

NIAS DUAL

BTFS 24 - BTFS 28 - BTFS 32

GB



INSTALLATION USE AND MAINTENANCE



Dear Customer,

Thank you for choosing and buying one of our boilers. Please read these instructions carefully in order to install, operate, and maintain this equipment properly.

Manufacturer recommends Customers to contact authorized qualified personnel only for any maintenance and repair operations.

General information for the installer, maintenance technicians and users

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

This boiler must be used for the purposes for which it has been intended. 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 and/or injury caused by incorrect installation or use and/or damage and/or injury due to non-observance of the manufacturer's instructions shall relieve the manufacturer from any and all contractual and/or extra-contractual liability.

Before installing the boiler, check the technical data to be compatible with the requirements for its operation in the system.

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

Do not obstruct the air suction and/or heat dissipation openings. Only manufacturer-approved accessories or optional kits are to be installed.

Properly dispose of the packaging 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 by its nature it may represent a hazard.

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

Manufacturer-approved parts must be used for all repairs to the boiler.

Non-observance of the above requirements may affect the safety of the boiler and endanger people, animals and property.

In order to guarantee efficient and correct functioning of the equipment it is legally binding to have the boiler serviced once a year, according to the schedule specified in the relevant section of this manual.

In the event of long periods of inactivity of the boiler, disconnect it from power mains and close the gas tap. **Warning! Should power mains and gas be disconnected, boiler electronic anti-freezing function will not be operative.**

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

IMPORTANT

Should gas smell be perceived:

- 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 doors and windows;
- contact a Service Centre, a qualified installer or the gas supply company.

Never use a flame to detect gas leaks

WARNING

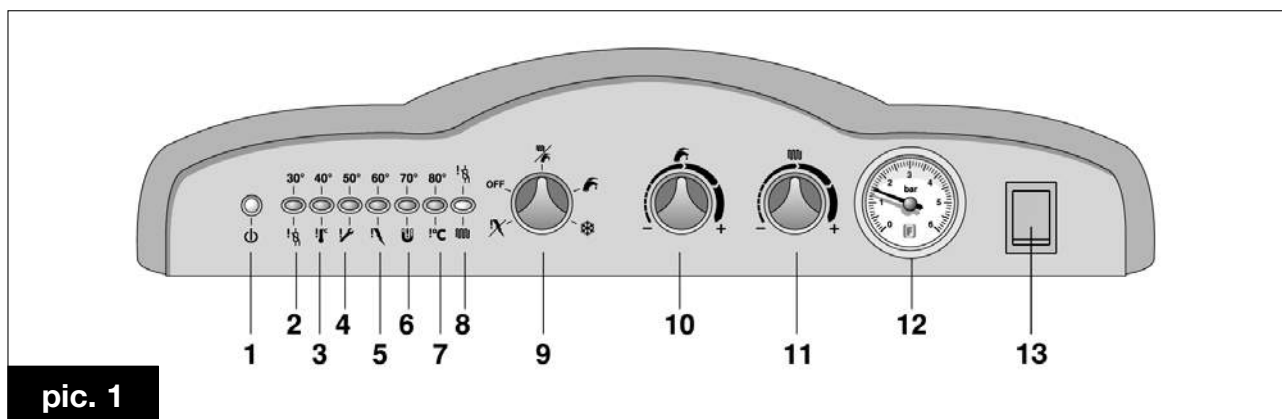
This boiler has been built for installation in the country indicated on the technical data plate: installation in any other country may be source of danger for people, animals and property.

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1. Instructions for the user

1.1. Control panel



1. Power mains connection light (green)

The light indicates that electric power is being supplied to the boiler.

2. Indication light (red)

When the light is on and fixed, it indicates that the temperature of the water in the heating system is between 25°C and 35°C. When the light is flashing, it indicates that the boiler has shut down due to a malfunction.

3. Indication light (red)

When the light is on and fixed, it indicates that the temperature of the water in the heating system is between 36°C and 45°C. When the light is flashing, it indicates that the boiler has shut down due to a malfunction.

4. Indication light (red)

When the light is on and fixed, it indicates that the temperature of the water in the heating system is between 46°C and 55°C. When the light is flashing, it indicates an air/flue gas system malfunction.

5. Indication light (red)

When the light is on and fixed, it indicates that the temperature of the water in the heating system is between 56°C and 65°C. When the light is flashing, it indicates that the boiler has shut down due to a malfunction.

6. Indication light (red)

When the light is on and fixed, it indicates that the temperature of the water in the heating system is between 66°C and 75°C. When the light is flashing, it indicates that water pressure in the boiler is too low.

7. Indication light (red)

When the light is on and fixed, it indicates that the temperature of the water in the heating system is between 76°C and 85°C. When the light is flashing, it indicates that CH water temperature is above 90°C.

8. Indication light (green)

When the light is on and fixed, it indicates that the boiler is operating in central heating mode. When the light is flashing, it indicates that the boiler has shut down due to a malfunction.

9. Boiler operation mode / reset knob

When the knob is set to the "OFF" position, the boiler is in stand-by mode.
When the knob is set to the "summer" position, the boiler supplies DHW only.
When the knob is set to the "winter" position, the boiler supplies both CH and DHW.
When the knob is set to the "anti-freezing" position, only the boiler anti-freezing function is active.
When the knob is turned to the "reset" position and back, the boiler resumes operation after burner shutdown.

10. DHW temperature knob

The knob sets DHW temperature between a minimum of 35°C and a maximum 57°C.

WARNING

DHW temperature supplied by the boiler depends on the positioning of the knob, and is also determined by the amount of water requested by the user and the temperature of water mains.

11. CH water temperature knob

The knob adjusts CH water temperature between a minimum of 35°C and a maximum 78°C.

12. Water pressure gauge

It shows water pressure in the heating system.

13. AQUA PREMIUM switch

The switch turns AQUA PREMIUM system ON or OFF. When set to the ON position, the water tank is operating and the boiler supplies DHW through AQUA PREMIUM system. When set to the OFF position, the water tank is inactive and the boiler supplies instantaneous DHW.

1.2. Operating the boiler

1.2.1. Switching on

- Open the gas stop cock
- Connect power mains to the boiler (no. 1 light on control panel turns on)
- Choose boiler mode by setting no. 9 knob (pic. 1)
- Choose to activate or de-activate the AQUA PREMIUM system through no. 13 switch (pic. 1)
- Adjust CH water temperature through no. 11 knob (pic. 1)
- Adjust DHW temperature through no. 10 knob (pic. 1)
- Set room temperature by means of the room thermostat (when available)
- When CH is required, no. 8 light comes on (pic. 1)

WARNING: should the boiler be left inactive for a long time, particularly when boiler is fired by LPG, ignition might be difficult. Before starting the boiler, switch on a different gas fired device (e.g. kitchen range, oven, etc.). Beware that even by following this procedure, the boiler might still experience some starting difficulties and shut down once or twice. Reset boiler by acting on no.9 knob (pic. 1).

1.2.2. Operation

CH water temperature can be adjusted within a 35°C to 78°C range.

In order to prevent too frequent ON and OFF ignition sequences in CH mode, the boiler has a 4 minute waiting time between subsequent ignitions. Should water temperature in the system fall below 40°C, waiting time procedure is cancelled and boiler reignites.

Boiler electronics always gives priority to DHW demand over CH water supply.

DHW temperature can be adjusted within a 35°C to 57°C range.

The boiler is equipped with patented AQUA PREMIUM system.

1.2.2.1. AQUA PREMIUM system

The boiler is equipped with a 25 l. stratification water tank and a secondary plate heat exchanger.

The boiler can either function as a standard instantaneous boiler, when the water tank is deactivated, or through the innovative AQUA PREMIUM system when the water tank is switched ON.

Water tank activation and deactivation can be operated by the user via the switch on the control board (no. 13 in pic. 1).

When the water tank is switched ON (AQUA PREMIUM mode), the flow switch detects the water stream from the water mains; the boiler ignites, the cut-off valve is opened and the DHW pump is turned ON (the pump flow rate is fixed).

When DHW demand is smaller than DHW pump flow rate, DHW to the tap is supplied by the secondary exchanger only and the excess DHW produced is deviated to the water tank.

When DHW demand is larger than DHW pump flow rate, DHW produced by the secondary exchanger is joined by DHW from the water tank; the combined DHW flow rate is larger than the one that can be produced by instantaneous boilers of identical thermal output or standard system boilers with same capacity water tank.

The boiler can also be operated as a standard instantane-

ous boiler, when the water tank is disabled.

1.2.2.2. Instantaneous DHW production

While the water tank is disabled, the boiler operates as a standard instantaneous boiler: the cut-off valve is closed and the DHW pump is always off. In this instance DHW supply is granted by the secondary heat exchanger only and maximum available DHW flow rate depends exclusively on the boiler thermal output.

DHW flow rate in liters per minute relies upon the boiler thermal output and water mains supply temperature, according to the following formula:

$$l = \text{DHW in liters per minute} = \frac{K}{\Delta T}$$

K represents:

- 341 for BTFS 24 model
- 407 for BTFS 28 model
- 449 for BTFS 32 model

ΔT = DHW temperature – water mains supply temperature

E.g. In BTFS 24 model, should water mains supply temperature be 8°C and DHW required to 38°C, the value of ΔT is:

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

and DHW liters per minute available at the required temperature of 38°C are:

$$l = \frac{341}{30} = 11,4 \text{ [liters per minute] (mixed water to the tap)}$$

The boiler is fitted with anti-freezing protection system, which is active in all boiler operation modes.

When CH water temperature sensor detects a water temperature of 5°C the boiler turns on to minimum thermal output until the temperature of CH water reaches 30°C or 15 minutes have elapsed.

Should the boiler shut down, pump operation is still granted.

Please Note: the anti-freezing function only protects the boiler and not other components of the heating system.

CH heating system protection is to be achieved via a room thermostat, which is disabled when no. 9 knob (pic. 1) is set to the anti-freezing position.

CH system can be effectively protected from frost by means of specific anti-freezing additives suitable in multi-metal systems. Do not use automotive anti-freezing products, and periodically check anti-freezing additive effectiveness.

The anti-freezing function also protects the water tank. When the water tank temperature sensor detects a water temperature of 5°C the boiler turns on to minimum thermal output until the temperature in the water tank reaches 10°C or 15 minutes have elapsed.

Should the boiler shut down, pump operation is still granted.

Should the boiler be inactive and connected to power mains, the pump and cut-off valve are operated for 6 seconds each 24 hours, in order to prevent blockage.

1.2.3. Boiler shut-down

Should any malfunction occur, boiler automatically shuts down. In order to uncover the plausible technical cause of shutdown, please refer to the troubleshooting section in this manual.

1.2.3.1. Burner shut-down

When the burner shuts down, no. 5 red light flashes. Should this happen proceed as follows:

- Check that the gas stopcock is open, and gas network is actually providing service, by lighting a gas powered kitchen appliance such as range or oven.
- Should a flame occur, wait an additional minute before resetting the boiler by turning no. 9 knob to position **X**: if the boiler still does not start and shuts down, after performing three reset procedures, contact a Service Centre or qualified personnel for service

1.2.3.2. Shut-down due to overheating

If the burner shuts down due to overheating, no. 3 red light comes on and flashes. Should this happen contact a Service centre or qualified personnel for service.

