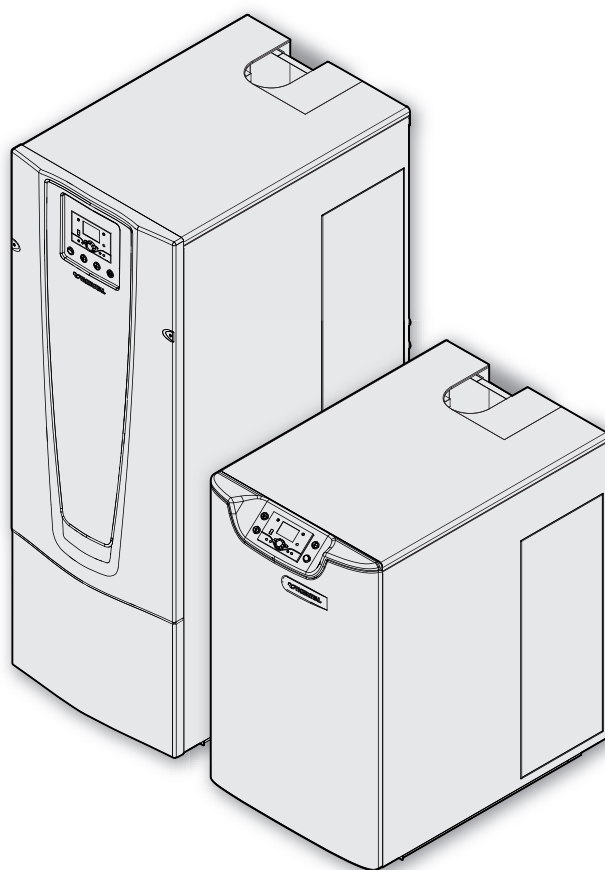


ISTRUZIONI PER L'UTENTE,
L'INSTALLATORE E PER IL CENTRO
ASSISTENZA TECNICA

THC V E OIL BLU



CONFORMITY

THC V E OIL BLU condensing boilers conform to the following directives:

- Efficiency Directive 92/42/EEC (☆☆☆☆)
- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Directive 2009/142/EC - Gas Appliances
- Ecodesign Directive 2009/125/CE for energy-related products
- Energy Labelling Directive 2010/30/EU
- Delegated Regulation (UE) N. 811/2013
- Delegated Regulation (UE) N. 813/2013
- Delegated Regulation (UE) N. 814/2013



RANGE

MODEL	CODE
THC V 28 E OIL BLU	20101223
THC V 28 BE OIL BLU	20101224

ACCESSORIES

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

Dear heating engineer,

*Congratulations on having chosen a **THERMITAL** boiler. You have selected a modern, quality product that is designed to give dependable, efficient and safe service and to provide comfort in the home for many years to come. This manual provides information that is essential to the installation of the appliance. Used in conjunction with your own knowledge and expertise it will enable you to install the appliance quickly, easily, and correctly.*

Once again, please accept our thanks and our congratulations on your choice of product.

Thermital

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The following symbols are used in this manual:











= Identifies actions that require caution and adequate preparation.



= Identifies actions that you MUST NOT do.












This manual, Code 20101826 Rev. 3 (04/17) is made up of 68 pages.

GENERAL SAFETY INFORMATION

-  As soon as you open the packaging, check immediately that the contents are all present and undamaged. Contact the **THERMITAL** reseller from whom you purchased the product if you notice any problems.
-  This **THERMITAL THC V E OIL BLU** boiler must be installed by a legally qualified heating engineer. On completion of the installation, the heating engineer 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.
-  The boiler must only be used for the purpose specified by **THERMITAL** and for which it is designed. The manufacturer 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** Technical Assistance Centre or a qualified heating engineer immediately.
-  Periodically check that operating pressure in the water circuit is **over 1 bar**. If water pressure is consistently low, contact **THERMITAL's** Technical Assistance Service or a professionally qualified heating engineer.
-  If the boiler is not going to be used for an extended period of time, proceed as follows to prepare it for shut-down.
 - Switch the appliance OFF at the control panel.
 - Turn the mains power switch OFF.
 - Close the fuel cock and heating circuit water cock.
 - Drain the central heating circuit if there is any risk of freezing.
-  This 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 electrical power demands that a number of fundamental safety precautions be respected.

-  Do not allow children or infirm persons to operate the boiler unsupervised.
-  Do not operate any electrical devices or equipment, including switches or domestic appliances, etc., if you can smell fuel or fumes. If you detect any suspicious smells:
 - Ventilate the room by opening all doors and windows.
 - Close the fuel shut-off cock.
 - Report the fault immediately to the **THERMITAL** Technical Assistance Service or a professionally qualified heating engineer.
-  Do not touch the boiler when 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 boiler's manufacturer.
-  Never pull, disconnect, or twist the electrical cables coming from the boiler even if it is disconnected from the mains electricity supply.
-  Do not obstruct or restrict the vents in the room where the appliance is installed. Adequate ventilation is essential for correct combustion.
-  Do not expose the boiler to the elements. It is not designed for use outdoors.
-  Do not switch the boiler off if outside temperature drops below ZERO (risk of freezing).
-  Do not leave flammable substances or containers in the room where the boiler is installed.
-  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.

PRODUCT DESCRIPTION

THC V E OIL BLU boilers are high efficiency, oil fuelled condensing boilers. "20" and "28" models are designed for heating only. "28 B" models come with a 120 litre steel storage cylinder and are designed for combined heating and domestic hot water production.

These boilers may be used as type "C" boilers if the combustion air inlet is extended to draw in air from outside the room where the boiler is installed.

The single stage jet burner is fitted with a fuel oil pre-heater to ensure dependable functioning under all conditions.

Used in conjunction with suitable water circuit and electrical accessory kits, these boilers can be used to serve up to two installations (zones).

The most important technical features of these boilers are:

- The combustion chamber and heat exchange system are specially designed and shaped to achieve the best possible volume ratio.

- The primary heat exchanger features vitrified steel pipes and wave turbulators to recover and transfer a large proportion of the thermal energy carried by the combustion fumes.
- The secondary heat exchanger is made from AISI 904L stainless steel and recovers latent heat from the fumes, boosting efficiency to up to 103.9% (50°C-30°C).
- The horizontal storage cylinder in AISI 316L stainless steel incorporates a vertical primary heat exchanger (28 B models).

The exclusively designed heat exchange unit and secondary exchanger are insulated by ultra-efficient high density glass wool. The controls and safety devices in the electronic control panel conform to all applicable technical and safety standards.

A highly flexible controller permits an additional zone to be served directly and also permits integration with **THERMITAL** solar heating systems without additional controllers.

SAFETY DEVICES

THC V E OIL BLU boilers are equipped with the following safety devices:

- **A safety valve** that opens if pressure in the heating circuit rises above the 3 bar threshold.
- **A safety thermostat** that forces the boiler to perform a safety shutdown if temperature exceeds the safety threshold (110°C).
- **A flue gas thermostat** in the bottom of the secondary heat exchanger that triggers a fault condition if flue gas temperature exceeds 90°C.
- **Burner safety device:** the oil burner is equipped with an electronic device to monitor correct implementation of the selected program. In the event of a fault, this device sends the control panel a burner lockout signal and displays a precise diagnostic signal.



The intervention of a safety device indicates a potentially dangerous malfunction in the system, and means that you must contact **THERMITAL's** Technical Assistance Service immediately.

You may attempt to restart the boiler after a short delay (see Preparing for initial start-up).



Never start the boiler up even for a short period if the safety devices are not functioning correctly or have been tampered with.



Safety devices must only be replaced by **THERMITAL's** Technical Assistance Service using original spare parts. Refer to the spare parts catalogue supplied with the boiler.

Always check that the boiler is functioning correctly after any repairs.

PRODUCT IDENTIFICATION

THC V E OIL BLU boilers are identified by two plates:

- Data plate

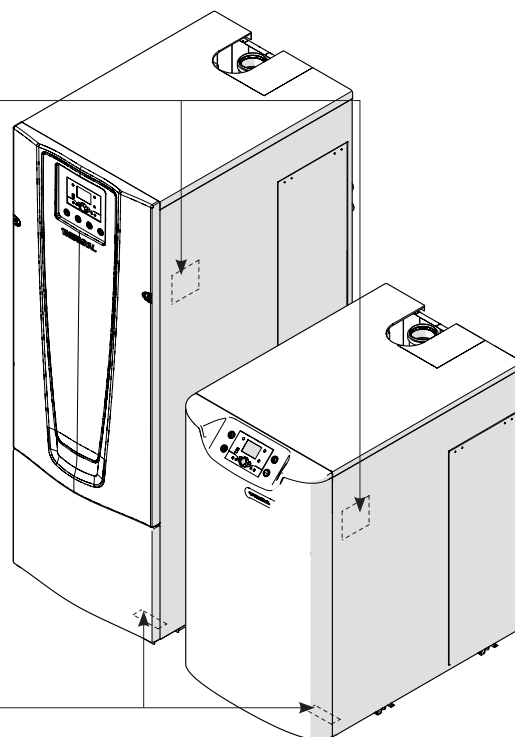
This lists the appliance's technical specifications and performance data.

THERMITAL		RIELLO S.p.A. Via Ing. Pilade Riello, 7 - 37045 Legnago (VR)		CE	
Mod.		Cod.		N°	
PAESE DI DESTINAZIONE/PAYS DE DESTINATION/BESTIMMUNGSLAND/BESTEMMING VIH L.A.					
COMBUSTIBILE/COMBUSTIBLE/BRENNSTOFF/BRANDSTOF:					
TIPO/TYP/TYPE:					
IP		W		European Directive 92/42/EEC:	
V-Hz				η =	
		Qn(min)=	kW	kW	
		Pn(min)=	kW	kW	
		Qn(max)=	kW	kW	D= l/min
		Pn(max)=	kW	kW	
Pmw= bar T= °C					
Pms= bar T= °C					

- Serial number plate

This is located on the base of the boiler and specifies the serial number, model, furnace power, and maximum operating pressure.

THERMITAL		CE	
RIELLO S.p.A. Via Ing. Pilade Riello, 7 - 37045 Legnago (VR)			
Mod. _____			
Cod. _____	Qn(max) _____ kW		
N° _____	Pn(max) _____ kW		
	Pms _____ bar		



⚠ 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.

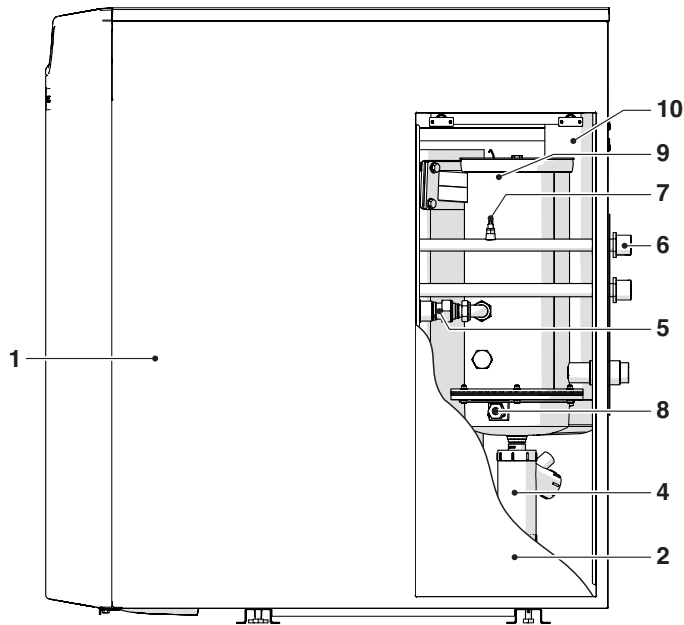
DATA PLATE

- Domestic hot water production (28 B models only)
- Central heating
- Qn** Rated heat input
- Pn** Rated useful heat output
- IP** Index of protection
- Pmw** Maximum operating pressure for DHW system (28 B models only)
- Pms** Maximum operating pressure for central heating system
- T** Temperature
- η** Efficiency
- D** Specific flow rate (28 B models only)

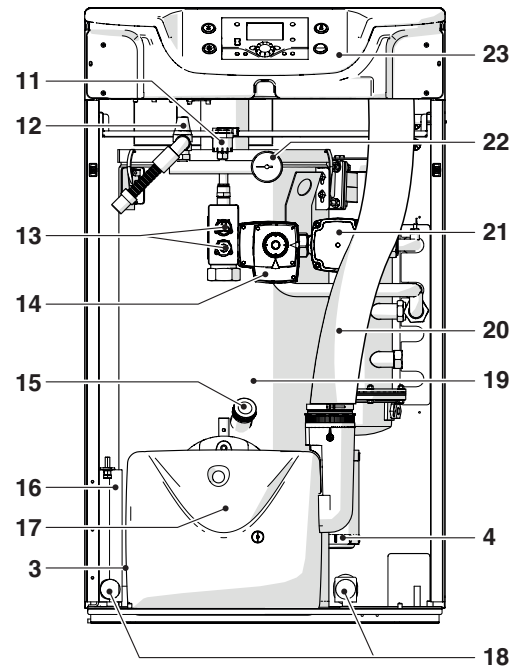
THERMITAL		RIELLO S.p.A. Via Ing. Pilade Riello, 7 - 37045 Legnago (VR)		CE	
Mod.		Cod.		N°	
PAESE DI DESTINAZIONE/PAYS DE DESTINATION/BESTIMMUNGSLAND/BESTEMMING VIH L.A.					
COMBUSTIBILE/COMBUSTIBLE/BRENNSTOFF/BRANDSTOF:					
TIPO/TYP/TYPE:					
IP		W		European Directive 92/42/EEC:	
V-Hz				η =	
		Qn(min)=	kW	kW	
		Pn(min)=	kW	kW	
		Qn(max)=	kW	kW	D= l/min
		Pn(max)=	kW	kW	
Pmw= bar T= °C					
Pms= bar T= °C					

THC V 28 E OIL BLU

SIDE VIEW



FRONT VIEW

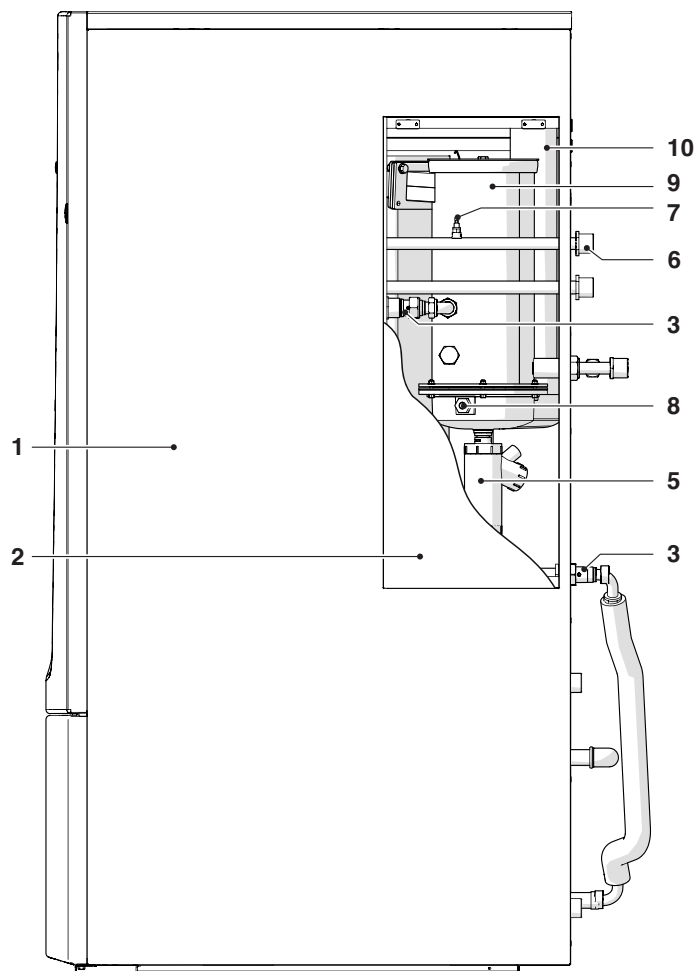


- 1 - Side panel
- 2 - Inspection panel
- 3 - Boiler drain cock
- 4 - Condensate drain siphon
- 5 - Non-return valve
- 6 - Non-return valve (supplied)
- 7 - Mixed heating circuit flow temperature sensor
- 8 - Socket for flue gas thermostat
- 9 - Secondary heat exchanger
- 10 - Flue gas exhaust
- 11 - Automatic vent valve
- 12 - Safety valve (3 bar)

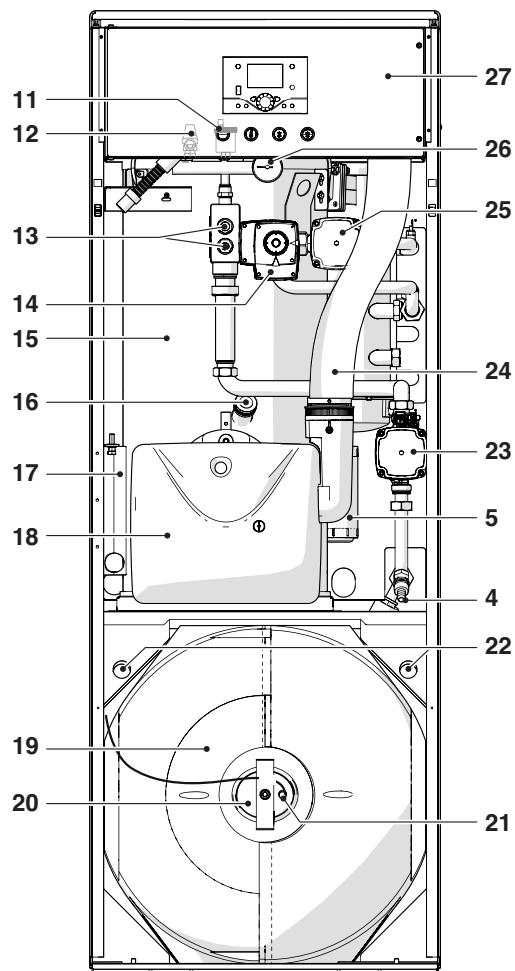
- 13 - Boiler sensor sockets
- 14 - Mixer valve motor
- 15 - Flame inspection window
- 16 - Burner bracket
- 17 - Burner
- 18 - Lifting eyebolts
- 19 - Boiler body
- 20 - Comburent air inlet pipe
- 21 - Central heating pump
- 22 - Pressure gauge
- 23 - Control panel

THC V 28 BE OIL BLU

SIDE VIEW



FRONT VIEW



- 1 - Side panel
- 2 - Inspection panel
- 3 - Non-return valve
- 4 - Boiler drain cock
- 5 - Condensate drain siphon
- 6 - Non-return valve (supplied)
- 7 - Mixed heating circuit flow temperature sensor
- 8 - Socket for flue gas thermostat
- 9 - Secondary heat exchanger
- 10 - Flue gas exhaust
- 11 - Automatic vent valve
- 12 - Safety valve (3 bar)
- 13 - Boiler sensor sockets
- 14 - Mixer valve motor

- 15 - Boiler body
- 16 - Flame inspection window
- 17 - Burner bracket
- 18 - Burner
- 19 - 120 litre storage cylinder
- 20 - Storage cylinder flange with magnesium anode
- 21 - Storage cylinder temperature sensor socket
- 22 - Lifting eyebolts
- 23 - Storage cylinder pump
- 24 - Comburent air inlet pipe
- 25 - Central heating pump
- 26 - Pressure gauge
- 27 - Control panel

