# **ELBA**





# INSTALLATION, USE AND MAINTENANCE





## To the user

Thank you for choosing our boilers. Please read these installation and maintenance instructions with care.

Please note that the boiler must only be installed, repaired and serviced by qualified personnel.

#### General information for installers, service engineers and users

This INSTR UCTION MANU AL, which is an integral and indispensable part of the product, must be handed o ver to the user by the installer and must be kept in a safe place for future reference. The manual must accompany the boiler should it be sold or moved.

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

The boiler m ust be installed in compliance with applicab le la ws and standards and according to the man ufacturer's instructions given in this man ual. Incorrect installation may cause injury or damage, for which the manufacturer cannot be held liable.

Damage or injur y caused by incorrect installation or use or failure to observe the man ufacturer's instructions shall relieve FON-DITAL of all liability whether under a contract or not.

Before installing the boiler, check that the specification meets the requirements of the system in which it is to be installed.

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

Do not obstruct the air intak e or heat dissipation grates.

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

All the pac kaging materials can be recycled and should be sent to specific w aste management sites.

Keep the pac kaging out of the reach of children as it constitutes a serious hazard.

In the e vent of a malfunction, switch off the boiler immediately. Do not attempt to mak e any repairs and contact a qualified technician.

Original parts must be used for all repairs to the boiler. Failure to do this may jeopardize the saf ety of the boiler and create a ser ious hazard.

To guarantee efficiency and correct operation of the boiler, it is legally binding to service the boilers once a year according to the schedule indicated in the relevant section of this manual.

If the boiler is not used f or a certain length of time, switch off the electricity and fuel supply. Place some calcium carbonate inside the comb ustion chamber to absorb moisture.

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

#### **WARNING**

If there is a smell of gas , when using a gas-fired boiler , alw ays follow these rules.

- Do not turn operate any electrical switches or electrical appliances.
- Do not light any flames or smoke.
- Close the main gas tap.
- Open all doors and windows wide.
- Contact a Service Centre, a qualified installer or the gas supply company.

Never use a flame to detect a gas leak.

#### **IMPORTANT**

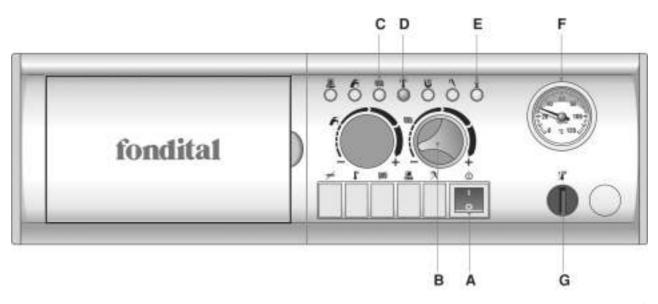
This ELBA boiler has been b uilt for installation only in the country indicated on the r ating plate. Installation in any other country may cause injury or damage.

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#### 1 Instructions for the user

#### 1.1 Control panel



pic.1

- A = Main switch with power light (green)
- B = Heating water temperature control
- C = Heating pump operating light (yellow)
- D = Overheating shutdown light (red)
- E = Burner light (green)
- F = Thermometer
- G = Safety thermostat with manual reset

# Main switch with power light (green) (A)

When the s witch is tur ned to position **0**, the boiler is off and the g reen po wer light is off. When the switch is in position **I**, the boiler is po wered on and the light on the switch is on.

## Heating water temperature control (B)

With this knob y ou can set the temperature of the heating water, range 42°C to 86°C.

# Heating pump operating light (yellow) (C)

When this light is on, it means that the system is in heating mode.

# Overheating shutdown light (red) (D)

When this light is on, it means the safety thermostat has cut in due to o verheating and needs to be reset manually.

### Burner light (yellow) (E)

This light indicates that the burner is in operation.

#### Thermometer (F)

The thermometer displays the temperature of the water in boiler.