1.2.3.3. Shut-down due to air/flue gas system malfunction

Should the burner shut down due to air intake and/or flue gas discharge system malfunction, no. 4 light comes on and flashes. In this instance, contact a Service Centre or qualified personnel for service.

1.2.3.4. Shut-down due to insufficient water pressure

Should no. 6 shutdown red light (pic. 1) flash, it indicates insufficient water pressure and insufficient water pressure switch intervention. Allow water in the system by opening the boiler inlet tap located at the bottom of the boiler and next to the hydraulic connections (pic. 2). In order to restore water pressure proceed as follows:

- Turn the boiler inlet tap counter-clockwise to let water into the boiler and keep it opened until no. 12 pressure gauge in pic. 1 shows that a pressure of 1-1.3 bar is reached. Close the tap by turning it clockwise.

WARNING

Once the loading procedure is completed, fully close the inlet tap. Should the tap not be properly closed, as pressure increases, boiler CH safety valve may open and water flow out.

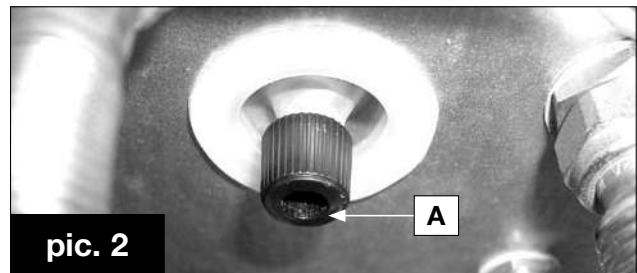
Should boiler frequently shut down contact a Service Centre or qualified personnel for service.

1.2.3.5. Shut-down due to malfunction of temperature probes

Should the burner shut down due to malfunction of temperature probes, the following lights turn on and flash:

- no. 2 red light and no. 8 green light when CH probe malfunction occurs
- no. 2 red light when DHW probe malfunction occurs.

In this case, contact a Service Centre or qualified personnel for service.



pic. 2

1.3. Maintenance

The user is legally required to have the boiler serviced once a year. Correct maintenance ensures boiler to function efficiently, environmentally friendly, preventing any danger to people, animals or property.

Only qualified personnel are lawfully allowed to service the boiler.

Manufacturer recommends Customers to contact a Service Centre for maintenance and repairs. The user may only clean the external boiler casing, by means of commonly marketed household products.

Do not use water!

1.4. Information for the User

The user may only access boiler parts that can be reached without using technical equipment and/or tools: the user is not authorized to remove boiler housing and operate on any internal part. No one, including qualified personnel, is authorized to modify the boiler.

The manufacturer shall not be held responsible for damage to people, animals, or property due to tampering with the boiler or improper intervention.

Should the boiler be inactive and power mains supply disconnected for a long time, its pump might not operate.

Pump service includes boiler housing dismounting and access to boiler internal parts, therefore only qualified personnel may perform it.

Pump blockage may be avoided by adding filming additives suitable for multi-metal systems to water.

2. Technical characteristics and dimensions

2.1. Technical characteristics

The boiler is equipped with an atmospheric burner. All versions are equipped with electronic ignition, ionization flame detection device, sealed chamber, forced draught, AQUA PREMIUM system for DHW supply employing a 25 l. stratification water tank and a secondary plate heat exchanger.

The following versions are available:

BTFS 24: heat output is 23.8 kW;

BTFS 28: heat output is 28.4 kW;

BTFS 32: heat output is 31.3 kW;

The boiler is designed in compliance with rules and regulations enforced in the country indicated on the technical data plate. The installation in a different country may be a source of danger for people, animals and property.

The main technical features of the boiler are listed below:

Construction characteristics

- Mono-thermal, high output, copper heat exchanger
- DHW Stainless steel plate heat exchanger
- Vertical stratification 25 l water tank with magnesium anode
- Three-speed circulation pump equipped with air purging device
- Motorized cut-off valve
- 8 l. expansion vessel (BTFS 24 model) and 10 l. expansion vessel (BTFS 28 and BTFS 32 models)
- 2 l. DHW expansion vessel
- Low water pressure switch
- DHW priority flow switch
- Adjustable by-pass
- Boiler loading and draining taps
- DHW and CH water temperature probes
- Safety limit thermostat
- IP44 electrically protected control panel
- Electronic safety board and integrated modulation
- Electronic ignition with separated igniter
- Flue gas pressure switch
- Motorized gas valve
- CH safety valve 3 bar
- DHW safety valve 6 bar
- DHW filter

User interface

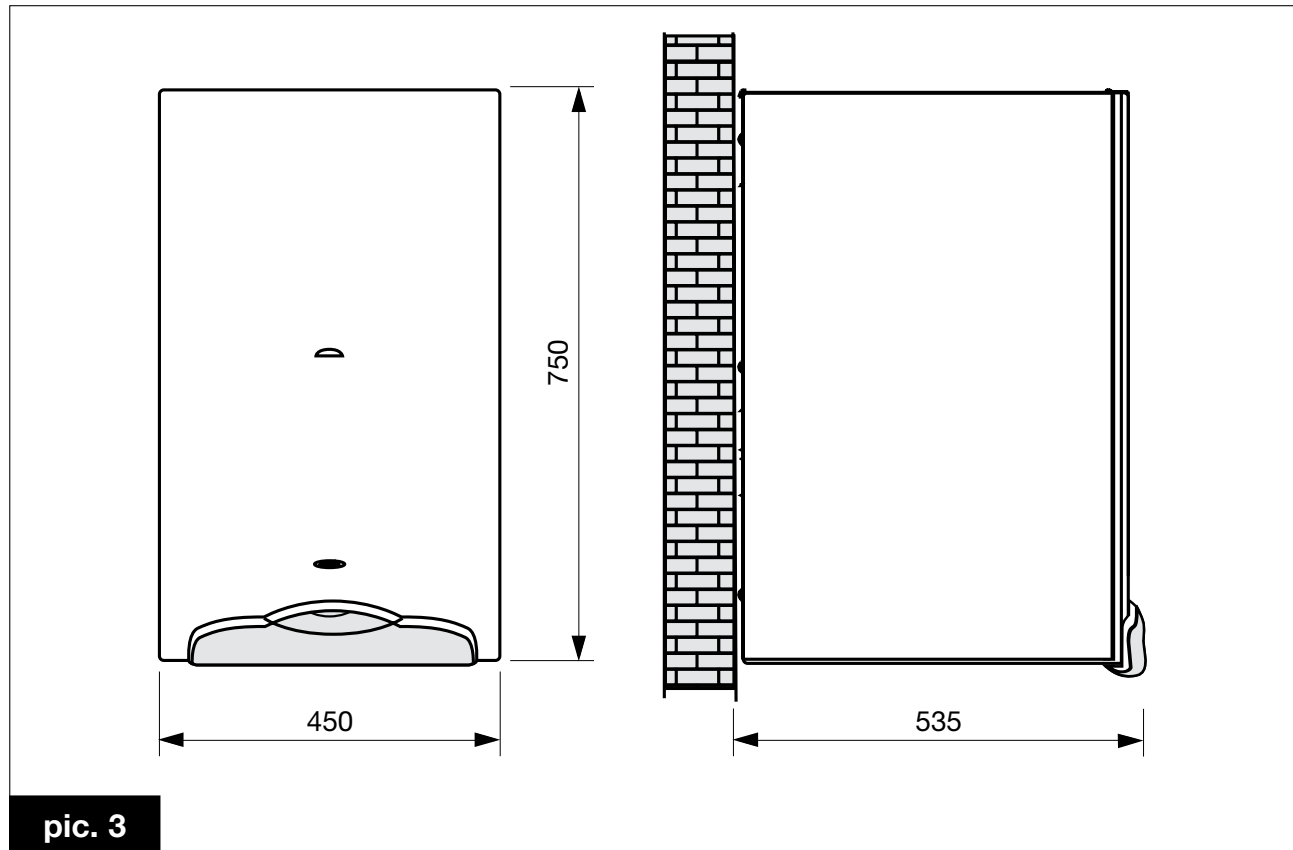
- Reset, stand-by, summer/winter, summer and anti-freezing function knob
- DHW temperature knob (35/57°C range)
- CH water temperature knob (35/78°C range)
- Lights indicating:
 - Power mains connection
 - CH boiler operation
 - Burner shut-down
 - Burner shut-down due to overheating
 - Burner shut-down due to flue gas pressure switch intervention

- Low water pressure
- CH water and/or DHW probe fault
- CH water thermometer with led display
- Water pressure gauge
- Room thermostat (24 Vdc 5 mA)

