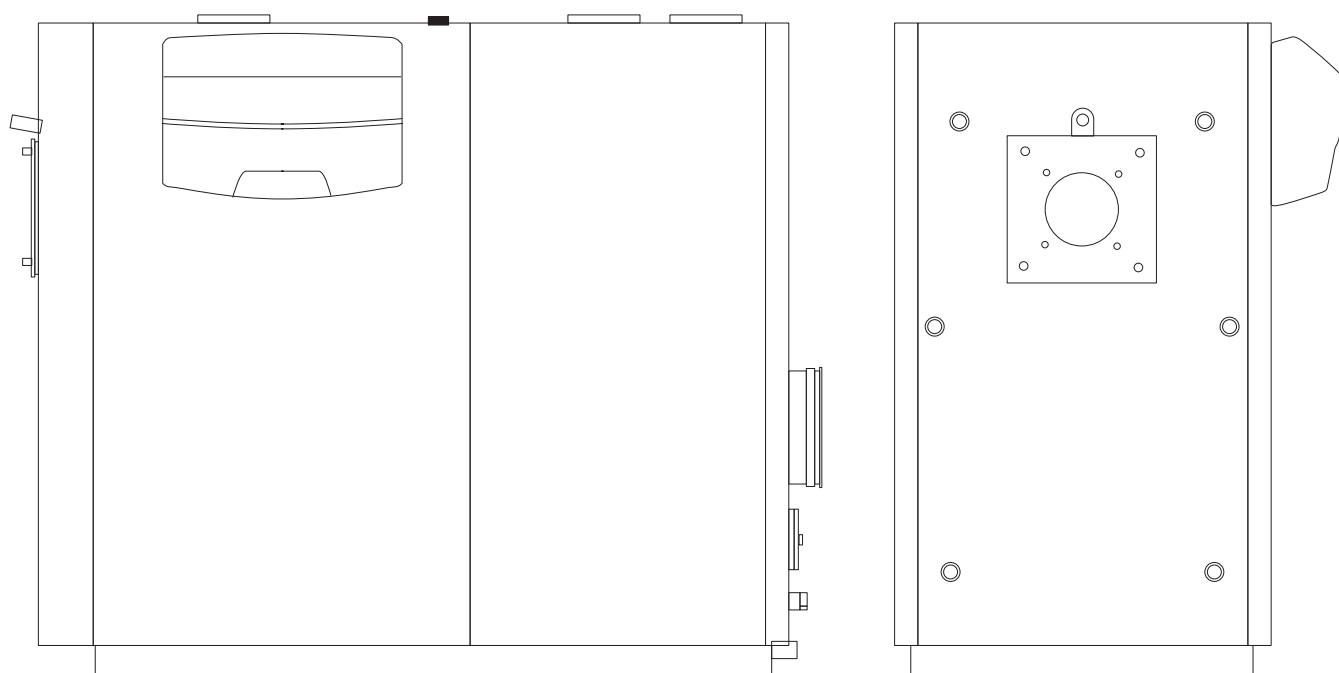


INSTALLATION, OPERATION AND MAINTENANCE MANUAL

THC 150-1450 GREY



RANGE

MODEL	CODE
THC 150 GREY	03504183
THC 210 GREY	03504184
THC 270 GREY	03504185
THC 350 GREY	03504186
THC 450 GREY	03504187
THC 600 GREY	03504188
THC 800 GREY	03504189
THC 1000 GREY	03504190
THC 1250 GREY	03504191
THC 1450 GREY	03504192
THC/C 450 GREY	20146806
THC/C 600 GREY	20146807
THC/C 800 GREY	20146808
THC/C 1000 GREY	20146809
THC/C 1250 GREY	20146810
THC/C 1450 GREY	20146811

ACCESSORIES

For a complete list of accessories and details of their compatibility, refer to the Catalogue.

Dear Customer,

Thank you for choosing a **THERMITAL** boiler. You have purchased a modern, high efficiency, quality product that is designed to give dependable and safe service and to provide comfort in the home for many years to come. Arrange for your boiler to be serviced regularly by an authorised Technical Assistance Centre **THERMITAL**. Their personnel are specially trained to keep your boiler efficient and cheap to run. They also stock any original spare parts that might be required.

This instruction manual contains important instructions and precautions that must be observed to ensure the efficient functioning of your **THC GREY** boiler.

Please accept our renewed thanks for your purchase
Thermital

CONFORMITY

THERMITAL THC GREY boilers conform to:

- Directive 92/42/EEC on efficiency requirements
- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Gas Appliances Directive 2009/142/EC (until 20 April 2018) and Regulation (EU) 2016/426 (from 21 April 2018)

Models up to 400 kW conform to the Energy-Related Products Directive 2009/125/EC and to the EU Delegated Regulation 813/2013.



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The following symbols are used in this manual:



CAUTION! = Identifies actions that require caution and adequate preparation.



STOP! = Identifies actions that you MUST NOT do.

This manual, Code 068672EN - Rev. 36 (10/18) comprises 40 pages.













GENERAL INFORMATION

General Safety Information

-  The boiler is delivered in separate crates. Check that it is complete, undamaged and as ordered as soon as you receive it. Report any discrepancies or damage to the dealer who sold it.
-  This product must be installed by a legally qualified heating engineer. On completion of the installation, the installer must issue the owner with a declaration of conformity confirming that the installation has been completed to the highest standards in compliance with the instructions provided by **THERMITAL** in this instruction manual, and that it conforms to all applicable laws and standards.
-  This product must only be used for the purpose for which it is designed and made, as specified by **THERMITAL**. **THERMITAL** declines all responsibility, contractual or other, for damage to property or injury to persons or animals caused by improper installation, adjustment, maintenance or use.
-  If you notice any water leaking from the boiler, disconnect it immediately from the mains electricity supply, shut off the water supply, and notify your local **THERMITAL**'s Technical Assistance Centre or a qualified heating engineer immediately.
-  Periodically check that operating pressure in the water circuit is over 1 bar but below the maximum limit specified for the boiler. If this is not the case, contact Technical Assistance Centre **THERMITAL** or a professionally qualified heating engineer.
-  If the boiler is not going to be used for an extended period of time, contact **THERMITAL**'s Technical Assistance Centre or a qualified heating engineer to have it prepared for shut-down as follows
 - Switch the boiler OFF at the control panel
 - Turn the main system switch "off"
 - Close the fuel cock and heating circuit water cock
 - Drain the central heating circuit if there is any risk of freezing.
-  The boiler must be serviced at least once a year.
-  This instruction manual is an integral part of the boiler. It must be kept safe and must ALWAYS accompany the boiler, even if it is sold to another owner or transferred to another user or to another installation. If you damage or lose this manual, order a replacement immediately from your local **THERMITAL**'s Technical Assistance Centre.

Precautions

The operation of any appliance that uses fuel, electrical power and water demands that a number of fundamental safety precautions be respected:

-  It is forbidden to use electrical devices or equipment, such as switches, appliances, etc. if there is a smell of gas or un-burnt products. If so:
 - Ventilate the room, opening doors and windows
 - Close the fuel shut-off cock
 - Report the fault immediately to the **THERMITAL**'s Technical Assistance Centre or a professionally qualified heating engineer.
-  Do not touch the boiler while barefoot or wet.
-  Never clean or service the boiler without first disconnecting it from the mains electricity supply by turning the main power switch and the control panel switch OFF.
-  Do not tamper with or adjust the safety or control devices without prior authorisation and instructions from the manufacturer.
-  Do not plug or block the condensate drain outlet.
-  Never pull, disconnect, or twist the electrical cables coming from the appliance even if it is disconnected from the mains electricity supply.
-  Do not obstruct or restrict the vents in the room where the boiler is installed. Adequate ventilation is essential for correct combustion.
-  Do not expose the boiler to the elements. It is designed to work indoors.
-  Do not switch the boiler off if outdoor temperature drops below ZERO (risk of freezing).
-  Do not store containers of flammable substances in the room where the boiler is installed.
-  Do not allow children or persons with reduced physical, sensorial or mental abilities or with insufficient experience and knowledge to operate this system without proper supervision from the person responsible for its safe use.
-  Do not dispose of packaging material into the environment, or leave it within the reach of children, since it can become a potential hazard. Dispose of packaging material in compliance with applicable legislation.

Description of the appliance

THC GREY THERMITAL steel boilers are triple flue pass, condensing boilers for installation in a boiler room. While they are designed primarily for central heating purposes, in conjunction with a suitable storage cylinder they can also be used to produce domestic hot water.

All parts that come into contact with the combustion gases are made from titanium stabilised stainless steel to ensure maximum resistance to the corrosive action of acid condensation. The boiler has been designed with the combustion chamber at the top and the smooth pipe tube bundle at the bottom to optimise heat exchange and energy efficiency and to maximise the condensing effect.

The boiler has a high total water content which is differentially distributed between its top and bottom sections. This allows outgoing water to reach the set temperature quickly while maintaining the condensing effect and the water heating time around the tube bundle for as long as possible.

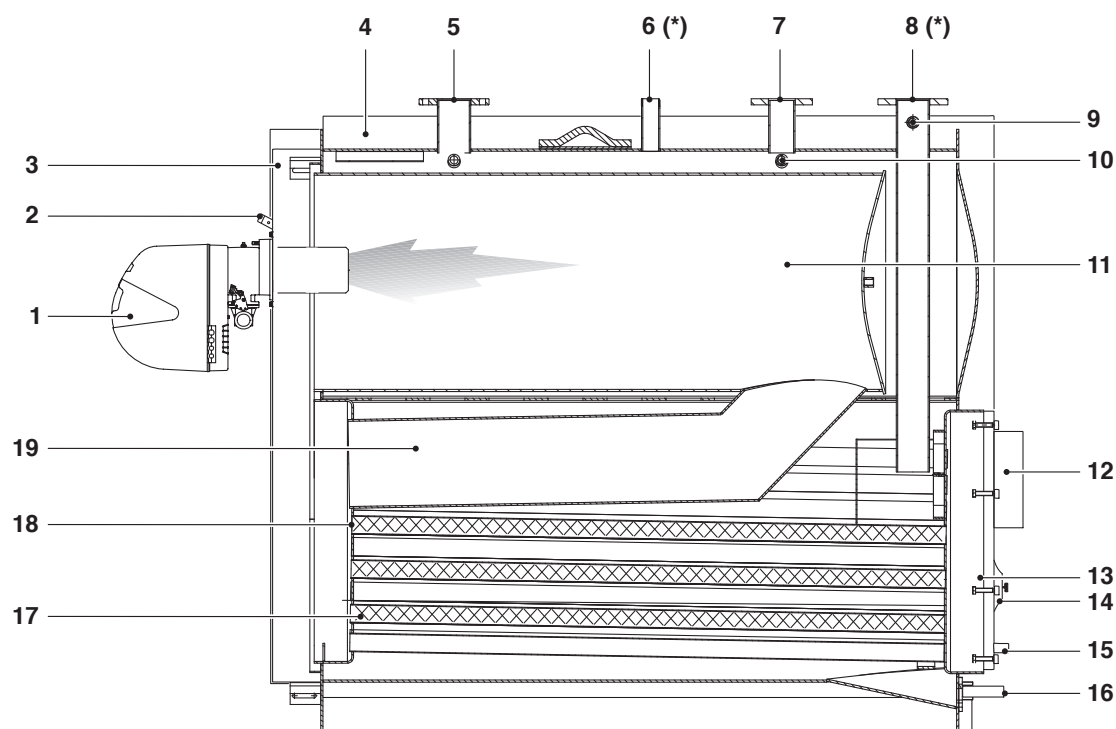
THC GREY boilers feature lightly pressurised combustion chambers for a smoother burner action, and high temperature resistant, stainless steel turbulators inside the tube bundle for maximum burner efficiency.

The boiler body is thoroughly insulated with a layer of high density glass wool.

The paint finished external panelling is also internally insulated with a layer of high density glass wool.

The boiler's front door and the flue gas chamber can be opened completely to facilitate the inspection, maintenance and cleaning of internal parts and to speed up servicing in general.

The front door can open in either direction and can be opened without removing the burner. The door is factory fitted with hinges on the left, but these can be reversed if necessary to suit individual installations.

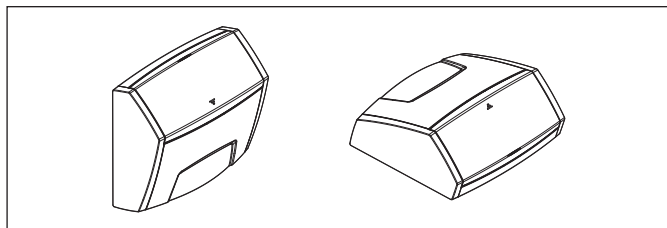


- | | |
|---|----------------------|
| 1 Burner | 12 Flue gas exhaust |
| 2 Flame inspection window with pressure measurement fitting | 13 Flue gas box |
| 3 Door | 14 Inspection window |
| 4 Casing | 15 Condensate outlet |
| 5 Outlet | 16 Boiler drain |
| 6 Safety device fitting | 17 Turbulators |
| 7 Heating return (high temperature) | 18 Flue gas pipes |
| 8 Heating return (low temperature) | 19 Second flue pass |
| 9 Blind plug | |
| 10 Instrument bulb/sensor sockets | |
| 11 Combustion chamber | |

(*) On the THC 1450 GREY the low temperature heating return (8) is located at the rear of the boiler, and the safety fitting (6) is flanged.

Control panels

The **THERMITAL** control panels that can be used with **THERMITAL THC GREY** steel boilers are listed below. These control panels cater for all the needs of the heating system and of all the devices installed in it.



TECH CLIMA TOP for central heating (1 direct zone and 2 mixed zones) and domestic hot water production with a single stage, two stage, or modulating burner. Also for controlling solar heating system and cascaded boiler systems.

TECH CLIMA COMFORT for central heating (1 direct zone and 1 mixed zone) and domestic hot water production with a single stage burner. Also for controlling solar heating system and cascaded boiler systems.

TECH CLIMA MIX for controlling 1 additional mixed zone.

Recommended burners and technical specifications

THC GREY GTM BLU with power < 400 kW

The burners suggested to obtain the best performance of **THERMITAL** THC GREY GTM BLU <400 kW boilers are:

BURNERS		BOILER THC GREY GTM BLU			
MODEL	CODE	150	210	270	350
GAS					
BS 3/M	3762350	X ^(R)			
RS 25/M BLU TC FS1	3910510		X ^(R)		
RS 25/M BLU TC FS1	3910510			X ^(R)	
RS 35/M BLU TC FS1	3910610				X ^(R)

(R) Reference burner used during performance qualification tests to derive the technical data declared.

NOTE: burners must be fitted with a gas ramp device.



See the instruction manual provided with the burner:

- Burner installation
- Electrical connections
- Burner adjustments.



To assemble/disassemble the burners equipped with recirculation tube, it might be necessary to remove the latter before carrying out such operations (strictly comply with the use and maintenance manual of the burner).