TECHNICAL SPECIFICATIONS

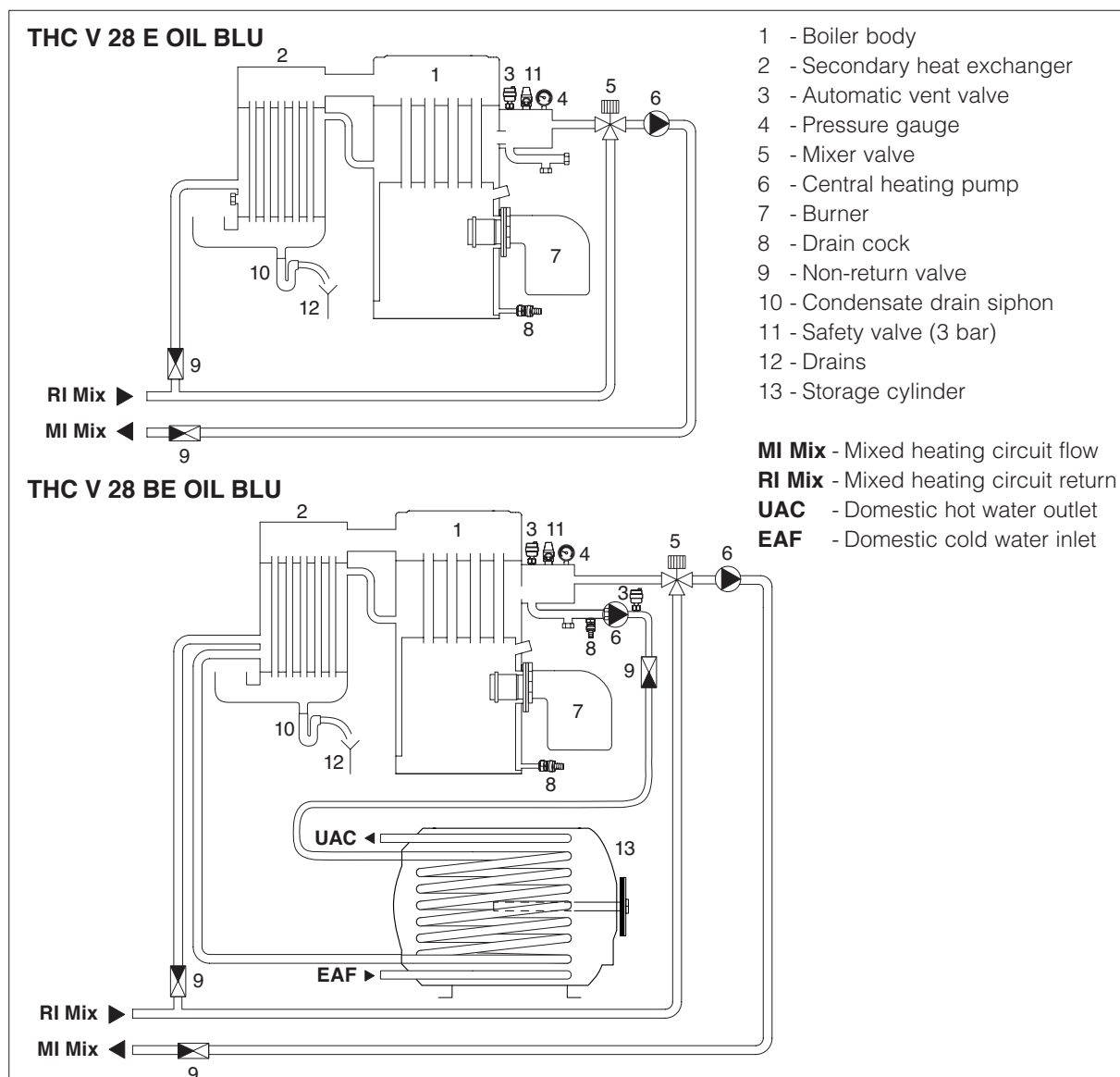
Descrizione			THC V 28 E OIL BLU THC V 28 BE OIL BLU	
Type of boiler			condensing boiler for mixed heating	
			B23-B23P-C13-C33-C63	
Fuel			Heating fuel oil (Light oil)	
Rated heat input at furnace referred to HVC (LCV)			30,5 (28,7)	kW
Useful (rated) heat output			28	kW
Rated heat output (60-80°C) P4			28,0	kW
Potenza termica utile 50-30°C			29,8	kW
30% heat output with return at 30°C (P1)			8,4	kW
Efficiency class in central heating mode			A	
Efficiency class in DHW mode			B	
Seasonal energy efficiency in central heating mode	η_s		90	%
Efficiency at rated heat input in high temperature mode (HCV)	η_4	utile Pn (60-80°C)	91,7	%
Efficiency at 30% rated heat input in low temperature mode (HCV)	η_1	Useful 30% of Pn	96,7	%
Energy efficiency in DHW mode	η_{wh}		66,3	%
Storage cylinder charging profile			XL	
Heat loss in standby mode	Pstby		200	W
Combustion efficiency			97,9	%
Annual energy consumption	QHE		89	GJ
Daily electrical energy consumption	Qelec		0,271	kWh
Annual electrical energy consumption	AEC		70,0	kWh
Daily fuel consumption	Qfuel		32,7	kWh
Annual fuel consumption	AFC		40,8	GJ
Noise level (sound power)	LWA		70	dB(A)
Emissions at maximum heat input	NO _x	(referred to HCV)	86	mg/kWh
	CO ₂		12,5	%
	CO w.a. <		7	ppm
	Δt flue gas	80-60°C	70	°C
	Δt flue gas	50-30°C	47	°C
Smoke scale			< 0,5	
Flue gas mass flow rate			0,012	Kg/s
Flue gas thermostat trip temperature			90	°C
Maximum working pressure			3	bar
Safety thermostat trip temperature			110	°C
Maximum operating temperature			82	°C
Minimum return temperature			30	°C
Boiler water capacity			28	l
Condensate production at 50/30°C			1,6	l/h
Power supply			230 ~ 50	V-Hz
Electric degree of protection			X0D	IP
Absorbed power supply (max)			303	W
Consumption at full load	Elmax		250	W
Consumption at part load	Elmin		75	W
Consumption in standby mode PSB	P sb		2	W

Storage cylinder characteristics	THC V 28 BE OIL BLU	
Type of storage cylinder	Stainless steel	
Cylinder layout	Horizontal	
Heat exchanger layout	Horizontal	
Maximum power input	23	kW
DHW temperature setting range	40 ÷ 65	°C
Storage cylinder capacity	120	l
Coil water capacity	4	l
Heat exchanger surface area	0,70	m ²
Domestic hot water production with ΔT 35°C	580	l/h
Water draw in 10 minutes with storage cylinder at 48°C	17,5	l/min.
Water draw in 10 minutes with storage cylinder at 60°C	24,2	l/min.
Specific flow rate (EN 625)	23,6	l/min.
Replenishment time (Δt 35°C)	23	min.
Maximum operating pressure of storage cylinder	6	bar

ACCESSORIES

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

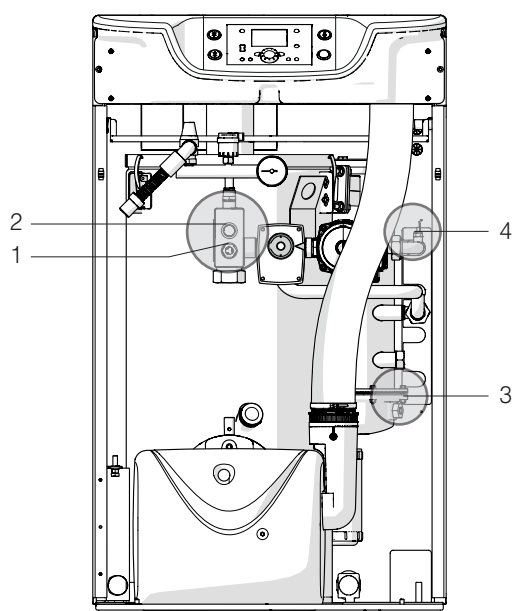
WATER CIRCUIT



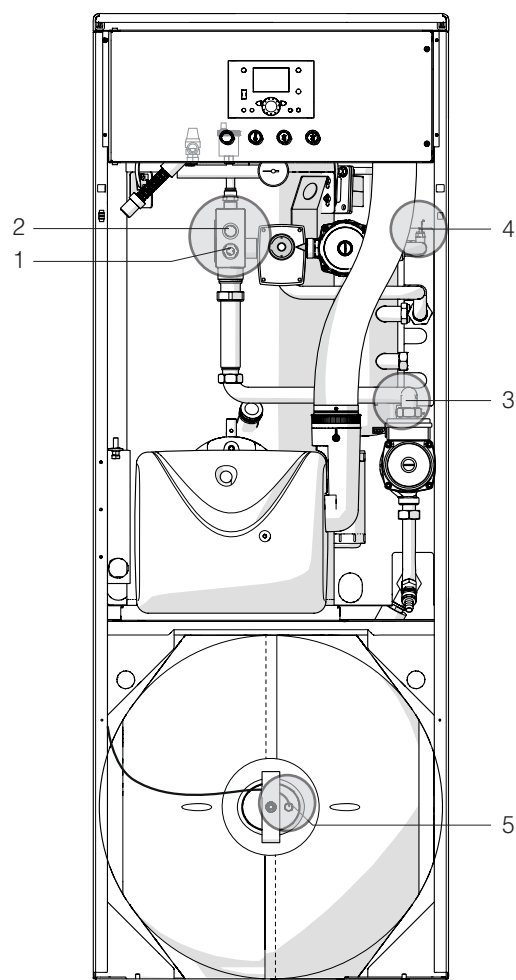
LOCATION OF SENSORS

- 1 - Safety thermostat sensor
- 2 - Boiler temperature sensor
- 3 - Flue gas thermostat sensor
- 4 - Mixed circuit flow temperature sensor (installed in the mixed circuit flow pipe, at the rear of the boiler)
- 5 - Storage cylinder temperature sensor

THC V 28 E OIL BLU



THC V 28 BE OIL BLU



Characteristics of boiler, flow and storage cylinder sensors

Measured temperature (°C) - Resistance (Ω).

T (°C)	R (Ω)	T (°C)	R (Ω)	T (°C)	R (Ω)	T (°C)	R (Ω)
-30.0	175203	30.0	8059	90.0	915	150.0	183
-25.0	129289	35.0	6535	95.0	786	155.0	163
-20.0	96360	40.0	5330	100.0	677	160.0	145
-15.0	72502	45.0	4372	105.0	586	165.0	130
-10.0	55047	50.0	3605	110.0	508	170.0	117
-5.0	42158	55.0	2989	115.0	443	175.0	105
0.0	32555	60.0	2490	120.0	387	180.0	95
5.0	25339	65.0	2084	125.0	339	185.0	85
10.0	19873	70.0	1753	130.0	298	190.0	77
15.0	15699	75.0	1481	135.0	262	195.0	70
20.0	12488	80.0	1256	140.0	232	200.0	64
25.0	10000	85.0	1070	145.0	206		

PUMP

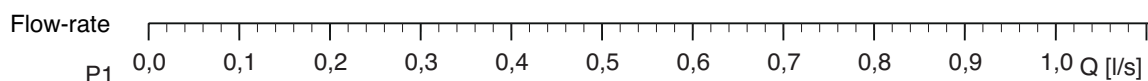
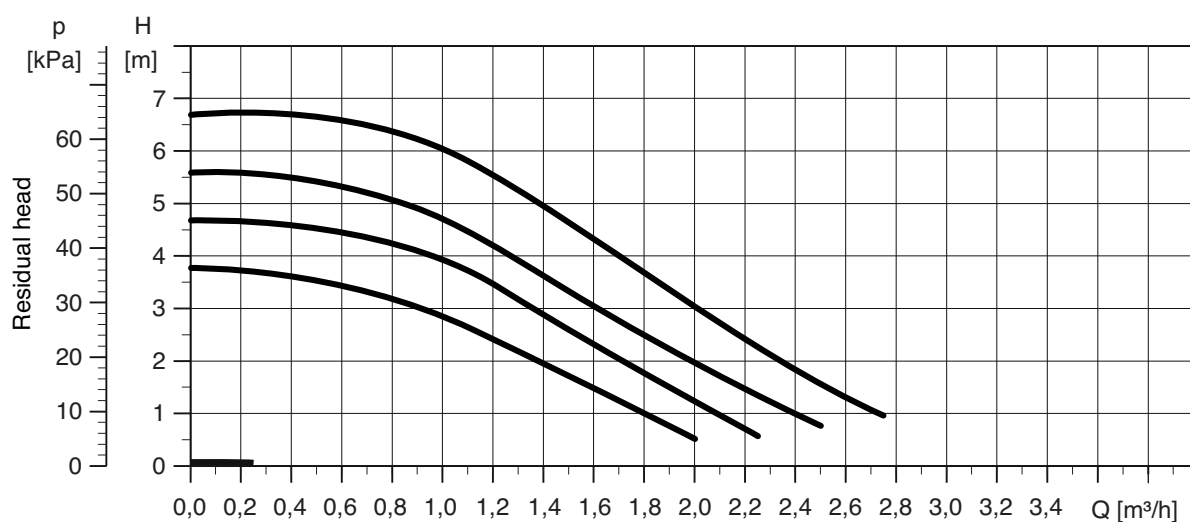
TECHNICAL SPECIFICATIONS

DESCRIPTION		
Electrical consumption	53	W
EEl Part 3 (*)	$\leq 0,20$	
P L,Avg (**)	≤ 24	W
Minimum pressure at pump suction inlet	0,5	bar

(*) Energy efficiency rating according to regulations 641/2009-622/2012

(**) Approximate average annual electricity consumption according to regulations 641/2009-622/2012

PUMP CURVE



Curves are referred to a water density of 983.2 Kg/m³, a temperature of +20°C, and a kinematic viscosity of 0.474 mm²/s (0.474 cSt).

ADJUSTING THE PUMP

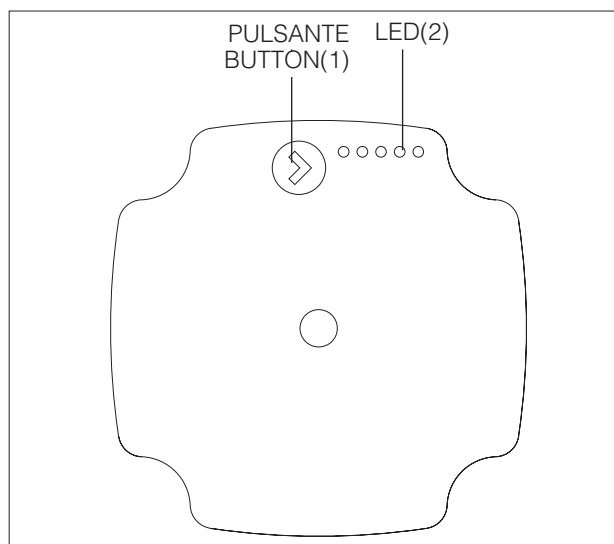
The boiler's pump is suitable for use in central heating only/domestic hot water applications. The pump can be controlled by an external PWM signal and has 4 different pressure curves for central heating applications.

When controlled by a PWM signal, pump speed varies according to the frequency of the incoming PWM signal, modulating head/flow rate on the basis of the selected curve .

In the absence of a PWM signal, the pump runs at full speed and delivers the head/flow rate determined by the selected curve. Each curve is characterised by a maximum head expressed in metres.

User interface

The user interface features one button (1), one red/green LED (2) and four yellow LEDs.



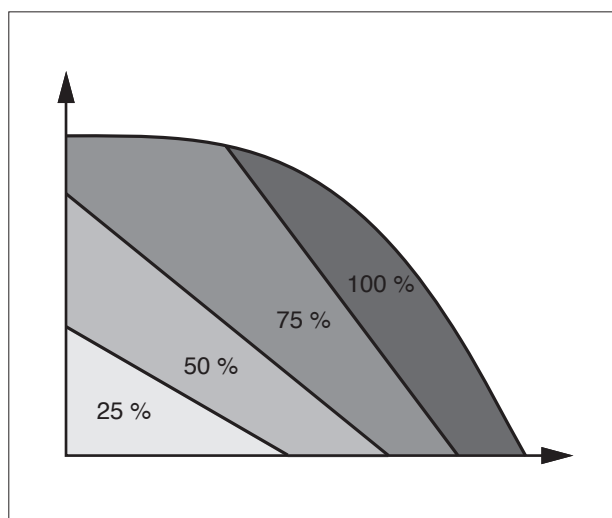
Via this interface, users can access:

Functioning (performance display) mode. Pump performance is displayed during functioning as a % of current draw with respect to rated load. Alarm conditions can be seen from the colour of LED (2).

Setting mode. Setting mode is accessed by pressing the button (1), and is used to select the pump curve.

Display	Meaning	% power
LED n.1 flashing green	Stand-by (only with PWM control)	0
LED n.1 green and LED 2 yellow, both lit	Low load	0-25
LED n.1 green and LEDs 2, 3 yellow, all lit	Low-medium load	25-50
LED n.1 green, LEDs 2, 3, 4 yellow, all lit	Medium-high load	50-75
LED 1 green, LEDs 2, 3, 4, 5 yellow, all lit	High load	75-100

PUMP LOAD CURVE



Functioning mode

A) Performance display

When the pump is functioning, LED 1 is green. The four yellow LEDs indicate the instantaneous power draw as shown in the table above. In functioning mode, all active LEDs are lit (not flashing) to differentiate this condition from setting mode. If the pump is stopped by the external control signal, LED 1 flashes green.

B) Alarm display

If the pump detects one or more alarm conditions, LED 1 changes from green to red. When an alarm is active, the LEDs indicate the type of alarm as shown in the following table. If more than one alarm is active at the same time, the LEDs only show the alarm condition with the highest priority. Alarm priority follows the order of the table.

When no alarm is active, the user interface automatically displays pump performance

Display	Meaning	Function	Action
LED 1 red and LED 5 yellow, both lit	The pump rotor is blocked.	The pump automatically attempts to start every 1.5 seconds.	Wait or check that the pump rotor is free to rotate.
LED 1 red and LED 4 yellow, both lit	Supply voltage too low	Indication only. The pump continues to function.	Check the voltage of the power supply
LED 1 red and LED 3 yellow, both lit	Electronic controller error	The pump has stopped because supply voltage is too low or because an error has occurred in the internal electronic controller	Check the voltage of the power supply or replace the pump

Setting mode

A) Setting display

To switch from performance display to setting display, press button (1). The LEDs show the current setting. See the following table for the meaning of the LED display. Setting display mode shows the type of pump control or the currently selected pump curve. Settings cannot be changed in performance display mode. After 2 seconds, the display returns to performance display mode. If LED 1 is red, it indicates that an alarm is active or that the pump is being controlled by an external (PWM) signal.

LEDs 2 and 3 show the type of internal control while LEDs 4 and 5 show the currently selected curve (1, 2, 3 or 4). All these LEDs are yellow in colour.

	LED 1	LED 2	LED 3	LED 4	LED 5
PWM A	Red	ON	-	-	-
Curve 1 (4m)			-	-	-
Curve 2 (5m)			-	ON	-
Curve 3 (6m)			-	ON	ON
Curve 4 (7m)			-	-	ON

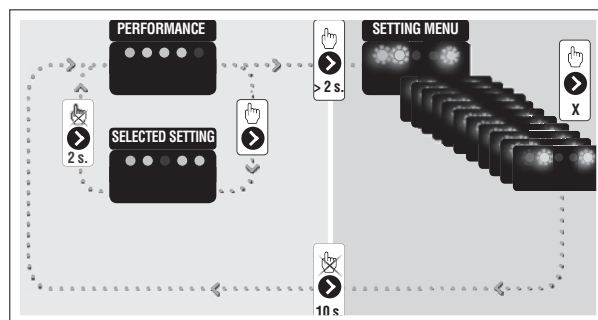
B) Button lock function

The button lock function serves to prevent improper use or accidental changes to pump settings.

When the button lock is active, pressing the button has no effect. This prevents users from accidentally accessing setting mode while allowing them to use setting display mode.

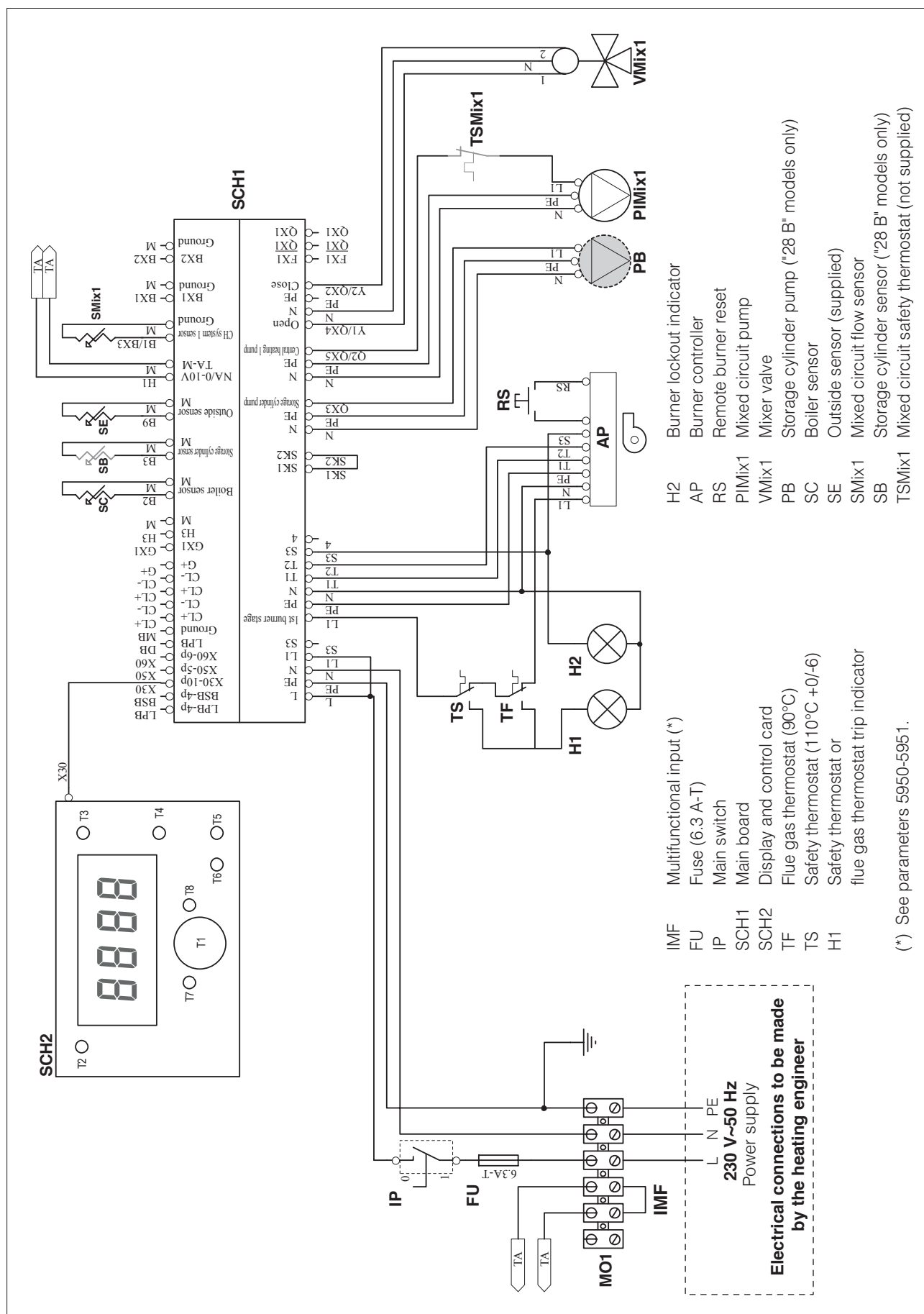
Press and hold the button for more than 10 seconds, to activate / deactivate the button lock.