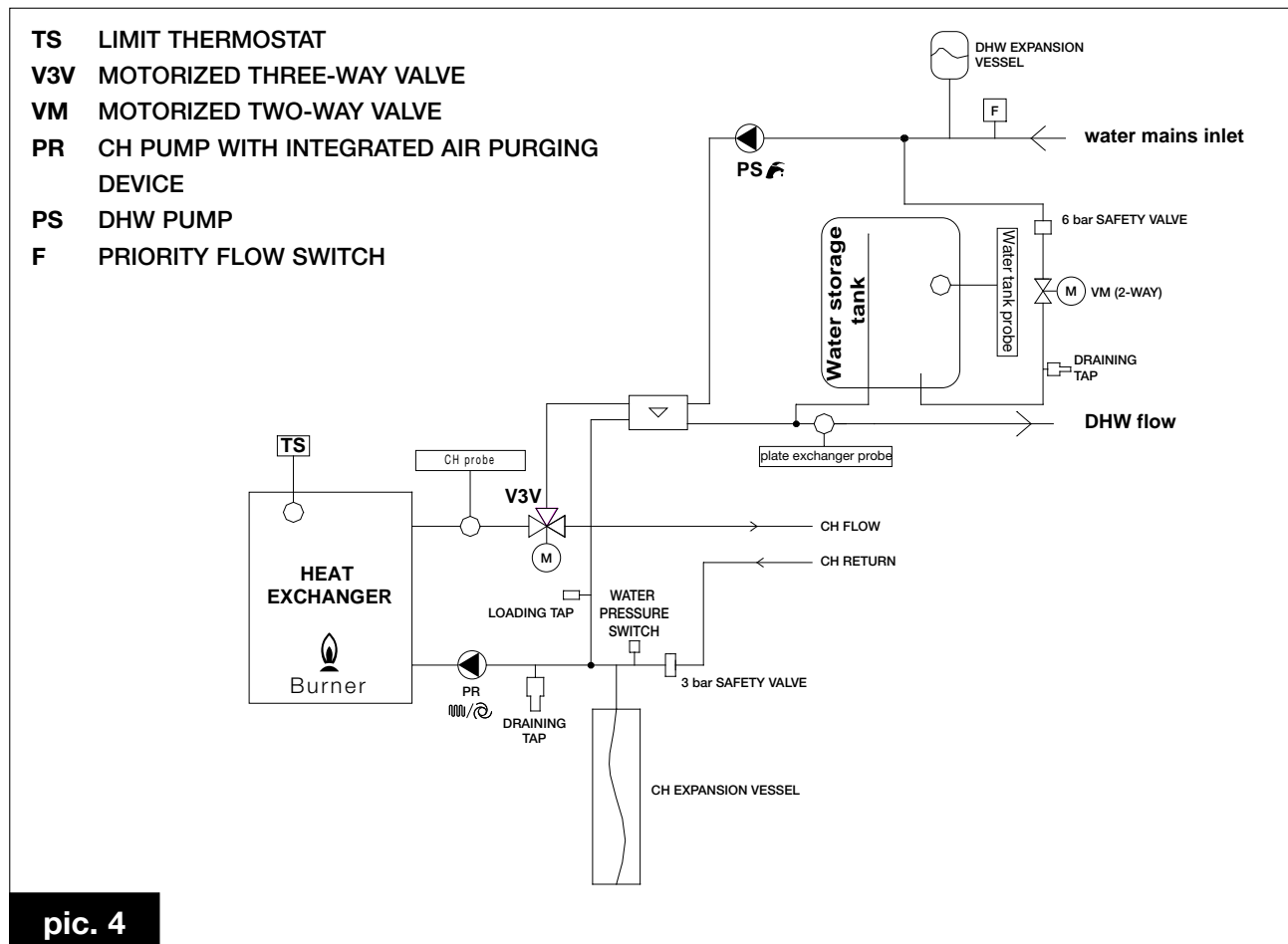
Operating characteristics

- DHW priority function
- CH mode electronic flame modulation, timer controlled flame rising ramp (50 seconds)
- DHW mode flame electronic modulation
- Boiler and storage tank anti-freezing function
- Max heat input adjusting trimmer
- Ignition heat input adjusting trimmer
- Timer-controlled "chimney sweep" function (15 minutes)
- Ignition flame propagation function
- Timer-controlled room thermostat (240 seconds when CH flow temperature > 40°C)
- CH pump post-circulation function in boiler winter mode (180 seconds)
- CH pump post-circulation function after DHW production
 - in boiler winter mode only (6 seconds)
- Post-ventilation safety function (ON: 95°C, OFF: 90°C)
- Anti-blocking function for: CH pump; DHW pump, three-way valve, two-way valve (6 seconds of pump operation each 24 hours of boiler inactivity)

2.2. Dimensions



2.3. Boiler layout



2.4. Operational data

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

BTFS 24							
Function	Max. heat input (kW)	Max heat output (kW)	Min. heat output (kW)	Gas mains pressure (mbar)	Nozzle diameter (mm)	Burner pressure (mbar)	
						min	max
Methane Gas G20	25.5	23.8	9.5	20	1.25	2.5	13.5
Butane Gas G30	25.5	23.8	9.5	29	0.77	4.2	27.0
Propane Gas G31	25.5	23.8	9.5	37	0.77	5.5	35.7

No. 1 chart

Instantaneous DHW supply ΔT 45°C = 7.6 litre per minute

Instantaneous DHW supply ΔT 30°C = 11.4 litre per minute

Instantaneous DHW supply ΔT 40°C = 8.5 litre per minute

Instantaneous DHW supply ΔT 25°C = 13.6 litre per minute

Instantaneous DHW supply ΔT 35°C = 9.7 litre per minute

BTFS 28							
Function	Max. heat input (kW)	Max heat output (kW)	Min. heat output (kW)	Gas mains pressure (mbar)	Nozzle diameter (mm)	Burner pressure (mbar)	
						min	max
Methane Gas G20	30.5	28.4	10.0	20	1.35	1.3	11.5
Butane Gas G30	30.5	28.4	10.0	29	0.80	3.5	28.5
Propane Gas G31	30.5	28.4	10.0	37	0.80	4.5	33.0

No. 2 chart

Instantaneous DHW supply ΔT 45°C = 9.0 litre per minute

Instantaneous DHW supply ΔT 30°C = 13.6 litre per minute

Instantaneous DHW supply ΔT 40°C = 10.2 litre per minute

Instantaneous DHW supply ΔT 25°C = 16.3 litre per minute

Instantaneous DHW supply ΔT 35°C = 11.6 litre per minute

BTFS 32							
Function	Max. heat input (kW)	Max heat output (kW)	Min. heat output (kW)	Gas mains pressure (mbar)	Nozzle diameter (mm)	Burner pressure (mbar)	
						min	max
Methane Gas G20	33.6	31.3	12.2	20	1.40	1.7	9.2
Butane Gas G30	33.6	31.3	12.2	29	0.78	4.1	28.2
Propane Gas G31	33.6	31.3	12.2	37	0.78	5.5	34.8

No. 3 chart

Instantaneous DHW supply ΔT 45°C = 10.0 litre per minute

Instantaneous DHW supply ΔT 30°C = 15.0 litre per minute

Instantaneous DHW supply ΔT 40°C = 11.2 litre per minute

Instantaneous DHW supply ΔT 25°C = 17.9 litre per minute

Instantaneous DHW supply ΔT 35°C = 12.8 litre per minute

2.5. Technical specifications

		BTFS 24	BTFS 28	BTFS 32
Boiler category		II2H3+	II2H3+	II2H3+
Burner nozzles	no.	12	13	15
Minimum CH flow rate	l/h	900	1000	1200
Minimum CH pressure	bar	0.5	0.5	0.5
Maximum CH pressure	bar	3	3	3
Minimum DHW pressure	bar	0.3	0.3	0.3
Maximum DHW pressure	bar	8	8	8
DHW specific capacity (ΔT 30 °C according to EN 625)	l/10'	160	180	200
Electrical power Supply – Voltage / Frequency	V - HZ	230 - 50	230 - 50	230 - 50
Power mains fuse	A	2	2	2
Maximum power consumption	W	180	200	230
Net weight	kg	67.0	67.5	68.0
Methane gas consumption (*)	m³/h	2.70	3.23	3.46
Butane gas consumption	kg/h	2.01	2.40	2.62
Propane gas consumption	kg/h	1.98	2.37	2.51
Maximum CH working temperature	°C	83	83	83
Maximum DHW working temperature	°C	62	62	62
Total capacity of expansion vessel	l	8	10	10
Maximum recommended CH system capacity (**)	l	160	200	200

(*) Value related to 15°C – 1013 mbar condition

(**) Maximum water temperature = 83°C, expansion vessel pressure pre-charge = 1 bar.

BTFS 24		Max output	Min output	30% output
Outer casing heat loss	%	0.23	0.23	-
Flue system heat loss with burner on	%	6.57	9.67	-
Flue system mass capacity	g/sec.	14.0	14.4	-
Flue temp.– air temp.	°C	75	67	-
CO ₂	%	7.2	2.8	-
Boiler efficiency rate	%	93.2	90.1	90.2

BTFS 28		Max output	Min output	30% output
Outer casing heat loss	%	0.23	0.23	-
Flue system heat loss with burner on	%	6.67	8.87	-
Flue system mass capacity	g/sec.	18.2	18.7	-
Flue temp.– air temp.	°C	75	45	-
CO ₂	%	6.6	2.1	-
Boiler efficiency rate	%	93.1	90.9	90.4

BTFS 32		Max output	Min output	30% output
Outer casing heat loss	%	0.23	0.23	-
Flue system heat loss with burner on	%	6.67	9.77	-
Flue system mass capacity	g/sec.	18.9	19.2	-
Flue temp.– air temp.	°C	92	45	-
CO ₂	%	6.9	2.5	-
Boiler efficiency rate	%	93.1	90.0	90.3

3. Instructions for the fitter

3.1. Installation standards

The boiler is rated II2H3+ and is to be installed in compliance with laws and standards enforced in the country of installation.

3.2. Installation

3.2.1. Packaging

Boiler is shipped in a sturdy cardboard box. Remove boiler from cardboard box and check on its integrity. The packing materials can be recycled. They are to be disposed of through appropriate waste management sites.

Keep packaging out of the reach of children, as it may be dangerous.

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

Packaging includes the boiler and:

- kit for gas/water connection and bicones;
- one copper pipe kit for boiler hydraulic and gas connection.
- one plastic bag containing:
 - a) installation, use and maintenance manual
 - b) boiler wall mounting template
 - c) metal bracket supporting boiler on the wall
 - d) screws and wall plugs for fixing the boiler to the wall
 - e) in BTFS 24 model packaging: three diaphragms for flue gas exhaust (40, 42, and 45 mm diameter)
 - f) in BTFS 28 model packaging: three diaphragms for flue gas exhaust (44, 47 and 49 mm diameter)
 - g) in BTFS 32 model packaging: four diaphragms for flue gas exhaust (45, 47, 49 and 51 mm diameter)
 - h) two closing caps with gaskets (see pic. 10 and pic. 12).

3.2.2. Choosing where to install the boiler

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

- "Air/flue gas system" paragraph instructions (3.2.6).
- Check the wall for sturdiness according to boiler weight.
- Do not fit the boiler above any equipment that may prejudice proper operation (steam and grease vapour emitting kitchen appliances, washing machines, etc.).

3.2.3. Positioning the boiler

Each boiler is supplied with a "TEMPLATE" allowing to position the couplings from the CH system, DHW system and gas supply to the boiler before installing the boiler itself.

The TEMPLATE is made of heavy duty paper and is to be affixed to the wall where the boiler is to be mounted. It provides all the indications required to drill the holes for fixing the boiler to the wall, which is done using two screws and wall plugs.

The lower section of the TEMPLATE shows where to mark the exact spot where the couplings are to be positioned for boiler connection to the gas supply pipe, water mains supply pipe, DHW flow pipe, CH flow and return pipes.

Since the temperature of the walls on which the boiler is mounted and the temperature of coaxial flue system does not exceed 60°C, no minimum distance from flammable

walls need to be respected.

For boilers with split pipe flue system, in presence of flammable walls and flue gas system through such walls, ensure proper insulation between wall and flue gas pipes.

3.2.4. Installing the boiler

Before connecting the boiler to CH and DHW networks, clean the pipes carefully and remove any metallic leftover matter from manufacturing and welding process, and any oil or grease deposit. Such foreign substances might damage the boiler or alter its function by interfering with boiler operation.

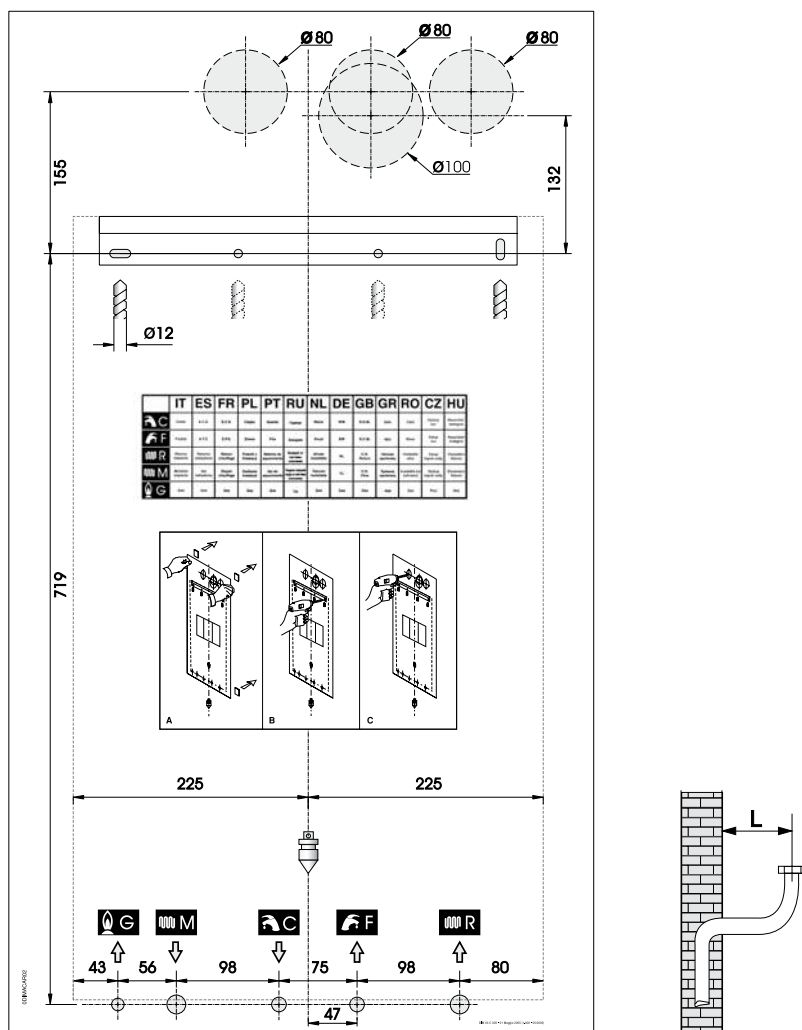
NB: Do not use solvents as they could damage system components.