Technical specifications

DESCRIPTION	BOILER THC GREY GTM BLU				
	150	210	270	350	
Device type	Condensing boiler for central heating				
	B23				
Fuel	All gas fuels				
Device category	See Burner				
Rated heat input (Q _{max}) HCV (LCV)	166,5 (150)	233,1 (210)	299,7 (270)	388,5 (350)	kW
Rated heat input (Q _{min}) HCV (LCV)	123,2 (111)	167,6 (151)	234,2 (211)	300,8 (271)	kW
Useful (rated) heat output	147	205	264	344	
Rated maximum useful heat output (80/60°C) P4	146,6	205,2	264,3	343,7	kW
Rated min. useful heat output (80/60°C) (P _n min)	108,2	147,5	207,2	266,4	kW
30% heat output with return at 30°C (P1)	44,0	61,6	79,3	103,1	kW
Seasonal energy efficiency η_s	92,0	93,0	93,0	93,0	%
Efficiency at rated heat input in high temperature mode η_4 (80-60°C) HCV (LCV)	88,0 (97,7)	88,0 (97,7)	88,2 (97,9)	88,5 (98,2)	%
Useful efficiency at P _n min (80/60°C) HCV (LCV)	87,8 (97,5)	88,0 (97,7)	88,5 (98,2)	88,6 (98,3)	%
Efficiency at 30% rated heat input in low temperature mode η_1 with return at 30°C (HCV)	97,7 (108,5)	98,5 (109,3)	98,4 (109,2)	97,9 (108,7)	%
Losses from stack for sensible heat (Q _{max})	1,7	1,7	1,5	1,5	%
Losses from casing with burner on	0,3	0,3	0,5	1,0	%
Constant pressure drop	300	420	540	700	W
Flue gas temperature (ΔT)	< 45÷75 (*)				°C
Emissions at max. heat input Nox (0% O ₂)	< 80				mg/kWh
Flue gas mass flow rate (Q _{max})	0,07	0,09	0,12	0,15	kg/sec
Furnace pressure	2,0	2,7	3,2	4,6	mbar
Furnace volume	172,0	172,0	241,0	279,0	dm ³
Tot. volume of flue gas side	272	292	413,0	482,0	dm ³
Heat exchange surface area	8,2	10,4	13,0	16,3	m ²
Volumetric heat load (Q _{max})	872	1221	1120	1254	kW/m ³
Specific heat load	18	19,9	20,4	20,9	kW/m ²
Maximum condensate production	18,4	27,4	31,9	40,9	l/h
Maximum working pressure	6				bar
Maximum permitted temperature	110				°C
Maximum operating temperature	95				°C
Pressure drop ΔT 10°C	43,2	36,0	54,0	46,4	mbar
Pressure drop ΔT 20°C	11,3	10,2	16,3	13,4	mbar
Water capacity	360	323	495	555	l
Consumption at full load (El _{max})	650	650	800	800	W
Consumption at part load (El _{min})	132	195	240	240	W
Electrical consumption in standby mode (PSB)	20	20	20	20	W

(*) Depends on return temperature (30-60°C).



The stack must guarantee the minimum draught specified by applicable technical standards, assuming zero pressure at the connection to the flue.



Values obtained with reference burners (R) used for the performance verification tests (see burner pairing table), calibrated with CO₂ = 9,7% and λ = 1,2.



WARNING: If coupled with low NO_x emission gas burners compliant with the 2018 ErP Directive, the generators are able to operate with nitrogen oxide emissions below the limits required by said Directive.

THC GREY PREMIX with power < 400 kW

The burners suggested to obtain the best performance of **THERMITAL** THC GREY PREMIX <400 kW boilers are:

BURNERS		BOILER THC GREY PREMIX				ACCESSORIES KIT
MODEL	CODE	150	210	270	350	FLANGE
GAS - MODULATING						
RX 180 S/PV	20135846	x ^(R)				4031894
RX 250 S/PV	20134866		x ^(R)			4031894
RX 360 S/PV	20078853			x ^(R)		20029111
RX 500 S/PV	20136698				x ^(R)	20029111

(R) Reference burner used during performance qualification tests to derive the technical data declared.

NOTE: burners must be fitted with a gas ramp device.



See the instruction manual provided with the burner:

- Burner installation
- Electrical connections
- Burner adjustments.




To assemble/disassemble the burners equipped with recirculation tube, it might be necessary to remove the latter before carrying out such operations (strictly comply with the use and maintenance manual of the burner).


Technical specifications


DESCRIPTION	BOILER THC GREY PREMIX				
	150	210	270	350	
Device type	Condensing boiler for central heating				
	B23 - B23P(*)				
Fuel	All gas fuels				
Device category	See Burner				
Rated heat input (Qmax) HCV (LCV)	166,5 (150)	233,1 (210)	299,7 (270)	388,5 (350)	kW
Rated heat input (Qmin) HCV (LCV)	123,2 (111)	167,6 (151)	234,2 (211)	300,8 (271)	kW
Useful (rated) heat output	147	205	264	344	
Rated maximum useful heat output (80/60°C) P4	146,6	205,2	264,3	343,7	kW
Rated min. useful heat output (80/60°C) (Pn min)	108,2	147,5	207,2	266,4	kW
30% heat output with return at 30°C (P1)	44,0	61,6	79,3	103,1	kW
Seasonal energy efficiency ηs	92,0	93,0	93,0	93,0	%
Efficiency at rated heat input in high temperature mode η4 (80-60°C) HCV (LCV)	88,0 (97,7)	88,0 (97,7)	88,2 (97,9)	88,5 (98,2)	%
Useful efficiency at Pn min (80/60°C) HCV (LCV)	87,8 (97,5)	88,0 (97,7)	88,5 (98,2)	88,6 (98,3)	%
Efficiency at 30% rated heat input in low temperature mode η1 with return at 30°C (HCV)	97,7 (108,5)	98,5 (109,3)	98,4 (109,2)	97,9 (108,7)	%
Losses from stack for sensible heat (Qmax)	1,7	1,7	1,5	1,5	%
Losses from casing with burner on	0,3	0,3	0,5	1,0	%
Constant pressure drop	300	420	540	700	W
Flue gas temperature (ΔT)	< 45÷75 (**)				°C
Emissions at max. heat input Nox (0% O2)	70	<60			mg/kWh
Emissions at max. heat input CO	0				mg/kWh
Flue gas mass flow rate (Qmax)	0,07	0,09	0,12	0,15	kg/sec
Furnace pressure	2,4	2,7	3,2	4,6	mbar
Furnace volume	172,0	172,0	241,0	279,0	dm³
Tot. volume of flue gas side	272	292	413,0	482,0	dm³
Heat exchange surface area	8,2	10,4	13,0	16,3	m²
Volumetric heat load (Qmax)	872	1221	1120	1254	kW/m³
Specific heat load	18	19,9	20,4	20,9	kW/m²
Maximum condensate production	18,4	27,4	31,9	40,9	l/h
Maximum working pressure	6				bar
Maximum permitted temperature	110				°C
Maximum operating temperature	95				°C
Pressure drop ΔT 10°C	43,2	36,0	54,0	46,4	mbar
Pressure drop ΔT 20°C	11,3	10,2	16,3	13,4	mbar
Water capacity	360	323	495	555	l
Consumption at full load (Elmax)	400	430	450	1050	W
Consumption at part load (Elmin)	140	160	180	250	W
Electrical consumption in standby mode (PSB)	20	20	20	20	W

(*) The B23P configuration may only be adopted with premix gas burners.

(**) Depends on return temperature (30-60°C)

 The stack must guarantee the minimum draught specified by applicable technical standards, assuming zero pressure at the connection to the flue.

 Values obtained with reference burners (R) used for the performance verification tests (see burner pairing table), calibrated with CO₂ = 9,7% and λ = 1,2.

 **WARNING:** If coupled with low NO_x emission gas burners compliant with the 2018 ErP Directive, the generators are able to operate with nitrogen oxide emissions below the limits required by said Directive.

THC GREY with power > 400 kW

The burners suggested to obtain the best performance of **THERMITAL** THC GREY >400 kW boilers are:

BURNERS		BOILER THC GREY						ACCESSORIES KIT	
MODEL	CODE	450	600	800	1000	1250	1450	BURNER FLANGE	HEAD SLIDING
GAS - MODULATING									
RS 55/M BLU TC FS1	20038484	x						4031188	
RS 68/M BLU T.C.	3897406		x					4031196	
RS 120/M BLU T.C.D	3897606			x				4031196	
RS 120/M BLU T.C.D	3897606				x			4031196	
RS 160/M BLU TC FS1	3788006					x		20047680	
RS 160/M BLU TC FS1	3788006						x		
RS 50/M MZ TC	3781622	x							
RS 70/M TC	3789610		x						
RS 100/M TC	3789710			x	x				
RS 130/M TC	3789810					x			
RS 190/M TC	3787623						x		
GAS - PREMIX									
RX 500 S/PV	20077444	x							20067543
RX 850 S/PV	20074219		x						20092252
RX 1000 S/PV	20050087			x					20092252
RX 1000 S/PV	20050087				x				20092252

NOTE: burners must be fitted with a gas ramp device.



See the instruction manual provided with the burner:

- Burner installation
- Electrical connections
- Burner adjustments.



To assemble/disassemble the burners equipped with recirculation tube, it might be necessary to remove the latter before carrying out such operations (strictly comply with the use and maintenance manual of the burner).

Technical specifications

DESCRIPTION	BOILER THC GREY						
	450	600	800	1000	1250	1450	
Device type	Condensing boiler for central heating						
	B23 - B23P(*)						
Fuel	All gas fuels						
Device category	See Burner						
Rated heat input (Q _{max}) HCV (LCV)	499,5 (450)	666,0 (600)	888,0 (800)	1110,0 (1000)	1387,5 (1250)	1609,5 (1450)	kW
Rated heat input (Q _{min}) HCV (LCV)	389,6 (351)	500,6 (451)	667,1 (601)	889,1 (801)	1111,1 (1001)	1388,6 (1251)	kW
Useful (rated) heat output	442	589	786	982	1228	1424	
Rated maximum useful heat output (80/60°C) P4	441,9	589,2	785,6	982,0	1227,5	1423,9	kW
Rated min. useful heat output (80/60°C) (P _n min)	345,0	443,3	590,8	787,4	984,0	1229,7	kW
30% heat output with return at 30°C (P1)	132,6	176,8	235,7	294,6	368,3	427,2	kW
Efficiency at rated heat input in high temperature mode η_4 (80-60°C) HCV (LCV)	88,5 (98,2)	88,5 (98,2)	88,5 (98,2)	88,5 (98,2)	88,5 (98,2)	88,5 (98,2)	%
Useful efficiency at P _n min (80/60°C) HCV (LCV)	88,6 (98,3)	88,6 (98,3)	88,6 (98,3)	88,6 (98,3)	88,6 (98,3)	88,6 (98,3)	%
Efficiency at 30% rated heat input in low temperature mode η_1 with return at 30°C (HCV)	97,9 (108,7)	97,9 (108,7)	97,9 (108,7)	97,9 (108,7)	97,9 (108,7)	97,9 (108,7)	%
Losses from stack for sensible heat (Q _{max})	1,9						%
Losses from casing with burner on	0,6						%
Constant pressure drop	<0,2						%
Flue gas temperature (ΔT)	< 45÷75 (**)						°C
Flue gas mass flow rate (Q _{max}) (***)	0,20	0,26	0,33	0,43	0,54	0,63	kg/sec
Furnace pressure	5,0	5,5	5,7	6,3	6,8	7,4	mbar
Furnace volume	442	496	753	845	1037	1249	dm ³
Tot. volume of flue gas side	737	860	1290	1454	1763	2097	dm ³
Heat exchange surface area	21,8	28,8	39,6	46,5	56,2	62,3	m ²
Volumetric heat load (Q _{max})	1018	1210	1062	1183	1205	1161	kW/m ³
Specific heat load	20,1	20,3	18,5	21,0	21,7	22,6	kW/m ²
Maximum condensate production	52,2	73,8	88,0	111,4	132,7	159,5	l/h
Maximum working pressure	6						bar
Maximum permitted temperature	110						°C
Maximum operating temperature	95						°C
Pressure drop ΔT 10°C	33,8	30,2	128,7	121,5	100,4	150,1	mbar
Pressure drop ΔT 20°C	9,0	8,5	28,7	30,6	28,4	36,3	mbar
Water capacity	743	770	1320	1395	1825	1900	l

(*) The B23P configuration may only be adopted with premix gas burners.

(**) Depends on return temperature (30-60°C)

(***) At P_n max and T_m = 80°C, T_r = 60°C e CO₂ = 10,3%



The stack must guarantee the minimum draught specified by applicable technical standards, assuming zero pressure at the connection to the flue.



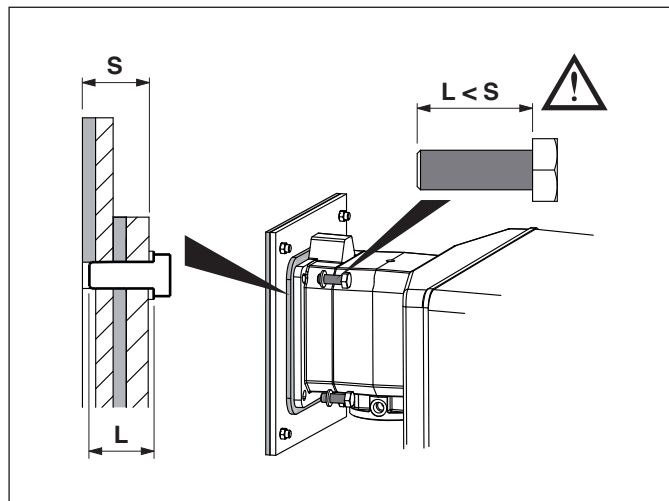
Values obtained with **THERMITAL** gas burners, calibrated with CO₂ = 9,7% and λ = 1,2.

IMPORTANT NOTES FOR BURNER INSTALLATION

Before fixing the burner to the boiler, make sure that:

- The door opens the right way (see the relevant sections for details on how to reverse the door)
- The length (L) of the burner fixing bolts is less than (S), i.e. the total depth of the seal, plates and washer.
Longer bolts can cause the door to warp, compromising its ability to seal the boiler hermetically and permitting the release of combustion fumes.

To ensure correct burner installation, also refer to the burner's own manual.

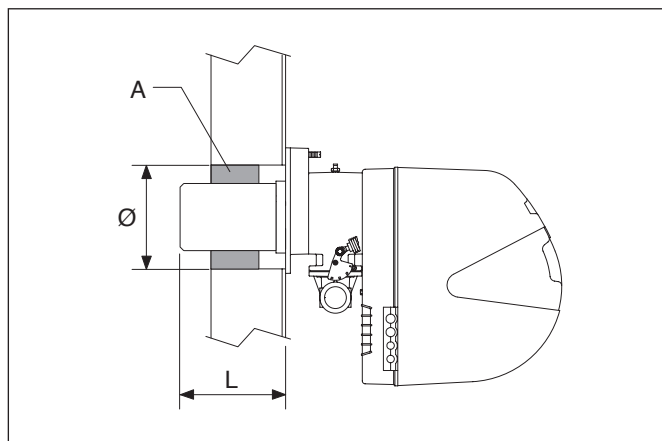


If you are installing a new boiler but re-using an old burner, always perform the following checks:

- Make sure that the performance of the old burner is adequate for the requirements of the boiler
- Make sure that the length and diameter of the burner nozzle are as specified in the following table.



When you finish installing the burner in the boiler, fill the gap between the burner's blast tube and the refractory material in the door with the ceramic insulation (A) supplied with the boiler.



	THC GREY				
	150	210	270	350	450
Burner head L min. (mm)	110	170	180	180	195
Hole in door Ø (mm)	162	162	180	180	210

	THC GREY				
	600	800	1000	1250	1450
Burner head L min. (mm)	200	200	200	200	205
Hole in door Ø (mm)	210	235	235	230	265



Do not re-use old burners if their blast tube lengths are below those specified in the table.

Identification

The products are identified by:

Serial number plate

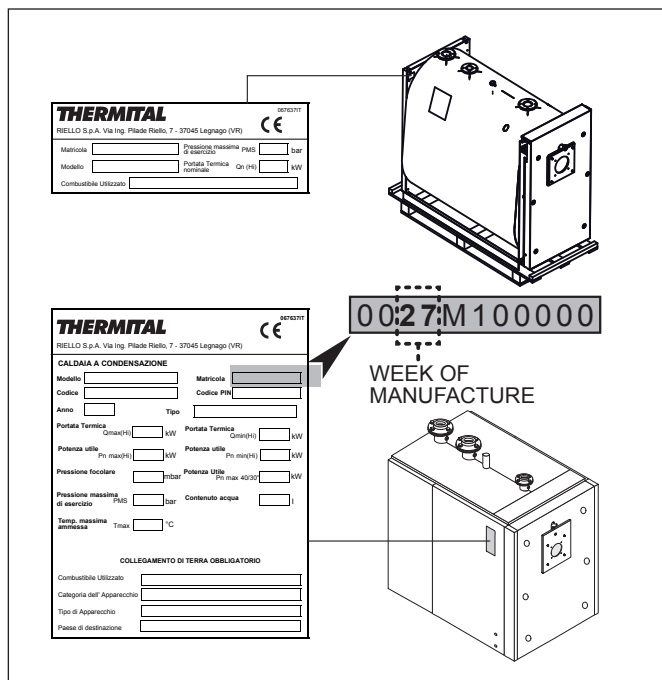
This is located on the boiler body and specifies the serial number, model, and furnace power.