## Safety thermostat with manual reset (G)

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

#### 1.2 How the boiler operates

#### 1.2.1 Switching on

- \* Open the fuel tap.
- \* Turn the boiler main s witch **A** to the ON position (the light comes on).
- \* Turn the heating water temperature control knob **B** to the required setting.
- \* Set the room temper ature value on the room thermostat.
- \* Light **C** is on when the heating system is in operation.
- \* Light **E** is on when the burner is in operation.

#### Warning

When starting gas boilers after a long period of inactivity, especially LPG-fired boilers, there may be air bubbles in the pipes. So, before switching the boiler on, turn on another gas appliance such as a cooker ring.

Even so, the boiler ma y not switch on once or twice. It is therefore necessar y to press the reset b utton (see par agraph below).

#### 1.2.2 Burner shutdown

If the boiler does not function correctly, the b urner cuts out automatically and the rele vant light comes on. It is necessary to proceed as follows:

\* Check the fuel supply . For gas

burners make sure the gas tap is open and gas is being supplied, for example by lighting a gas ring.

\* Press the burner reset button. If the boiler does not star t up after two attempts, contact an author i-

sed Service Centre or a qualified

servicer.

If the b urner cuts out frequently , this means there is a recurr ing malfunction, so contact a qualified servicer or an author ised Service Centre.

# 1.2.3 Shutdown due to overheating

If the red light **D** comes on due to overheating, it means the saf ety thermostat has cut in due to a recurrent malfunction. Contact an authorised Ser vice Centre or a qualified servicer.

#### 1.3 Maintenance

It is a legal requirement to ha ve the boiler and the burner serviced once a year.

If the boiler is serviced regularly, it will optimise efficiency, safeguard the en vironment and not cause damage or injury.

The boiler m ust be ser viced by qualified personnel.

The user may only clean the exterior jacket of the boiler, using a suitable cleaning product.

Do not use water!

#### 1.4 Information for the user

The user only has access to parts of the boiler which can be reached without the need for specific tools. The user must never remove the outer covering of the boiler or tamper with the parts inside.

NO ONE IS AUTHORISED TO MODIFY THE BOILER IN ANY WAY, NOT EVEN QUALIFIED TECHNICIANS.

Qualified technicians are author ised to install specific original spares on the boiler.

FONDITAL declines all liability for injury or damage resulting from attempts to tamper with the boiler or incorrect operation.

The heating system can be protected against freezing by using a specific anti-freeze for multi-metal systems. Do not use car engine anti-freeze products. Check the level and quality of the anti-freeze regularly.

The boiler has a thermometer displaying the water temperature.

#### 2 Technical features and dimensions

#### 2.1 Technical features

#### **ELBA**

is a floor-standing gas or oil boiler with a cast iron heat e xchanger with 3 smok e passes, working with oil or gas blown-air b urners. The following models are available:

ELBA 23 with 24 kW heat output ELBA 33 with 33 kW heat output ELBA 43 with 43.6 kW heat output ELBA 53 with 53 kW heat output ELBA 63 with 63 kW heat output ELBA 73 with 74.5 kW heat output

**ELBA** boilers comply with the basic requirements of the following EEC directives:

Gas Directiv e 90/396/EEC of 29 June 1990

Thermal Efficiency Directive 92/42 EEC of 21 May 1992

EMC Directive 89/336/EEC of 3 May 1989 amended by Directive 92/31/EEC of 28 April 1992 European Community's Low Voltage Directive 73/23/EEC of 19 February 1973 amended by Directive 93/68/EEC of 22 July 1993

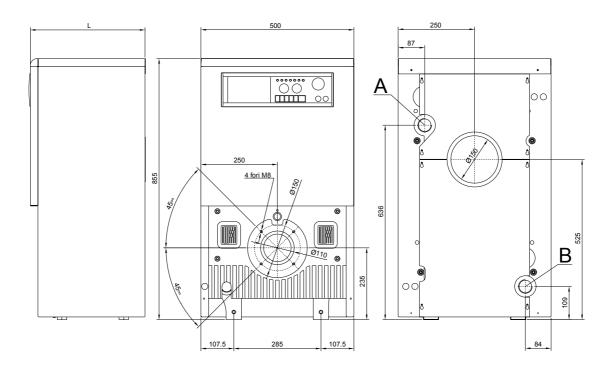
and are fitted with all the safety features required under the applicable laws.