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

In order to install the boiler proceed as follows.

- Affix template to the wall
- Drill four holes in the wall to accommodate boiler support bracket wall plugs
- Arrange air/flue gas system path in the wall
- Secure boiler support bracket to the wall using 4 screws
- Position gas supply network pipe, water mains supply pipe, DHW flow pipe, and CH flow and return pipes as shown on the template (see template lower area)
- Position the boiler on its wall-fixed support bracket
- Connect the boiler to network pipes by means of the pipe kit supplied with the boiler
- Connect the boiler to the air intake and flue gas exhaust system
- Connect electrical power supply and room thermostat (if available).

BOILER WALL HANGING TEMPLATE



	Ø (inch) coupling	Ø (mm) copper pipe	L (mm)
M = CH flow	3/4"	18	349
C = DHW flow	1/2"	14	389
G = Gas mains intake	1/2"	14	349
F = Water mains intake	1/2"	14	389
R = CH return	3/4"	18	349

pic. 5

3.2.5. Boiler room ventilation

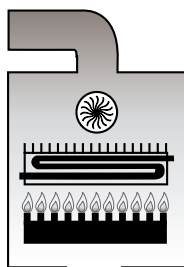
The boiler has a sealed combustion chamber. Combustion air is not drawn from boiler room therefore specific recommendations need not to be applied concerning openings and ventilation, necessary in case of room air depletion, or involving boiler room requirements.

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

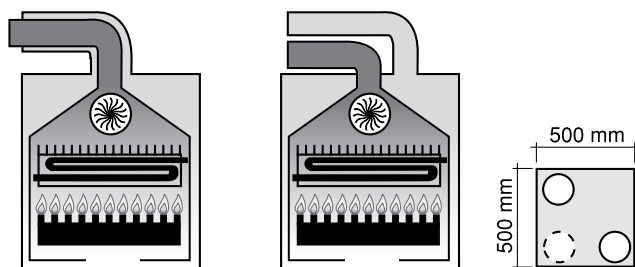
3.2.6. Air / flue gas system

In discharging flue gas into the atmosphere, comply with applicable laws and standards in the country of installation.

type B22



type C12



3.2.7. Air/flue gas system configuration

B22

This boiler is intended for connection to an existing flue gas system either internal or external to the boiler room. Combustion air is taken directly from the boiler room while flue gas is conveyed to the outside.

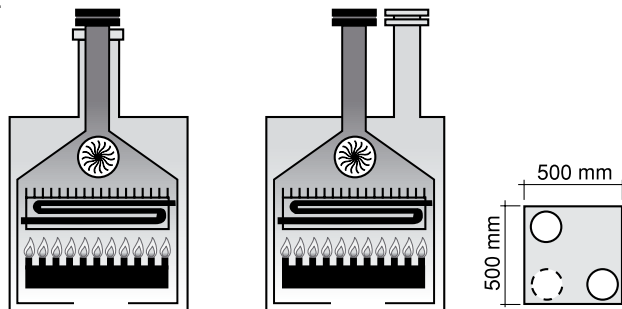
The boiler **must not** be fitted with an anti-wind gust device, it has to be equipped with a fan, to be mounted after the combustion chamber/heat exchanger.

C12

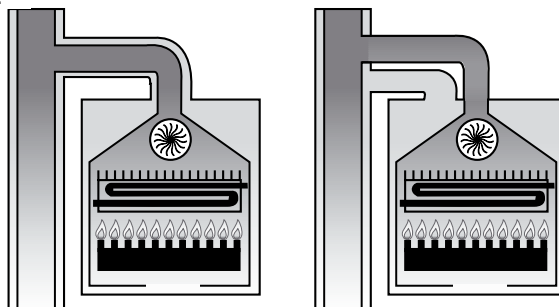
This boiler is intended for connection to horizontal outlet and intake ducts, connected to the outside by means of coaxial or split ducts.

The distance between the air intake duct and the flue gas outlet duct is to be a minimum of 250 mm (see picture to the right) and both terminals must be positioned within a squared area having 500 mm sides.

type C32



type C42



C32

This boiler is intended for connection to vertical outlet and intake ducts connected to the outside by means of coaxial or split ducts.

The distance between air intake duct and flue gas flue duct is to be a minimum of 250 mm (see picture to the right) and both terminals must be positioned within a squared area having 500 mm sides.

C42

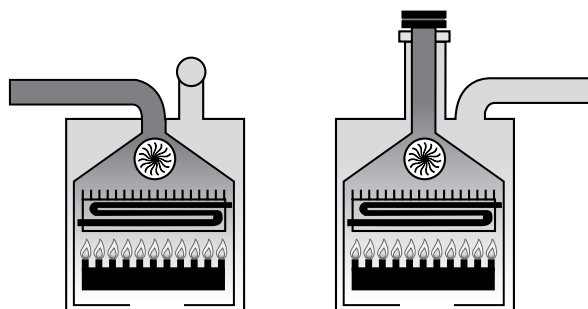
This boiler is intended for connection to a collective chimney pipe system which includes two ducts, air intake and flue gas exhaust.

These ducts may be coaxial or split. The flue gas collective chimney system must comply with current standards.

C52

Boiler with separate air intake and flue gas discharge pipes. Air and flue gas may operate to different pressure values. Air and flue gas terminals may not face each other from opposite walls.

type C52

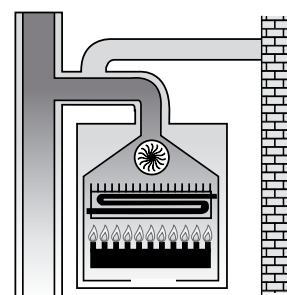


C82

The boiler is intended to be connected to an air terminal and to a single flue gas terminal or to a collective chimney system.

The flue gas collective chimney system must comply with current standards.

type C82



3.2.8. Air/flue gas system with 100/60 mm diameter coaxial pipes

C12 - C32 - C42 installation type

BTFS 24

Minimum acceptable length of pipes is 0.5 meters and one elbow. Maximum acceptable length of pipes is 4 meters and one elbow.

In presence of additional elbows, maximum acceptable length must be reduced by 1 meter for each elbow installed.

Choosing the applicable diaphragm supplied with the boiler

Pipe length (m.)	Flue gas discharge diaphragm diameter (mm)
$0.5 < L < 1$	Ø 40
$1 < L < 3$	Ø 45
$3 < L < 4$	No diaphragm required

BTFS 28

Minimum acceptable length of pipes is 0.5 meters and one elbow. Maximum acceptable length of pipes is 4 meters and one elbow.

In presence of additional elbows, maximum acceptable length must be reduced by 1 meter for each elbow installed.

Choosing the applicable diaphragm supplied with the boiler

Pipe length (m.)	Flue gas discharge diaphragm diameter (mm)
$0.5 < L < 3$	Ø 42
$3 < L < 4$	Ø 45

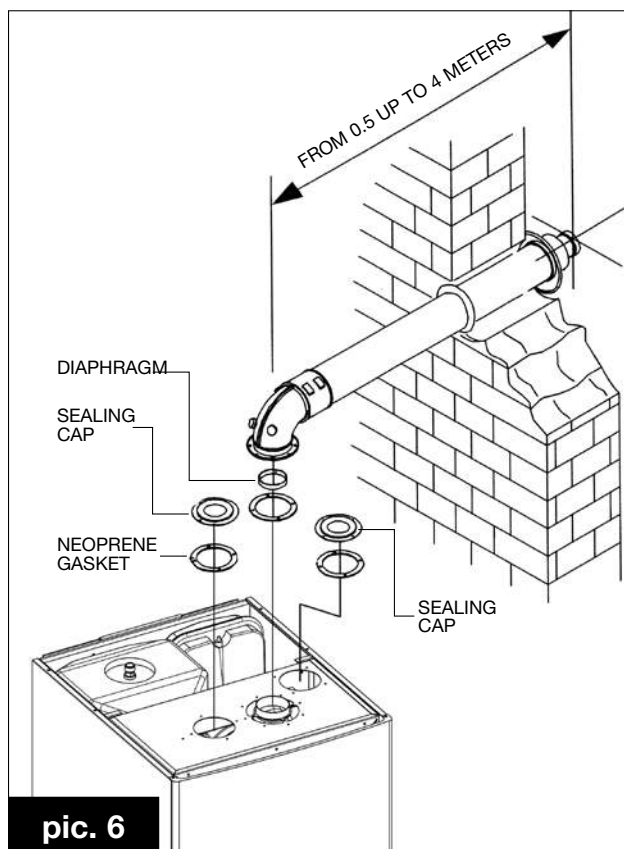
BTFS 32

Minimum acceptable length of pipes is 0.5 meters and one elbow. Maximum acceptable length of pipes is 4 meters and one elbow.

In presence of additional elbows, maximum acceptable length must be reduced by 1 meter for each elbow installed.

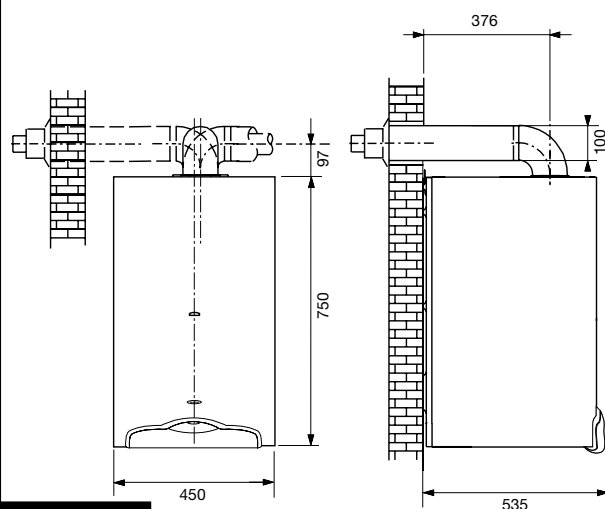
Choosing the applicable diaphragm supplied with the boiler

Pipe length (m.)	Flue gas discharge diaphragm diameter (mm)
$0.5 < L < 1$	Ø 45
$1 < L < 2$	Ø 47
$2 < L < 3$	Ø 49
$3 < L < 4$	No diaphragm required



pic. 6

Dimensions for connection to coaxial air/flue gas system



pic. 7

3.2.9. Air/flue gas system with 80 mm diameter split pipes

C12 – C 32 – C42 – C52 – C82 installation types

When installing a split pipe air/flue gas system, employ split pipe standard kit (code OSDOPPIA06) which includes the following components (pic. 8):

- one Ø 80 mm flanged female pipe for connection to flue gas discharge pipe
- one Ø 80 mm flanged female pipe for connection to air intake pipe
- one standard air intake deflector

- one air intake terminal equipped with grille and anti-pulse device
- one Ø 51 air intake diaphragm to be used according to the instructions in the following "air intake terminal" section
- fixing screws and sealing gaskets.