When the button is held down for 10 seconds, all the LEDs except the red LED flash for one second to indicate that the button lock function has been activated/deactivated.



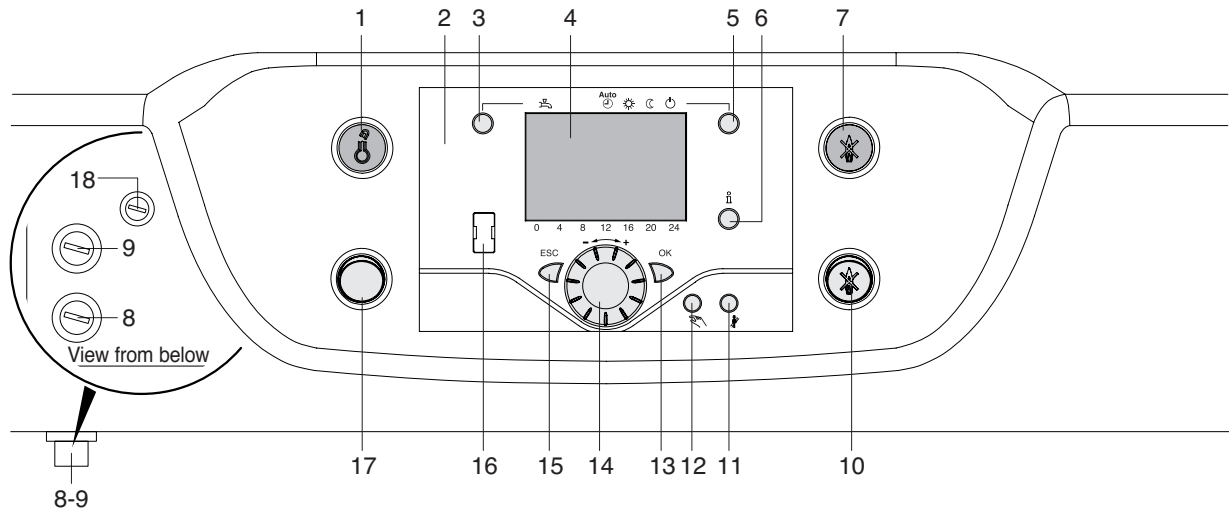
C) Setting mode

To access setting mode, press and hold the button (1) for between 2 and 10 seconds. The button lock must be deactivated in order to change settings. Available settings are displayed in a pre-defined sequence that is repeated every time the button is briefly pressed and released. If the button is not pressed for over 10 seconds, the pump exits setting mode and returns to performance display mode. The last settings made are saved in memory. See the table above for the meanings of the LED sequences.

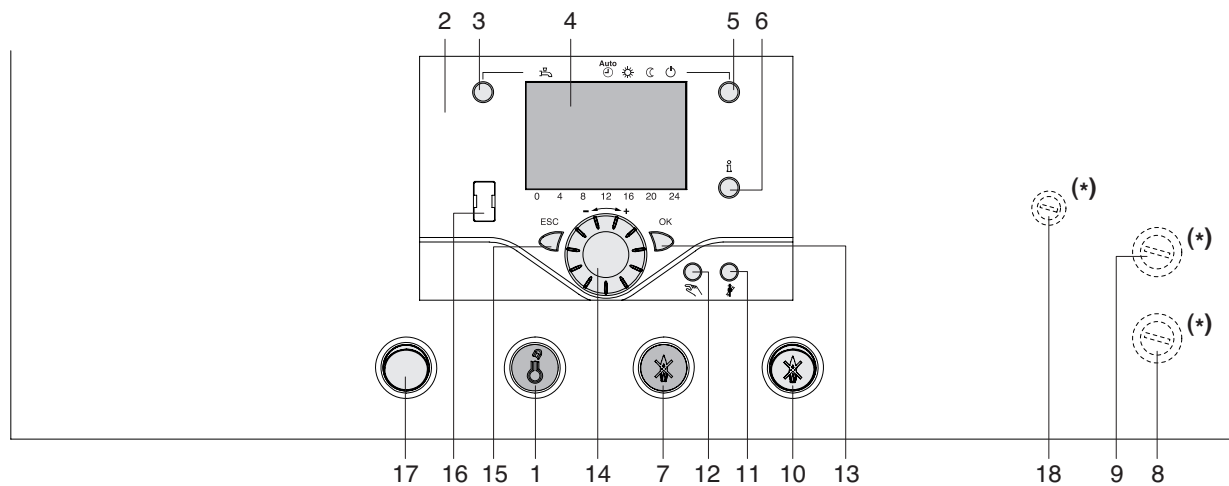
ENGLISH

CONTROL PANEL

THC V 28 E OIL BLU



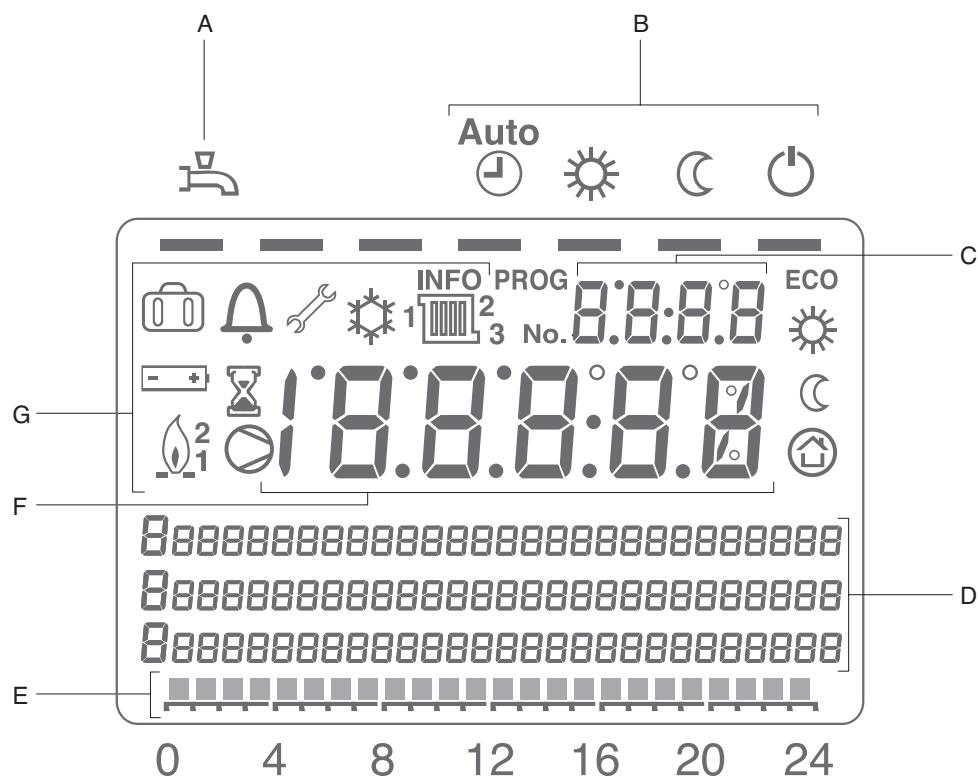
THC V 28 BE OIL BLU



- 1 - Safety thermostat trip indicator.
- 2 - Electronic operator unit (controller).
- 3 - DHW production on/off button. A line appears under the "🚿" symbol on the display when DHW production is enabled.
- 4 - Display.
- 5 - Central heating mode selection button. A line appears under the symbols:
 - ☀️ AUTOMATIC
 - ☀️ Continuous COMFORT
 - 🌙 Continuous REDUCED
 - ❄️ COOLING
 - 🔒 Frost protection. The "🔒" symbol is displayed.
- 6 - Information button "i".
- 7 - Burner lockout indicator.
- 8 - Manual reset for flue gas thermostat. Unscrew the protective cover to access the reset button.
- 9 - Manual reset for safety thermostat. Unscrew the protective cover to access the reset button.
- 10 - Remote burner reset button.
- 11 - "🧹" button for chimney sweep/safety thermostat test functions.
- 12 - "👉" button for manual mode.
- 13 - Value confirm (OK) button.
- 14 - Value change knob.
- 15 - ESCape button.
- 16 - PC BUS connector.
- 17 - Main switch.
- 18 - Fuse.

(*) Located at rear of control panel.

SECONDARY USER INFORMATION / DISPLAY



A - DHW mode: ON or OFF

B - Central heating modes:

- ⌚ AUTOMATIC
- ☀ CONTINUOUS COMFORT
- ☾ Continuous REDUCED
- ⚙ COOLING
- ⏻ Frost protection. The "⏻" symbol is displayed.

C - Small numeric display: time

D - Message area

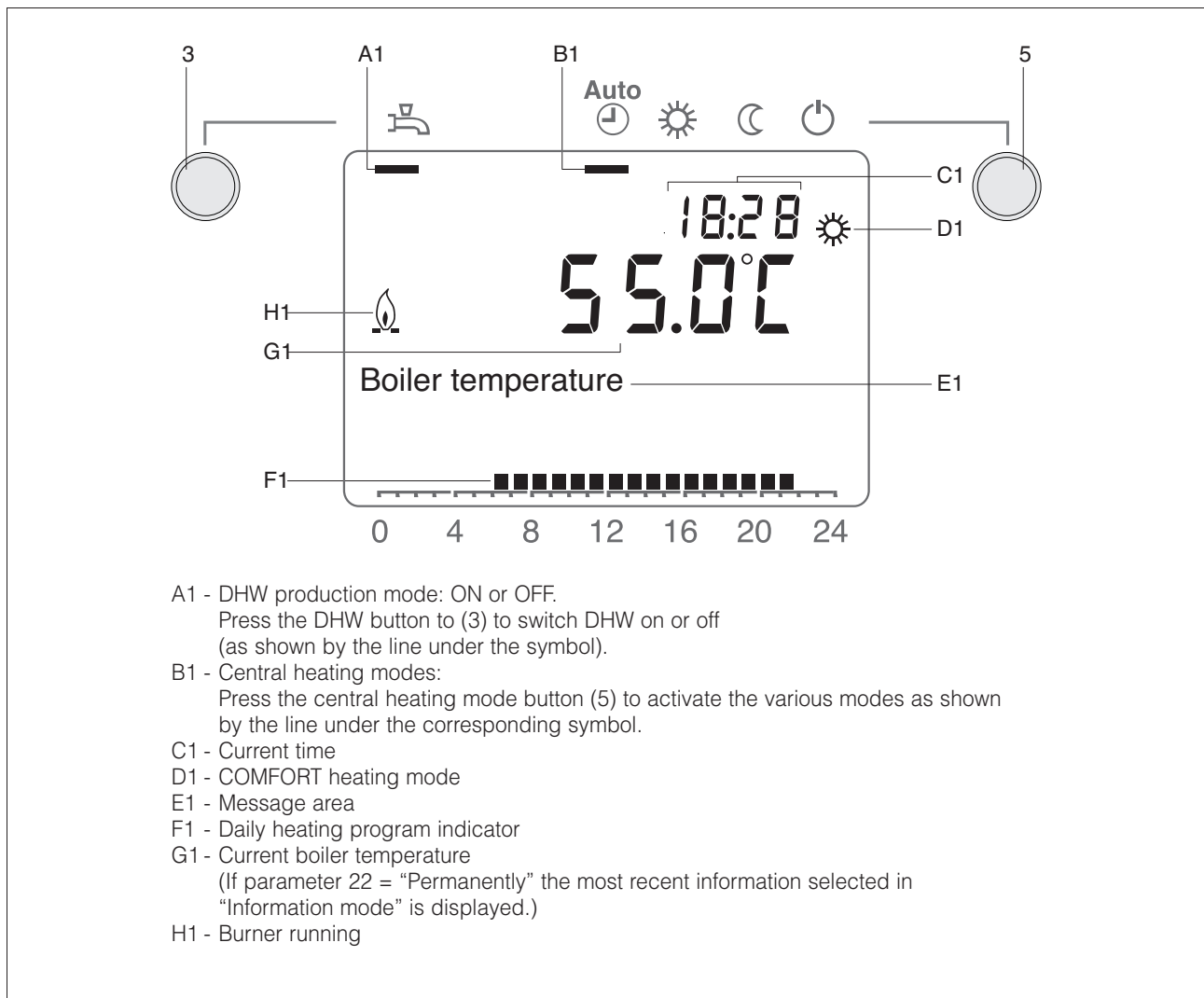
E - Daily heating program indicator

F - Large numeric display: current value

G - Display symbols:

- 🔥 Burner running
- 🔋 Change battery (room unit only, not supplied)
- 🏠 Holiday mode active
- 🔔 Error. Press the **i** button to display the error message.
Press **ESC** to return to the main screen.
- ⌚ Wait: process running
- 🔧 Maintenance - manual or chimney sweep mode
- 📊 Reference to heating circuit
- ECO Heating temporarily OFF - ECO mode active

MAIN SCREEN



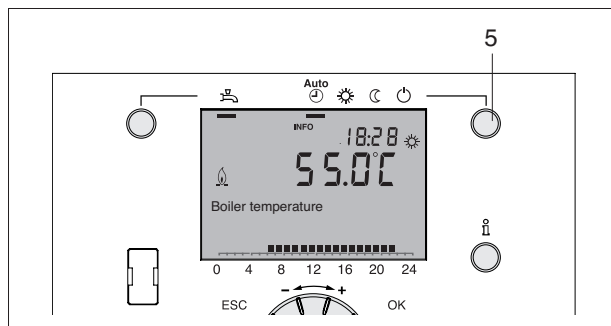
Notes on functioning

The control panel on the **THC V E OIL BLU** boiler controls the following functions.

- Frost protection: The pumps are switched on on the basis of outside temperature irrespective of demand for heat.
If outside temperature drops below -4°C the pumps are switched on. If outside temperature is between -5° and 1.5°C, the pumps are switched on for 10 minutes at intervals of 6 hours. If outside temperature is above 1.5°C the pumps are switched off.
- Chimney sweep: The burner is ignited to obtain the conditions necessary for combustion analysis. To obtain continuous burner functioning, maximum operating temperature is set at the boiler's maximum setpoint.
All loads are switched off to start with, in order to bring the boiler to its 64°C setpoint as quickly as possible. When the boiler reaches 64°C, the heating circuits are opened one by one to dissipate the heat and allow the burner to continue functioning.
- Limit thermostat (parameter 2310): This function shuts the burner down if boiler temperature exceeds the maximum permitted limit, which coincides with the boiler's maximum setpoint (parameter 2212 = 80 °C).
- DHW charging priority: If domestic hot water is drawn off while the central heating circuit is also in use, this function directs boiler power mainly to the DHW circuit.
- Boiler switching differential: This establishes a minimum run time for the burner, to stop it igniting and shutting down repeatedly. The burner shuts down only if boiler temperature exceeds a predetermined threshold (parameter 2240).
- Solar collector protection:
 - Collector frost protection
 - Collector overtemperature protection
 - Heat transfer liquid evaporation protection.

MODE SELECTION

Press the central heating mode button (5) to select the various modes. The active mode is shown by a line under the corresponding symbol.



Automatic

In automatic mode, room temperature is controlled by the time program.

Characteristics:

- Central heating operates according to the time program.
- The temperature setpoint is set to comfort "☀" or reduced "☾"
- All protection functions are active.
- Summer/winter switching is automatic (ECO functions) and 24h limit functions are active.

Continuous operation or

In continuous mode, room temperature is controlled on the basis of the comfort/reduced setting:

- ☀ Central heating set to comfort setpoint
- ☾ Central heating set to economy setpoint

Characteristics:

- Central heating is continuously on with no time program.
- All protection functions are active.
- Summer/winter switching is automatic (ECO functions) and 24h limit functions are inactive if comfort level is selected (see parameters 730 and 732).

Protection

In protection mode the central heating is switched off, but the system remains protected against frost (provided the electrical supply remains switched on).

Characteristics:

- Central heating is switched off.
- Temperature is set to the frost protection setpoint.
- All protection functions are active.
- Automatic summer / winter changeover and automatic 24-hour heating limit active (ECO functions)


Domestic hot water (DHW)

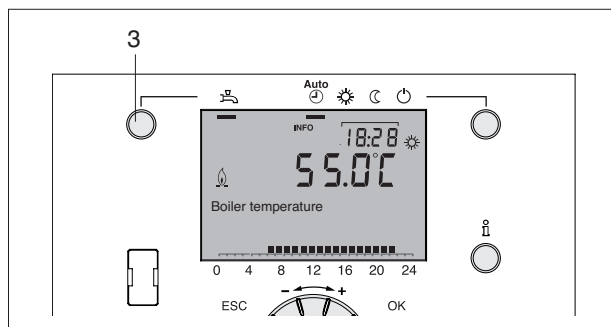
Press the DHW button (3) to enable domestic hot water production.

A line appears under the DHW symbol.

ON: DHW is generated according to the DHW time program (parameters 560 to 566).

OFF: DHW production is switched off but the protection functions remain active.

 You can force DHW production (PUSH function) by pressing and holding the DHW button (3) for at least 3 seconds.



Setting the room temperature setpoint

Turn the knob (14) to set the desired **room temperature comfort setpoint**.

Proceed in a similar way to set the **room temperature reduced setpoint**.

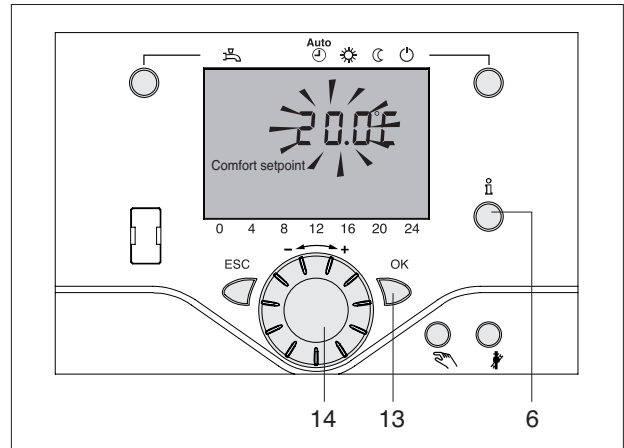
- Press the "OK" button (13).
- Select "Heating circuit 1".
- Set the room temperature reduced setpoint.



After changing a setpoint, you need to wait about 2 hours for the new setting to have any effect on room temperature.



If no room unit is installed, changing the room temperature setpoint simply shifts the heating curve.



Information

Press the information button (6) to display:

- Errors or maintenance codes (see the "Errors/Maintenance codes" section)
- Special messages.


Other screens:




Other screens depend on the system configuration and status. Some of the info lines shown below may not therefore appear.

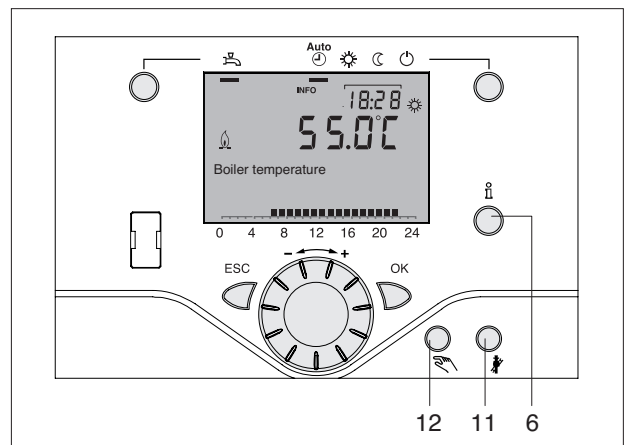
- | | | |
|------------------------------------|---|---|
| - Room temperature | - Flow 1 temperature | - Heating circuit 3 status |
| - Minimum room temperature | - Flow 1 temperature setpoint | - Cooling circuit state |
| - Maximum room temperature | - Flow 2 temperature | - DHW status |
| - Room 1 setpoint | - Flow 2 temperature setpoint | - Boiler status |
| - Room 2 setpoint | - Flow 3 temperature | - Solar heating status |
| - Room 3 setpoint | - Flow 3 temperature setpoint | - Solid fuel boiler status |
| - Cascade flow temperature | - Collector 1 temperature | - Buffer storage tank status |
| - Boiler temperature | - Wood fuelled boiler temperature | - Pool state |
| - Outside temperature | - Solar flow temperature | - Error message |
| - Minimum outside temperature | - Solar return temperature | - Maintenance message |
| - Maximum outside temperature | - 24 hours solar energy yield | - Floor curing function |
| - DHW 1 temperature | - Total solar energy yield | - Date and time |
| - DHW 2 temperature | - Pool temperature | - Telephone number of technical assistance centre |
| - Buffer tank 1 temperature | - Pool setpoint | |
| - Buffer tank 2 temperature | - Heating circuit 1 status | |
| - Buffer tank temperature setpoint | - Heating circuit 2 status (not active) | |

Chimney sweep mode

When you select manual mode, the "" symbol appears and relays are energised/de-energised not according to any heating program but according to a default manual setting that can be set by pressing the information button (6).

Chimney sweep mode

To select chimney sweep mode, press the chimney sweep button (11) briefly (max. 3 seconds). The "" symbol is displayed. Chimney sweep mode prepares the boiler for combustion analysis. To exit chimney sweep mode, press the button (11) again. The system exits chimney sweep mode automatically after 1 hour.



Safety thermostat test



To test the safety thermostat, press and hold the chimney sweep button (11) for longer than 3 seconds.

Hold the button down for the duration of the test.

The test terminates as soon as you release the button.



This test must only be performed by the **THERMITAL** Technical Assistance Service, since it raises boiler temperature over the normal permitted limits.