The main technical f eatures of **ELBA** boilers are listed below.

- \* High-efficiency cast iron heat exchanger with 3 smok e passes
- \* Extra thick glass wool insulation (50 mm) with aluminium craft
- \* Epoxy-coated zinc-plated metal iacket
- \* Lighted main switch
- \* Lights indicating power on, hea-

- ting pump on, b urner on, and overheating shutdown
- \* Heating temper ature control (42-86°C)
- \* Saf ety thermostat (110°C)
- Wiring system with pr inted circuit
- \* Designed for electrical connection to a heating pump
- Designed for electrical connection to a low water level pressure switch
- Designed f or connection to a remote D .H.W. storage tank control board (optional kit)
- Designed f or connection to a climate control unit (optional kit)
- Designed f or connection to a control board for managing up to three heating areas (optional kit)
- \* Ther mometer
- \* Dr ain cock

## 2.2 Dimensions



pic. 2

MODEL	L	Flow A	Return B
23	375	1" 1/4	1" 1/4
33	485	1" 1/4	1" 1/4
43	595	1" 1/4	1" 1/4
53	695	1" 1/4	1" 1/4
63	795	1" 1/4	1" 1/4
73	895	1" 1/4	1" 1/4

## 2.3 Technical characteristics

	Model						
		23	33	43	53	63	73
Class of efficiency EC		☆	কক	क्रेक्र	কক	ኔ ተ	क्रक
Max. heat output	kW	24,0	33,0	43,6	53,0	63,0	74,5
Min. heat output	kW	20,0	28,0	36,0	46,0	55,0	64,0
Heat input	kW	27,0	36,5	47,9	57,9	68,4	80,5
Efficiency at P.N.	88,8	90,5	90,9	91,4	92	92,5	
Efficiency at 30% of capacity	%	89,9	91,4	91,7	92	92,5	92,8
Holding loss at $\Delta t = 50^{\circ}$	%	1,8	1,4	1,1	0,8	0,7	0,5
No. of elements		3	4	5	6	7	8
Net weight	kg	121	150	177	202	230	259
Water content		14,6	18,2	21,8	25,4	29	32,6
Min. flow rate	l/h	680	950	1230	1520	1800	2150
Load loss on water side Δt=10°C	Pa	4800	5600	6000	7100	10000	11200
Operating pressure	bar	4	4	4	4	4	4
Length of combustion chamber	mm	238	344	450	556	662	768
Volume of combustion chamber	dm³	14,91	22,37	29,83	37,29	44,75	52,21
Flue gas temperature	°C	215	190	187	184	175	170
Flue gas flow rate	kg/h	40	53,2	69,3	83,1	97,7	114,5
Load loss on flue side, PN	Pa	8	22	30	32	45	60
Volume on flue gas side	dm³	21,83	31,82	41,72	51,66	61,5	71,52
Flue Ø	mm	150	150	150	150	150	150
Max. burner hole Ø	mm	110	110	110	110	110	110
Ø of M8 burner holes	mm	150	150	150	150	150	150
Working temperature	°C	42-86	42-86	42-86	42-86	42-86	42-86
Voltage/frequency	V/Hz	230/50	230/50	230/50	230/50	230/50	230/50
Mains fuse	Α	4	4	4	4	4	4

## Recommended nozzles for blown-air oil burners

Producer	Delavan W – Steinen Q – Danfoss S						
Flow rate	Usgal/h	0,65	0,75	1,00	1,10	1,35	1,65
Angle/cone		60° W		60° B			

#### Note

The installation of blown-air burners, according to the standards in force (EC marking as per Directives: CEE/73/23 – CEE/89/336; EN267 regulation), must be done respecting the b urner manufacturer instructions and making a b urner adjusting which per mits to have CO2 values (as indicated below).