WARNING

Should the split pipe standard kit provided by the manufacturer not be installed, boiler operation will not be appropriate.

BTFS 24

Air intake

The load loss of each 90° wide radius (R=D) **air intake** elbow is equivalent to a 1 meter long pipe.

The load loss of each 90° narrow radius **air intake** elbow is equivalent to a 1.5 meter long pipe.

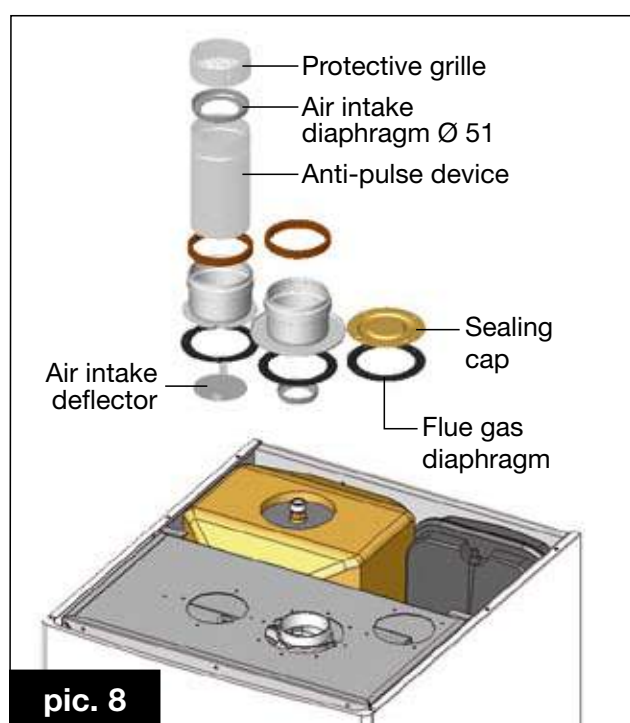
The load loss of the air intake terminal is not to be taken into account

Flue gas discharge

The load loss of each 90° wide radius (R=D) **flue gas** elbow is equivalent to a 1.5 meter long pipe.

The load loss of each 90° narrow radius **flue gas** elbow is equivalent to a 3.5 meter long pipe.

Air intake pipe must be at least 1 meter long. Install the air intake anti-pulse terminal included in the split pipe standard kit which contains a Ø 51 air intake diaphragm and install the standard air intake deflector.



Pipe length (m.)	Flue gas discharge diaphragm diameter (mm)
1 < L < 14	Ø 45
14 < L < 21	Ø 49
21 < L < 28	No diaphragm required

BTFS 28

Air intake

The load loss of each 90° wide radius (R=D) air intake elbow is equivalent to a 1 meter long pipe.

The load loss of each 90° narrow radius air intake elbow is equivalent to a 1.5 meter long pipe.

The load loss of the air intake terminal is not to be taken into account.

Flue gas discharge

The load loss of each 90° wide radius (R=D) **flue gas** elbow is equivalent to a 2 meter long pipe.

The load loss of each 90° narrow radius **flue gas** elbow is equivalent to a 4 meter long pipe.

Air intake pipe must be at least 1 meter long. Install the air intake anti-pulse terminal included in the split pipe standard kit which contains a Ø 51 air intake diaphragm and install the standard air intake deflector.

Pipe length (m.)	Flue gas discharge diaphragm diameter (mm)
1 < L < 11	Ø 49
11 < L < 21	No diaphragm required

BTFS 32

Air intake

The load loss of each 90° wide radius (R=D) **air intake** elbow is equivalent to a 1.5 meter long pipe.

The load loss of each 90° narrow radius **air intake** elbow is equivalent to a 2 meter long pipe.

The load loss of the air intake terminal is not to be taken into account

Flue gas discharge

The load loss of each 90° wide radius (R=D) **flue gas** elbow is equivalent to a 2 meter long pipe.

The load loss of each 90° narrow radius **flue gas** elbow is equivalent to a 5 meter long pipe.

Air intake pipe must be at least 1 meter long. Install the air intake anti-pulse terminal included in the split pipe standard kit and install the standard air intake deflector.

Do NOT install the Ø 51 air intake diaphragm.

Pipe length (m.)	Flue gas discharge diaphragm diameter (mm)
1 < L < 10	Ø 49
10 < L < 14	Ø 51
14 < L < 22	No diaphragm required

3.2.10. 80 mm diameter flue gas discharge system

B22 installation type

BTFS 24

The load loss of each 90° wide radius (R=D) **flue gas** elbow is equivalent to a 1.5 meter long pipe.

The load loss of each 90° narrow radius **flue gas** elbow is equivalent to a 3.5 meter long pipe.

Flue gas discharge pipe must be at least 0.5 meter long. Install the air intake anti-pulse terminal included in the split pipe standard kit which contains a Ø 51 air intake diaphragm and install the standard air intake deflector (pic. 8).

Pipe length (m.)	Flue gas discharge diaphragm diameter (mm)
0.5 < L < 8	Ø 45
8 < L < 14	Ø 49
14 < L < 19	No diaphragm required

BTFS 28

Flue gas discharge

The load loss of each 90° wide radius (R=D) **flue gas** elbow is equivalent to a 2 meter long pipe.

The load loss of each 90° narrow radius **flue gas** elbow is equivalent to a 4 meter long pipe.

Flue gas discharge pipe must be at least 0.5 meter long. Install the air intake anti-pulse terminal included in the split pipe standard kit which contains a Ø 51 air intake diaphragm and install the standard air intake deflector (pic. 8).

Pipe length (m.)	Flue gas discharge diaphragm diameter (mm)
$0.5 < L < 9.5$	Ø 49
$9.5 < L < 15.5$	No diaphragm required

BTFS 32

Flue gas discharge

The load loss of each 90° wide radius (R=D) **flue gas** elbow is equivalent to a 2 meter long pipe.

The load loss of each 90° narrow radius **flue gas** elbow is equivalent to a 5 meter long pipe.

Flue gas discharge pipe must be at least 0.5 meter long. Install the air-intake anti-pulse terminal included in the split pipe standard kit and install the standard air intake deflector (pic. 8).

Do NOT install the Ø 51 air-intake diaphragm.

Pipe length (m.)	Flue gas discharge diaphragm diameter (mm)
$0.5 < L < 5.5$	Ø 51
$5.5 < L < 10.5$	No diaphragm required

WARNING:

Flue gas pressure switch intervention

Should the air/flue gas system malfunction, the safety device shuts down the boiler(see 1.2.3.3 paragraph)

It is absolutely forbidden to tamper with and/or exclude the safety device.

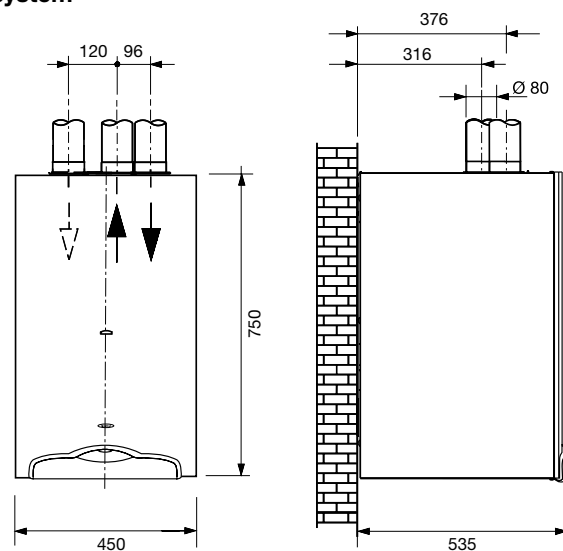
If the boiler shuts down frequently, check the flue gas system. The pipes may be obstructed or unsuitable for the discharge of flue gas into the atmosphere.

The Manufacturer shall not be held responsible for damage resulting in incorrect installation, use, modification of the boiler or for non-observance of the instructions provided by the manufacturer or applicable installation standards for the product.

3.2.11. Installation examples

Ø 80 mm air/flue gas system configuration

Dimensions for connection to air/flue gas split pipe system



pic. 9

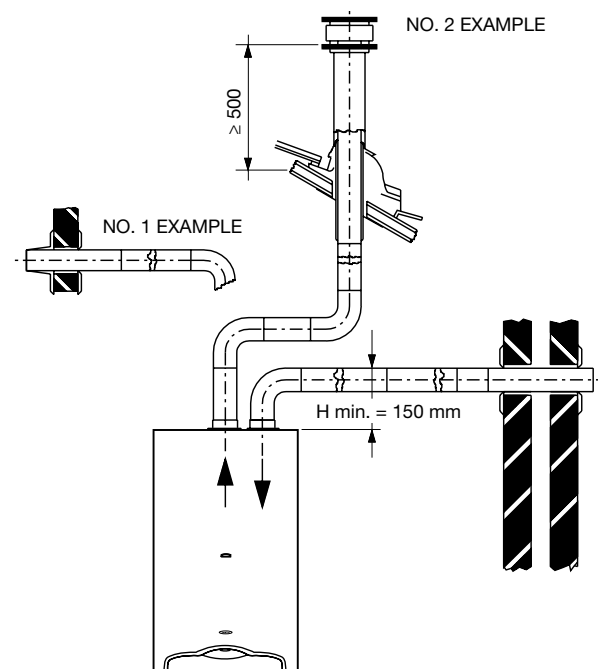
No. 1 example

Air intake and flue gas pipe terminals facing each other from two opposite external walls.

No. 2 example

Air intake from external wall and roof flue gas discharge.

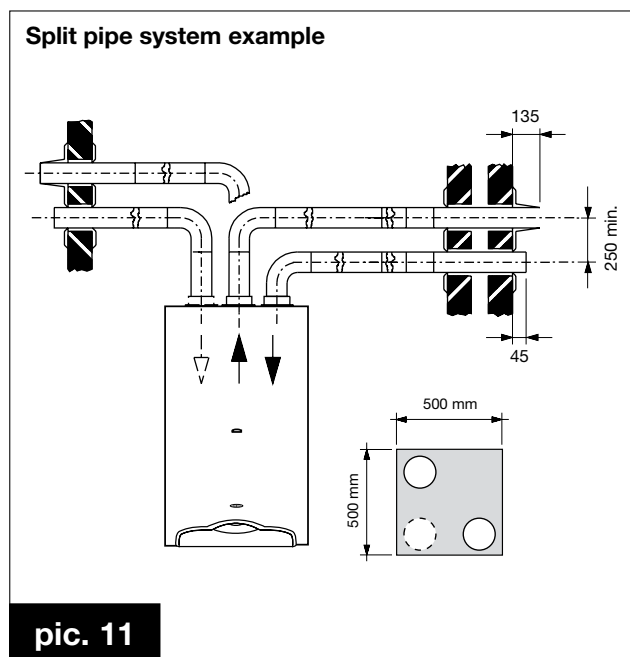
Split pipe system example



pic. 10

No. 3 example

Air intake from external wall and flue gas discharge from the same external wall.