RESET function (parameter 6205)

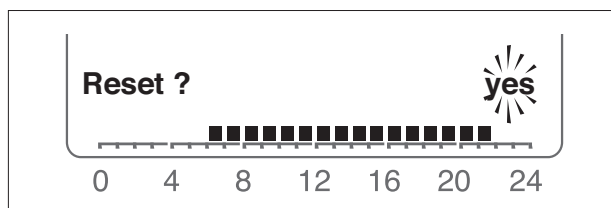
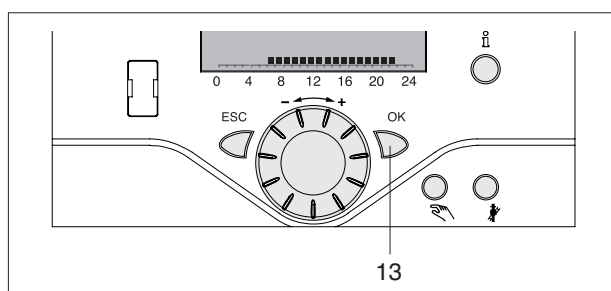
The meters and parameter table RESET icon only appears in the bottom line of the display if it is possible to perform a reset in the current user level (End user, Commissioning, Heating engineer).



This operation must only be performed by the **THERMITAL** Technical Assistance Service.

Performing a RESET restores all parameters to their default values, according to the "Complete list of parameters".

To perform a reset, press the "OK" button (13) when the "Yes" prompt flashes on the display.



Special conditions



The following icons can be displayed under certain conditions:

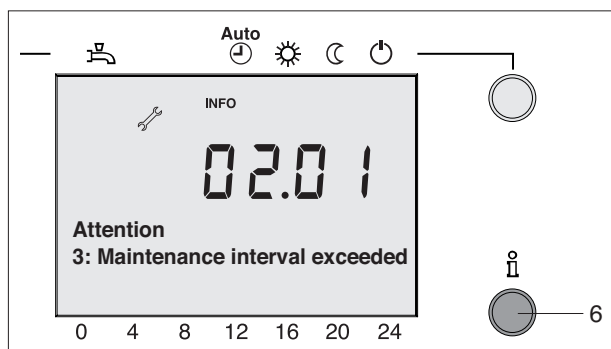
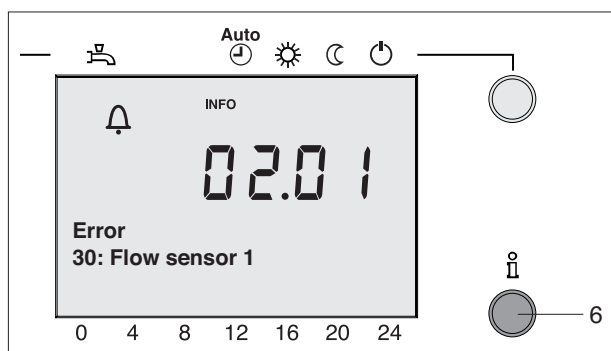


This symbol appears if a system error has occurred. Press button (6) for further information.



This symbol appears if a maintenance alarm is present or if the boiler has entered a special functioning mode. Press button (6) for further information.

See also "Error/Maintenance codes".



USER LEVELS

There are 4 different user levels:

- End user
- Commissioning
- Heating engineer
- OEM (Manufacturer).

See the "Complete list of parameters" section for a list of the parameters displayed in each level.

Proceed as follows to access the user level you require.

- Go to the main screen.
If necessary, press the **"ESC"** button one or more times to return to the main screen.

Press the **"OK"** button.

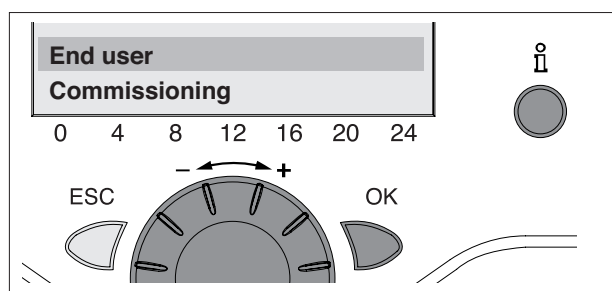
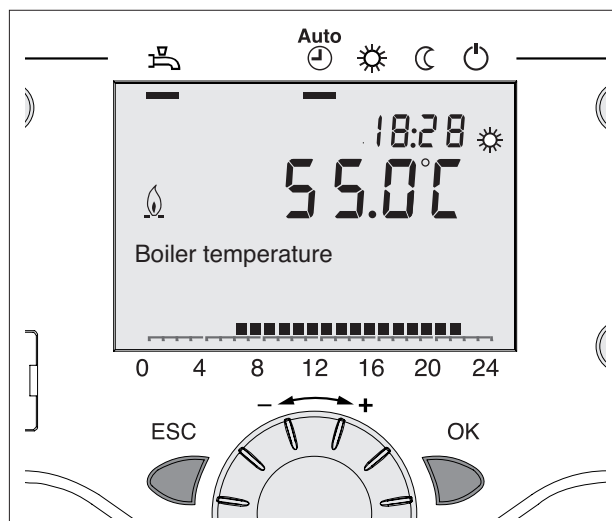
Press and hold the information button **"i"** for 3 seconds.

- End user level. Turn the knob to scroll through the menu until you reach the end user programming level. Press **"OK"**.

To enter the OEM level, you need to enter the

Password (12434).

Press the **"OK"** button to confirm each digit. Press **"ESC"** to cancel an entry.

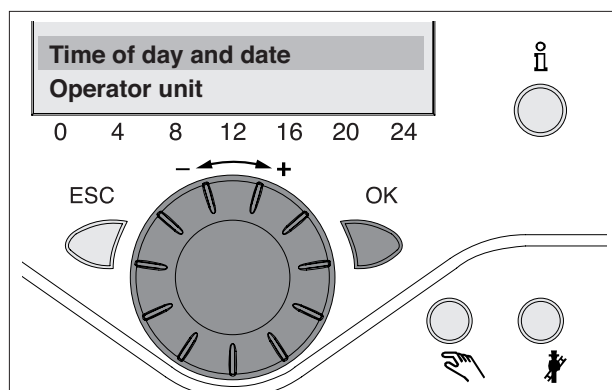


- ⚠ - Pressing the **"ESC"** button takes you just one step back: the value entered is not saved.
- If no change is made for 8 minutes, the system returns to the main screen.
- Programming lines are displayed or hidden according to the system configuration and the user level (User, Commissioning, etc.).

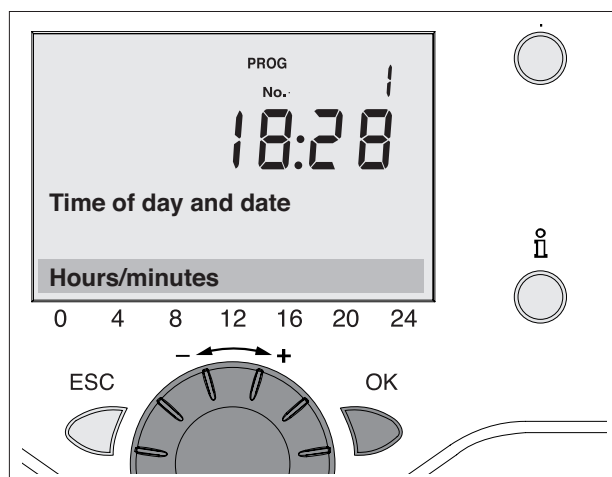
- ⚠ Parameter values on the Commissioning, Heating engineer and OEM levels must only be changed by the **THERMITAL** Technical Assistance Service.

EXAMPLE: SETTING THE CURRENT TIME

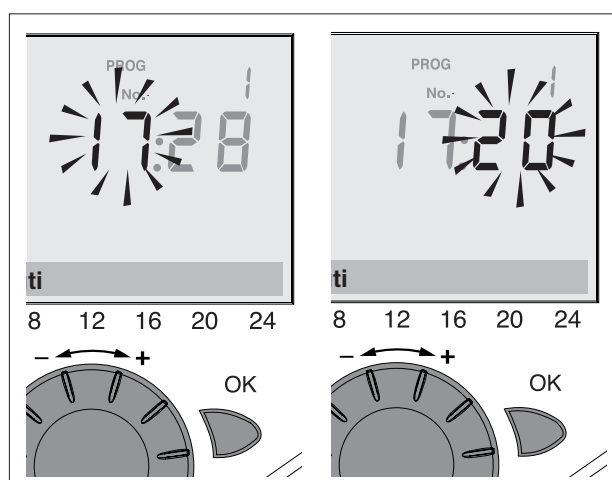
- From the main screen press **"OK"**.
- The message area displays a number of setting pages. Turn the knob until you reach the "Time and date" line. Press **"OK"** to confirm.



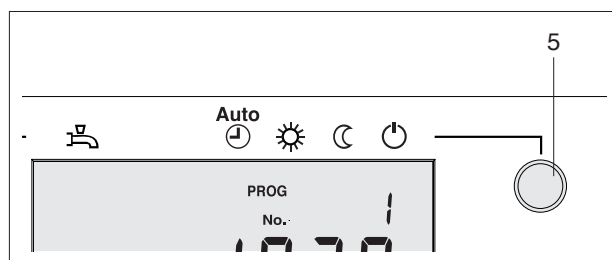
- The message area shows the current hour.
Press **"OK"**.



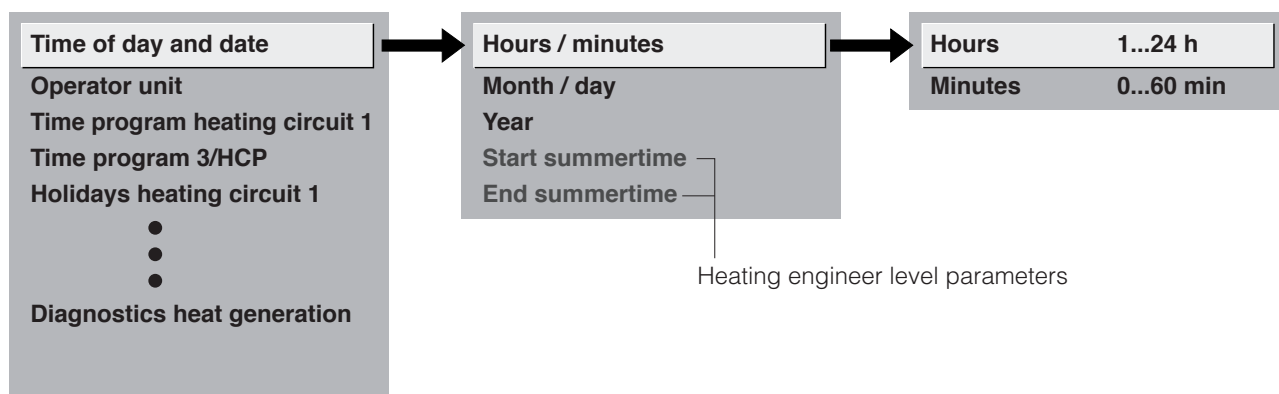
- The display flashes the current hour. Turn the knob to go on or back to the correct value.
Press **"OK"** to confirm.
- The display flashes the current minutes. Turn the knob to go on or back to the correct value.
Press **"OK"** to confirm.



The new time setting is saved and the display stops flashing. At this stage you can continue programming or press the central heating mode button (5) to return to the main screen.




EXAMPLE OF THE MENU STRUCTURE

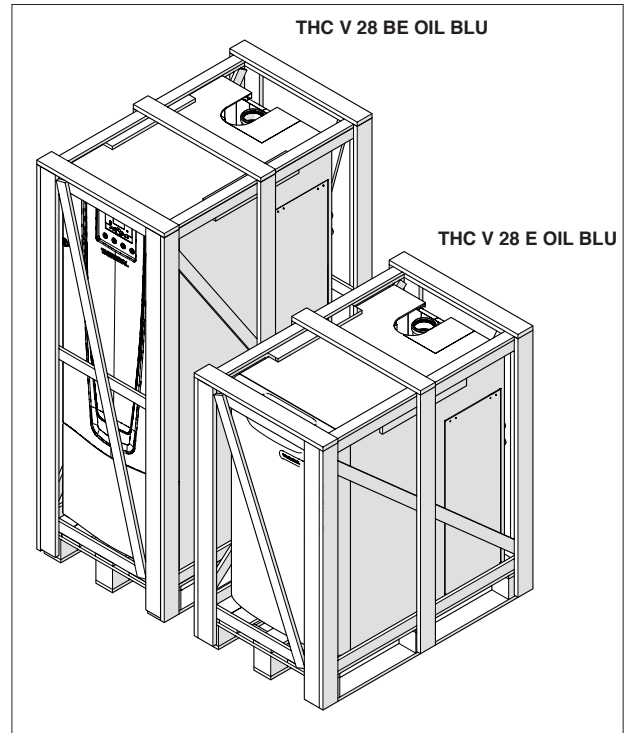


UNPACKING THE PRODUCT

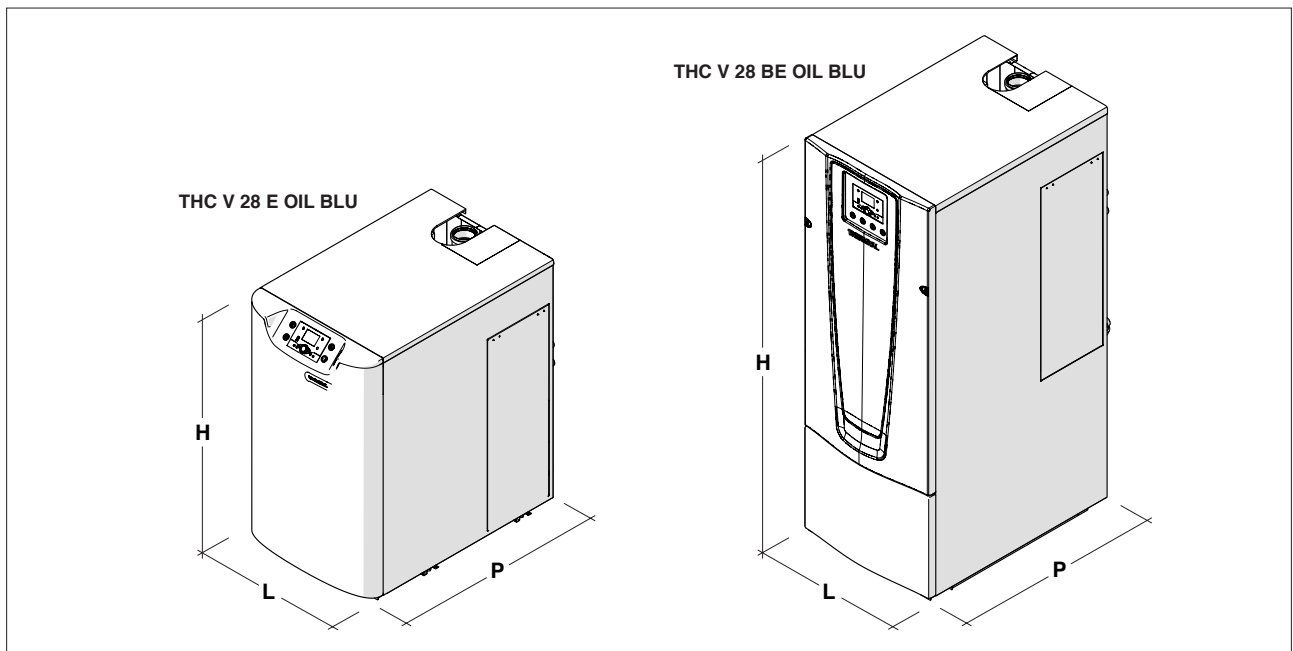
THC V E OIL BLU THERMITAL boilers come in a robust palletised wooden cage, protected by a PVC sheet. The following items are delivered in a plastic bag inside the boiler:

- Installation, operation and maintenance manual
- Spare parts catalogue
- Certificate of warranty
- Hydraulic test certificate
- Non-return valve
- Outside sensor
- Connections and hose
- Air collar.

 The instruction manual is an integral part of the boiler. Once located, read it thoroughly and keep it safe.



DIMENSIONS AND WEIGHT

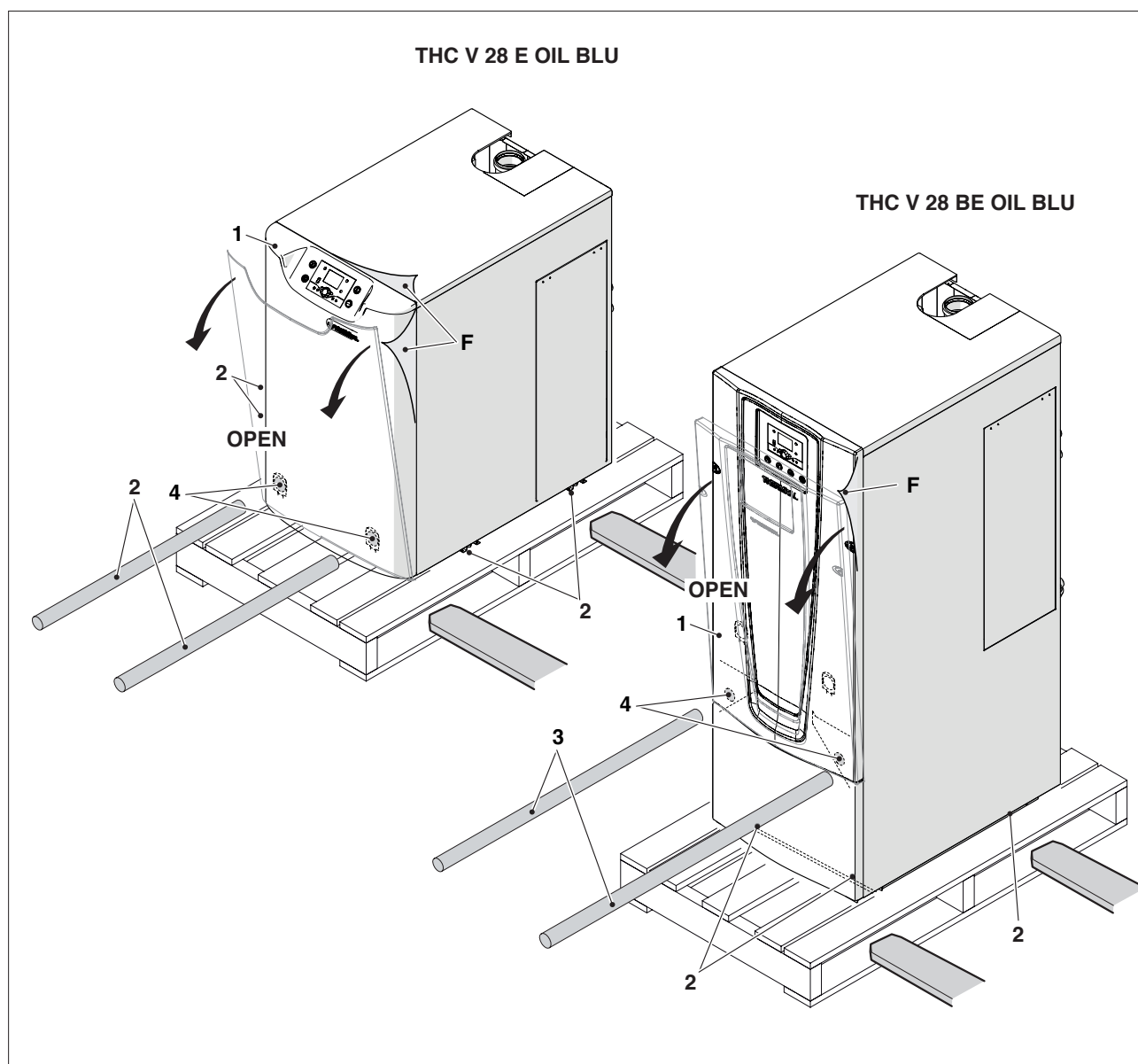


Description	THC V		
	28 E OIL BLU	28 BE OIL BLU	
L	600	600	mm
P	980	940	mm
H	1025	1650	mm
Net weight	115	200	kg

HANDLING

Once you have removed the packaging, proceed as follows to handle the boiler.

- Remove the front panel (1) by pulling it forwards.
- Remove the screws (2) securing the boiler to the wooden pallet.
- Insert two 3/4" pipes (3) through the eyebolts (4) inside the boiler and lift the boiler carefully off the pallet.




 Wear suitable personal protective equipment and use suitable safety devices.


 Remove the protective film (F) from the front panel. On 28 A OIL BLU model this film also covers the control panel.


 Do not leave packaging material within the reach of children, since it can become a potential hazard. Dispose of packaging material in compliance with applicable legislation.

PLACE OF INSTALLATION

THC V E OIL BLU THERMITAL boilers must be installed in rooms with suitably sized air vents conforming to applicable technical standards.

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


 Make sure that the appliance's index of electrical protection is adequate for the characteristics of the room where it is to be installed.


 These boilers must be installed indoors. They are not designed for outside use.

INSTALLATION IN OLDER SYSTEMS AND SYSTEMS REQUIRING MODERNISATION

When installing these boilers in old systems or systems requiring modernisation, always perform the following checks:

- Make sure that the flue is able to withstand the temperature of the combustion gases and that it has been designed and made in compliance with applicable standards. The flue must also be as straight as possible, sealed, insulated and not blocked or choked.
- Make sure that the flue is fitted with a condensation drainage union.
- Make sure that the electrical system has been installed by a qualified electrician in compliance with applicable standards.
- Make sure that flow rate, head and direction of flow of the pumps are suitable and correct.
- Make sure that the fuel feed line and any storage tank are made and installed in compliance with applicable standards.
- Make sure that expansion vessels are big enough to contain the additional volume generated by thermal expansion.
- Make sure that the central heating circuit has been flushed out to remove all sludge and lime scale, and that it has been bled and seal tested.
- Make sure that a suitable water treatment system is installed. (See the "Water in central heating systems" section.) Refer to the catalogue for details of specific products.

