	1st stage regulation thermostat
R2:	2nd stage regulation thermostat
IPS:	DHW re-circulation pump switch
IBR:	Burner switch
L3:	Zone 1 pump “ON” light
L4:	Burner “ON” light
L5:	Overheating shutdown light
L6:	Burner shutdown light
L7:	DHW re-circulation pump “ON” light
h1:	Burner 1st stage hour counter
h2:	Burner 2nd stage hour counter
KROMSCHRODER E7.0631:	Manufacturer’s optional kit code 0KITCEEL05

For more information on how to install the thermoregulation control unit, please refer to the instruction hand-book supplied with our optional kit, code 0KITCEEL05.

3.4.6 Wiring connection diagrams to Fondital burners



4. Maintenance

In order to ensure that the boiler operates correctly and efficiently, it needs to be serviced periodically according to the following schedule.

All maintenance and repairs must be carried out by a properly qualified service engineer.

It is advisable for the boiler to be serviced and repaired by an authorised Service Centre, which can provide properly trained qualified personnel.

IMPORTANT

Before carrying out any maintenance involving the replacement of components or cleaning inside the boiler, and in particular before opening the furnace door at any time, it is important to take the following safety precautions:

- Switch off the oil or gas supply to the burner.
- Allow water in the system to cool, and then switch off the power supply.
- Place on the boiler a notice reading: **BOILER BEING SERVICED. DO NOT USE.**

Put on protective clothes, gloves, goggles and mask. Use a vacuum cleaner to remove the residue of combustion, which must be disposed of in special containers showing the contents.

IMPORTANT

Combustion residue is a highly polluting substance which must be properly disposed of.

Any valves in the plumbing circuits that have been closed must be indicated as such.

4.1 Routine maintenance

The operating conditions of the boiler vary considerably from case to case, according to the type of fuel, the burner regulation, the number of times the boiler is started up and the features of the system.

A set maintenance schedule cannot be established for all boilers. The service engineer must determine a suitable time interval on the basis of his observation of the general state of the boiler.

As a guide, it is advisable to clean the boiler as follows according to the type of fuel:

- **once a year for gas boilers;**
- **twice a year for oil boilers, or more frequently if necessary.**

Local maintenance rules must always be followed strictly.

It is good practice to shake the flue gas agitators – without removing them from the flue ducts, at least once every 15-20 days of operation to prevent them from getting clogged with combustion residue, which would be very difficult to remove. During routine maintenance, remove the flue gas agitators, and clean the tube nest and furnace with a brush and remove the residue through the doors in the smoke chamber.

Do not use flammable products, such as petrol or solvents, to clean the heat exchanger.

Make sure the control and measuring instruments on the boiler (thermostats, thermometers) and the system (hydrometers, flow meters, pressure switches, expansion vessels, power units and safety devices) are all in perfect working order. Measure the quantity of water required for topping up to help you determine when to apply a preventive descaler. This also depends on the hardness of the water.

Bear in mind that, with frequent topping up, the calcium and magnesium salts dissolved in raw water lead to deposits in the boiler preventing circulation and causing the metal to overheat. This causes the risk of serious damage, which cannot be attributed to the Manufacturer or to the material used or to the design of the boiler and therefore is **not covered by the warranty.**

During routine maintenance it is useful to drain the boiler from the bottom to check whether any sludge comes out, in which case, the boiler must be rinsed until the water comes out clear.

The system can now be filled with water.

When re-lighting the boiler after cleaning the smoke tubes, **check the seal of the burner door plate and the smoke chamber.**

Also check the refractory insulation on the furnace door. If there are any leaks, tighten the screws in the smoke chamber, and replace the sealing strip if necessary.

The same precaution shall involve the door. Loosen the counternuts, tighten the nuts, and replace the whole sealing strip if necessary.

If you need to centre the sealing strips on the counterplate of the door, the position of the door can be adjusted as well.

Check the seals of the flue port, burner and door. Replace if necessary.

All maintenance performed must be entered in the official booklet.

4.2 End-season maintenance or maintenance when the boiler is not used for a long time

Follow the instructions under routine maintenance and then proceed as follows:

- Check the flue gas agitators for wear and replace them if necessary. For models 1040-3500 boilers, a special tool is provided for removing the flue gas agitators.
- After cleaning the flue ducts, clean the inside of the pipes and furnace with a cloth soaked in a diluted solution of caustic soda.
- Allow the surfaces to dry, then rub with an oil-soaked cloth.
- Seal the air intake opening in the burner and the opening to the chimney to prevent the flow of moist air through the boiler.
- It is good practice to place some quicklime in a container inside the furnace to absorb any moisture.
- Do not empty the system or the boiler.
- Protect the screws, nuts and the hinges of the door with graphite grease.
- Take note of everything that needs to be done for the boiler next start-up. In particular, check operation of the recirculating pump.

4.3 Checking boiler performance

Check the following to ensure that the boiler runs efficiently and safely:

- the regulation thermostat
- the safety thermostat
- the minimum thermostat
- the recirculating pump
- the thermoregulator, if present.
- all the other safety and control devices required by standards applicable in the place of installation.

If the boiler is started up for the first time, check:

- declaration of conformity of the system;
- system booklet.

Also check:

- the suitability of the room where the boiler is installed;
- air vents in the room;
- flue exhaust pipes (diameter and length);
- correct installation of the boiler in compliance with the instructions in this manual.

Should the boiler not operate correctly and in the absence of hazard to persons, animals and property, notify the system supervisor and fill out a declaration indicating this fact.

4.4 Burner maintenance

For burner maintenance, follow the instructions in the burner manual.



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The producer reserves the right to make minor modifications to the products as required, without affecting the basic features.

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