Data plate

This lists the technical specifications and performance of the product. It comes inside the documentation envelope. On completion of the installation you **MUST** apply it in a clearly visible position at the top of one of the side panels. If you damage or lose this label, order a replacement immediately from **THERMITAL's** Technical Assistance Centre.



If these plates or any other means of clearly identifying the product are defaced, removed or lost, proper installation and servicing may be rendered difficult.



SYSTEM MANAGER

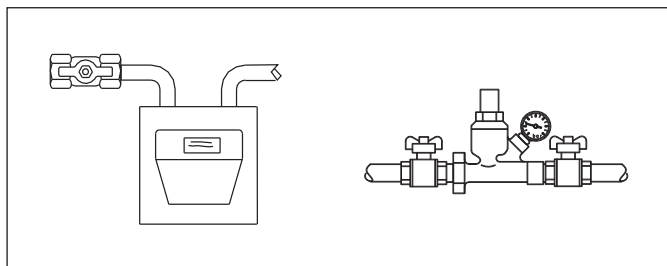
Putting into service

Have **THERMITAL's** Technical Assistance Centre start up your **THERMITAL THC GREY** boiler for the first time. Once this has been done, the boiler can be left to function automatically.

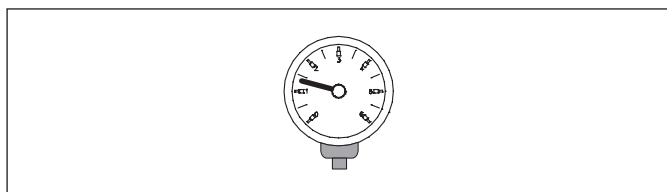
Under certain circumstances, such as after long periods of dis-use, the service engineer responsible for the boiler may need to re-start it without involving the Technical Assistance Centre.

To do so, perform the following checks and operations:

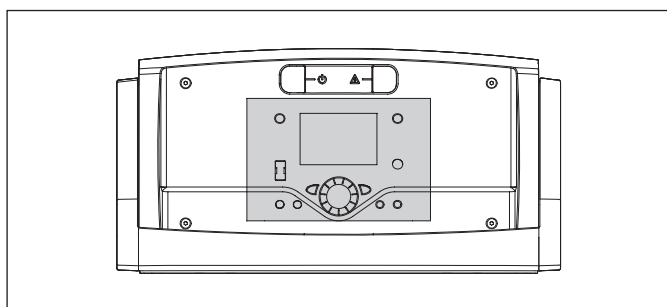
- Check that the gas cock and heating water cock are open



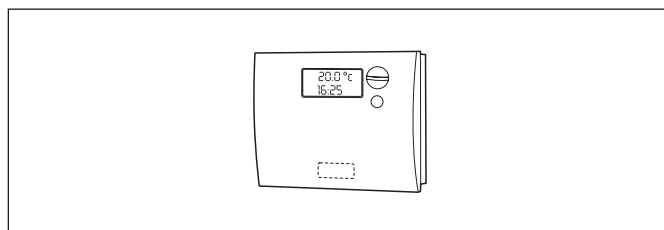
- While the system is still cold, check that working pressure in the central heating circuit is over 1 bar but below the maximum limit specified for the boiler



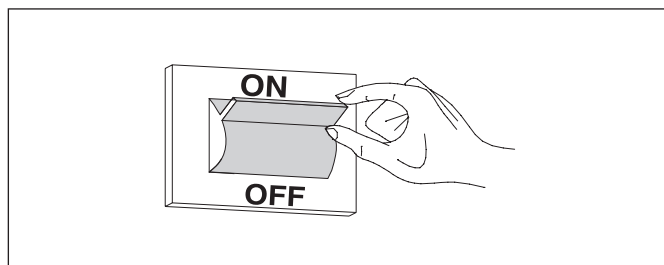
- Since the control panel incorporates a temperature control function, make sure that the control panel is switched on



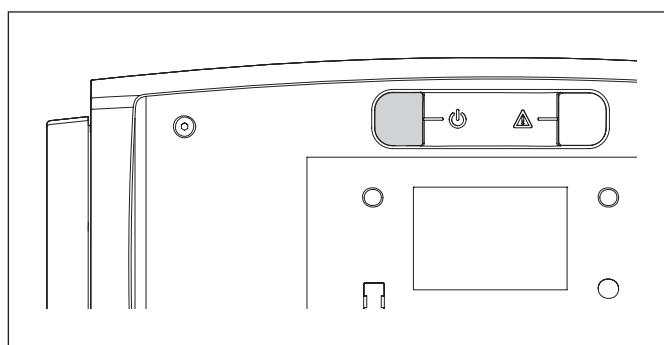
- Adjust the timer thermostat (if installed) or the temperature control to the desired temperature (~20° C)



- Turn the boiler's mains power switch ON



- Turn the control panel power switch ON and make sure that the green power indicator lights
- Make the settings as instructed in the instruction manual for your control panel.



The burner should now ignite and remain in operation until the set temperature is reached.

The burner will then switch off and on automatically to maintain the set temperature without further operator action.

If any ignition faults or malfunctions occur, the burner performs a "LOCKOUT SHUTDOWN". This is shown by the red button light on the burner and by the warning light on the control panel.

! If a "LOCKOUT SHUTDOWN" occurs, wait about 30 seconds before resetting the burner.

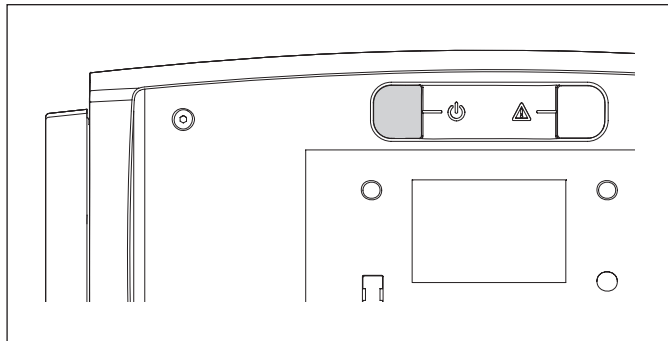
To reset the burner, press the red button light on the burner and wait until the flame ignites.

Repeat this operation 2-3 times at the most. If the problem persists after that, call **THERMITAL's** Technical Assistance Centre.

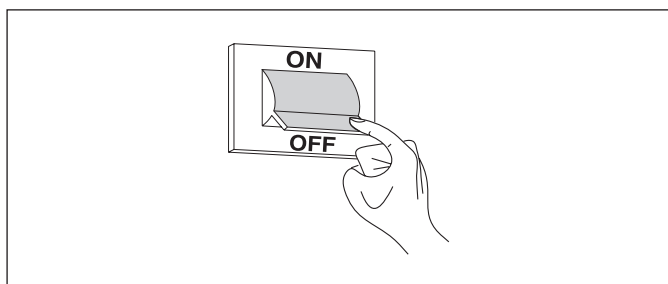
Preparing for extended periods of disuse

If the boiler is not going to be used for an extended period of time, perform the following operations:

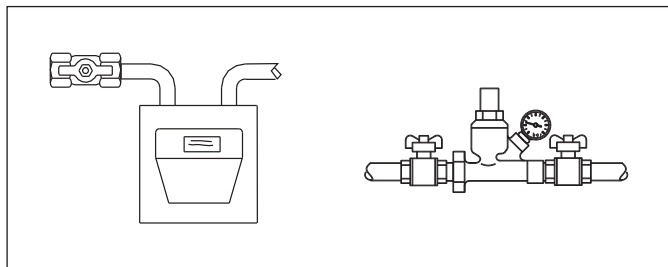
- Turn the control panel power switch OFF and make sure that the green power indicator goes out



- Turn the main system switch "off"



- Close the fuel cock and heating circuit water cock



- Drain the central heating circuit if there is any risk of freezing.

 Contact your local **THERMITAL** Technical Assistance Centre if you encounter any problems in completing the above procedure.

Cleaning

Use a cloth dampened in soapy water to clean the boiler's external casing.

To remove stubborn marks, use a cloth dampened in a 50% mix of water and denatured alcohol or a suitable cleaning product. Carefully dry after cleaning.



Do not use abrasive cleaning pads or powder detergents.



Never clean the boiler without first disconnecting it from the mains electricity supply by turning the mains power switch and the control panel switch OFF.



The combustion chamber and flue pipes must be cleaned periodically by the manufacturer's Technical Assistance Centre or by a qualified heating engineer.

Maintenance

Please remember that THE PERSON RESPONSIBLE FOR SYSTEM MANAGEMENT MUST ENSURE THAT PROFESSIONALLY QUALIFIED HEATING ENGINEERS UNDERTAKE PERIODIC MAINTENANCE AND COMBUSTION EFFICIENCY MEASUREMENTS.

THERMITAL's Technical Assistance Centre is qualified to satisfy these legal requirements and can also provide useful information on MAINTENANCE PROGRAMMES designed to guarantee:

- Greater safety
- Compliance with applicable legislation
- Freedom from the risk of fines in the event of spot checks.

Regular maintenance is essential for the safety, efficiency and durability of the boiler.

Servicing is a legal requirement and must be performed at least once a year by a professionally qualified heating engineer.

Useful information

Seller:.....

Installer:.....

Mr.:

Mr.:

Address:

Address:

Tel.:.....

Tel.:.....

Technical Assistance Centre:

Mr.:

Address:

Tel.:.....

Date	Work done

Fuel oil supplier:

Mr.:

Address:

Tel.:.....

Date	Quantity supplied	Date	Quantity supplied	Date	Quantity supplied	Date	Quantity supplied


INSTALLER

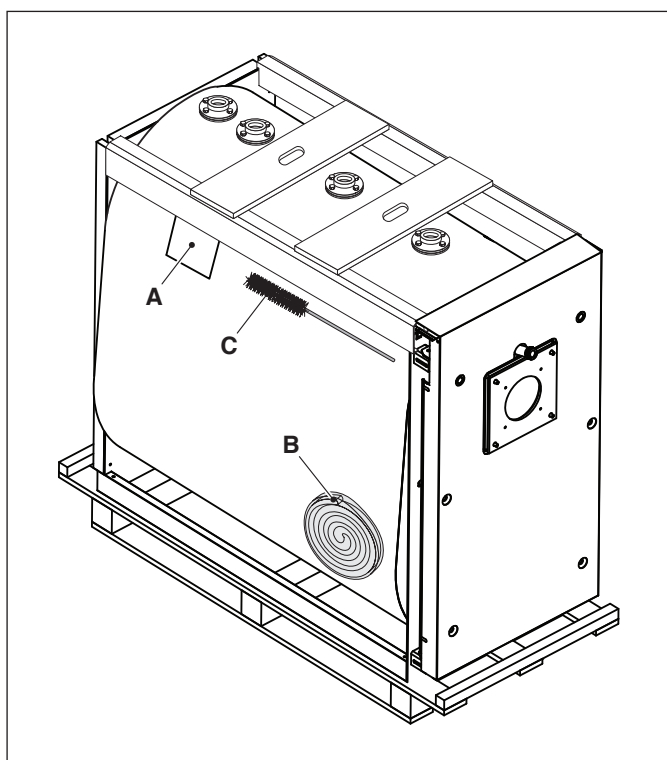
Unpacking the product

The **THC GREY** boiler is supplied in two separate packages.


1 BOILER BODY CRATE to which is attached the documentation envelope (A) containing:

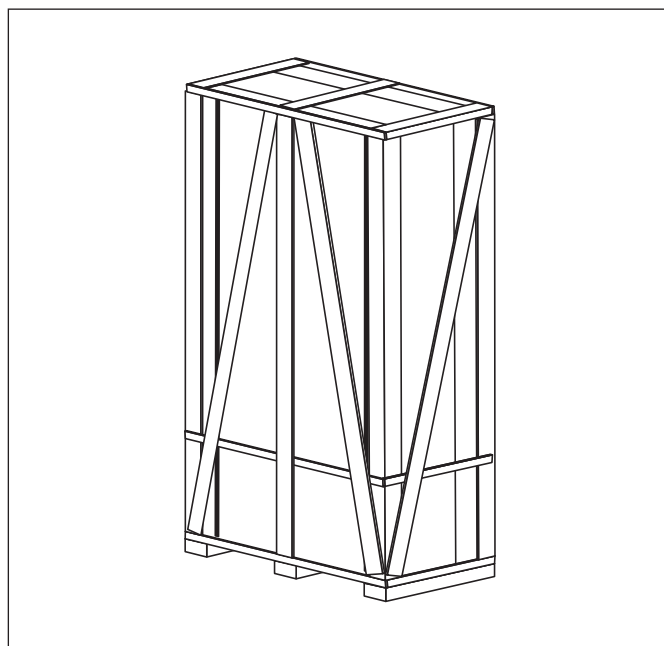
- Instruction manual
- Data label (to be applied to the panelling on completion of the installation)
- Hydraulic test certificate
- Bar code labels
- Ceramic insulation (B)
- Cleaning brush (C).

 The instruction manuals are an integral part of the boiler, therefore we recommend to read and keep them with care.

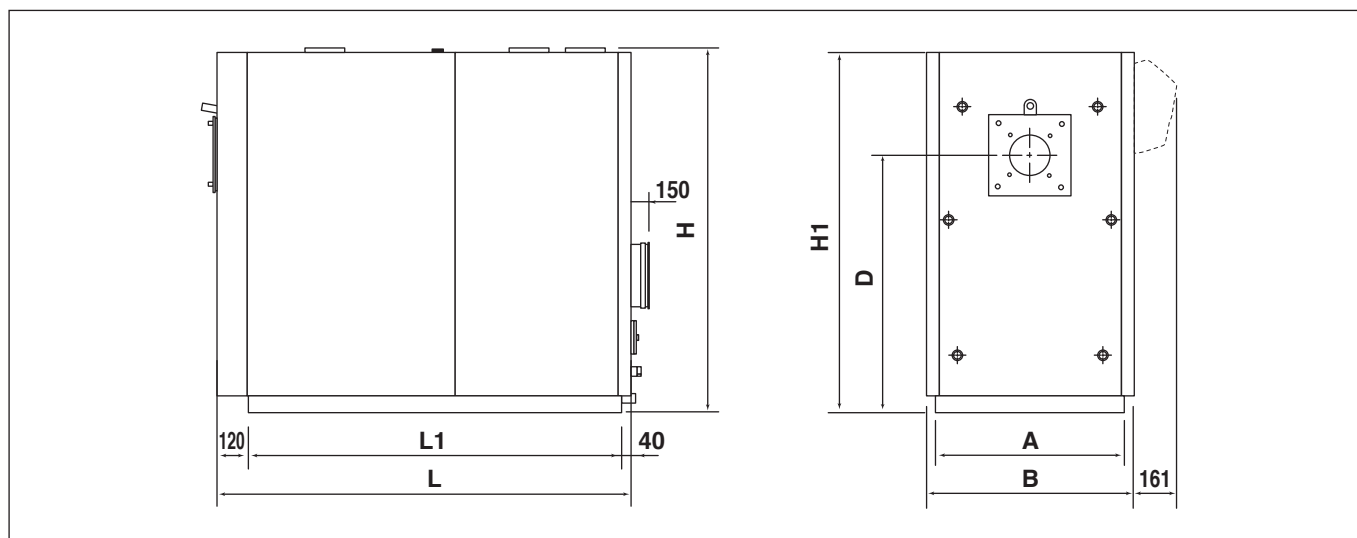


2 PANELLING CRATE, complete with assembly accessories, protected by cardboard packaging and a wooden crate.

 For the boiler to function correctly, it must be connected to a **THERMITAL** control panel and dedicated control accessories.