 The manufacturer declines all responsibility for damage caused by incorrectly constructed flue systems.

 Flue pipes for condensing boilers must be made from special materials, different from those used for standard non-condensing boiler flues.

HEATING CIRCUIT WATER


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, limescale and other contaminants in water can cause irreversible damage to boilers even in relatively short times, and despite the use of top quality materials in their manufacture.

Contact RIELLO's Technical Assistance Service for further information on water additives and their use.

 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			
		Water used for first filling	Water with system operating (*)
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			
		Water used for first filling	Water with system operating (*)
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 a system comprises a number of boilers, when that system is first put into service, make sure that all the boilers function simultaneously or on a short interval rotation basis in order to evenly distribute initial limescale deposits.
-  When you finish installing a system, always flush it out to remove installation residues.
-  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.
-  Before re-filling an existing system, clean and flush it out thoroughly. Only fill the boiler after the central heating circuit has been thoroughly flushed out.

2.1 New central heating systems

Initial filling of the system must be performed slowly. In theory, once filled and bled of all air, a heating circuit should not need topping up.

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

Deposit corrosion is an electro-chemical phenomenon caused by the presence of foreign bodies (sand, rust, etc.) in the water mass. These solid substances generally form deposits (sludge) in the bottom of the boiler, in the tube heads and in the joins of tube bundles.

These parts of the boiler can therefore be affected by micro-corrosion caused by the electrochemical potential difference created between the metal parts in contact with impurities and other metal parts around them.

3.2 Stray current corrosion

Stray current corrosion is caused by the different electrical potentials of the water in the boiler and the metal body of the boiler or piping. Stray current corrosion is easily identified by the regular tiny conical holes it leaves.



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 has been said above we can see that it is essential to avoid two main factors that could lead to corrosion. These are contact between system water and air and the continuous addition of fresh water to the circuit.

To eliminate contact between system water and the air (thus avoiding oxygenation of the system water), we need to:

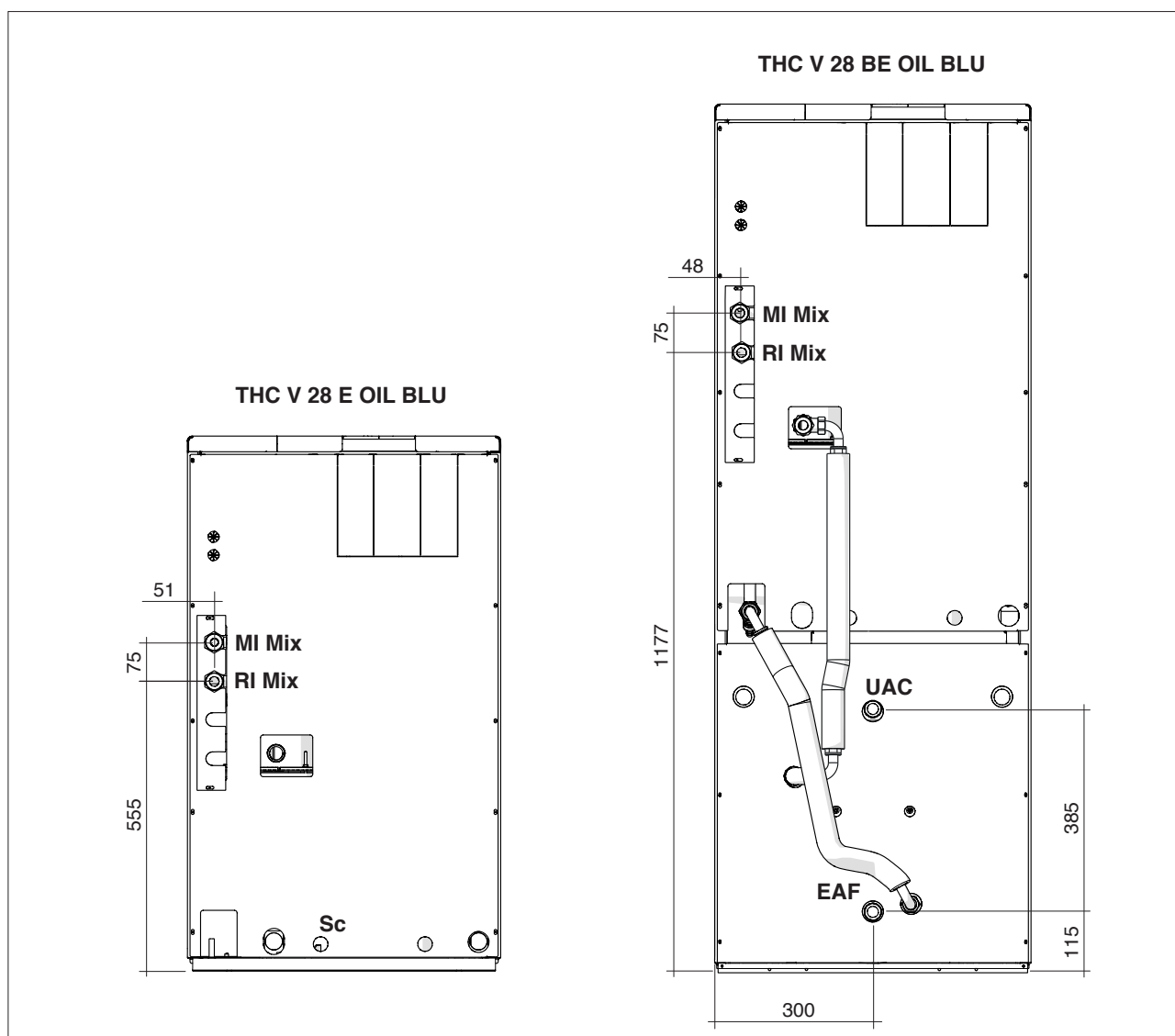
- ensure that the expansion vessel is a closed vessel, and of the correct size and pre-charge pressure (the pressure to be checked periodically);
- ensure that the system is always kept at a pressure higher than atmospheric pressure at all points (including the pump suction side) and under all operating conditions (precisely because the seals, gaskets and joins in a water circuit are designed to resist pressure from within, but not to resist a vacuum within);
- ensure that no part of the system is made from materials that are permeable to gases (e.g. plastic pipes with no oxygen barrier destined for under-floor heating systems).



Finally, never forget that boiler failures caused by encrustation and corrosion are not covered under the terms of the warranty.

WATER CONNECTIONS

THC V E OIL BLU THERMITAL boilers are designed and made for installation in combined central heating and domestic hot water production systems. The water fittings have the following specifications:



Description	THC V		
	28 E OIL BLU	28 BE OIL BLU	
MI Mix - Mixed heating circuit flow	1" M	1" M	Ø
RI Mix - Mixed heating circuit return	1" M	1" M	Ø
UAC - Domestic hot water outlet	-	3/4" F	Ø
EAF - Domestic cold water inlet	-	3/4" F	Ø
Sc - Condensate drain	-	-	

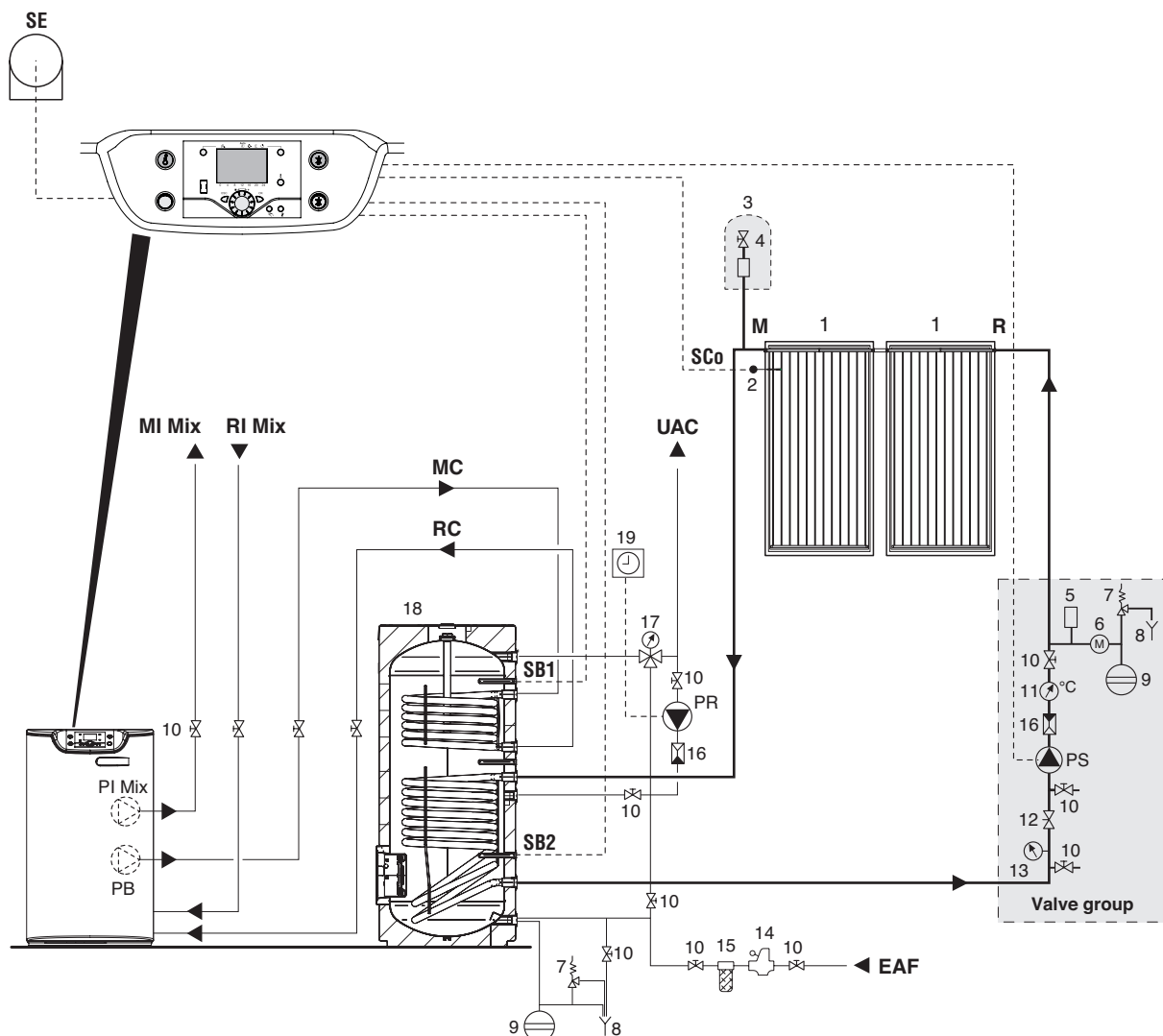
⚠ The safety valve must be connected to a suitable collection and drain system. The manufacturer declines all responsibility for damage caused by water escaping from the safety valve.

⚠ Circuits filled with anti-freeze must be fitted with water disconnectors.

⚠ Low temperature (under-floor) heating systems must be fed through a circuit fitted with a mixer valve.

⚠ The choice of system components and the method of their installation are left up to the heating engineer installing the system. Installers must use their expertise to ensure proper installation and functioning in compliance with all applicable legislation.

FUNCTIONAL WATER SCHEMATIC for THC V 28 E OIL BLU

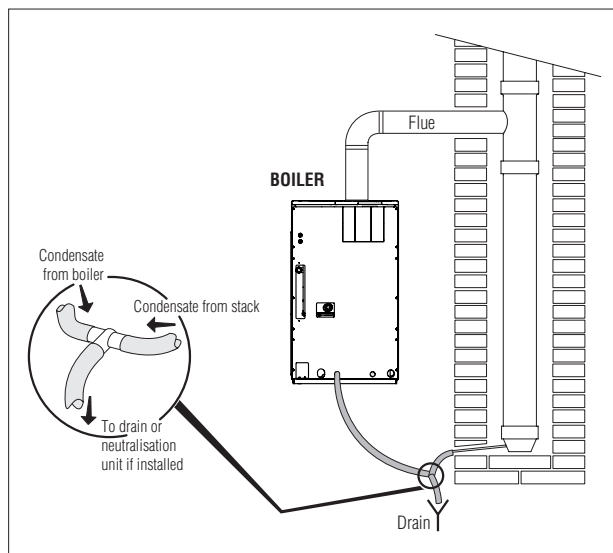
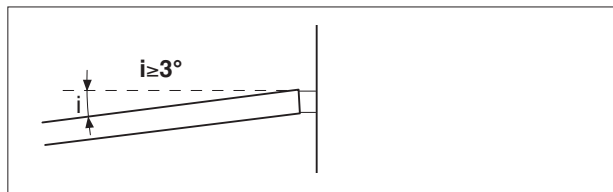


- 1 - Solar collector
- 2 - Collector sensor socket
- 3 - Manual bleed valve
- 4 - Vent cock
- 5 - Vent valve
- 6 - Pressure gauge
- 7 - Safety valve
- 8 - Drain
- 9 - Expansion vessel
- 10 - Disconnect valves
- 11 - Temperature gauge
- 12 - Flow regulator
- 13 - Flow meter
- 14 - Pressure reducer
- 15 - Softener filter
- 16 - Non-return valve
- 17 - Thermostatic mixer valve
- 18 - **BPS** solar storage cylinder
- 19 - Clock

- UAC - Domestic hot water outlet
- EAF - Domestic cold water inlet
- MI Mix - Mixed heating circuit flow
- RI Mix - Mixed heating circuit return
- MC - Boiler flow (use kit 20012781)
- RC - Boiler return
- M - Collector outlet
- R - Collector return
- PI Mix - Mixed circuit pump
- PB - Solar storage cylinder filling pump
- PR - DHW recirculation pump
- PS - Solar circuit pump
- SE - Outside sensor
- SB1 - Top storage cylinder sensor (accessory code 4031847)
- SB2 - Bottom storage cylinder sensor (accessory code 4031847)
- SCo - Collector sensor (accessory code 4031913)

DRAINING THE CONDENSATE

- ⚠ Always maintain a slope “i” of over 3° and ensure that the diameter of the condensate drain hose is always greater than that of the drain fitting on the boiler.
- ⚠ The connection to the waste water drain pit must be made in compliance with national and local legislation and standards.
- ⚠ Condensate from the boiler and that from the flue stack should be channelled to the same drain pit.
- ⚠ The surface on which the boiler stands must be perfectly horizontal and flat over the entire area of the boiler frame in order to avoid condensate drainage problems.
- ⚠ Any condensate neutralisation units deemed necessary may be connected downstream from the siphon. Evaluate the neutralisation unit after one year of operation to estimate the duration of the neutralisation charge. The total duration of the charge can be estimated from the level after one year.
- ⚠ It is mandatory to use a condensate trap (see the **THERMITAL** catalogue).

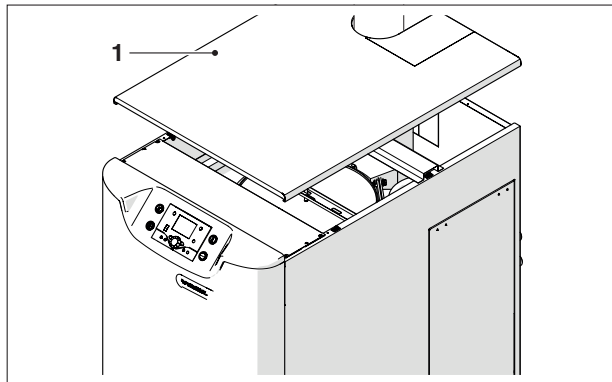


ELECTRICAL CONNECTIONS

THC V E OIL BLU condensing boilers are fully wired in the factory. Only the following electrical connections remain to be made:

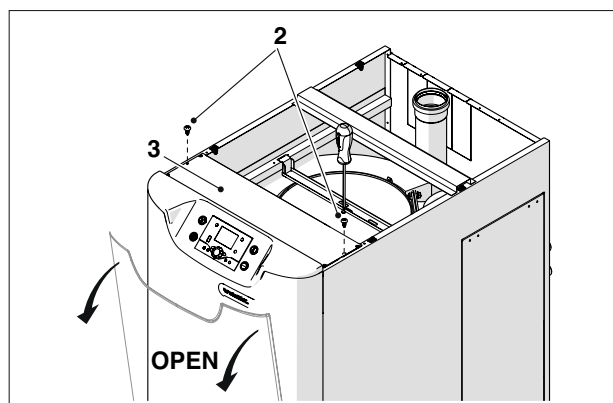
- Power supply
- Outside sensor
- Room unit (not supplied)
- The automatic shut-off device (not supplied; only where required; see also the “Fuel connections” section).

Proceed as follows to make these connections.



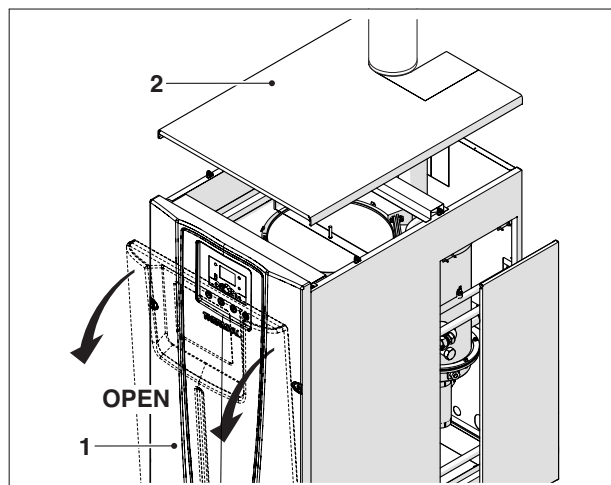
THC V 28 E OIL BLU

- Pull up and remove the top panel (1) from the boiler.
- Unscrew the screws (2) and remove the cover (3) from over the control panel.

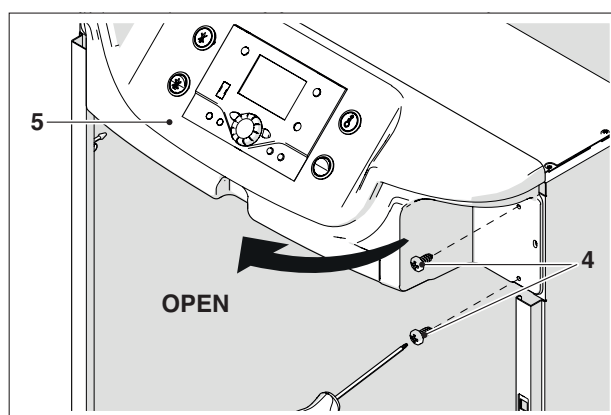


THC V 28 BE OIL BLU

- Remove the front panel (1) from the boiler.
- Pull up and remove the top panel (2) from the boiler.



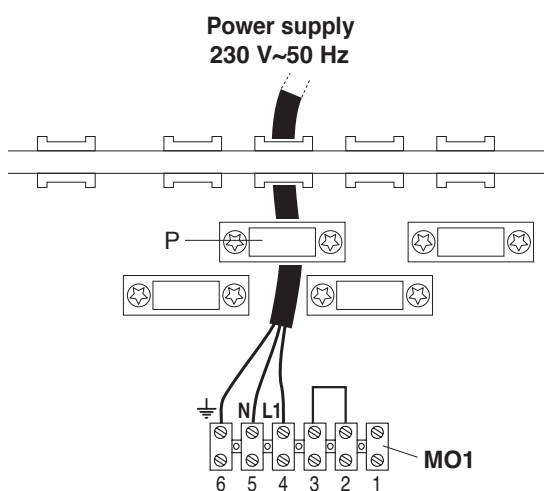
- Unscrew the screws (4) and turn out the front panel housing the control panel (5).



ALL models

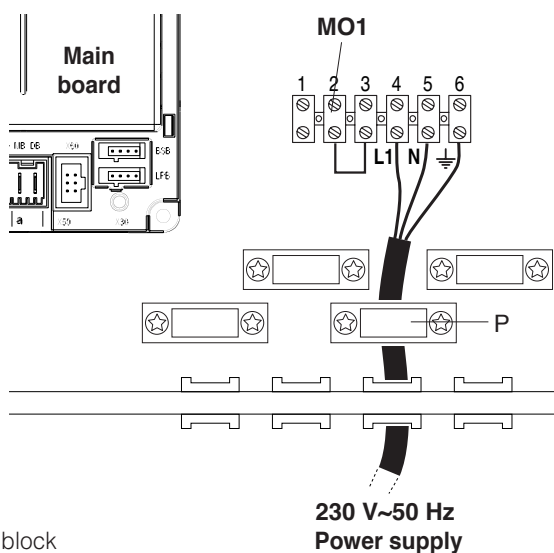
- Make the electrical connections to terminal block (MO1) as shown below.

THC V 28 E OIL BLU



MO1 Boiler terminal block

THC V 28 BE OIL BLU



⚠ Use the cable clamp (P) to hold the mains cable in place.

Terminals (2-3) provide a multi-functional input that can be used to control boiler ignition from a room thermostat for a direct heating zone (accessory code 20012781). If the terminals are used for this purpose, set parameter 5951 = "NC".

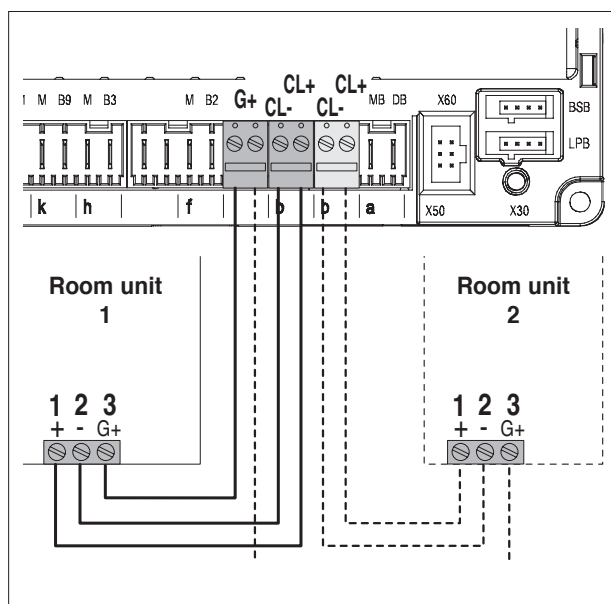
- Connect up the outside sensor (see relevant section).