3.2.12. Verifying combustion efficiency

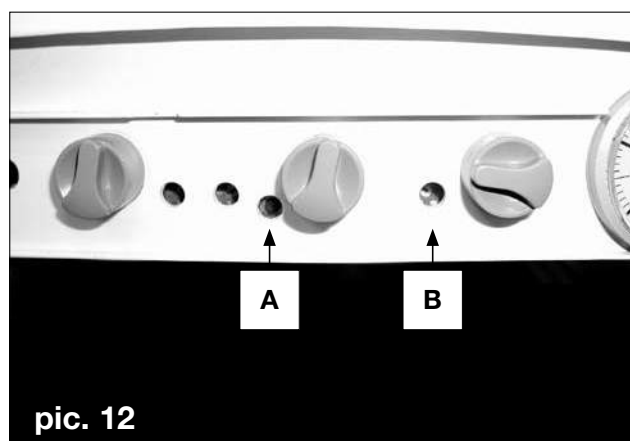
3.2.12.1. "Chimney sweep" function

The boiler has "chimney sweep" function in order to test boiler combustion efficiency and to adjust burner.

Set knob 9 (pic. 1) to WINTER, and room thermostat (if available) to ON. While the boiler is operating, press the SPA button ("A" in pic. 12), the boiler will turn off and then resume ignition sequence and proceed operating with an output corresponding to the setting of MAX R trimmer (B in pic. 12).

"Chimney sweep" function factory set running time is 15 minutes.

In order to deactivate the "chimney sweep" function, turn selector 9 to any position other than WINTER.



3.2.12.2. Combustion efficiency verification procedure

Coaxial pipe system

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

- check combustion air temperature from no. 1 opening (see pic. 13 A)
- check flue gas temperature and CO₂ concentration from no. 2 opening (see pic. 13 A).

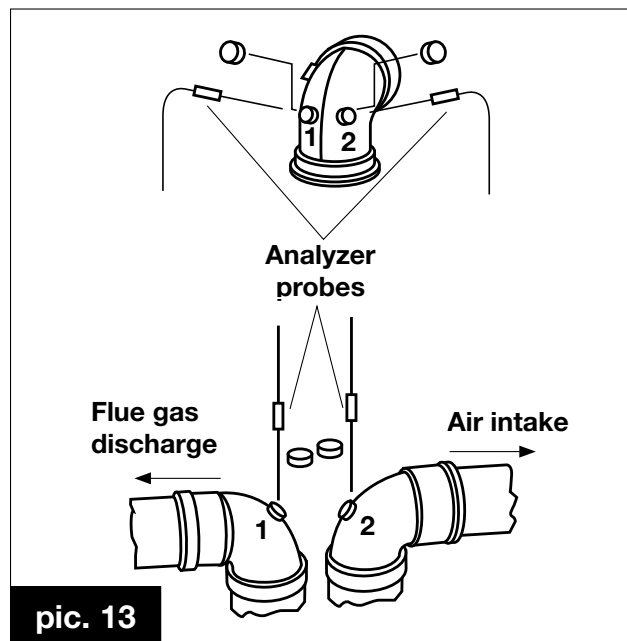
Allow boiler to reach working temperature before performing any measurement.

Split pipe system

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

- check combustion air temperature from no. 2 opening (see pic. 13 B);
- check flue gas temperature and CO₂ concentration through hole 1 (see fig. 13 B).

Allow boiler to reach working temperature before performing any measurement.



3.2.13. Gas mains connection

Gas supply pipe cross-section must be equal or greater than boiler gas inlet pipe. Calculation of the cross-section size of the gas pipe depends on pipe length, layout pattern, gas flow rate. Gas pipe size is to be dimensioned accordingly.

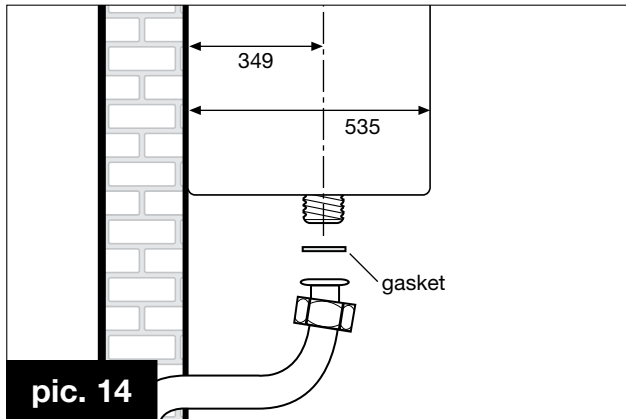
Comply with installation standards enforced in the installation country. They are considered as an integral part of this booklet.

Remember that before operating a gas distribution system internal to the premises and before connecting it to a metre, it must be checked for leaks. If any part of the gas system will result inaccessible, leak test must be carried out before pipes are covered. Leak test must not be carried out using flammable gas. Use air or nitrogen for this purpose.

Should gas be already in the pipes, leak testing by a naked flame is forbidden. Use specific products available on the market.

WARNING

IT IS MANDATORY when connecting the boiler to the gas supply network, to employ an appropriately sized and made gasket (pic. 14). The boiler gas inlet thread configuration **IS NOT** appropriate for hemp, plastic tape or similarly made gaskets.



3.2.14. Power mains connection

The boiler is supplied with a three-poled power cable, already connected to the electronic board; it is provided with an anti-rupture firming clamp. The boiler must be connected to a 230V-50Hz power mains supply.

When connecting the boiler to the power mains, respect phase / neutral sequence.

Installation must be carried out in compliance with applicable standards which are considered as integral part of this manual.

An easy accessible two-poled switch must be installed outside the boiler. The switch minimum distance between contacts is 3 mm. The switch must allow power supply interruption in order to safely perform maintenance and service.

Power supply to the boiler must be fitted with a differential magnetic-thermal automatic switch of appropriate shut-down capacity.

Electrical power supply must be appropriately earthed. The above mentioned safety measure must be verified. If in doubt, ask a qualified technician to thoroughly check the power network. The Manufacturer shall not be held responsible for any damage due to failure in grounding the system. Gas, hydraulic, or CH system pipes are not suitable for grounding a power network.

3.2.15. Room thermostat connection (option)

The boiler may be connected to a room thermostat: **room thermostat contacts must be properly sized in relation to a 5 mA, 24 Vdc load.**

The room thermostat wiring must be connected to M9 position on the terminal board shown in pic.16, after removing the jumper supplied as standard with the boiler.

The room thermostat wiring must NOT be grouped together with the power mains supply cables.

3.2.16. Hydraulic connections

Prior to installing the boiler, the hydraulic system has to be cleaned in order to remove impurities which could be present in system components and damage the pump and the heat exchanger.

CENTRAL HEATING SYSTEM

CH flow and return pipes must be connected to the relevant 3/4" M and R couplings on the boiler (pic. 5).

When calculating CH system pipe size, bear in mind load losses caused by radiators, thermostatic valves, radiator gate valves, and the configuration of the system itself.

It is advisable to convey the flow from the boiler safety valve to the sewer system. Should the above precaution not be implemented and the safety valve be activated, boiler room flooding may occur.

The manufacturer shall not be held responsible for any damage resulting from failure in observing the above mentioned technical precaution.

DOMESTIC HOT WATER

DHW flow and water mains inlet pipes must be connected to the relevant 1/2" C and F couplings on the boiler (pic. 5).

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

WARNING

Depending on hardness level of the water supplied, it might be necessary installing a suitable water treatment device for domestic use and in compliance with applicable laws and standards.

Water treatment is always advisable when hardness level of water supplied to the boiler is more than 20°F.

WARNING

Water treated by commonly marketed softeners, due to pH level induced, may not be compatible with some components in the system.

3.2.17. Remote control board installation (optional equipment)

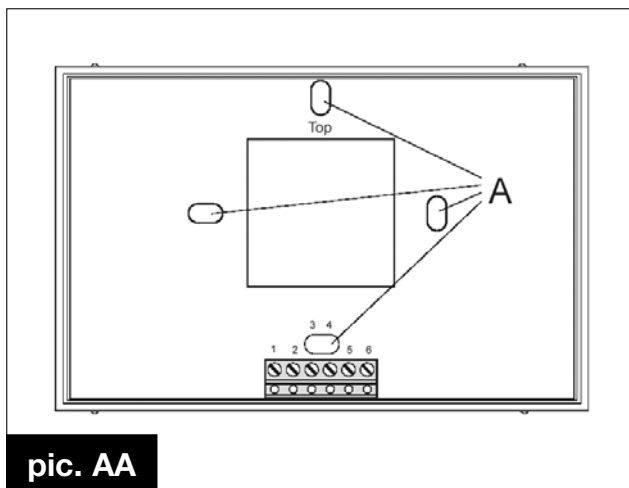
A remote control board (optional equipment) can be connected to the boiler in order to achieve increased functional management such as operation temperatures, CH scheduling and malfunction detection.

The remote control board is to be positioned on an inside wall, far from heat sources or draughts.

Detach by means of a screwdriver the rear part of the casing (grey) from the front one (white) and fix the rear part of the casing to the wall through holes A (pic. AA).

WARNING

Remote control board is to be connected to 230V power mains. Remote control board wirings are not to be grouped together with the power mains wires.



In order to implement the connection, employ two wires with the following characteristics:

- max length: 40 m;
- max impedance: $2 \times 4\Omega/\text{m}$;
- it is appropriate to employ interwoven or screened wires in order to prevent disturbs.

Remote control board connection to the boiler is to be performed by linking no. 1 and no. 2 positions on the remote control board to OT-BUS M6 terminal board of 0SCHE-REM00 printed circuit board which is supplied with the remote control board kit (see kit manual for printed circuit board installation procedure). BUS connection is protected against false polarity, allowing for connection positions to be interchangeable.

The remote control board front casing can now be re-installed if no external probe or phone operation device is to be installed. Otherwise proceed as below described.

3.2.18. External probe installation (optional equipment)

The boiler can be connected to a probe for external temperature detection (optional equipment), allowing for "sliding temperature management" operation.

The probe is to be connected to the remote control board via a double insulated wire with a minimum 0.35sq.mm cross-section. External temperature probe wires are to be connected to no. 5 and no. 6 positions of the remote control board.

The external temperature probe wires are NOT to be grouped together with the power mains wires.

The external temperature probe is to be affixed to an external wall, facing North/North-East.

Do not install the probe in a window enclosure, near ventilation openings or heat sources.

Only manufacturer-approved probe is to be installed in order to ensure proper boiler operation.

Operation with external temperature probe

The probe detects the external temperature and the boiler manages CH water temperature according to probe information. CH water temperature is increased when external temperature decreases and is decreased when external temperature increases. CH water temperature management ensures considerable energy savings (the above described function is called "sliding temperature management").