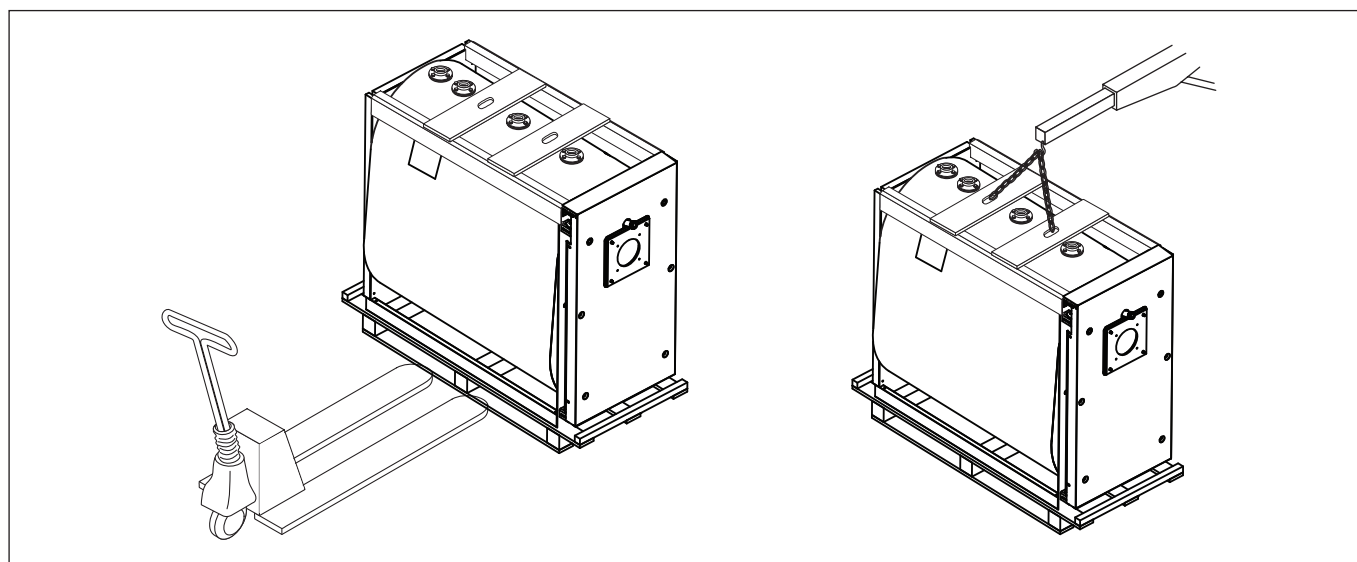


Overall dimensions and weights



DESCRIPTION	THC GREY										
	150	210	270	350	450	600	800	1000	1250	1450	
A - Base width	690	690	750	750	790	790	980	980	1070	1130	mm
B - Width	760	760	820	820	890	890	1080	1080	1170	1225	mm
L - Length	1455	1455	1630	1830	2035	2235	2560	2810	3010	3080	mm
L1 - Base depth	1295	1295	1470	1670	1875	2075	2400	2650	2830	2850	mm
H - Height of water fittings	1315	1315	1450	1450	1630	1630	1910	1910	2030	2180	mm
H1 - Boiler height	1300	1300	1437	1437	1615	1615	1900	1900	2015	2167	mm
D - Height of burner plate	925	925	1030	1030	1235	1235	1390	1390	1495	1590	mm
Weight of boiler	510	530	677	753	1095	1250	1870	2085	2515	3050	kg
Weight of casing	50	50	60	70	90	120	140	160	215	230	kg

Handling



THC GREY THERMITAL steel boilers are fitted with lifting attachments. Take great care when moving them and only use lifting equipment of adequate capacity.

Remove the transport straps and remove the wooden pallet before positioning the boiler.



Wear suitable personal protective equipment and use suitable safety devices.

Installation premises

THERMITAL THC GREY steel boilers must be installed in a dedicated boiler room, with adequately sized vents, in compliance with applicable laws and standards.

If at all possible, the boiler should be installed on a raised base to stop the burner fan sucking up dust and to facilitate installation of a condensate drain system.

The boiler condensate drain must be located above the height of the lid of the system's condensate neutraliser.

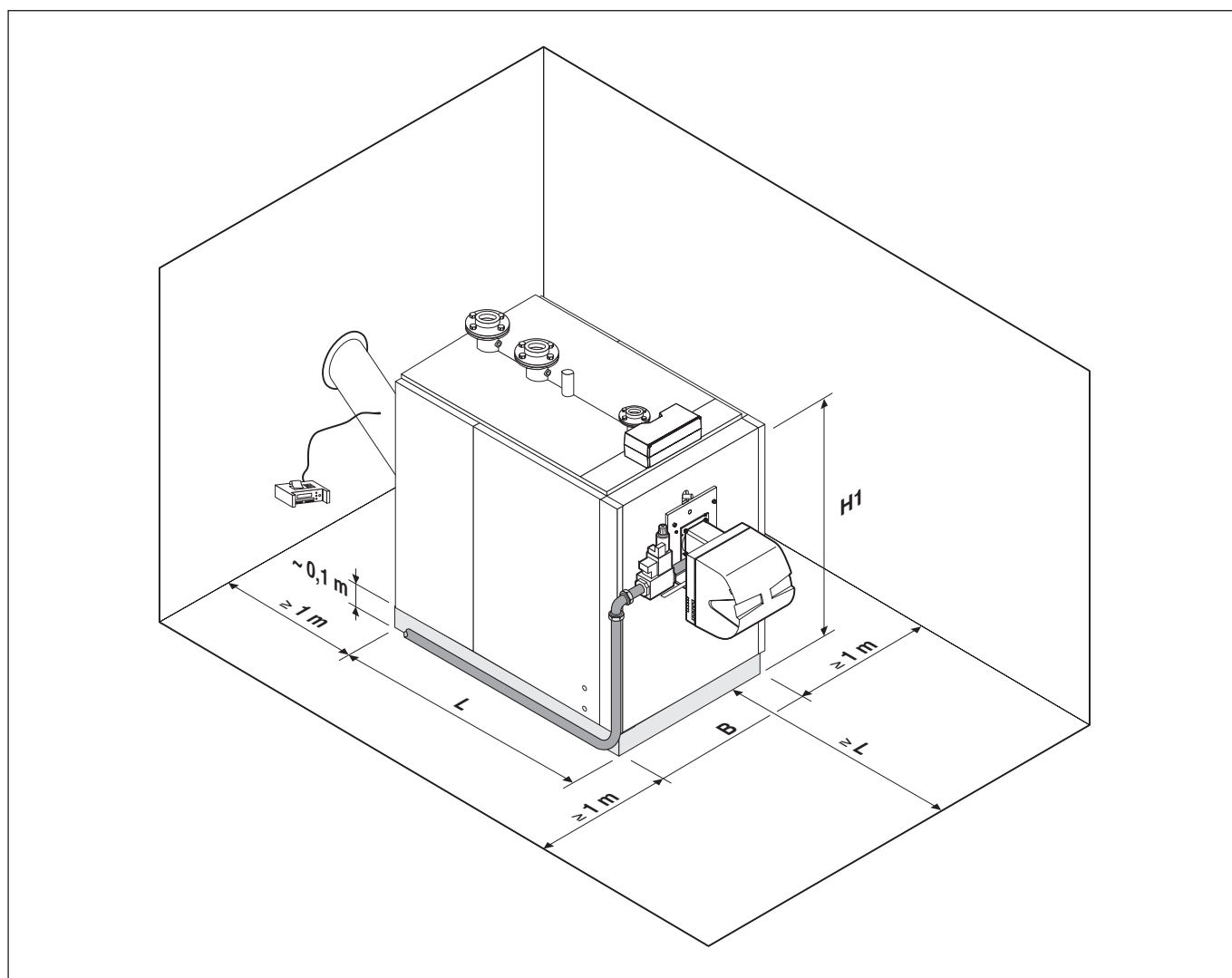
The gas supply pipe must be installed in such away that the boiler's panelling can be removed and the front door opened without having to remove the burner.

⚠ In Belgium, boilers must be installed according to standards NBN D51.003, NBN D30.003, NBN B61.002 (heat output < 70 kW), and NBN B61.001 (heat output >70 kW).

⚠ When installing the boiler, allow sufficient space around it to access all safety and control devices and to permit easy maintenance.

⚠ If the specific weight of the gas supply to the burner is greater than the specific weight of air, install all electrical parts at least 500 mm above floor level.

⊘ Do not install the boiler outdoors. It is not designed to work outdoors and is not fitted with the necessary automatic anti-frost systems to do so.



DESCRIPTION	THC GREY										
	150	210	270	350	450	600	800	1000	1250	1450	
B - Width	750	750	850	850	900	900	1000	1000	1200	1250	mm
L - Length	1350	1350	1620	1820	1930	2140	2400	2700	2920	3100	mm
H1 - Overall height (boiler + base)	1420	1420	1540	1540	1700	1700	2010	2010	2130	2280	mm

Water in central heating systems

INTRODUCTION

Water used in central heating systems MUST be suitably treated to ensure the correct functioning of those systems and to guarantee an extended working life for boilers and all other system components. This applies not only to existing systems but to newly installed systems too.

Sludge, lime-scale and pollutants present in the water can cause permanent damage to the heating unit, also within a short time and regardless of the quality standards of the materials used.

Contact the Technical Assistance Centre for any further information on type and use of additives.

⚠ Always conform to the standards and legislation applicable in the country of installation.

WATER IN CENTRAL HEATING SYSTEMS. INSTRUCTIONS FOR THE DESIGN, INSTALLATION AND MANAGEMENT OF CENTRAL HEATING SYSTEMS.

1. Chemical and physical characteristics of water

The chemical and physical characteristics of water used in central heating systems must conform to the requirements of EN 14868 standard and to the following tables:

STEEL BOILERS with furnace power < 150 kW			
		Initial filling water	Regular ser- vice water (*)
ph		6-8	7,5-9,5
Hardness	°fH	< 10°	< 10°
Electrical conductivity	µs/cm		< 150
Chlorides	mg/l		< 20
Sulphides	mg/l		< 20
Nitrides	mg/l		< 20
Iron	mg/l		< 0,5

STEEL BOILERS with furnace power > 150 kW			
		Initial filling water	Regular ser- vice water (*)
ph		6-8	7,5-9,5
Hardness	°fH	< 5°	< 5°
Electrical conductivity	µs/cm		< 100
Chlorides	mg/l		< 10
Sulphides	mg/l		< 10
Nitrides	mg/l		< 10
Iron	mg/l		< 0,5

(*) values for water in system after 8 weeks of functioning

General note on water used to top up systems:

- If softened water is used to top up a system, 8 weeks of functioning after topping up, verify that the water in the system respects the above limits, in particular for electrical conductivity
- This check is not necessary if demineralised water is used to top up the system.

2. Central heating systems

⚠ Do not use automatic filling devices to add water to central heating systems. Use a manual device instead and record top-ups in the system service book.

⚠ If there are more than one boiler, they must all be put into service either contemporarily or with a very low rotation time during the initial period of service, so as to evenly distribute the limited quantity of initial lime-scale.

⚠ A flushing cycle must be programmed after the plant has been installed to flush out any installation debris.

⚠ Water used to fill a system for the first time and water used to top it up must always be filtered (using synthetic or metal mesh filters with a filtration rating of no less than 50 microns) to prevent sludge from forming and triggering deposit corrosion.

⚠ The heating system must be flushed out and cleaned with good workmanship before filling up the existing systems. The boiler may not be filled until after the heating system has been flushed out.

2.1 New central heating systems

The system must be filled up slowly the first time; once it is filled and the air expelled it should never need to be topped up again.

Systems should also be operated at maximum working temperature the first time they are started up, in order to facilitate de-aeration. (Gas is not released from the water at low temperatures).

2.2 Reconditioning old central heating systems

If a boiler has to be replaced, do not refill the entire central heating circuit if the quality of water in it conforms to requirements. If the quality of water fails to conform to requirements, either recondition the old water or separate the water circuits (water in the boiler circuit must conform to requirements).

3. Corrosion

3.1 Deposit corrosion

Under-deposit corrosion is an electrochemical process, due to the presence of sand, rust, etc., inside the mass of water. These solid substances generally deposit on the bottom of the boiler (sludge), on tube and pipe heads or in the gaps between pipes and tubes.

Micro-corrosion phenomena may be triggered off owing to the difference in electrochemical potential coming to be created between the material in contact with the impurity and the surrounding one.

3.2 Stray current corrosion

Corrosion from stray currents can occur due to the differing electrical potentials between water in the boiler and the metallic mass of the boiler or piping. This process leaves unmistakable traces i.e. small regular conical holes.

⚠ All metallic parts should be grounded by an efficient earth cable for this reason.

4. Eliminating air and gas from central heating systems

If oxygen enters a circuit continuously or even intermittently (e.g. in under-floor heating systems whose pipes are not protected by impermeable synthetic sheaths, in circuits with open expansion vessels, or in circuits that require frequent top-ups) always separate the boiler's water circuit from the central heating circuit.

Mistakes to avoid and precautions.

From what we have seen it is therefore important to avoid two factors possibly leading to the above mentioned processes i.e. contact between air and water in the installation and regular topping up with fresh water.

To eliminate contact between air and water (and to prevent the latter from becoming oxidized), it is necessary:

- For the expansion system to be a closed vessel type, correctly scaled and with the correct pre-loading pressure (to be regularly checked)
- For the installation to always be at a higher pressure than that of the atmosphere at any point (comprising the pump suction side) and under all running conditions (all the water sealing and couplings in the installation are designed to resist pressure towards outside, but not for depression)
- That the installation will not be made with materials permeable to gas (e.g. plastic pipes for floor systems without anti-oxygen barrier).

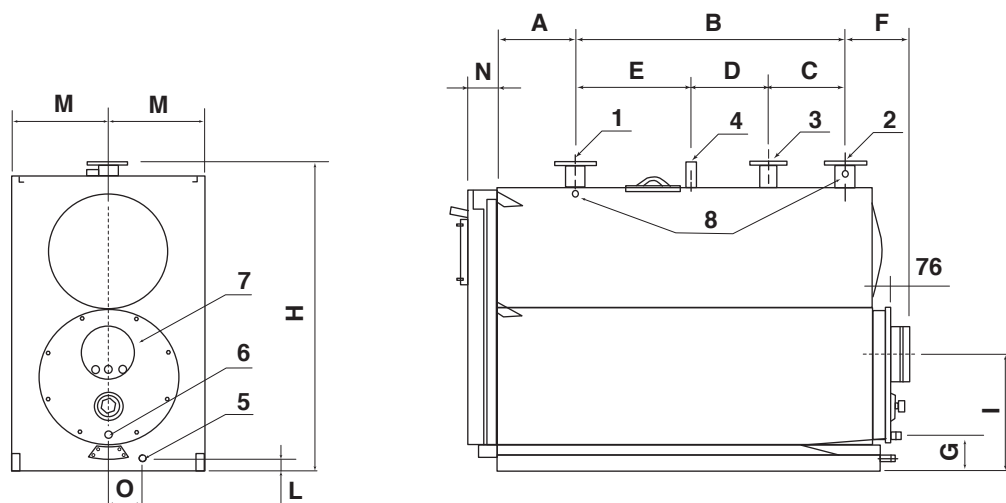


Lastly we would remind you that the warranty does not cover breakdowns incurred by the boiler due to deposits and corrosion.