- Connecting up the room unit (not supplied)

Use a two core cable to connect the room unit to terminals CL+ and CL- on the main board, taking care not to invert polarity.

Set the relevant parameters to assign the room unit to the corresponding circuit (see "Preparing for initial start-up").

- Once you have made all the necessary connections, close the control panel, reversing the steps followed to open it.



Automatic shut-off device (DAI)

(not supplied; only where required; see also the "Fuel connections" section)

- Connect up the automatic shut-off device (DAI) as shown in the wiring diagram alongside. This ensure that fuel only passes when the burner is functioning.

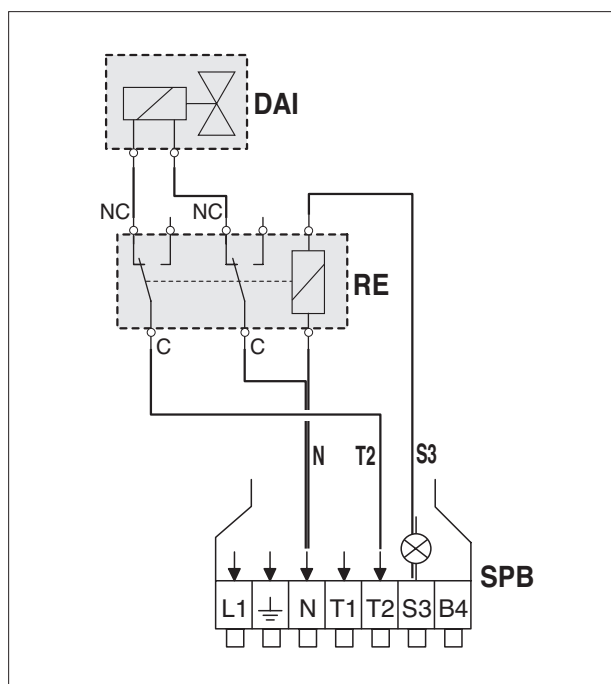
⚠ The automatic shut-off device (DAI) and the relay (RE) must be suitable for a 230 VAC power supply.

See the "Fuel connections" section for details of the fuel connections.

DAI - Automatic shut-off device (not supplied)

RE - Relay (not supplied)

SPB - 7-pin burner plug



⚠ The following instructions are mandatory.

- 1 -Use a multi-pole magnetic thermal trip switch and disconnector conforming to IEC-EN standards (with a contact gap of at least 3 mm).
- 2 -Respect the L (Phase) - N (Neutral) polarity. Keep the ground wire about 2 cm longer than the power wires.
- 3 -Use cables with a cross section of 1.5 mm² or more, complete with end terminals.
- 4 -Always refer to the electrical wiring diagrams in this manual when performing any electrical work.
- 5 -Make sure the appliance is connected to an effective ground.

⊖ It is strictly forbidden to use fuel and/or water pipes to ground the appliance.

⊖ Do not route the power cable or room thermostat cables near hot surfaces (like heating circuit flow pipes). Use a suitable class of cable if there is any possibility of contact with parts at temperatures above 50°C.

The manufacturer declines all responsibility for damage caused by failing to ground the appliance adequately or by failure to respect the wiring diagrams provided in this manual.

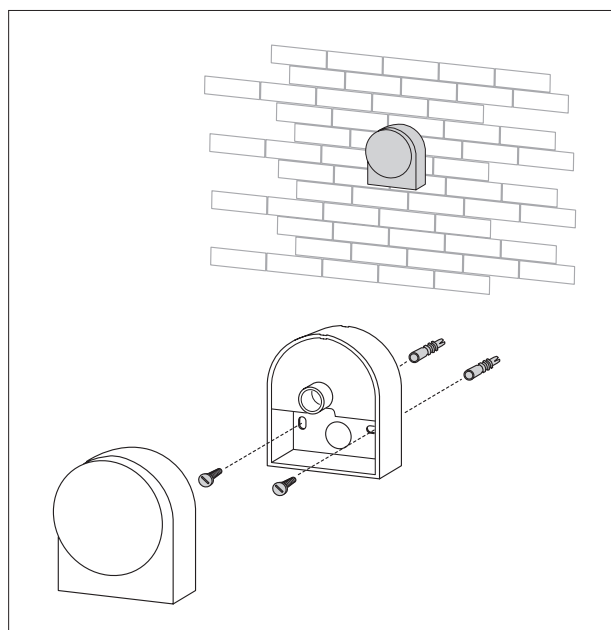
OUTSIDE SENSOR CONNECTIONS

Correct positioning of the outside sensor is essential to proper indoor temperature control.

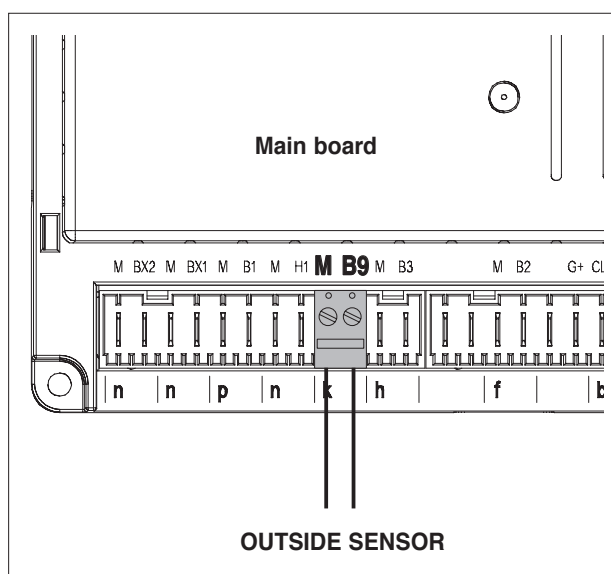
The sensor must be installed outside the building to be heated, about 2/3 of the way up a NORTH or NORTH-WEST facing wall, well clear of any flues, doors, windows and out of direct sunlight.

Fixing the outside sensor to the wall

- Unscrew the cover from the sensor casing to access the terminal block and the fixing holes.
- Use the sensor casing as a template and mark the points to drill on the wall.
- Remove the sensor casing and drill 5x25 holes for the expansion plugs.
- Fix the sensor casing to the wall using the two expansion plugs provided.
- Insert a two core cable (with cross section between 0.5 and 1 mm², not supplied) to connect the sensor to the boiler.
- Fit the cover on the sensor casing.



- Open the control panel and identify the main control board (see the "Electrical connections" section).
- Connect the wires from the outside sensor to terminals "M-B9" on the main board. Polarity is irrelevant.
- Once you have made all the necessary connections, close the control panel, reversing the steps followed to open it.



- ⚠ Position the sensor on a smooth area of wall. Prepare a smooth contact area for the sensor casing if the wall is made from exposed brick or other rough material.
- ⚠ Avoid junctions in the cable between the outside sensor and the control panel. If different cable lengths have to be joined, make sure that the junctions are sealed and adequately protected.
- ⚠ If cable ducts are used to route the sensor connection cable, keep these well clear of any power cables (230Vac).

Correspondence table

Measured temperature (°C) – Resistance of outside sensor (Ω).

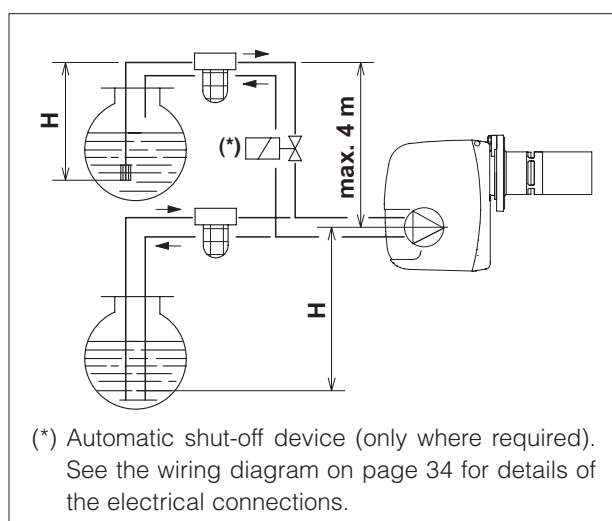
T (°C)	R (Ω)	T (°C)	R (Ω)	T (°C)	R (Ω)	T (°C)	R (Ω)
-30.0	13'034	-9.0	4'358	12.0	1'690	33.0	740
-29.0	12'324	-8.0	4'152	13.0	1'621	34.0	713
-28.0	11'657	-7.0	3'958	14.0	1'555	35.0	687
-27.0	11'031	-6.0	3'774	15.0	1'492	36.0	663
-26.0	10'442	-5.0	3'600	16.0	1'433	37.0	640
-25.0	9'889	-4.0	3'435	17.0	1'375	38.0	617
-24.0	9'369	-3.0	3'279	18.0	1'320	39.0	595
-23.0	8'880	-2.0	3'131	19.0	1'268	40.0	575
-22.0	8'420	-1.0	2'990	20.0	1'218	41.0	555
-21.0	7'986	0.0	2'857	21.0	1'170	42.0	536
-20.0	7'578	1.0	2'730	22.0	1'125	43.0	517
-19.0	7'193	2.0	2'610	23.0	1'081	44.0	500
-18.0	6'831	3.0	2'496	24.0	1'040	45.0	483
-17.0	6'489	4.0	2'387	25.0	1'000	46.0	466
-16.0	6'166	5.0	2'284	26.0	962	47.0	451
-15.0	5'861	6.0	2'186	27.0	926	48.0	436
-14.0	5'574	7.0	2'093	28.0	892	49.0	421
-13.0	5'303	8.0	2'004	29.0	859	50.0	407
-12.0	5'046	9.0	1'920	30.0	827		
-11.0	4'804	10.0	1'840	31.0	796		
-10.0	4'574	11.0	1'763	32.0	767		

FUEL CONNECTIONS

THC V E OIL BLU THERMITAL boilers have their fuel connections at the rear.

Fuel supply hoses must pass through the gap between the boiler base and the floor before being connected to the fuel pump.

If the oil feed system is in negative pressure, the return line must reach the same height as the suction line. This avoids having to install a bottom valve, which would be essential if the return hose were to reach above the level of the fuel.



⚠ The installer must ensure that the negative pressure differential in the oil feed never exceeds 0.4 bar (30 cm Hg). Over this value the fuel oil will release gas. Make sure that the oil hoses are perfectly oil-tight.

⚠ Clean out the oil tank at suitable intervals.

⚠ The oil feed line must be suitable for the flow rate demanded by the burner. The oil feed system must also be equipped with all the necessary safety and control devices required by applicable legislation and standards. Refer to the table alongside for oil feed line characteristics.

⚠ A filter must be installed in the oil feed line.

⚠ Make sure that the oil return line is not kinked or blocked before starting up the boiler. Excessive back-pressure can lead to breakage of the pump seal.

Priming the pump

To prime the pump simply start up the burner and check for a flame.

If the burner enters lockout before any fuel reaches it, wait at least 20 seconds then press the "remote burner reset" button on the control panel and repeat the ignition procedure until the flame lights.

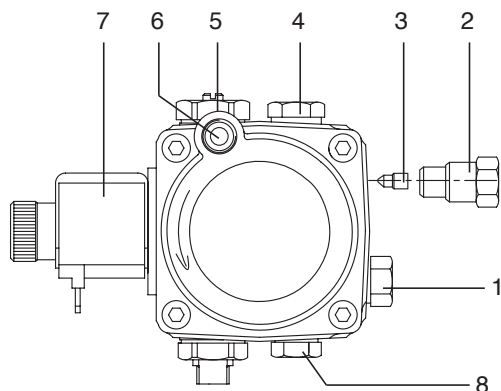
H (m)	L (m)	
	Øi (8 mm)	Øi (10 mm)
0	35	100
0,5	30	100
1	25	100
1,5	20	90
2	15	70
3	8	30
3,5	6	20

H = Head

L = Maximum length of suction hose

Øi = Internal diameter of hose

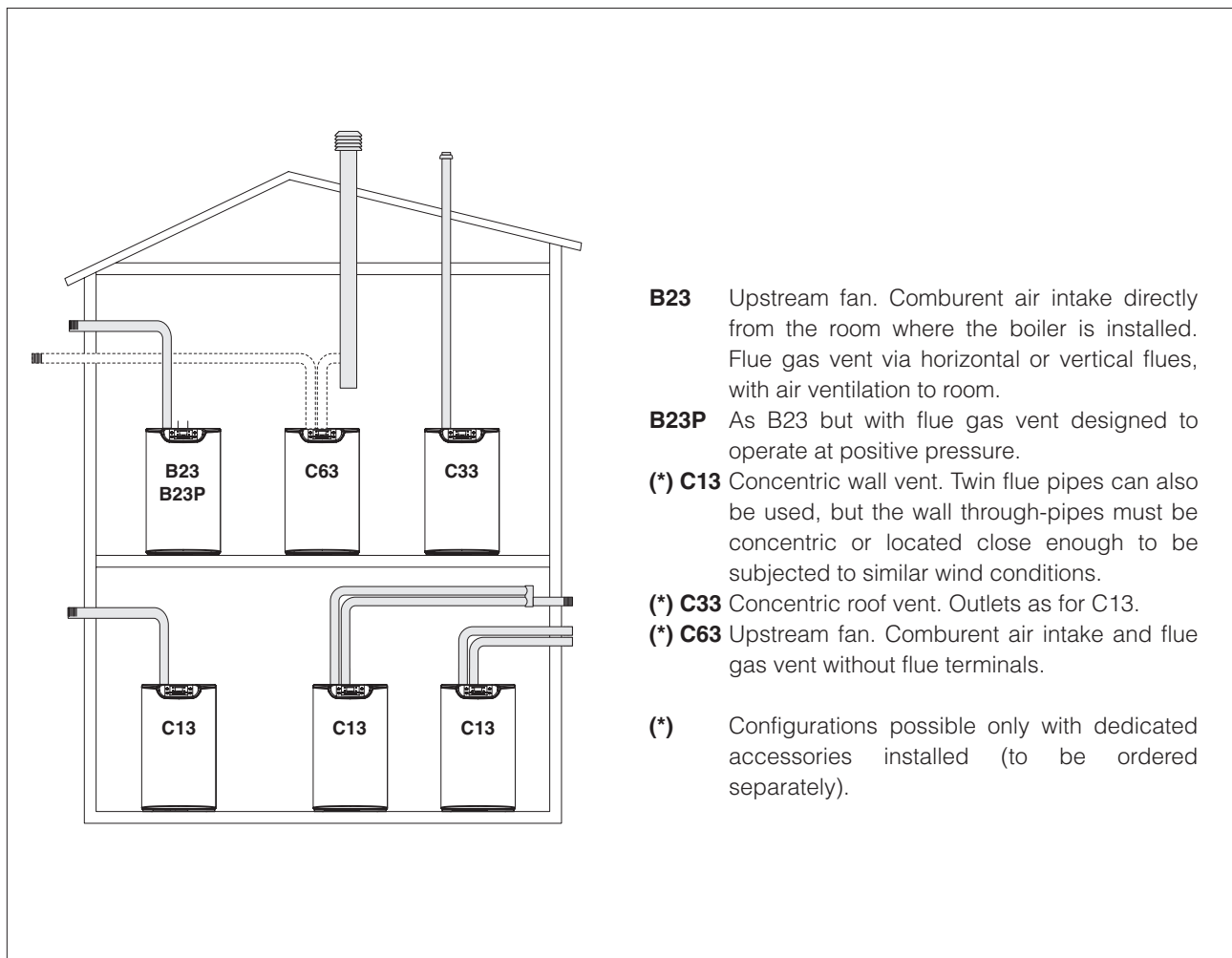
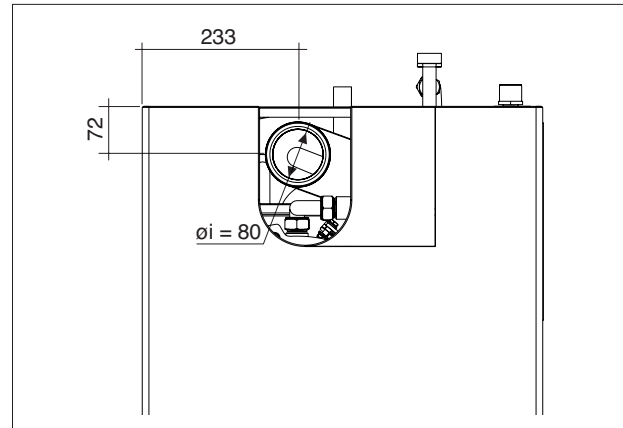
- 1 - Suction
- 2 - Return
- 3 - By-pass screw
- 4 - Pressure gauge fitting
- 5 - Pressure regulator
- 6 - Vacuum gauge fitting
- 7 - Valve
- 8 - Auxiliary pressure measurement fitting



FLUE GAS OUTLET AND COMBURENT AIR INLET

The flue and the connection to the stack must be made in compliance with applicable laws and standards. Use of heat resistant, condensate resistant and stress resistant rigid pipe and sealed joints is mandatory.

THERMITAL THC V E OIL BLU boilers can be installed as "sealed" boilers with the addition of the relevant accessory kit.



Maximum equivalent length of pipes

		THC V	
		28 E OIL BLU	28 BE OIL BLU
Category	Flue Ø (mm)	Maximum length of flue pipe (m) (*)	
open B23 - B23P	80	10	10
twin flue pipes C63	80	10+10	10+10
concentric flue pipes C13 - C33	80/125	6	6

(*) These length must be reduced by 3 metres for every 90° curve and by 1.5 metres for every 45° curve.

⚠ A check on the quality of combustion must be made on initial start-up. Combustion quality can be affected by parameters other than the length, height and position of the flue pipes.

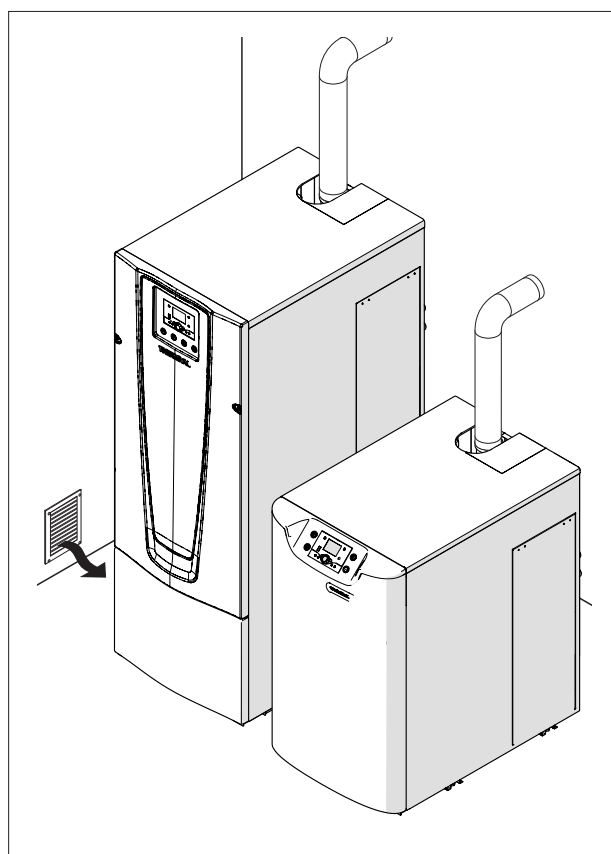
⚠ All flue seals must be made from condensate (acid) resistant materials.

THERMITAL THC V E OIL BLU boilers can also be installed in B23 open configurations using suitable piping in compliance with applicable laws and standards.

⚠ Even if the flue pipes pass through combustible walls, it is not necessary to respect a minimum installation distance (between the flue and the walls), since flue gas temperature is below the maximum permitted temperature for the flue pipes (according to EN 15035). You should nevertheless always respect the specifications given in the technical data sheets for the materials used in the walls.


THERMITAL THC V E OIL BLU boilers derive their comburent air from the room in which they are installed. Suitable air vents must therefore be provided in compliance with applicable laws and standards.

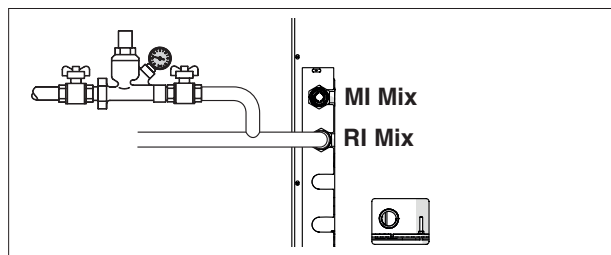
⊘ Never obstruct or restrict the air vents in the room where the appliance is installed.



FILLING AND EMPTYING THE SYSTEM

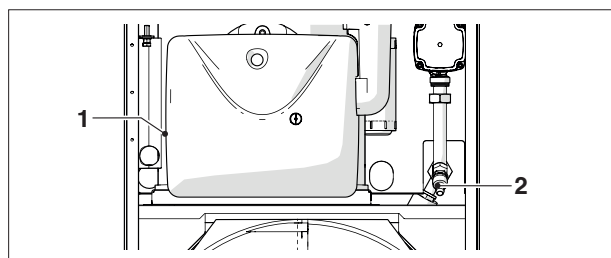
THC V E OIL BLU THERMITAL boilers require a filling pipe connected to the central heating circuit return pipe.