CH water temperature is managed in relation to the curves set in the remote control board program and depending on external temperature and home temperature thermostat setting. The fitter can choose among different curves in the "CURVA RISC" section of "TECNICO" menu of the remote control board (see remote control board kit instruction manual).

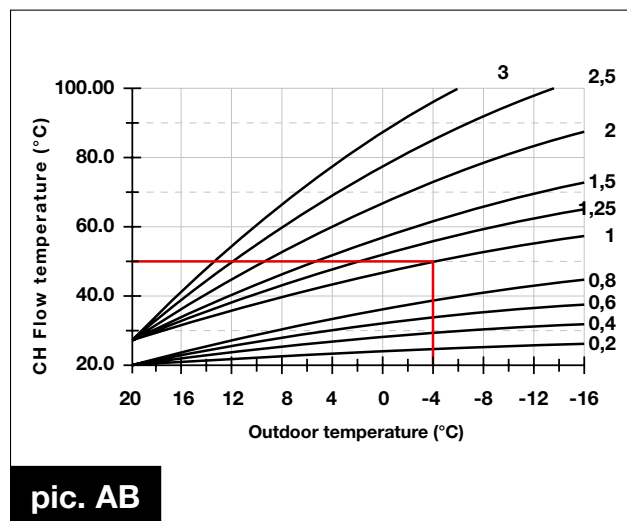
The curves are adjusted in relation to a "K" parameter which value can be set between 0 and 3 and has a default setting of 1.2.

The higher is "K" value programmed, given constant external temperature and room thermostat setting, the higher will CH water flow temperature be supplied.

AB picture shows the curves when a 20°C room temperature is desired.

When increasing the desired room temperature, the curves are moved higher. E.g. When choosing a curve corresponding to $K = 1$ and external temperature is minus 4°C, CH flow temperature is 50°C.

The most appropriate curve programming is attained by taking into consideration CH system characteristics and premises configuration. Curve is best set by subsequent fine tuning changes. The remote control board can program the most appropriate curve by itself. In order to have the remote control to self program the proper curve, set "AUTOADATT" to 1 in the "TECNICO" menu. For more detailed information please see the remote control board instruction manual.



pic. AB

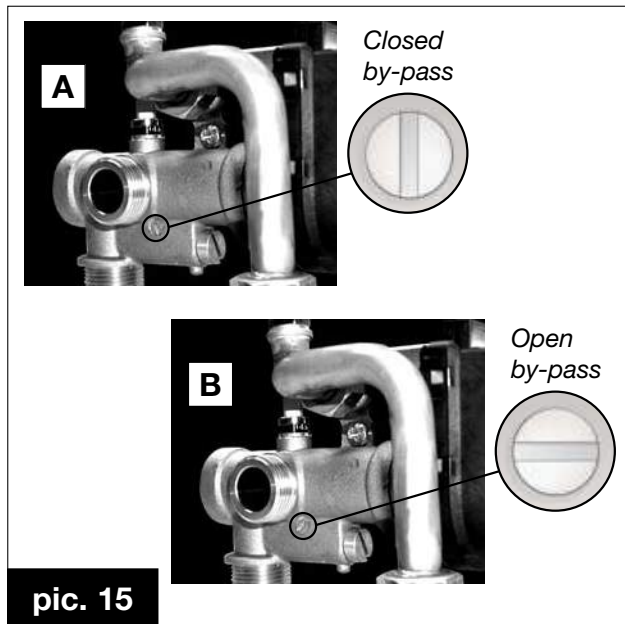
3.2.19. Phone operation device connection (optional equipment)

Boiler electronics are designed to host a phone operation module (optional equipment), which can activate CH operation. The phone operation device is to be connected to positions no. 3 and no. 4 on the remote control board.

3.2.20. Adjustable by-pass

The boiler is equipped with an adjustable by-pass. By-pass operation can be disabled.

Pic. 15 A shows the adjusting by-pass screw set for by-pass closed position, pic. 15 B shows adjusting bypass screw set to open position.



3.3. Loading the system

Once all boiler connections have been completed, CH system can be filled. This procedure must be cautiously carried out, following each below indicated step.

- Open the air purging valves on all radiators and verify the boiler automatic valve operation.
- Gradually open the boiler filling tap to load the system, checking that all automatic air purging valves installed in the system work properly.
- Close all radiator air purging valves as soon as water starts coming out.
- Check boiler water pressure gauge; reading is not to exceed 1 / 1.3 bar.
- Shut the boiler filling stopcock and purge any left air by opening all bleeding valves on radiators.
- Start the boiler and as soon as the system reaches working temperature, stop the pump and repeat the air bleeding procedure.
- Allow the system to cool and restore water pressure to 1 / 1.3 bar.

WARNING

As far as domestic heating systems treatment of water is concerned, for best performance and safety, in order to preserve efficient conditions over time, ensuring long-lasting regular operation of auxiliary equipment as well, and to minimize energy consumption, and complying with current laws and standards, it is advisable to employ specific additives, suitable for multi-metal systems.

WARNING

Safety low water pressure switch will not allow the burner to be started when water pressure is below 0.4/0.6 bar. CH system water pressure must not be below 1-1.3 bar. Restore proper value as needed and while the water in the

system is cold. Boiler pressure gauge indicates water pressure in the system.

WARNING

After long boiler inactivity, its pump may be blocked. Before switching the boiler ON, make sure that the pump is operative implementing the following procedure.

Unscrew the protective bolt, located in the centre front section of pump motor. Put a screwdriver into the hole and manually rotate the circulation unit shaft clockwise.

Once the unblocking procedure is completed, screw back on the protective bolt and check for water leaks.

WARNING

When the pump protective bolt is removed, some water may flow out. Before re-installing the boiler outer casing, verify all internal surfaces to be dry.

3.4. Starting the boiler

3.4.1. Preliminary checks

Before starting the boiler it is necessary to perform the following checks.

- Flue gas exhaust pipe and terminal are installed as instructed: **when the boiler is running no fumes generated by combustion are to leak from any gasket.**
- Supply power to the boiler is 230 V – 50 Hz.
- The system is properly filled with water (pressure reading on water gauge has to be 1-1.3 bar).
- All system pipes stopcocks are open.
- The gas type supplied to the boiler corresponds to that for which the boiler is set. Convert the boiler if needed following the “ADAPTATION FOR OTHER GASES AND BURNER ADJUSTMENT” section instruction (§ 3.6). This operation must be carried out by qualified technical personnel.
- The gas supply stopcock is open.
- There are no gas leaks.
- The external power main switch is on.
- The boiler safety valve is not blocked.
- There are no water leaks.
- The pump is not blocked.

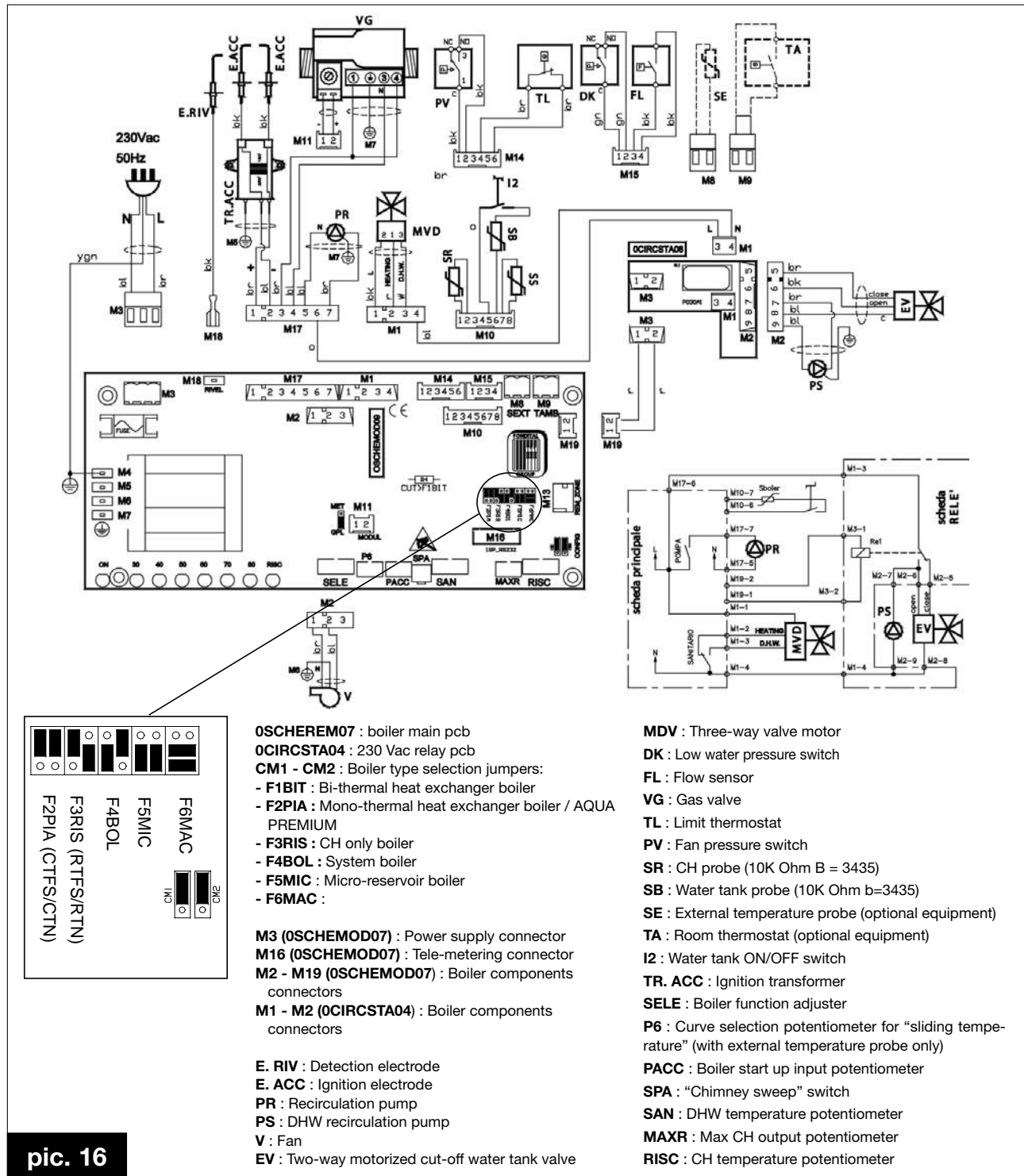
WARNING

The boiler is delivered with the pump speed set to III and the by-pass is closed. Adjust according to system requirements.

3.4.2. On/off switching

For boiler switching on and switching off procedure, follow the “**Instruction for the user**” section.

3.5. Wiring diagram



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

Relation between temperature (°C) and nominal resistance (Ohm) of CH probe SR and DHW probe SS.

3.6. Switching to different gas and burner adjustment

Boilers are manufactured to be fueled by the gas type which was specified upon order

Subsequent transformations are to be performed exclusively by qualified personnel, employing manufacturer approved parts, and implementing all the adjustments and modifications necessary for a correct tune-up.

Adjusting the boiler from methane to LPG

- Remove the main burner
- Remove main burner nozzles from main burner, replacing them with new gas type correct diameter nozzles.

WARNING! It is mandatory to install copper gaskets.

- Re-install the main burner
- On the electronic board, switch **J MET-GPL** jumper to **GPL** position (see pic. 19).