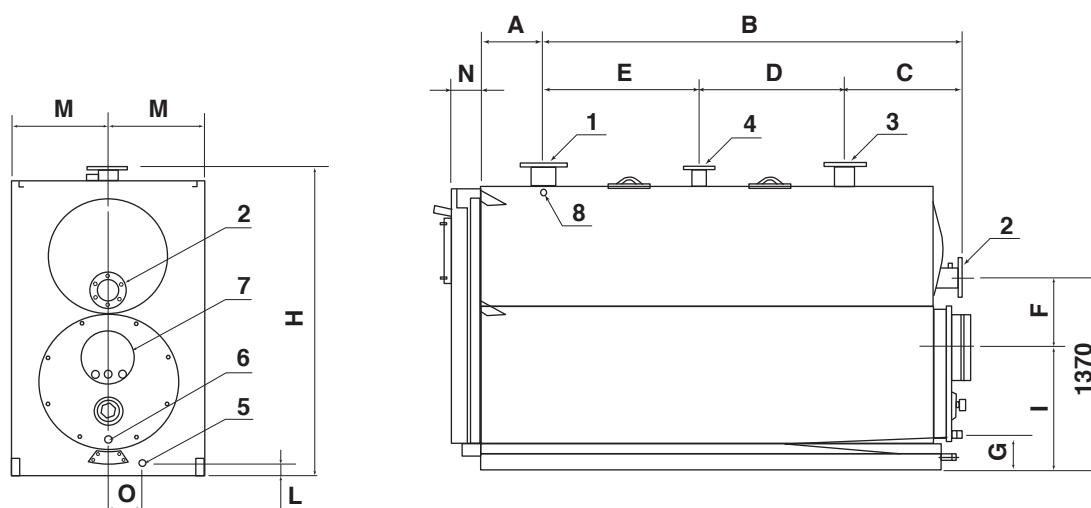
Water connections

THERMITAL THC GREY boilers are designed and made for use in central heating installations, but can also be used for domestic hot water production if connected to a suitable storage cylinder. Water fittings are as specified in the following table.

THC GREY 150 ÷ 1250 models



THC GREY 1450 model



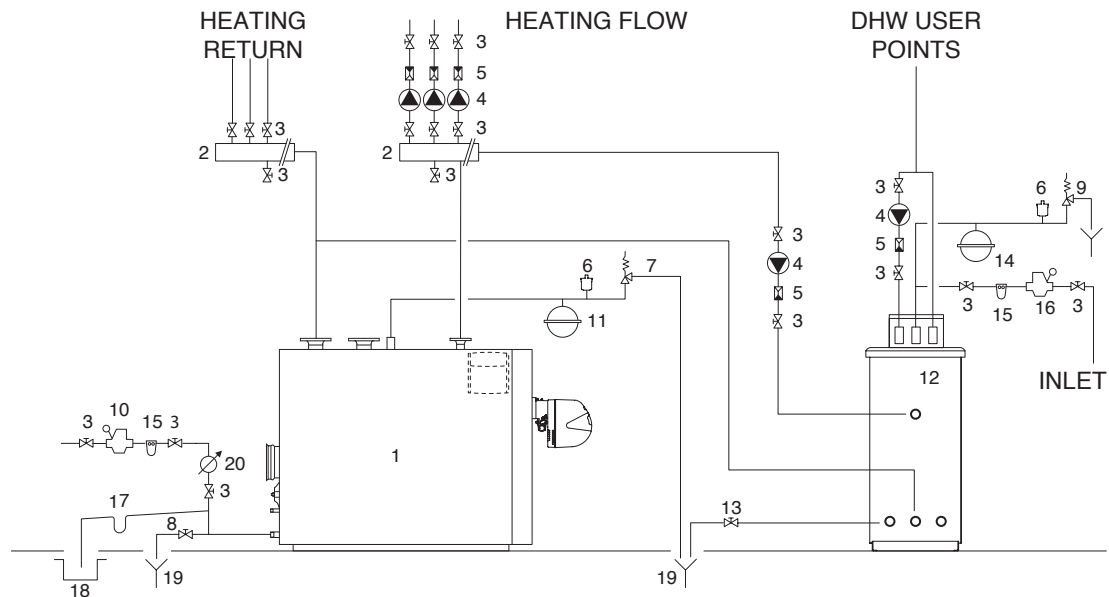
- ⚠ The choice of system components and the method of their installation are left up to the installer. Installers must use their expertise to ensure proper installation and functioning in compliance with all applicable legislation.
- ⚠ Circuits filled with anti-freeze must be fitted with water disconnectors.

DESCRIPTION	THC GREY										
	150	210	270	350	450	600	800	1000	1250	1450	
1 - Heating flow (*)	65	65	65	80	100	100	125	125	150	150	DN
2 - Heating return 1 (Low Temperature) (*)	65	65	65	80	100	100	125	125	150	150	DN
3 - Heating return 2 (High Temperature) (*)	50	50	50	65	80	80	80	80	100	100	DN
4 - Safety device fitting	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/2	1" 1/2	80	80	80	80	Ø " - DN
5 - Boiler drain fitting	1"	1"	1"	1"	1"	1"	1"1/4	1"1/4	1"1/4	1"1/4	Ø"
6 - Condensate drain fitting	1"	1"	1"	1"	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1"1/4	1"1/4	Ø " - DN
7 - Flue gas exhaust fitting	200	200	250	250	300	300	350	350	400	450	Ø mm
8 - Instrument bulb/probe sockets	3 x 1/2"	3 x 1/2"	3 x 1/2"	3 x 1/2"	3 x 1/2"	3 x 1/2"	3 x 1/2"	3 x 1/2"	3 x 1/2"	3 x 1/2"	n° x Ø "
A - Distance from burner head to heating flow outlet	300	300	300	315	311	311	410	410	430	440	mm
B - Distance from heating flow outlet to return 1	885	885	1050	1235	1400	1600	1800	2050	2200	2585	mm
C - Distance between heating returns 1 & 2	200	200	300	250	250	300	350	350	350	735	mm
D - Distance between heating return 2 and safety device fitting	285	285	300	450	600	700	750	850	850	850	mm
E - Distance between heating flow outlet and safety device fitting	400	400	450	535	550	600	700	855	1000	1000	mm
F - Distance between heating return 1 and flue gas outlet	200	200	225	225	270	270	325	325	345	560	mm
G - Height of condensate drain	152	156	156	156	215	213	195	195	213	235	mm
H - Height of boiler flanges	1340	1340	1450	1450	1630	1630	1910	1910	2030	2180	mm
I - Height of flue gas outlet	505	505	535	535	635	635	680	680	720	805	mm
L - Height of boiler drain fitting	60	60	60	60	82	82	86	86	90	85	mm
M - Boiler centreline	345	345	375	375	395	395	490	490	535	565	mm
N - Distance from burner head to door	110	110	120	120	125	125	125	125	140	150	mm
O - Distance from Boiler drain fitting	132	132	137	137	125	125	175	175	180	180	mm

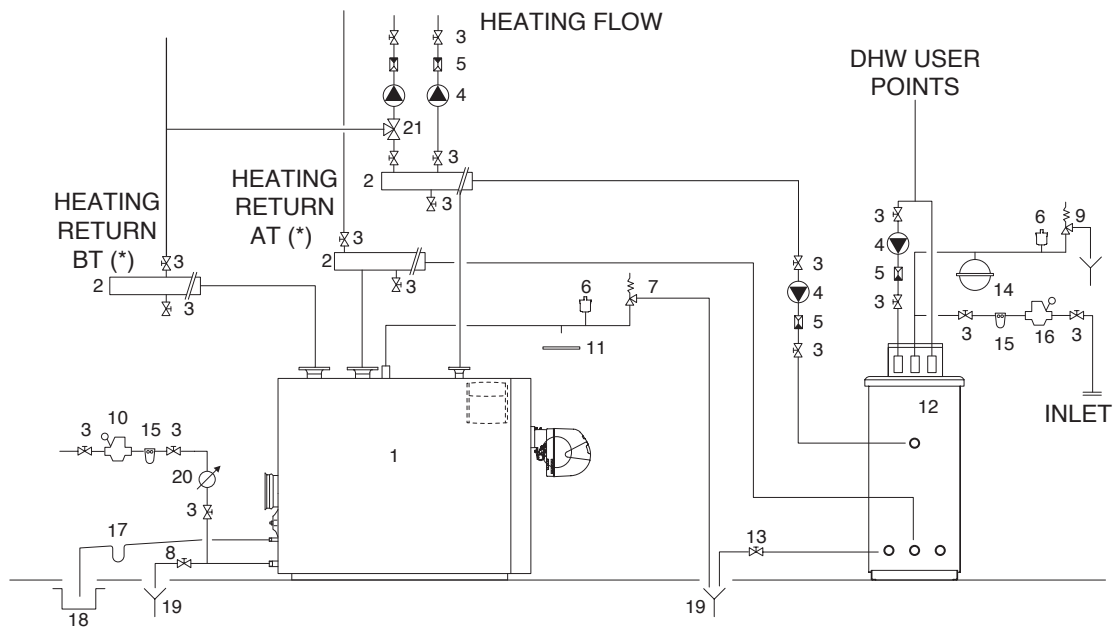
(*) All flanged connections are PN6 according to EN 1092-1.

TYPICAL INSTALLATION SCHEMATIC

Direct systems



Direct and mixed systems



- 1 Boiler **THERMITAL THC GREY**
- 2 Central heating system manifolds
- 3 Disconnect valves
- 4 System pumps
- 5 Non-return valves
- 6 Automatic vent valve
- 7 Boiler safety valve
- 8 Boiler drain cock
- 9 Storage cylinder safety valve
- 10 System filling cock
- 11 CH expansion vessel
- 12 Remote controlled water tank (**THERMITAL BSS**)
- 13 Storage cylinder drain cock
- 14 DHW expansion vessel

- 15 Water softener filter
- 16 Pressure reducer
- 17 Siphon
- 18 Condensate outlet
- 19 Drain
- 20 Water supply/top-up counter
- 21 Servo valve

(*) AT= High Temperature BT= Low Temperature

Condensate evacuation

THC GREY condensing boilers produce a flow of condensate that varies according to operating conditions. The maximum hourly production of condensate is shown in the technical specifications table for each individual model. The condensate outlet must be sized according to this value and at no point must the diameter be less than the diameter of the boiler condensate discharge (7).

In order to avoid the release of combustion products in the thermal room, it is necessary to insert the trap supplied with the boiler in the condensation drain path. The connecting pipes between the boiler, siphon and waste water drain pit must be laid at a minimum down slope of 3° and must be installed in such a way as to prevent any build-up of.

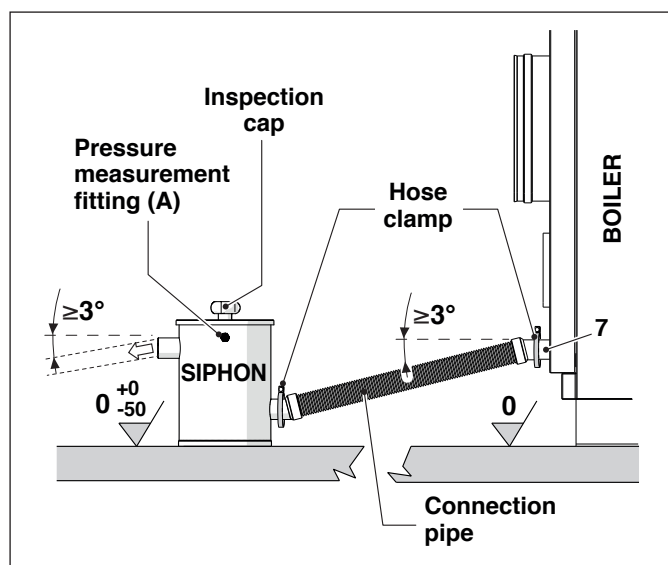
The siphon is fitted with a tapping point (A), which a pressure gauge can be connected to.

The siphon is available in two sizes:

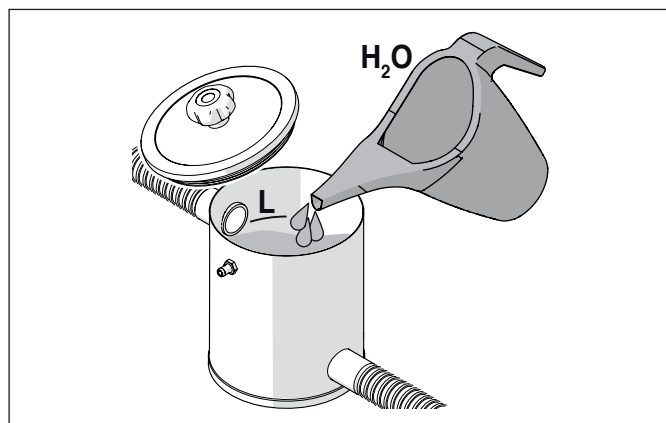
- 1" connectors for <400kW boilers
- 1¼" connectors for >400kW boilers

⚠ Check and clean the condensation drain line on a yearly basis.

⚠ The connection to the waste water drain pit must be made in compliance with national and local legislation and standards.



⚠ Before commissioning, fill the siphon with water up to level "L" in line with the top fitting.

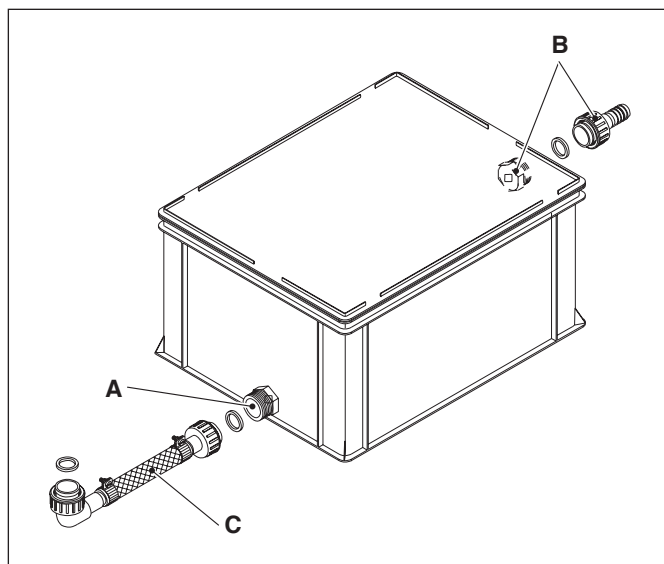


Neutralising the condensate

NEUTRALISATION KIT N2-N3

N2-N3 neutralisation units are designed for systems with boiler condensate drain pits located at a lower level than the boiler condensate drain fitting. These neutralisation units do not require any electrical connections.

Type	N2	N3
Maximum flow rate of neutralised condensation (litres/hour)	54	180
Dimension (mm)	420x300x240	640x400x240
Q.ty of granulate	25 kg	50 kg
Fitting Ø	1"	1" 1/2



The inlet fitting (A) of the N2 neutralisation unit (the lower fitting) must be connected to the boiler condensate drain fitting using the flexible hose (C) supplied. This condensate drain hose is specially made to prevent combustion fumes escaping into the atmosphere.

The outlet fitting (B) of the neutralisation unit (the top fitting) must be connected to the boiler room's waste water drain pit using another section of flexible hose (not supplied).

⚠ The boiler room's condensate drain pit must be located at a lower level than the fitting (B) on the neutralisation unit.

⚠ The connection pipes used must be as short and straight as possible and corrosion-resistant. Any curves or sharp bends can lead to the hoses becoming clogged and can therefore prevent proper condensate discharge.

If it is necessary to neutralise condensation produced in the chimney, we recommend to connect the condensation drains of boiler and chimney using a tee connector and then get them to the neutraliser inlet.

⚠ Make sure that you tighten the hose clamps sufficiently.