 See Appendix II for further information on water treatment for the central heating system.



FILLING THE CENTRAL HEATING SYSTEM

- Make sure that the boiler drain cocks (1) (and 2 on "28 B" models) are closed before you start filling the system.



- Open the non-return valve (3) (and 4 on "28 B" models) to facilitate filling.

- On type A valves the dot on the screw must be positioned as shown in the figure.

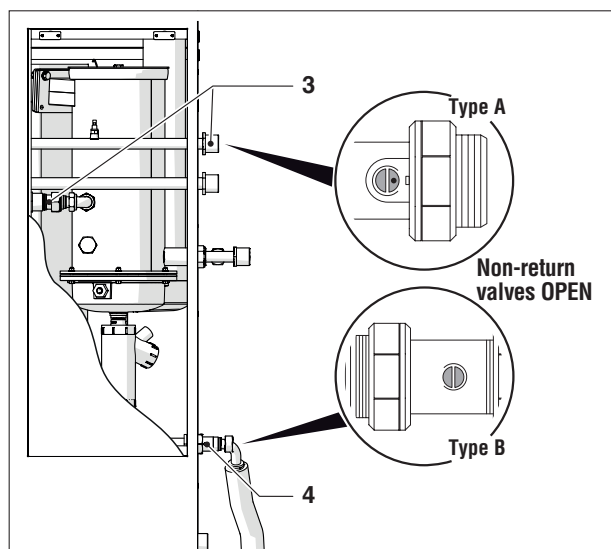
- On type B valves the slot in the screw must be perpendicular to the direction of flow.

- Slacken off the cap of the automatic vent valve (5) to let air out of the system.

- Open the central heating circuit shut-off cocks and slowly fill the system until the pressure gauge (6) reads out value of **1.5 bar** (cold).

- Close the shut-off cocks and tighten down the cap on the automatic vent valve (5).

- Close the non-return valve (3) (and 4 on "28 B" models). See the figure to ascertain the correct position for the dot on the screw.

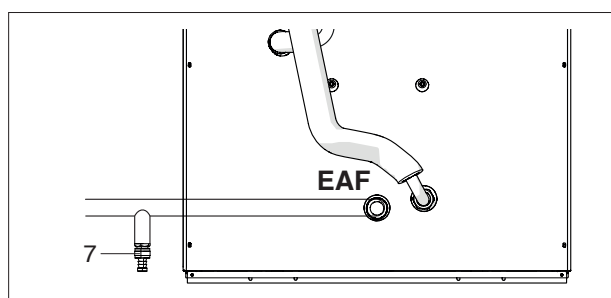
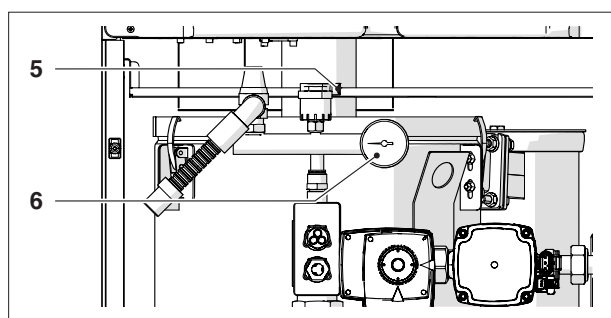


FILLING THE STORAGE CYLINDER ("THC V 28 BE OIL BLU" models only)

- Make sure that drain cock (7) fitted to the storage cylinder piping during installation is closed.

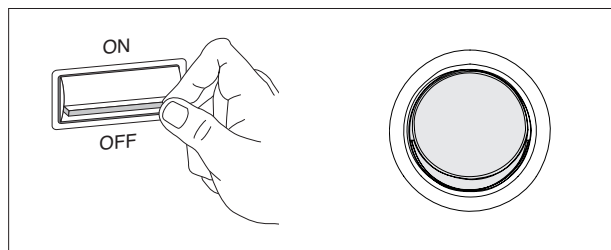
- Open the DHW taps.

- Open the DHW circuit shut-off cocks and slowly fill the storage cylinder until clean, air-free water flows out from the taps in a uniform manner.



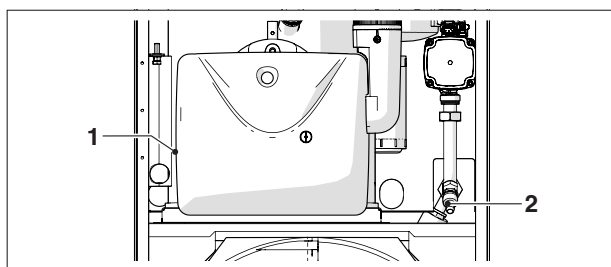
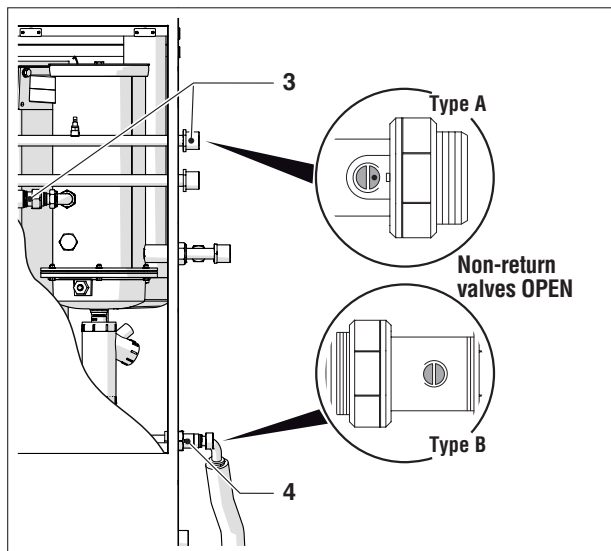
EMPTYING

Switch the electricity supply OFF at the system's main switch and at the control panel before starting to empty the boiler or storage cylinder.



EMPTYING THE CENTRAL HEATING SYSTEM

- Open the non-return valve (3) (and 4 on "28 B" models) to facilitate emptying.
- On type A valves the dot on the screw must be positioned as shown in the figure.
- On type B valves the slot in the screw must be perpendicular to the direction of flow.
- Close the shut-off cocks for the water circuit.
- Connect a plastic hose to the nipples on the boiler drain cocks (1) (and 2 on "28 B" models) and open the cocks.
- Close the non-return valve (3) (and 4 on "28 B" models). See the figure to ascertain the correct position for the dot on the screw.

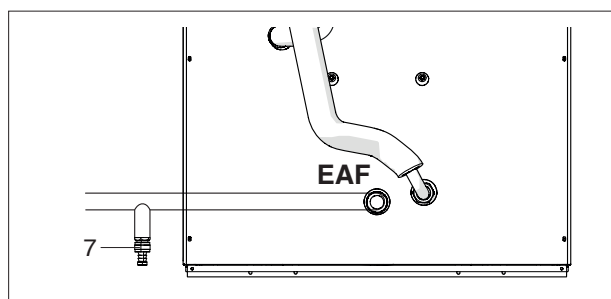


EMPTYING THE STORAGE CYLINDER ("THC V 28 BE OIL BLU" models only)

- Close the shut-off cocks for the domestic hot water circuit.
- Connect a hose to the storage cylinder drain cock (7) fitted on installation, and open the cock.
- Close the drain cock (7) once the storage cylinder is empty.

NOTE:


Open a hot water tap to facilitate emptying.

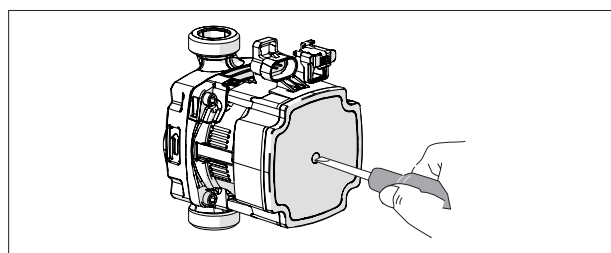
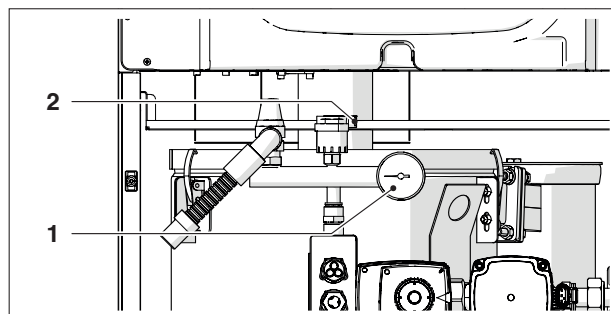


PREPARING FOR INITIAL START-UP

Remove the front panel of the boiler and perform the following checks before switching the boiler on or testing any of its functions.

- The water and fuel shut-off cocks must be open.
- With the system cold, the water pressure gauge (1) must show a pressure **over 1 bar**, with the water circuit properly de-aerated.
- The expansion vessel must be properly pre-charged.
- The cap on the vent valve (2) must be open.
- All electrical connections to the mains supply and to the system's control and safety devices must have been made correctly.
- The flue gas exhaust and flue pipes must have been correctly installed and connected.
- The pump must turn freely. Unscrew the inspection cap and use a flat blade screwdriver to check that the pump shaft turns smoothly.
- The room unit (if fitted) must be correctly connected (see the "Electrical connections" section).

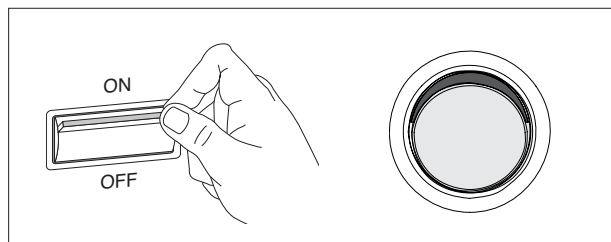
 Protect all electrical devices under the pump before you unscrew the inspection cap just in case water comes out.



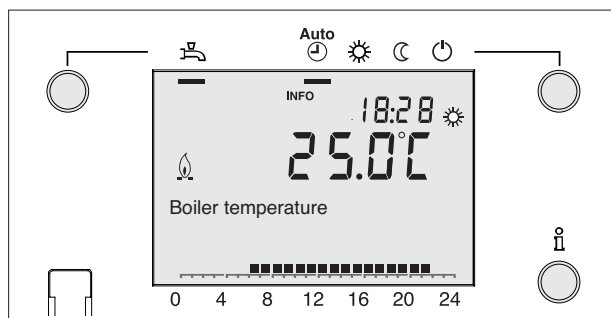
INITIAL START-UP

Once you have completed all the checks listed above, proceed as follows to start up the boiler for the first time.

- Switch the electricity supply ON at the system's main switch and at the control panel.
Check that the display comes on.



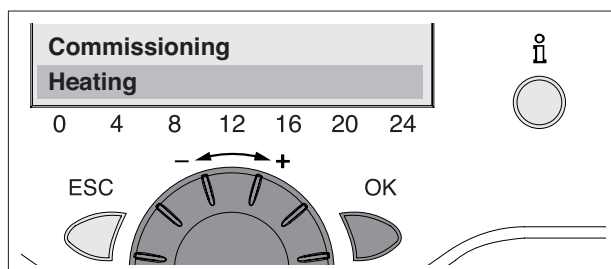
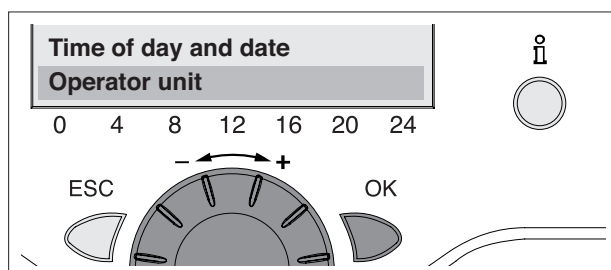
- When the boiler is first powered on, it performs a number of self-tests. These may take a few minutes. When the tests are completed, the display reads out boiler temperature.



Perform the following operations on the boiler control panel.

- Press the **"OK"** button.
Select **"Operator unit"** and press **"OK"**.
Select **"Language"** and press **"OK"**.
Set the language you want.

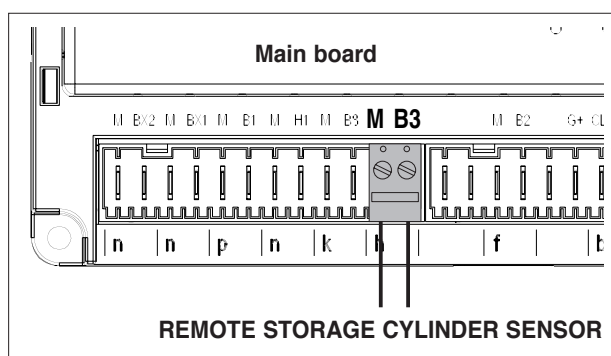
SEE THE "INSTALLER PARAMETERS" MANUAL TO ACCESS THE HEATING ENGINEER (INSTALLER) FUNCTIONING LEVEL.



Only for "20"- "28" models with a remote storage cylinder (optional)

- If a storage cylinder with temperature sensor is connected, install the "Storage cylinder sensor kit" code 4031847 and connect this to terminals "M-B3".

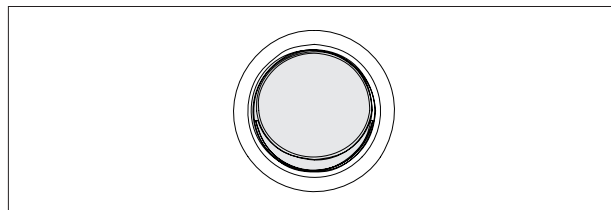
SEE THE "INSTALLER PARAMETERS" MANUAL FOR INFORMATION ON CONFIGURATION.



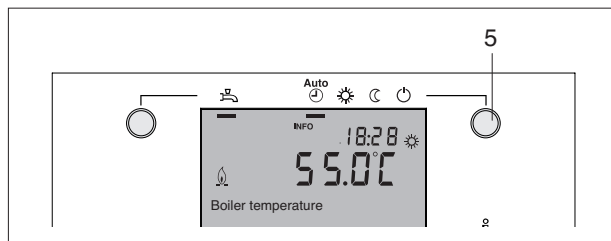
CHECKS DURING AND AFTER INITIAL START-UP

Once the boiler has started up, make sure that it shuts down and re-starts properly too. Proceed as follows:

- Switch the control panel OFF.

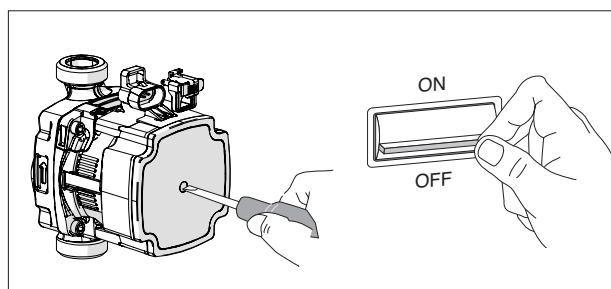


- Press button (5) to switch from "Automatic" (☼) mode to "Protection" (⏻) and back again.

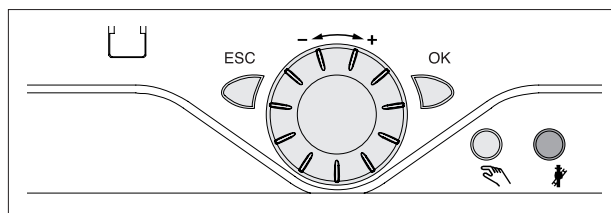


Make sure that all the pumps in the system are free and rotate in the right direction.

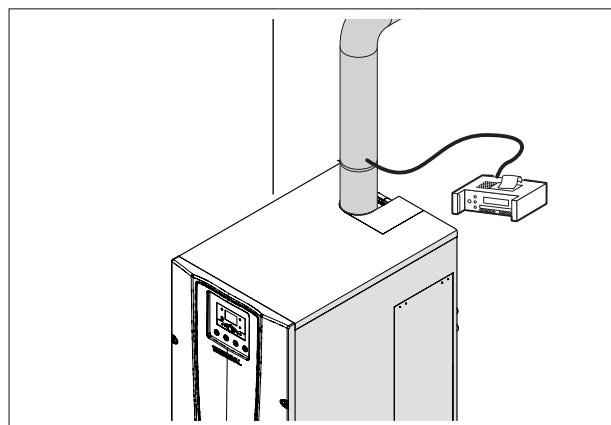
Turn the main power switch OFF and make sure that the boiler shuts down completely.



Provided these conditions are satisfied, re-start the boiler, press the chimney sweep button (🔧) briefly (max. 3 seconds) and perform combustion analysis. Press the (🔧) button again to exit chimney sweep mode.



The flue should be fitted with a test socket for combustion analysis.



TEMPORARY SHUTDOWN

If you are going to be away for a short period of time like a weekend or a short holiday, etc. proceed as follows.

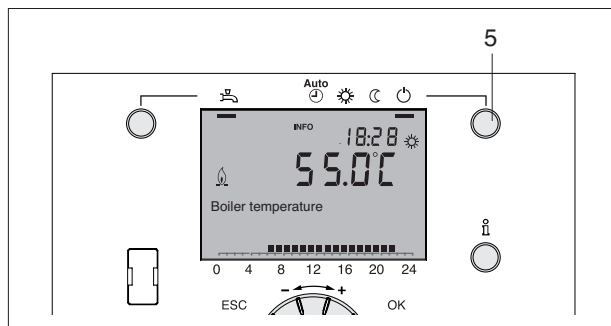
- Press the central heating mode button (5) to select "Protection" mode (☺).

Power to the boiler remains switched on, and the display remains active. The fuel feed also remains open so that the **frost protection** function can protect the boiler against freezing.

Boiler frost protection: If boiler temperature falls below 5°C, the burner ignites and runs at full power until temperature reaches the minimum setpoint (parameter 2210).

Plant frost protection: This function is only active if an outside temperature sensor is connected.

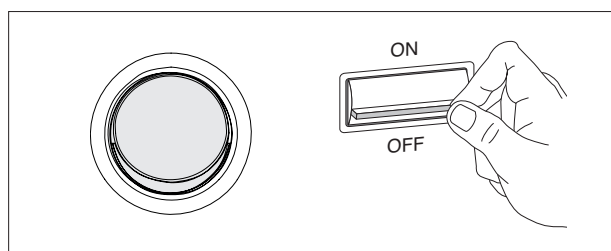
If outside temperature drops below -4°C the pumps are switched on. If outside temperature is between -5° and 1.5°C, the pumps are switched on for 10 minutes at intervals of 6 hours. If outside temperature is above 1.5°C the pumps are switched off.



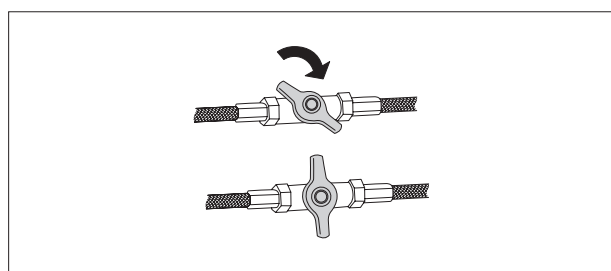
PREPARING FOR EXTENDED PERIODS OF DISUSE

If the boiler is not going to be used for an extended period of time, proceed as follows to prepare it for shut-down.

- Turn the control panel power switch OFF and make sure that the display goes out.
- Turn the mains power switch OFF.



- Close the fuel shut off cock and the central heating and DHW circuit shut off cocks.



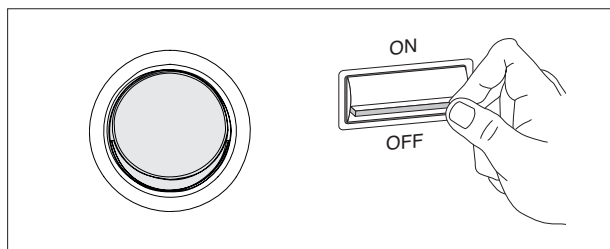
⚠ Under these conditions the system is not protected against frost. Drain the central heating circuit and domestic hot water circuit if there is any risk of freezing.

MAINTENANCE

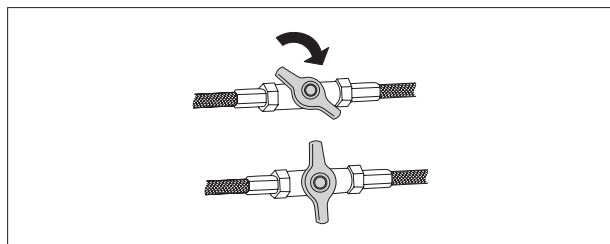
Regular maintenance may be a legal requirement. In Italy it is required by Presidential Decree 412 of the 26th August 1993. It is also essential for the safety, efficiency and durability of the boiler. Proper maintenance keeps consumption and emissions down, and ensures that the boiler continues to operate reliably over time.

Perform the following operations before beginning any maintenance.

- Switch the electricity supply OFF at the system's main switch and at the control panel.



- Close the fuel shut-off cocks.



Once all the necessary maintenance has been completed, restore all original settings (see the values in the tables below).