Fuel		% CO₂
Natural gas	G20	9÷9,7
Natural gas	G25	8,8÷9,5
Butane gas	G30	10,7÷11,6
Propane gas	G31	10,5÷11,4
Gas oil		12,5÷13

#### 3 Instructions for the installer

#### 3.1 Installation standard

The ELBA boiler must be installed in compliance with current laws and standards which are considered an integral part of this handbook.

#### 3.2 Installation

#### 3.2.1 Packaging

The ELBA boiler comes packed in a sturdy cardboard bo x on a wooden pallet. Take the boiler out of the box and check that it is intact. All the pac kaging materials can be recycled and should be sent to specific waste management sites.

Keep the packaging out of the reach of children as it is a source of hazard.

FONDITAL declines all liability for damage or injury resulting from failure to follow this rule.

Inside the box is a bag containing the handbook f or the installation, use and maintenance.

#### 3.2.2 Choosing where to install the boiler

Rules to bear in mind when choosing the place:

- It is advisable to leave at least 50 cm on either side of the boiler f or easy access f maintenance.
- Do not install the boiler an vwhere that is wet or dusty.
- The boiler must not be accessible to animals, children or anyone else.

#### 3.2.3 Installing the boiler

Before connecting the boiler to the tap water and heating system pipes, carefully clean the pipes to remove all traces of metal resulting from processing and welding operations as well as an y oil and g rease which could damage the boiler or jeopardize its operation.

N.B. Do not use solvents which could damage the components.

FONDITAL declines all liability for damage or injur y resulting from failure to follow the above rules. Proceed as f ollows to install the

- Remove the rear lo wer metal panel.
- Unscrew the f our scre ws securing the brackets of the boiler to the pallet (pic. 3).
- Pass belts or cables underneath the boiler and round the legs, lift it off the pallet and place it in position on the g Attention: when lifting the boiler from the pallet, keep it for avoiding it from turning over (pic. 4).
- If the boiler needs to be stabilised, inser t shims betw een the floor and the boiler leas.
- Connect the boiler to the intak e and outlet pipes.
- Remember that the plumbing system must be fitted with all the necessary saf ety and control systems specified by law (safety valve, water pressure switch, hot water discharge v alve, pressure gauge, etc.).

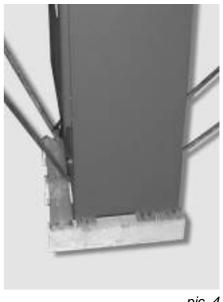


pic. 3

- Connect the boiler to the chimnev.
- If there is an ambient ther mostat, heating pump or hot water pressure switch, connect to the wiring system.
- Connect to the mains supply.

#### **Important**

Leave at least 10 cm between the boiler and the wall behind it to allow removal of the upper panel.



pic. 4

#### 3.2.4 Ventilation

**ELBA** boilers ha ve an open combustion chamber and are designed f or connection to a chimney. The combustion air is taken directly from the room in which the boiler is installed. The boiler must be installed in a suitable room pursuant to applicable standards and laws, which are considered an integral part of this handbook.

3.2.5 Flue gas discharge system ELBA boilers have a flue gas discharge pipe designed for connection to a 150 mm Ø duct. As regards flue gas emission into the atmosphere, it is mandator y to comply with the applicable standards and la which are considered an integral part of this handbook.

The ducts from the boiler must be connected to a chimne y in compliance with the applicab le standards and la ws, which are considered an integral part of this handbook.

Below is a list of legal require-

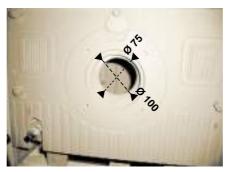
ments for chimneys and ducts.