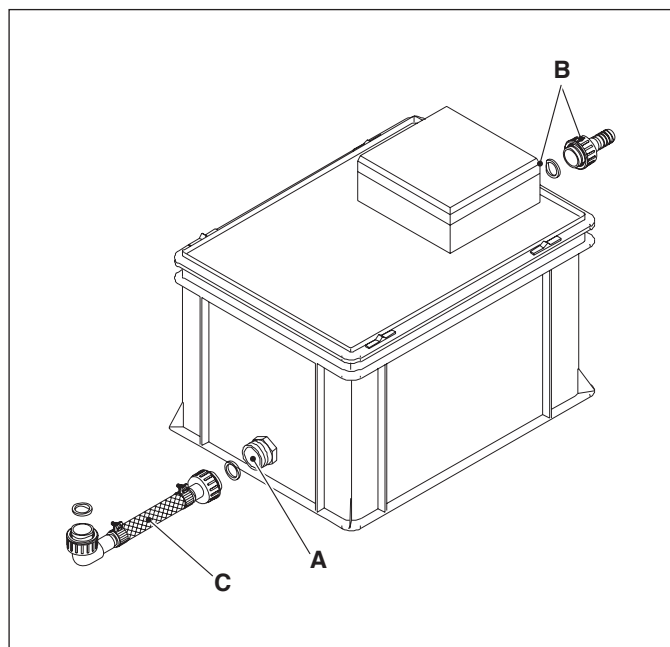
NEUTRALISATION UNIT TYPES HN2-NH3 (with pump)

HN2 and NH3 neutralisation units are designed for systems with boiler condensate drain pits at a higher level than the boiler condensate drain fitting.

The maximum head that the pump can overcome consists of its maximum head minus the resistance of the drain pipe. The pump is controlled by an electrical level switch.

Refer to the instructions provided to connect these neutralisation units up electrically. The protection rating of electrical connections is IP54.

Type	HN2	HN3
Consumption (W)	40	45
Power supply (V~Hz)	230 ~ 50	230 ~ 50
Maximum flow rate of neutralised condensation (litres/hour)	34	90
Dimensions (mm)	420x300x290	640x400x320
Quantity of granulate (kg)	25	50
Circulator maximum head (m)	6	4
Fitting Ø	1" - 5/8"	1" 1/2 - 5/8"



The inlet fitting (A) of the N2 neutralisation unit (the lower fitting) must be connected to the boiler condensate drain fitting using the flexible hose (C) supplied. This condensate drain hose is specially made to prevent combustion fumes escaping into the atmosphere.

The outlet fitting (B) of the neutralisation unit (the top fitting) must be connected to the boiler room's waste water drain pit using another section of flexible hose (not supplied).



The connection pipes used must be as short and straight as possible and corrosion-resistant. Any curves or sharp bends can lead to the hoses becoming clogged and can therefore prevent proper condensate discharge.

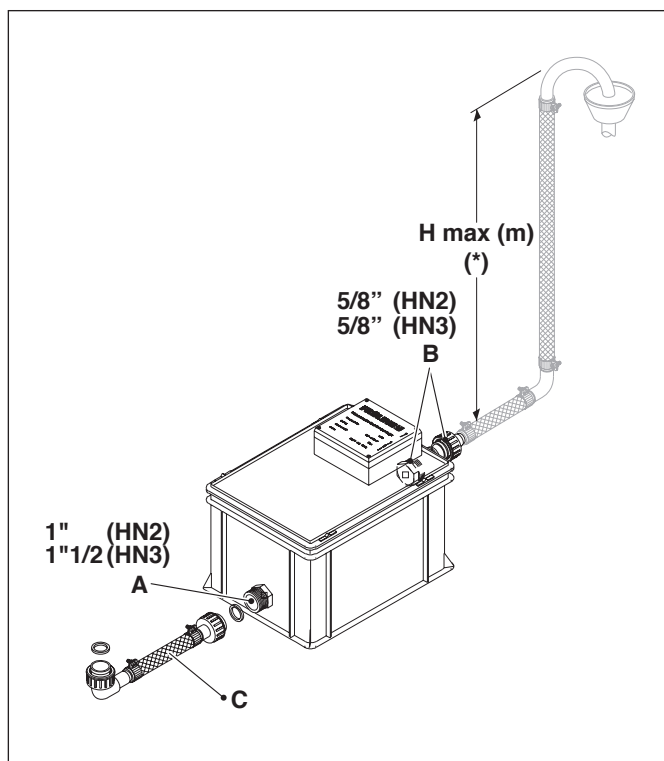
If it is necessary to neutralise condensation produced in the chimney, we recommend to connect the condensation drains of boiler and chimney using a tee connector and then get them to the neutraliser inlet.



Make sure that you tighten the hose clamps sufficiently.



Hoses should also be fixed to the floor and suitably protected whenever possible.



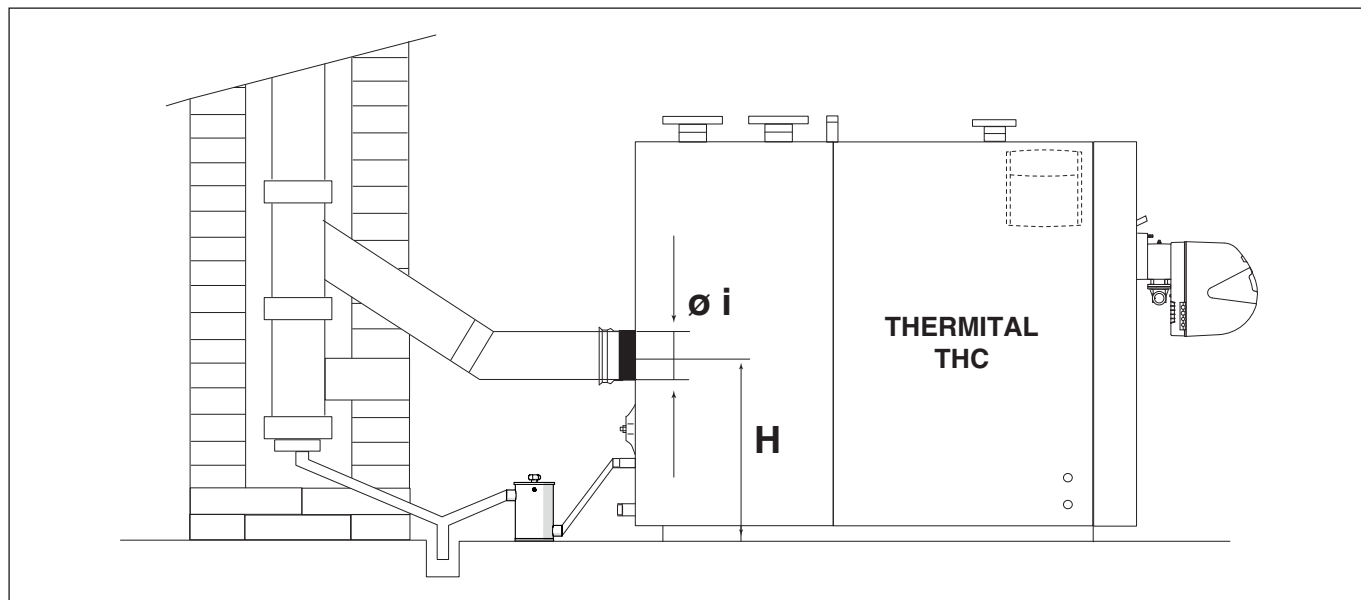
(*) The maximum head that the pump can overcome consists of its maximum head minus the resistance of the drain pipe.

Discharge of combustion products

The flue gas exhaust and stack connection must be made in compliance with applicable laws and standards, using heat resistant, condensate resistant and stress resistant rigid pipe and sealed joints.

The stack must be fitted with a condensate trap and drain and the flue gas exhaust pipe must be installed at a slope of at least 3° towards the boiler.

DIMENSIONS (mm)	THC GREY										
	150	210	270	350	450	600	800	1000	1250	1450	
H - Height of flue gas outlet	515	515	545	545	645	645	680	680	720	805	mm
Ø i Diameter of flue gas fitting	200	200	250	250	300	300	350	350	400	450	mm



- ⚠ The stack must guarantee the minimum draught specified by applicable technical standards, assuming zero pressure at the connection to the flue gas exhaust.
- ⚠ Inadequate or badly dimensioned stacks and flues can increase combustion noise and affect combustion parameters
- ⚠ Joints must be sealed using suitable materials (e.g. filler, mastic or silicon based sealant).
- ⚠ Uninsulated flues are potentially dangerous and can cause burns.
- ⚠ If plastic flue gas outlet ducts are used, install an O-ring safety thermostat set to 90°C. Install the thermostat on the flue gas outlet, with the distance from the boiler body outlet equal to the diameter of the flue gas outlet itself.

Installation in B23P configuration

The B23P configuration may only be adopted with premix gas burners. The table below specifies maximum permissible flue back-pressure. Make sure that flue pipes are of a suitable class for the values specified in the table.

BOILER model	PREMIXED BURNER model	Flue exhaust tube maximum pressure (*) (Pa)	Boiler noise (**) (db(A))
THC 150 GREY	RX180S/PV	150	68
THC 210 GREY	RX250S/PV	150	68
THC 270 GREY	RX360S/PV	150	69
THC 350 GREY	RX500S/PV	180	67
THC/C 450 GREY	RX500S/PV	180 (***)	74 (***)
THC/C 600 GREY	RX850S/PV	180	74
THC/C 800 GREY	RX1000S/PV	200	76
THC/C 1000 GREY	RX1000S/PV	200	76

(*) With B23P exhaust configuration (only with RX Series premix burners).

(**) Noise level measured as continuous sound pressure weighted according to scale A, at 1 metre from the appliance.

(***) The values indicated are valid only in working conditions with CO₂ ≥ 9.2 % and at less than 300 metres above sea level.

Door hinges

The boilers are pre-fitted with three hinges so that the direction of opening of the door can be rapidly reversed.

Once you have checked that the default direction of opening is as required, or have reversed the direction of opening as instructed in the 'Changing the direction of door opening' section, remove the spare hinge assembly 'B' (screw, bushing and washer) opposite the pivot side of the door.

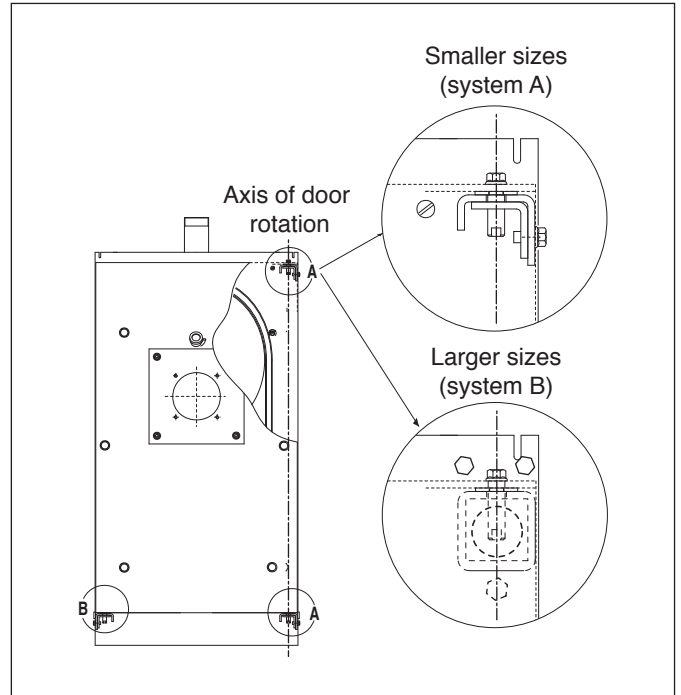
Two different door hinging systems have been used to satisfy varying constructional requirements:

System A

(on the smaller sizes) - comes with a bracket and two hinge fixing nuts.

System B

(on the larger sizes) - comes with a hinge fixing plate, a nut and an internal compression spring.

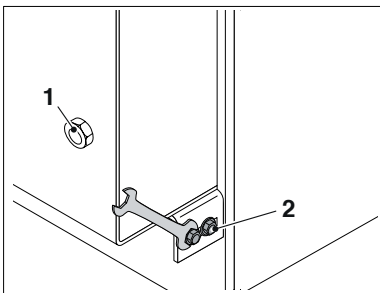
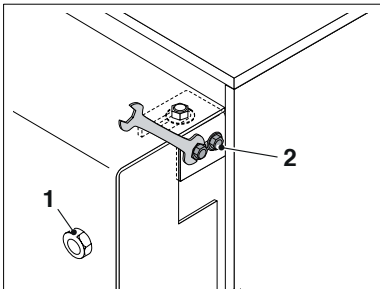


Changing the direction of door opening

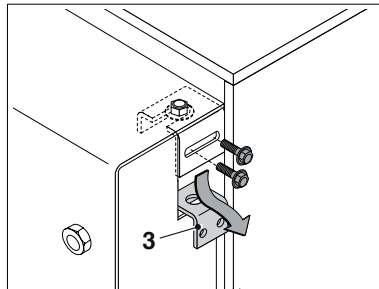
The boiler door hinges are fitted on the right of the door in the factory.

If you need to reverse the direction of opening, remove the boiler's side panel and proceed as follows.

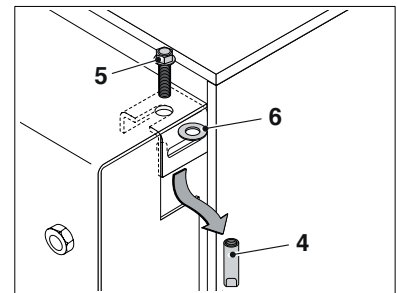
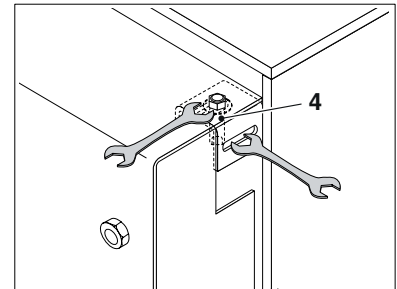
System A - Smaller sizes



First ensure that the main door fixing bolts (1) are tight and then remove the safety bolts (2).



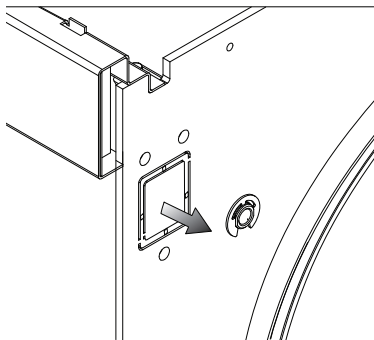
And lift off the door fixing brackets (3)



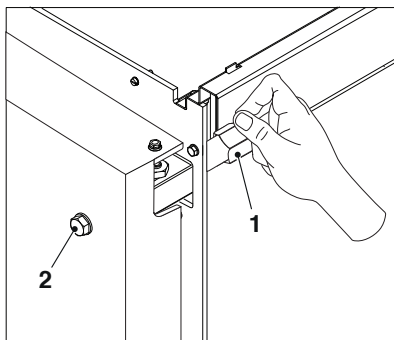
insert a spanner through the top slot and hold the bushing (4) steady. Unscrew the top bolt (5), then remove the bushing (4) and washer (6).

Reverse the above steps to fit the door on the opposite side.

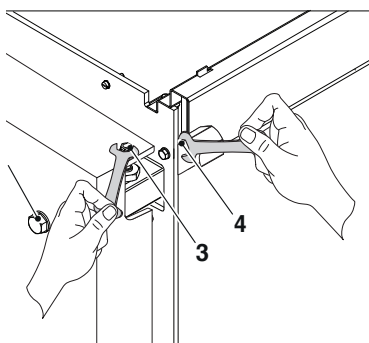
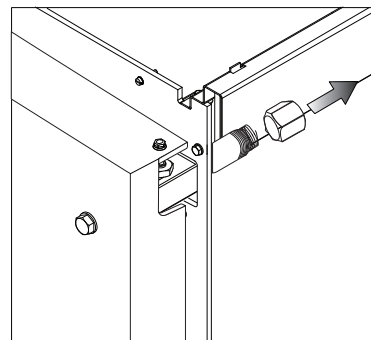
System B - Larger sizes



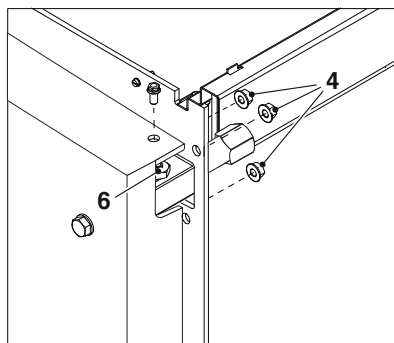
Open the door and with the aid of a small hacksaw or a file remove the knockout on the side opposite the leading edge of the door (both top and bottom).