Adjusting the boiler from LPG to methane

- Remove the main burner
- Remove main burner nozzles from main burner replacing them with new gas type correct diameter nozzles.

WARNING! It is mandatory to install copper gaskets.

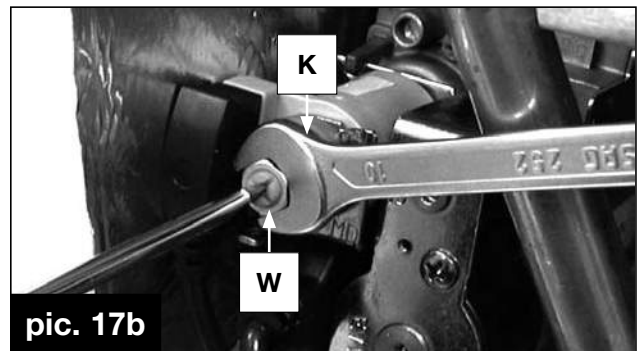
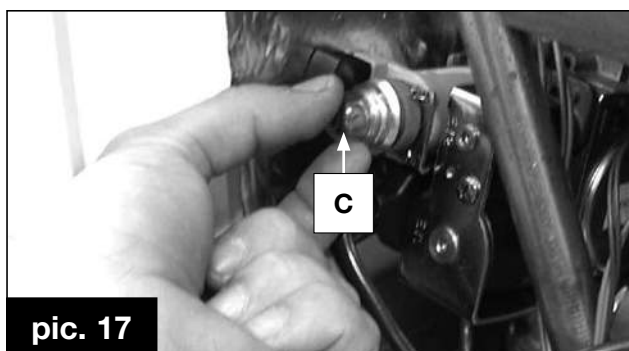
- Re-install the main burner;
- On the electronic board, switch **J MET-GPL** jumper to **MET** position (see pic. 19).

A) Max output gas valve adjustment

- Check gas mains supply pressure (refer to NOZZLE-PRESSURE section on page 10);
- remove plastic cap **C** (pic. 17), which is positioned on top of the modulating coil and protects gas valve pressure adjusting nut and screw;
- Connect a manometer to **V** check in pic. 18;
- Adjust **R** screw (pic. 20) to MAX by rotating it fully clockwise after removing the cap;
- Select "winter" boiler operation by means of no. 9 knob (pic. 1);
- Start boiler in "chimney sweep" mode (see § 3.2.12.1);
- Turn nut **K** (external) clockwise in order to increase nozzle pressure and vice-versa (pic. 17b);
- In LPG-fired boilers, turn brass nut **K** fully clockwise.

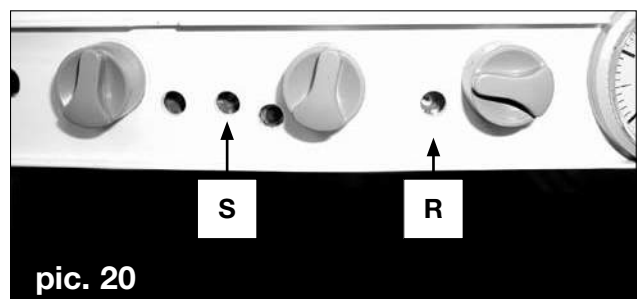
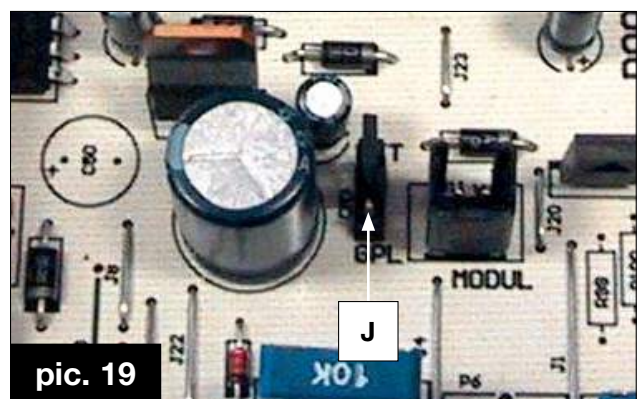
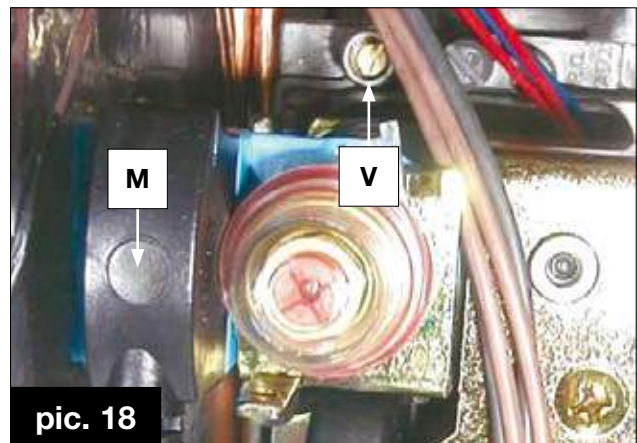
B) Min output gas valve adjustment

- Disconnect the electrical wiring to modulation coil (**M** in pic. 18);
- Turn the burner on and check **MIN** pressure according to NOZZLE PRESSURE chart on page 10;
- In order to adjust pressure, hold nut **K** still by means of a 10 mm tool, turn screw **W** clockwise to increase and counter-clockwise to decrease gas pressure;
- Re-connect electrical wiring to modulation coil.



C) Final settings

- Turn **P ACC** screw (**S** in pic. 20) to middle set point, exit the "chimney sweep" mode and check burner ignition to be correct and silent: should it result incorrect or noisy, increase or decrease ignition power by acting on **P ACC** adjuster (clockwise to increase, counter-clockwise to decrease);
- Re-check for correct min and max gas valve pressure values;
- Adjust as necessary;
- Install plastic protective cap **C**;
- Close gas pressure checks;
- **Check for gas leaks.**



4. Testing the boiler

4.1. Preliminary checks

Before testing the boiler, it is recommended to carry out the following checks:

- Compliance of the installation with current standards
- Flue gas evacuation ducts and terminal are implemented according to instruction. **When the boiler is running no fumes generated by combustion are to leak from any gaskets**
- Power mains supply to boiler is 230 V – 50 Hz
- The system is correctly loaded (water pressure gauge must read 1 – 1.3 bar)
- All stopcocks in the system piping must be open
- Gas type supplied to the boiler is in accordance to boiler specs. Should the gas type not be correct for the boiler current set-up, the boiler can be converted to the available gas type (see the “Switching to different gas and burner adjustment” section § 3.6)
- Gas supply stopcock is open
- No gas leaks are detected
- The external power mains switch is on
- Boiler safety valve is not blocked
- No water leaks are detected
- The pump is not blocked

If the boiler is not installed in compliance with current laws and standards, inform the system supervisor and do not test the boiler.

4.2. On/off switching

For boiler switching on and switching off procedure, follow the “**Instruction for the user**” section.

5. Maintenance

In order to ensure boiler efficiency and correct operation, maintenance must be carried out annually, based on the program laid out below: It is mandatory all maintenance (and repair) operations to be carried out by qualified personnel.

Manufacturer recommends Customers to contact a Service Centre for all maintenance (and repairs) required.

Before implementing any maintenance involving replacement of components and/or cleaning inside parts of boiler, disconnect electrical power supply to the boiler.

Maintenance schedule

Routine maintenance schedule must include the following checks:

- General integrity of the boiler
- Boiler and network gas supply leakage
- Gas supply pressure to boiler
- Minimum and maximum gas pressures to boiler nozzles
- Boiler ignition sequence
- Boiler combustion parameters by analysis of flue gas (this check to be performed once every two years if boiler is individually installed. When the system is served by

- multiple boilers, this check is to be performed annually)
- Air/flue gas system integrity, state of conservation, and leak test
- Air pressure switch operation
- Integrity of safety devices of the boiler in general
- Water leaks and calcium deposit covered areas on boiler couplings
- Safety valve efficiency
- Expansion vessel loading pressure
- Water pressure switch efficiency

And the following cleaning operations are to be performed:

- Boiler internal areas in general
- Gas nozzles
- Air intake and flue gas exhaust system
- Flue gas side of the heat exchanger

When implementing a maintenance schedule for the very first time to the boiler, also check:

- Boiler room suitability
- Diameter and length of air/flue gas system ducts
- Boiler installation in accordance to the manufacturer Installation manual

Should the boiler not correctly operate, or should it pose any danger to people, animals or property, inform the system supervisor both verbally and in writing.

6. Troubleshooting

BOILER STATUS	MALFUNCTION	PROBABLE CAUSE	SOLUTION
The boiler has shut down, and red light no. 5 is flashing. Turn selector 9 to RESET position in order to resume boiler operation.	Burner does not ignite	Gas supply failure	Check gas pressure Check gas valve to be open or network safety valve intervention
		Gas valve is disconnected	Reconnect gas valve.
		Gas valve is faulty	Replace it.
		PCB is faulty	Replace it.
	Burner does not ignite: spark is not generated	Spark electrode is faulty	Replace the spark electrode
		Ignition transformer is faulty	Replace the ignition transformer
		PCB is faulty	Replace PCB
	Burner ignites for a few seconds and then goes off	PCB does not detect flame: phase and neutral connections are inverted	Verify correct neutral and phase connections
		Flame detection electrode wire is faulty	Connect or replace flame detection electrode wire
		Flame detection electrode is faulty	Replace flame detection electrode
		PCB does not detect flame	Replace PCB
		P ACC Ignition value set point is too low	Increase P ACC ignition value set point
		Min heat input is not set correctly	Check burner adjustment
The boiler has shut down and red light no. 4 is flashing. Turn selector 9 to RESET position in order to resume boiler operation	Air/flue gas pressure switch is not operating	Air/flue gas pressure switch is faulty	Check air/flue gas pressure switch and replace if necessary
		Silicone pipes are disconnected or damaged	Reconnect or replace silicone pipes
		Insufficient air intake or flue gas discharge	Check air/flue gas ducts: unclog or replace as needed
		Fan is faulty	Replace it
		PCB is faulty	Replace it
The boiler has shut down and red light no. 3 is flashing. Turn selector 9 to RESET position in order to resume boiler operation	Boiler safety thermostat has shut boiler down	CH water does not flow: pipes might be clogged, thermostatic valves might be shut, system stopcocks might be closed	Check CH system
		Pump is blocked or faulty	Check the pump
The boiler has shut down and red light no. 6 is flashing. Reset boiler by replenishing correct water pressure.	Insufficient water pressure	Possible water leaks	Check system for leaks
		Water pressure switch is disconnected	Reconnect it
		Water pressure switch is faulty	Replace it
The boiler has shut down, red light no. 2 and green light no. 8 are flashing. Boiler will automatically resume operation when the problem is solved	CH probe is not operative	CH probe is disconnected	Reconnect it
		CH probe is faulty	Replace it
The boiler has shut down and red light no. 2 is flashing. Boiler will automatically resume operation when the problem is solved	DHW probe is not operative	DHW probe is disconnected	Reconnect it
		DHW probe is faulty	Replace it
Boiler is not supplying DHW	DHW flow metre is not operative	System insufficient pressure or capacity	Check DHW system Check DHW flow metre filter
		Flow metre sensor is disconnected or faulty	Reconnect or replace it
		Flow metre is stuck	Replace it

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