- \* The diameter must not be less than the diameter of the boiler discharge outlet. For square or rectangular chimneys, the inside cross section m ust be 10% greater than that of the boiler fitting.
- \* The mater ial used m ust be waterproof and resistant to the flue gas temper atures and acid condensate.
- \* Mandator y f eatures are lo w thermal conductivity, adequate mechanical resistance, perf ect seal and carefully calculated height and cross section.
- \* The chimney must be as vertical as possible, and have a constant cross section and no throttling.
- \* The final section m ust allo w efficient emission of the flue gas under all atmospher ic conditions.
- \* The final section m ust protrude at least 50 cm abo ve an y adjacent structure within a fiv emetre radius.

# 3.2.6 Choosing and installing the burner

When choosing a burner for the boiler, mak e sure the f eatures are compatible with the rated features of the boiler . The burner must be fix ed into the front panel of the boiler using f screws. The panel comes with four M8 threaded holes on a 150 mm diameter circumf erence. If the burner uses a different fixing method, an adapter needs to be used. The maximum diameter of the burner head is 108 mm. The standard insulation hole is about 75 mm. If the burner head has a larger diameter. widen the hole in the insulation. If it is smaller, add extra insulation to protect the b urner from the flame (pic. 5).

The boiler is equipped with a universal se ven-pole plug f or the electr ic connection of the burner (pic. 6).



pic. 5

# 3.2.7 Measuring combustion efficiency

Proceed as follows to determine combustion efficiency:

- \* Measure the comb ustion air temperature.
- Measure the flue gas temper ature and percentage of CO 2 through the hole in the flue gas duct.

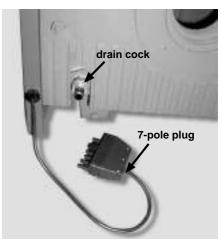
Take the readings when the boiler is running at a steady state.

# 3.2.8 Connecting to the gas mains (for boilers with gas burners)

The cross section of the gas supply pipe must be equal to or greater than that of the burner.

Comply with the applicable standards and laws on boiler installation, which are considered an integral part of this handbook.

Perform a gas tightness test before starting up an indoor gas supply system and connecting to the meter.



pic. 6

If the system has any concealed parts, the tightness test must be carried out before covering the pipes. The tightness test must not be carried out with combustible gas. Use air or nitrogen.

When there is gas in the pipes, never use a naked flame to detect gas leaks. Use a suitable product available from the trade.

# 3.2.9 Connecting to the fuel oil supply system (for boilers with a fuel oil burner)

The fuel oil supply pipeline must be perfectly watertight. In particular, there m ust be no infiltr ation of air along the pipe leading from the tank. It is advisable to supply the b urners using two o pipes, from tanks positioned at a height of +4 metres (b y gravity) to -5 metres (b y suction). For higher values, it is necessar y to install a pressure reducer or an auxiliary pump, respectively. With tanks oper ating by gravity or fuel oil systems ha ving an auxiliary pump, it is mandator y to fit an additional shutoff solenoid valve that closes automatically when the b urner switches off automatically.

If the boiler is installed in a particularly cold area, use fuel oil with a low par affin content. If necessary, fit the burner with a fuel oil pre-heating system.

It is also advisable to install a filter for oil.

3.2.10 Connecting to the power mains (pic. 7, 8, 9, 10) ELBA boilers are supplied with a terminal for connecting a three-wire mains lead, and a cable clip to pre vent it from being tor n away.

The boiler must be connected to a **230V-50Hz** power mains. Make sure the positiv e, negative and neutral wires are connected properly.

Comply with the applicable standards and laws on boiler installation, which are considered an integral part of this handbook.

A bipolar s witch m ust be fitted upstream of the boiler so that maintenance oper ations can be carried out safely.

The boiler mains supply must be protected by a differential magnetothermal switch with appropriate breaking power.

The mains power supply must be properly ear thed. This basic safety requirement is mandatory. In case of doubt, have the wiring thoroughly checked by a professionally qualified electrician.