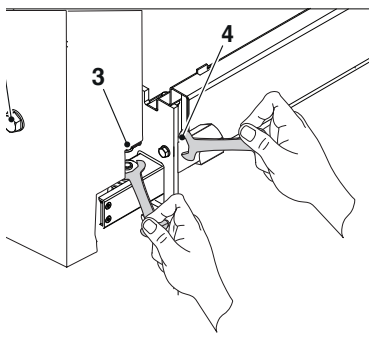
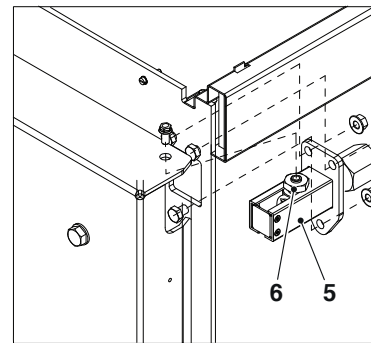
Then seal the door by tightening the bolts (2) so that the door is self-supported by compression against the packing. Remove the plug (1) taking care not to lose the compressed spring inserted in the threaded tube.



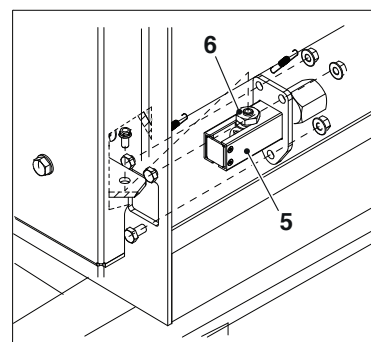
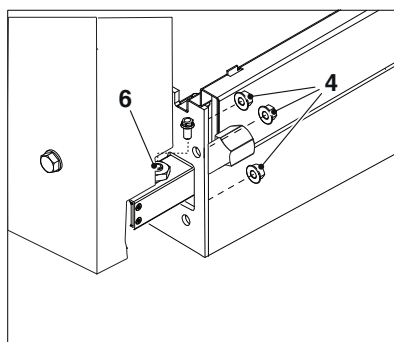
Remove the bolt (3) and the nuts (4).



Remove the nuts (4) that secure the hinge plate (5) to the door and remove the plate.



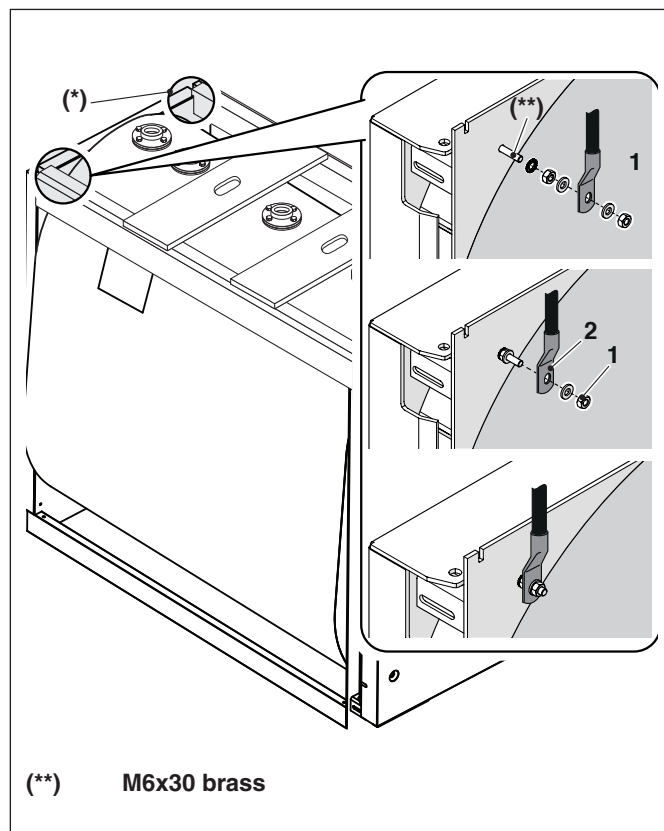
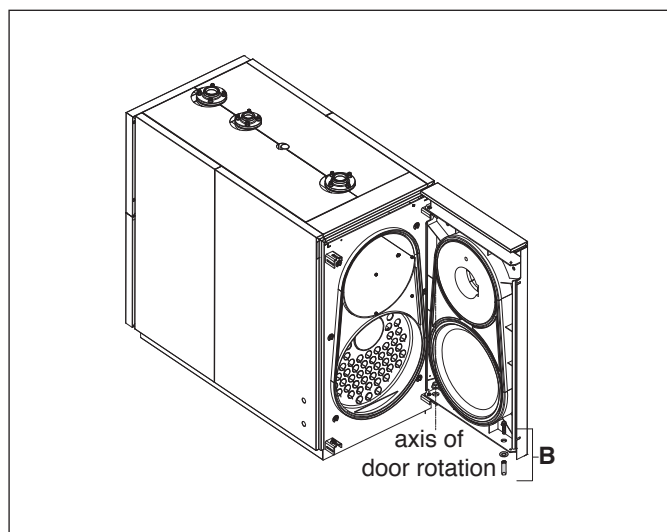
Remount the hinge plate on the opposite side, ensuring that the cylinder projecting above the nut (6) enters into its slot. If necessary tighten the nut (6) to raise it. Lastly, tighten the bolt ((3).



Removing the hinge assembly "B"

System A

- First ensure that the side safety bolt (2) is tight and then remove the main fixing bolt (1)
- With the door open, remove the hinge assembly 'B' (bushing, bolt, and washer) opposite the pivot side of the door.



Earth connection

A terminal is provided on the front boiler head to connect the boiler body to an efficient earth system.

Proceed as follows.

- Unscrew the nut and washer (1) from the earth terminal
- Attach the earth cable's eye connector (2) to the terminal. (Make sure that the cable is of adequate size and complies with legislation in the country of installation)
- Fit the nut and washer (1) to the earth terminal and tighten the nut
- Connect the other end of the cable to the system's earth bar.



Another hole (*) in the left side of the boiler head can also be used to earth the appliance. If you wish to use this hole for the earth connection, remove the terminal fittings from the right of the head and move them to the left earthing point.

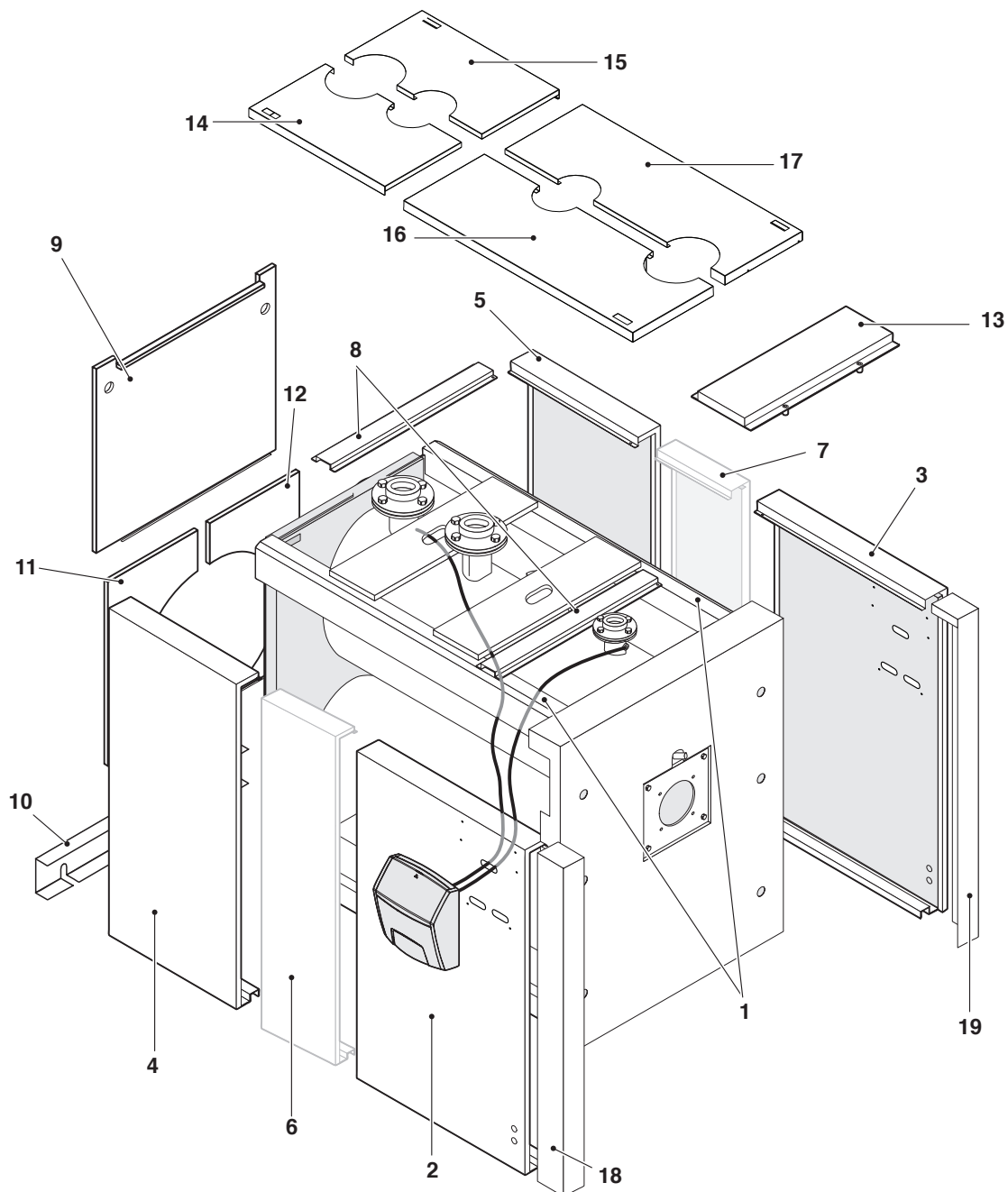
Fitting the casing panels

To mount the panelling, proceed as follows:

- Push out the pre-formed slots in the boiler's side panel (2) or (3) depending on what side you want to install the control panel) corresponding to the oval cable grommets in the control panel
- Perforate the membranes of the control panel cable grommets. Route the electrical cables through them and insert the sensors in their sockets
- Fix the control panel (20) to the boiler casing using the screws provided
- The front side panels (2) and (3) and rear side panels (4) and (5) over the boiler frame (1) and to the top side beams.

On models THC GREY 450, 600, 800, 1000, 1250 e 1450, also fit side panels (6) and (7).

- Secure the side panels in place using the top cross beams (8) and the screws provided
- Fit the top rear panel (9), the bottom rear bracket (10) and then the bottom rear panels (11) and (12). Fit the front top panel (13)
- Fit the top panels (14), (15), (16) and (17)
- Smaller models have only two top panels, one over the right and one over the left of the boiler
- Finally, fit the front trim panels (18) and (19).

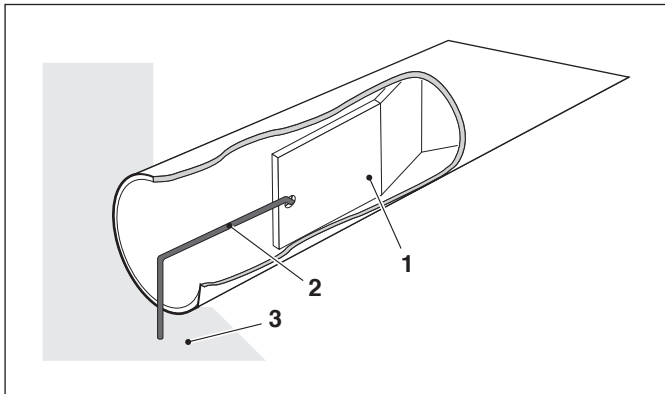


TECHNICAL ASSISTANCE CENTRE

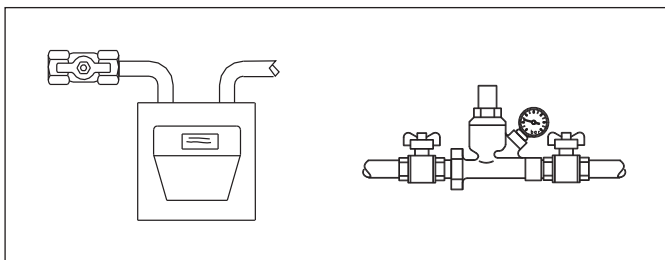
Preparing for initial startup

It is essential to perform the following checks before starting up or testing the functioning of your **THERMITAL THC GREY** boiler. In particular, check that:

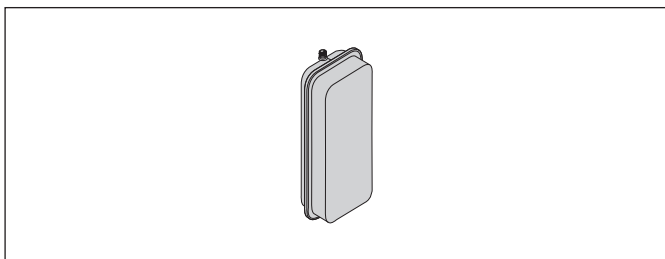
- The turbulators (1) are correctly positioned (vertical position) inside the heat exchanger tubes and the clips (2) are resting against the wall (3) of the heat exchanger



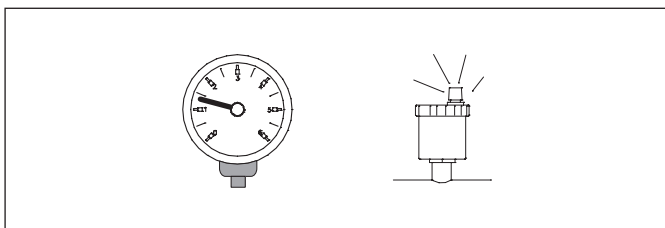
- The water and gas cocks are open



- The expansion vessel is properly charged

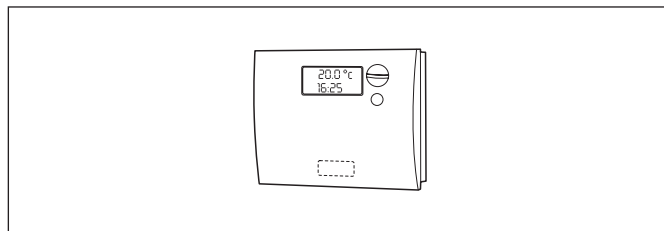


- The working pressure in the heating circuit is over 1 bar but below the maximum limit specified for the boiler
- The water circuits have been properly bled



- The condensate discharge siphon has been filled with water

- The mains power connections to the boiler and its accessories (burner, pump, control panel, thermostats, etc.) have been properly made.



- ⚠ The phase-neutral polarity has been respected.
- ⚠ A ground (earth) connection is obligatory.

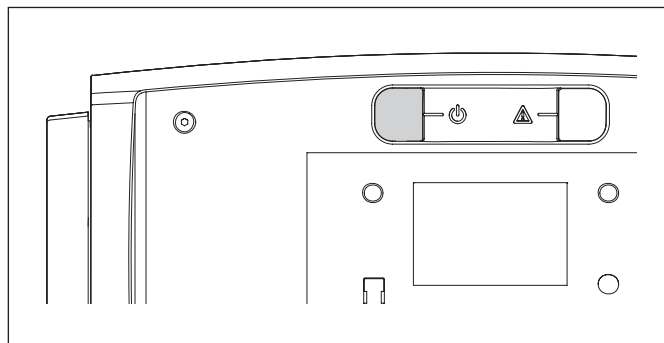
Initial startup

Once you have completed all the preparatory steps, proceed as follows to start up the boiler for the first time:

- Turn the boiler's mains power switch ON
- If the system is equipped with a temperature controller or timer thermostat, make sure that it is switched on



- Turn the control panel power switch ON and make sure that the green power indicator lights
- Make the settings as instructed in the instruction manual for your control panel



- Adjust the timer thermostat/s or temperature controller to the desired temperature (~20°C);

The burner should now ignite and remain in operation until the set temperature is reached.