FONDITAL declines all liability for damage or injury resulting from failure to earth the system properly. Gas, hot water or heating system piping is not suitable for earthing.



pic. 7

#### 3.2.11 Plumbing

Before installing the boiler, it is important to clean the system thoroughly. This is to remo ve all impurities and particles from the components, which could damage the pump or heat exchanger.

The heating system delivery and return pipes m ust be connected to the relevant G1 1/4" fittings on the boiler.

When choosing the siz e of the pipes for the heating system, it is important to take account of load losses caused by radiators, any thermostat valves, radiator stop valves and the actual configur ation of the system.

#### 3.2.12 Fondital kits

**FONDITAL** supplies original kits for installing the timer, the remote boiler control board and the temperature control. These kits must be installed following the accompanying instructions.

#### 3.3 Filling the system

After completion of all the system connections, the heating circuit can be filled with water.

This must be done with care as follows:

- Open the radiator air vents and check the relief v alve on the hydraulic system.
- Gradually open the w ater inlet tap and chec k that the relief valves in the system, if there are an y, are w orking properly.
- Close the r adiator air v ents as soon as w ater star ts to come out.
- Check on the pressure gauge installed on the h ydraulic system that the v alue is 0.8-1 bar.
- -Turn off the water inlet tap and then release the air again through the radiator air vents.
- -After s witching on the boiler and after the system has reached the correct temper ature, stop the pump and repeat the air relief operations.
- -Allow the system to cool do wn and then set the water pressure to 0.8-1 bar.

#### WARNING

In domestic heating systems, it is essential to treat the water using specific products that are compatible with multimetal systems. This is to optimise efficiency and safety, keep the system in good working order, ensure that ancillar yequipment continues to function efficiently, and minimise energy consumption in line with current legal requirements.

NOTE: The boiler is equipped with a drain cock, located in the front, which can be used for emptying the system (pic. 6).

#### 3.4 Starting up the boiler

#### 3.4.1 Preliminary checks

Before starting up the boiler, it is good practice to carr y out the following checks.

 Make sure the flue gas pipe has been installed according to the instructions. When the boiler is running there must be no leakage of combustion products from any of the seals.

- The supply v oltage m ust be 230 V- 50 Hz.
- The system m ust be full of water (h ydrometer pressure 0.8-1 bar).
- The cut-off v alves on the system pipes must be open.
- The fuel supply cock must by open.
- Check for any oil or gas leaks.
- Check that the main s witch has been turned on.
- Check the boiler safety valve.
- Check for water leaks.

### 3.4.2 Switching on and off

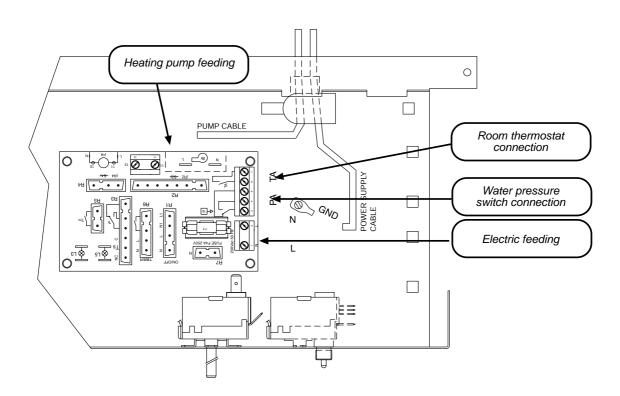
Refer to the **User Instructions** for switching the boiler on and off.

#### 3.4.3 Regulating thermal power

The ther mal power of the burner must be regulated according to the boiler and heating system specifications.

### 3.5 Wiring diagrams

#### 3.5.1 Connections



### 3.5.2 General layout

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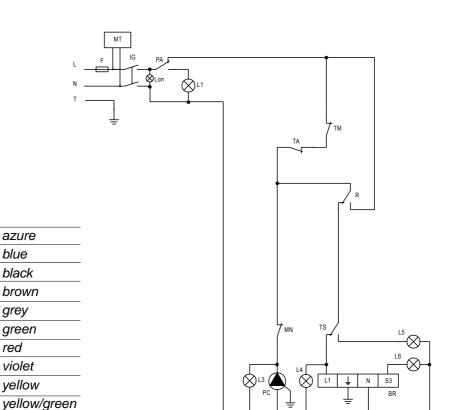
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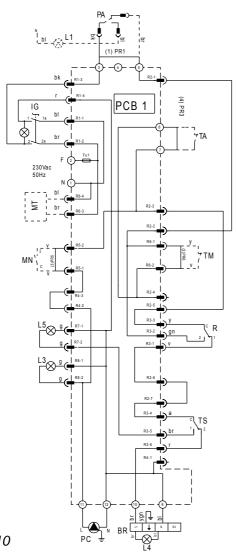
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pic. 9

#### 3.5.3 Topographical layout



azure

blue

black

brown

grey

green red

violet

yellow

### Key to symbols

IG: Main switch [on the printed circuit it is indicated with "on/off"]

Low water light (optional) L1:

L3: Heating pump light

Burner light L4:

L5: Overheating light

L6: Burner stop light (optional)

MT: Programming clock motor (optional)

[on the printed circuit it is indicated with TIMER]

TM: Programming clock contact (optional) [on the printed circuit it is indicated with TIMER]

Water pressure switch PA:

[on the pr inted circuit it is indicated with the w ater presure s witch

symbol

Minimum temperature thermostat (optional) MN:

[on the printed circuit it is indicated with Tm]

TA: Room thermostat

R: Heating thermostat [on the printed circuit it is indicated with Tr]

Safety thermostat TS:

Fu1: Safety fuse type F4A 250V

BR: Burner

PC: Heating system circulating pump PCB1: Heating system printed circuit

(1) PR1: Remove jumper and connect PA

(2) PR6: Remove jumper and connect TM

(3) PR5: Remove jumper and connect MN

(4) PR3: Remove jumper and connect TA

#### 4 Maintenance

To ensure that the boiler continues to run efficiently, it must be serviced once a y ear as specified below.

### Maintenance or repairs must be performed by qualified personnel.

For maintenance and repairs , users are advised to contact a qualified technician or a Service Centre where the personnel is specifically trained for the purpose.

Before replacing any components or cleaning the inside of the boiler, turn off the main switch.

#### **Maintenance schedule**

Routine maintenance should include the following functional checks:

- general conditions of the boiler
- tightness of the system supplying gas or oil to the boiler
- boiler ignition
- boiler comb ustion par ameters

through flue gas analysis . Individually-installed boilers need to be chec ked once every two years, cascade boilers need to be chec ked once a year.

- condition and tightness of the flue gas pipes
- condition of all the boiler safety devices
- water tightness and scaling of the boiler connections
- efficiency of the system safety valve

# and the following cleaning operations:

(with the boiler cold)

- the boiler as a whole
- the burner: this may also need to be reset according to the manufacturer's instructions (see combustion check)
- boiler room ventilation grille
- flue gas side of the heat exchanger. Use a br ush or suction device to remo ve soot deposits from the w alls and heat exchange fins
- . Alternatively, specific chemical products can be used provided that the man ufacturer's instructions are followed carefully.

# Do not clean the heat exchanger with flammable products such as petrol or solvent.

When remounting the front panels, check the state of the seals and replace them if necessary.

### Before acting on the boiler for the first time, check the existence of the following:

 heating system documents and/or cer tificates complying with the applicab le la ws (if any) issued by the installer

#### Also check that:

- the room where the boiler is installed is suitable for the purpose.
- the room is adequately ventilated.
- flue gas pipes are the right diameters and lengths.
- the boiler has been installed correctly in compliance with the instructions in this manual.

If the boiler does not function correctly or there is a hazard to persons, animals or property, notify the supervisor and write a report specifying details.



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The producer reserves the right to modify the data contained herein at any time without notice.

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