If any ignition faults or malfunctions occur, the burner performs a "LOCKOUT SHUTDOWN". This is shown by the red button light on the burner and by the warning light on the control panel.



If a "LOCKOUT SHUTDOWN" occurs, wait about 30 seconds before resetting the burner.

To reset the burner, press the red button light on the burner and wait until the flame ignites.

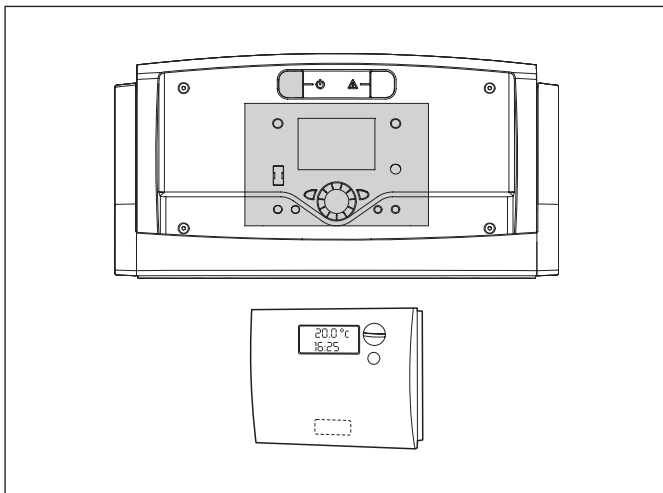
This operation can be repeated 2 or 3 times at the most. If the problem still persists after that, check:

- Check that all the instructions in the burner manual have been performed properly
- Check that the instructions in the 'Preparing for Initial Startup' section have been performed properly
- Check that all the electrical connections shown on the control panel wiring diagrams have been performed properly.

Checks during and after initial start-up

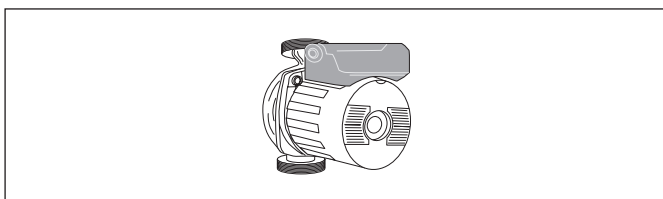
Once the boiler has started up, make sure that it shuts down and re-starts properly when the following actions are taken:

- Set the boiler thermostat to the required setting (making sure that the temperature control is in manual mode)
- The control panel is switched OFF
- Set the room thermostat or timer to the required temperature.

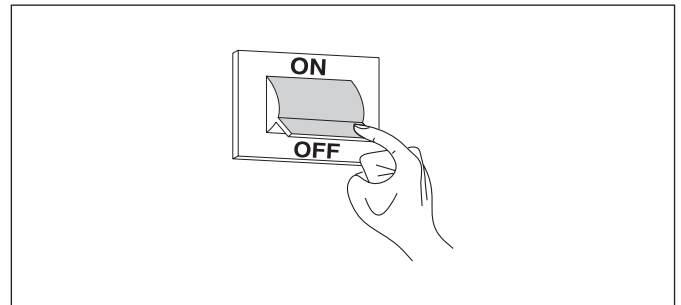


Make sure that there are no leaks around the boiler door seal. If you detect any leakage of fumes, increase the tightening of the door fixing bolts.

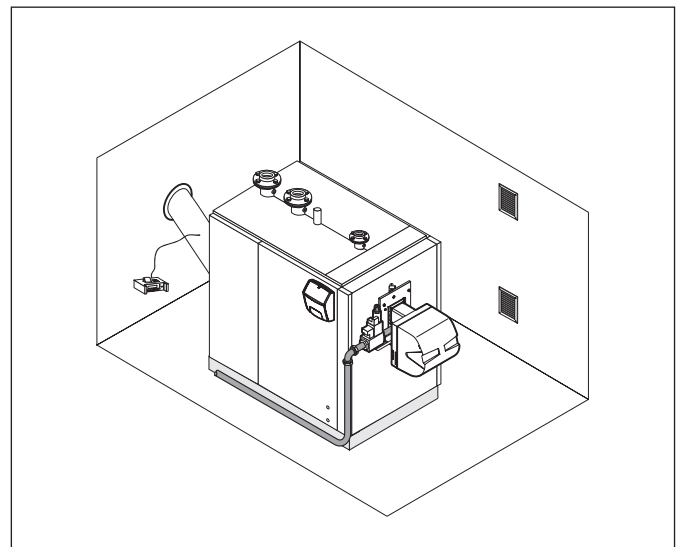
Make sure that all the pumps in the system are free and rotate in the right direction.



Turn off the main power switch to the boiler and make sure that the boiler shuts down properly.



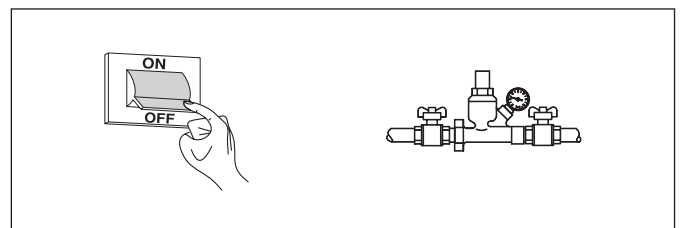
Provided all the above conditions are satisfied, start the boiler up again, then analyse the combustion fumes, measure fuel flow and re-check the door seal.



Maintenance

Regular maintenance is a legal requirement. It is also essential for the safety, efficiency and durability of the boiler. Proper maintenance keeps consumption and emissions down, and ensures that the boiler continues to operate reliably over time. Have your boiler serviced either by **THERMITAL's** Technical Assistance Centre or by a qualified heating engineer. Analyse the combustion fumes before commencing any maintenance. The results of fume analysis can give a clear idea of what servicing or repairs are needed.

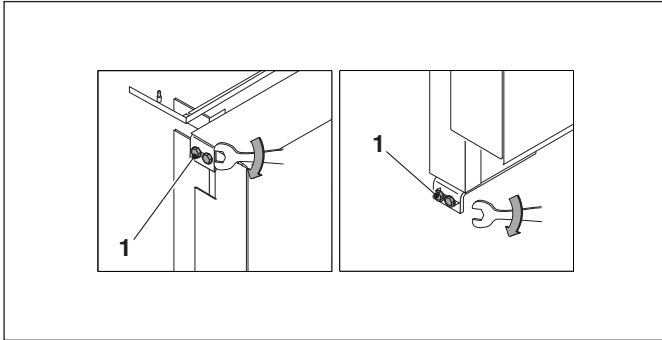
- Turn the system's main power switch OFF
- Close all the gas cocks.



OPENING THE DOOR

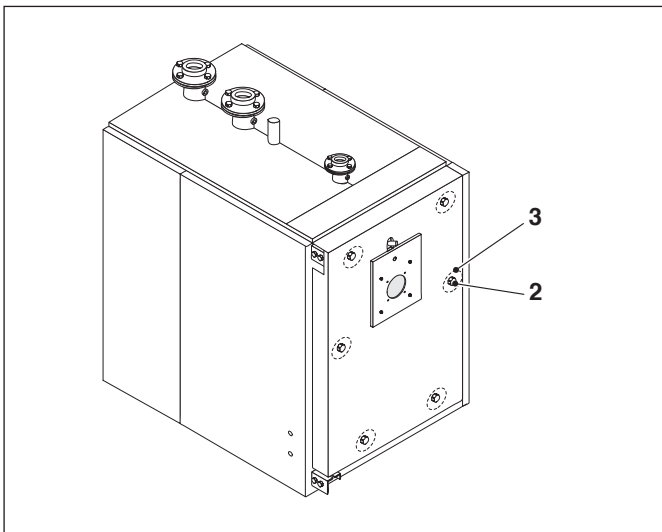
System A


- Make sure that the safety bolts (1) on the side of the boiler are tight.



System A - B

- To open the door, simply remove the main fixing bolts (2) holding the door in place.



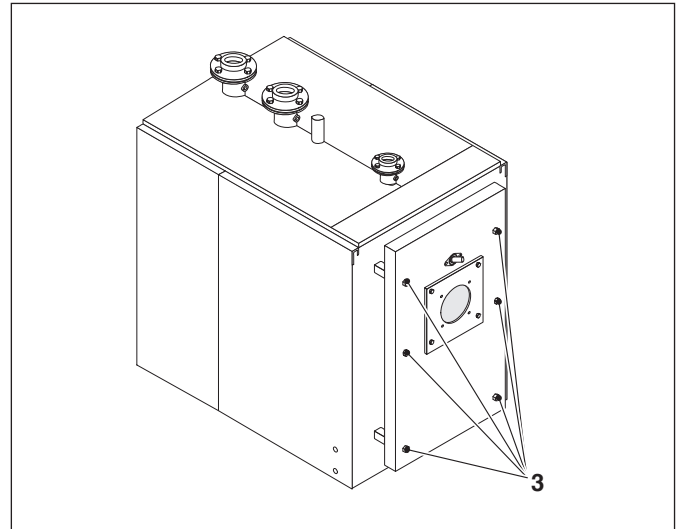
-  The first time you open the door, remove the spare hinge assembly 'B' (bushing, bolt, and washer) opposite the pivot side of the door.

ADJUSTING THE DOOR

Make quite sure that the door presses uniformly all around the double seal to prevent dangerous fumes escaping into the air from the pressurised furnace. Proceed as follows to adjust the door seals:


System A

- Fit the door and tighten the main fixing bolts (1) until the seals start to compress
- Loosen the safety bolts (1) then fully screw in the main door fixing bolts (2)
- Make sure that the door is properly adjusted after every maintenance operation.



System B

- Put the door in its correct position and tighten the main locking screws (2) until the packing starts to be compressed.

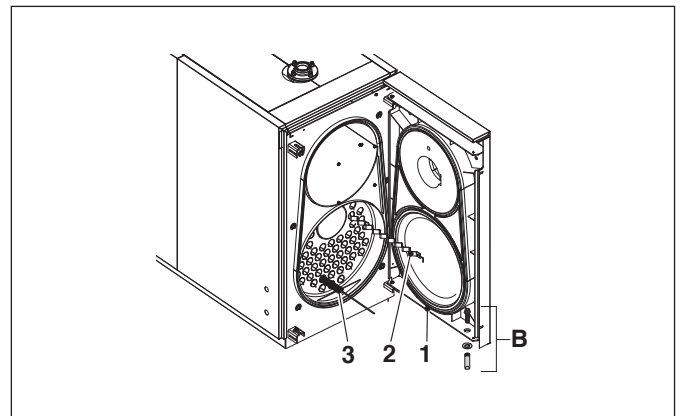
-  Make sure that the door is properly adjusted after every maintenance operation.

Cleaning the boiler

Clean the boiler and remove any carbon deposits from the surfaces of the heat exchanger **at least once a year**. This not only extends the boiler's working life, but also keeps it efficient in terms of heat output and consumption.

Proceed as follows to clean the boiler:

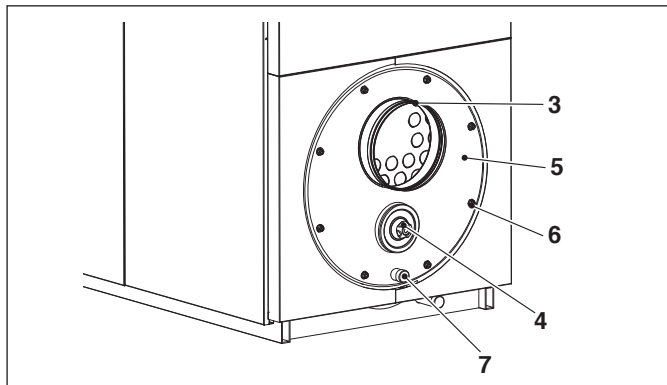
- Open the front door (1) and remove turbolators (2)



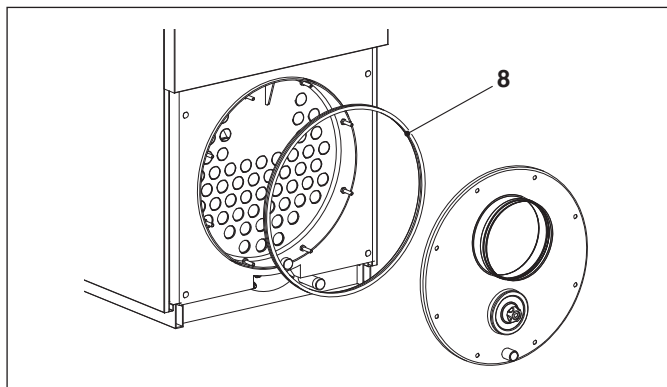
- Use a flue brush (3) or other suitable tool to clean inside the combustion chamber and the flue gas pipes
- Remove the deposits accumulated in the flue box through the opening of the inspection door (4).

If more thorough cleaning is required, remove the outer panels, unscrew the eight fixing bolts and pull firmly on the flue gas box (5) to remove it from the boiler.

Check at regular intervals that the condensate drain (7) is not blocked.

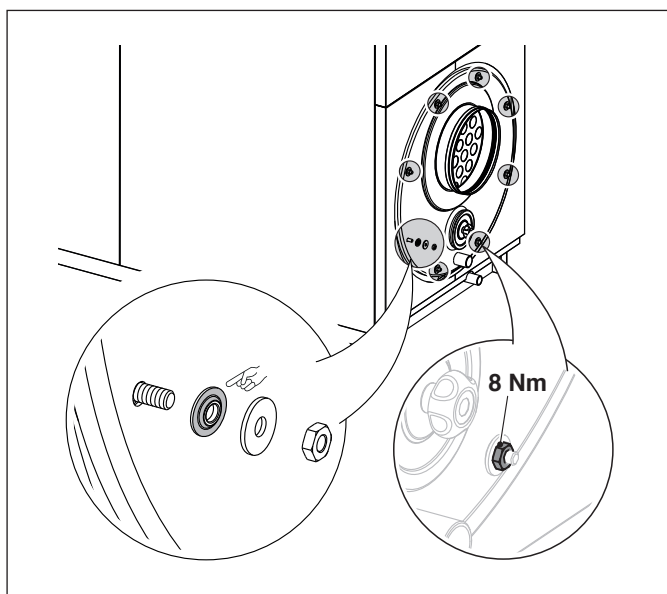


If necessary, replace the seal (8).



On completion of cleaning, follow the above steps in the reverse order to refit all removed parts.

Use a tightening force of 8 Nm on the retaining nuts.



Troubleshooting

FAULT	CAUSE	SOLUTION
The boiler does not reach its temperature setpoint	Boiler dirty	- Clean the flue gas pipes
	Heat exchanger and burner mismatched	- Check specifications and settings
	Burner capacity insufficient	- Check and adjust the burner
	Control thermostat faulty	- Check correct functioning - Check the temperature setting
The boiler keeps shutting down, and the control panel warning light comes on	Control thermostat faulty	- Check correct functioning - Check the temperature setting - Check the electrical wiring - Check the sensors
	No water supply Air in the circuit	- Check the circuit pressure - Check the vent valve
The generator is at temperature but the heating system is cold	Air in the circuit	- Bleed the circuit
	Pump malfunctioning	- Check/unseize the pump
	Problem with minimum temperature thermostat (if present)	- Check the temperature setting
There is a smell of fumes	Fumes escaping into the air	- Clean the boiler body - Clean the flue gas pipes - Check that the boiler, flue pipes and flue gas exhaust stack are all properly sealed
The safety valve keeps opening	Incorrect circuit pressure	- Check the circuit pressure - Check pressure reducer functioning - Check pressure reducer setting
	CH expansion vessel	- Check the efficiency of the expansion vessel
There are traces of condensate on the rear head	Flue gas box seals	- Check the seals between the rear head and the flue gas box

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THERMITAL

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