THC V 28 E OIL BLU - THC V 28 BE OIL BLU

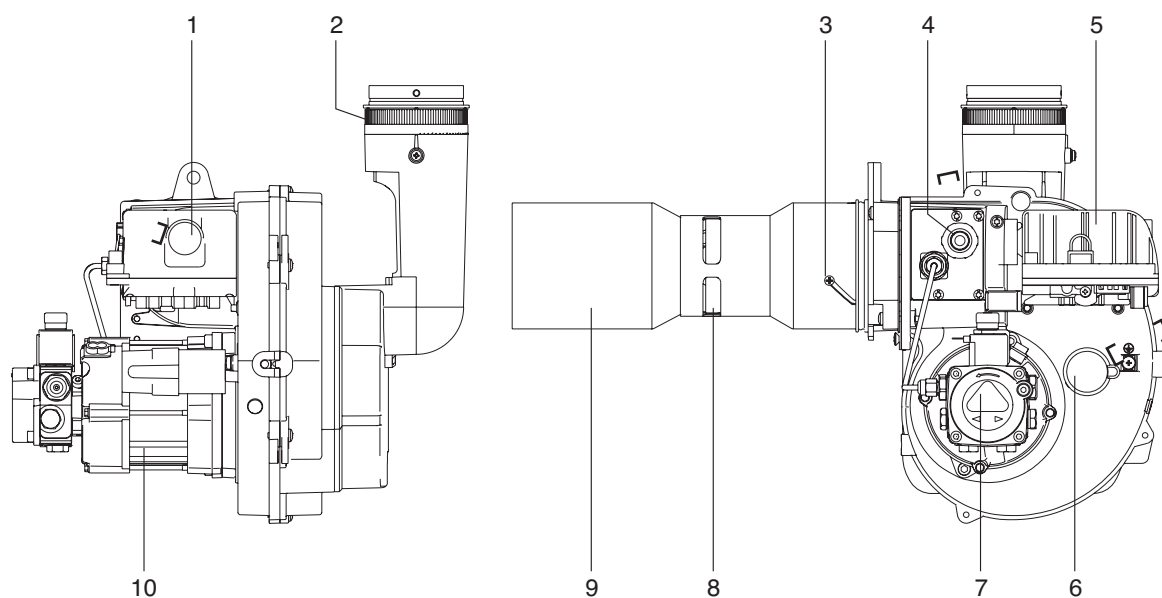
Descrizione	THC V 28 - 28 BE OIL BLU	
Position of regulator	2,00	line
Position of air adjuster	2	line
Slot aperture	8	mm
Post-ventilation	1	min.
Type	738T4	
Model	G30	
Nozzle	0,60	GPH
	80° A	⊥
	Delavan	mark
Pump pressure	12,5	bar
Fuel flow rate	2,3 (± 4%)	kg/h



Perform combustion analysis to verify the correct functioning the boiler.

THC V 28 E OIL BLU - 28 BE OIL BLU

DESIGN



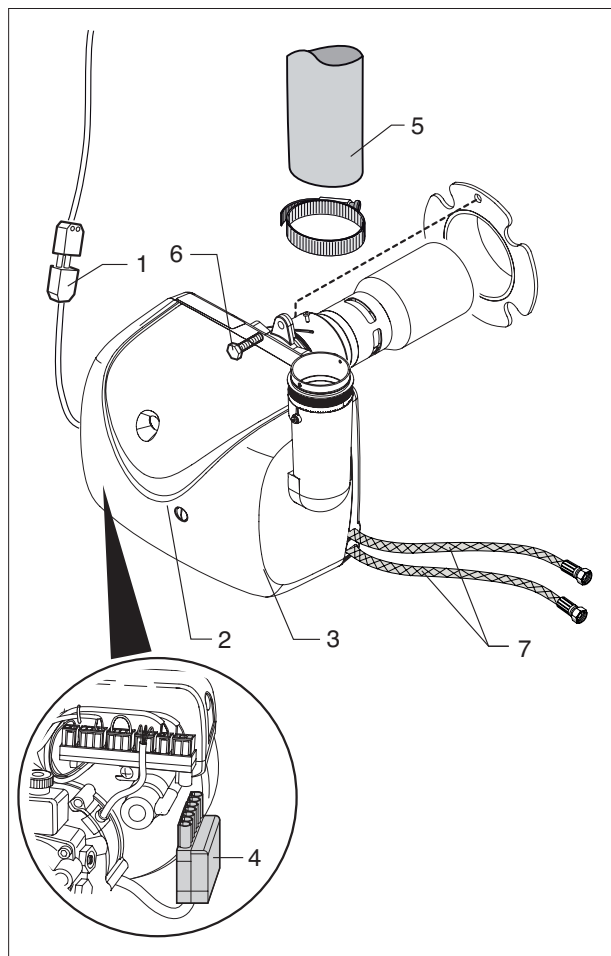
- 1 - Reset button with lockout indicator
- 2 - BF air adjustment group
- 3 - Slot adjustment screw
- 4 - Heater connection locking screw
- 5 - Burner control box

- 6 - Capacitor
- 7 - Oil pump
- 8 - Flue gas recirculation slots
- 9 - Blast tube
- 10 - Motor

REMOVING THE BURNER


Proceed as follows to remove the burner.

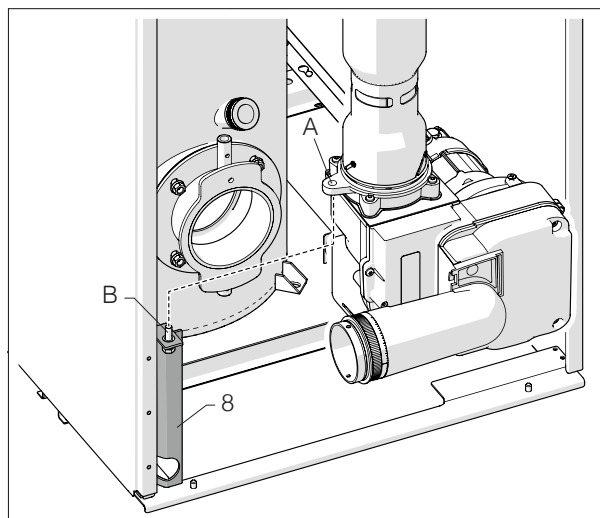
- Close the fuel shut-off cocks.
- Disconnect the connector (1).
- Unscrew the screw (2) and remove the casing (3). Disconnect connector (4) from the burner control box.
- Disconnect the air intake pipe (5).
- Unscrew the fixing nut (6) and remove the burner.



- Turn the burner upright.
- Fix the burner to the bracket (8) by engaging the pin (B) in the hole (A).

Reverse the above steps to reassemble.

 If the burner needs to be completely removed from the boiler, disconnect the hoses (7) first. Use a suitable rag to soak up the fuel that inevitably comes out.

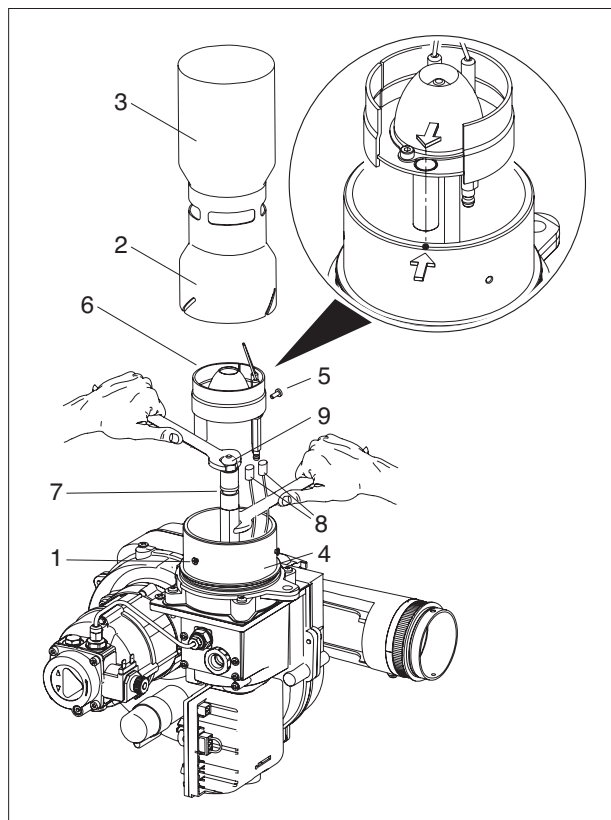


REPLACING THE NOZZLE

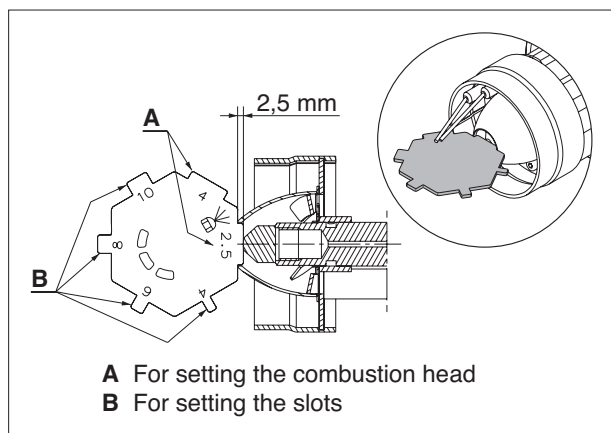
Proceed as follows to replace the nozzle.

- Unscrew the fixing nut from the flange and remove the burner.
- Loosen the screws (1).
- Remove the blast tube (2) and the flame tube (3) from the collar (4).
- Loosen the screw (5) and remove the combustion head (6) from the nozzle holder (7), carefully disconnecting the cables (8) from the electrodes.
- Replace the nozzle (9).
- **Align the glass on the combustion head with the reference mark on the collar, and fit the combustion head (6).** Fix the combustion head to the nozzle holder (7) with the screw (5).

It is strictly forbidden to use nozzles of different make, type and specifications to the original.



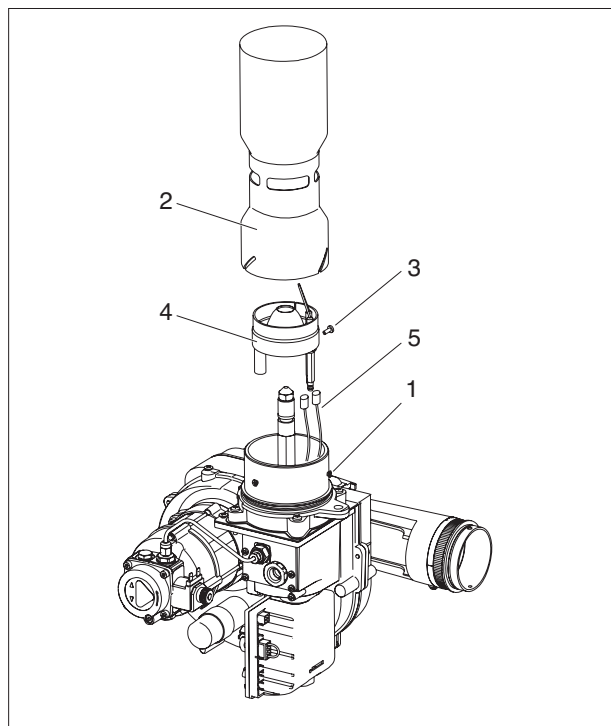
- Use the template provided to make sure that the combustion head is adjusted properly.



REPLACING THE COMBUSTION HEAD AND ELECTRODES

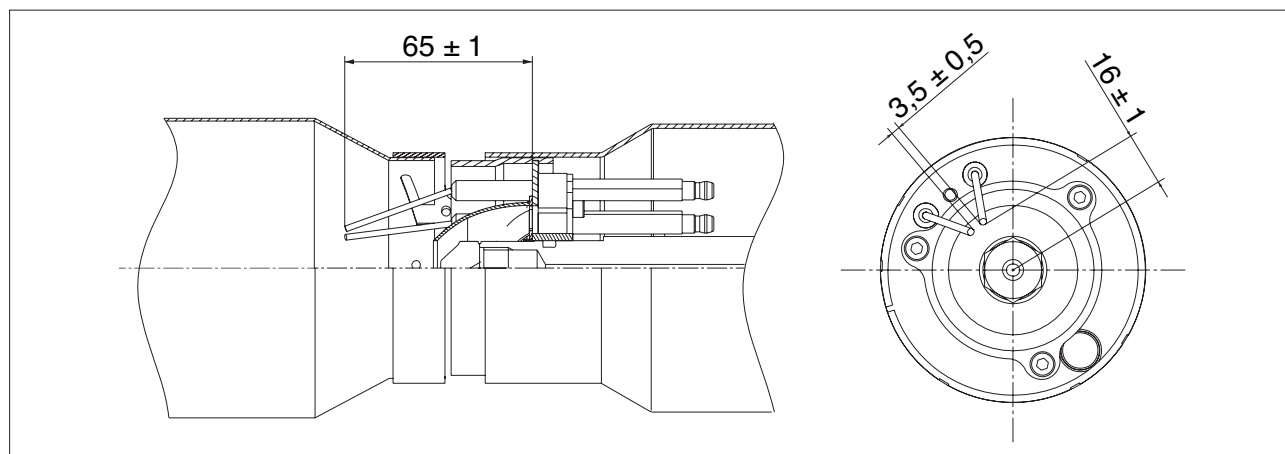
Proceed as follows to access the combustion head and electrodes.

- Unscrew the fixing nut from the flange and remove the burner.
- Unscrew the screws (1) and remove the blast tube (2).
- Unscrew the screw (3) and remove the combustion head (4) from the nozzle holder, carefully disconnecting the cables (5) from the electrodes.
- Replace the combustion head (4).
- Re-assemble in the reverse order, as instructed in the section "Replacing the nozzle".



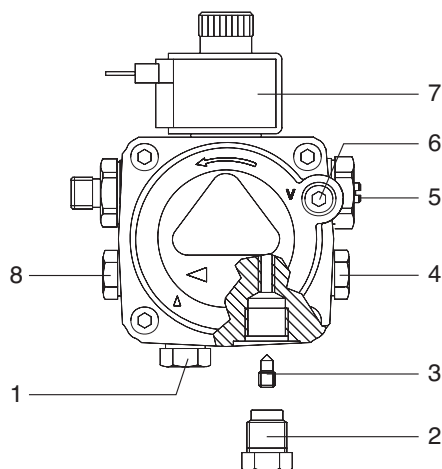
SETTING THE ELECTRODES

⚠ The position of the electrodes is not adjustable. If ignition problems are encountered, make sure that the dimensions shown in the figure are respected.



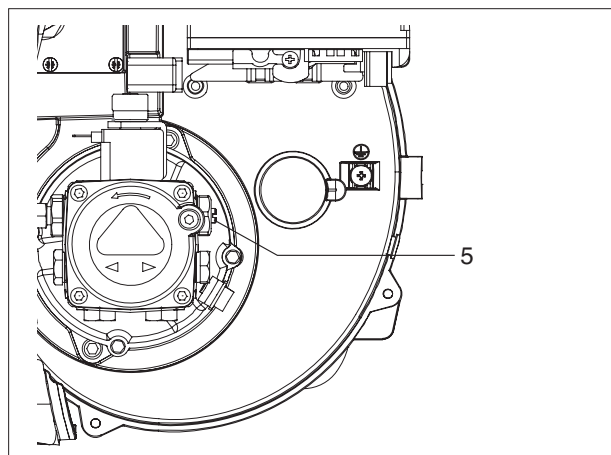
OIL PUMP

- 1 - Suction port
- 2 - Return port
- 3 - By-pass screw
- 4 - Pressure gauge fitting
- 5 - Pressure regulator
- 6 - Vacuum gauge fitting
- 7 - Valve
- 8 - Auxiliary pressure measurement fitting



ADJUSTING PUMP PRESSURE

Turn the adjuster screw (5) to achieve the pressure setting specified in the table on page 46.



ADJUSTING THE FLUE GAS RECIRCULATION SLOTS

Proceed as follows to adjust the flue gas recirculation slots (1):

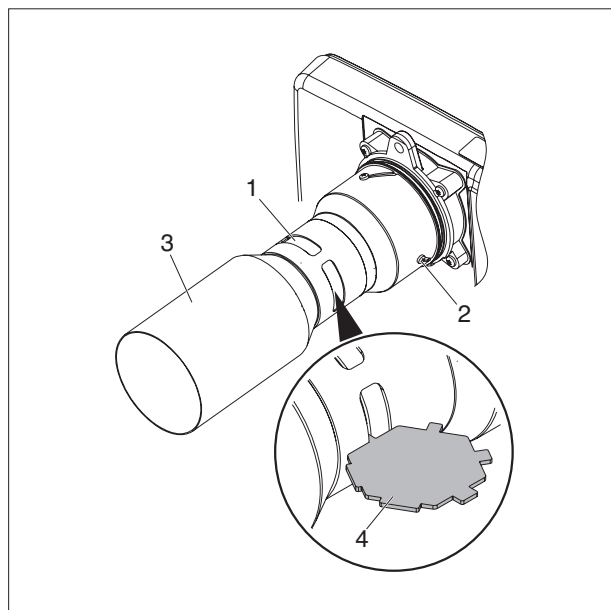
- Loosen the screws (2) and gently rotate the flame tube (3). Refer to the table on page 46 for the required slot aperture. The template (4) supplied with the boiler can also be used to make the adjustment, as shown in the figure.
- On completion of the adjustment, tighten the screws (2) to a torque no greater than 0.8 Nm.



The specified aperture of the slots (1) is purely indicative.

If the flame burns in a stable manner, open the slots (1) a bit more to reduce NO_x emissions.

If the flame burns unsteadily, close the slots a bit at a time.



ADJUSTING AIR FLOW

Air flow may have to be adjusted to suit the power of the burner. To do so, turn the air adjuster (1) and then the regulator (2).

SETTING THE AIR ADJUSTER

Proceed as follows to set the air adjuster.

- Remove the casing (3) from the burner. Loosen the four screws (4) and remove the cover assembly (5).
- Loosen the three screws (6) and turn the air adjuster (1) to the setting specified in the table on page 46.
- Tighten the three screws (6).

⚠ Make sure that the air adjuster is held securely by the screws (6) to prevent the burner from losing its setting during functioning. Also take care not to damage the seal of the cover (5).

SETTING THE REGULATOR

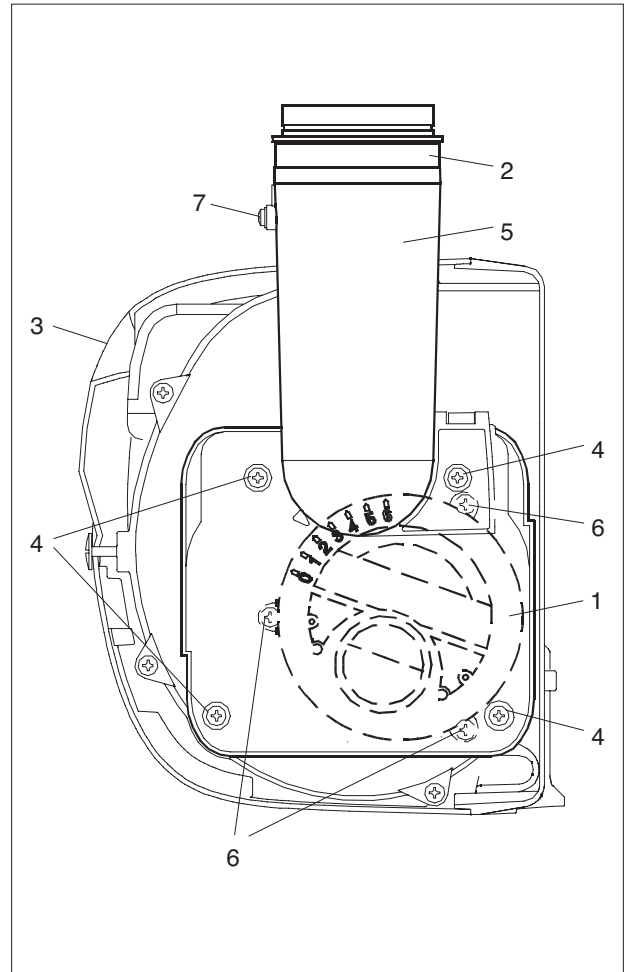
Proceed as follows to set the regulator.

- Loosen the screw (7) and turn the regulator (2) to the setting specified in the table on page 46.
Turn clockwise to increase air flow and reduce CO₂ emissions. Turn anti-clockwise to achieve the opposite effect.
- Tighten the screw (7) on completion of adjustment.

⚠ Make sure that the regulator is held securely to prevent the burner from losing its setting during functioning.

The air intake to the regulator must never be obstructed for any reason whatsoever and the intake pipe must not be fitted with any form of choke or restriction (valves, diaphragms, etc.).

On completion of adjustment, replace all removed components in the opposite order.



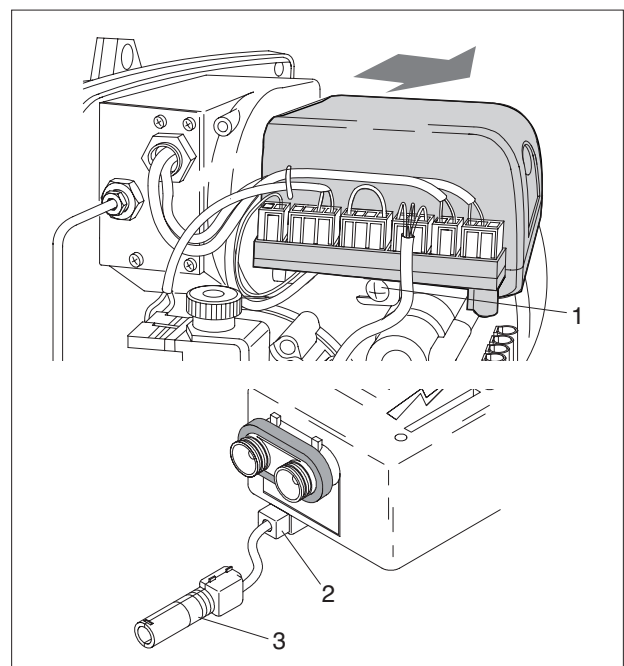
REMOVING THE BURNER CONTROL BOX

To remove the control box from the burner, disconnect all the cables, then loosen screw (1) and pull the control box off in the direction shown by the arrow.

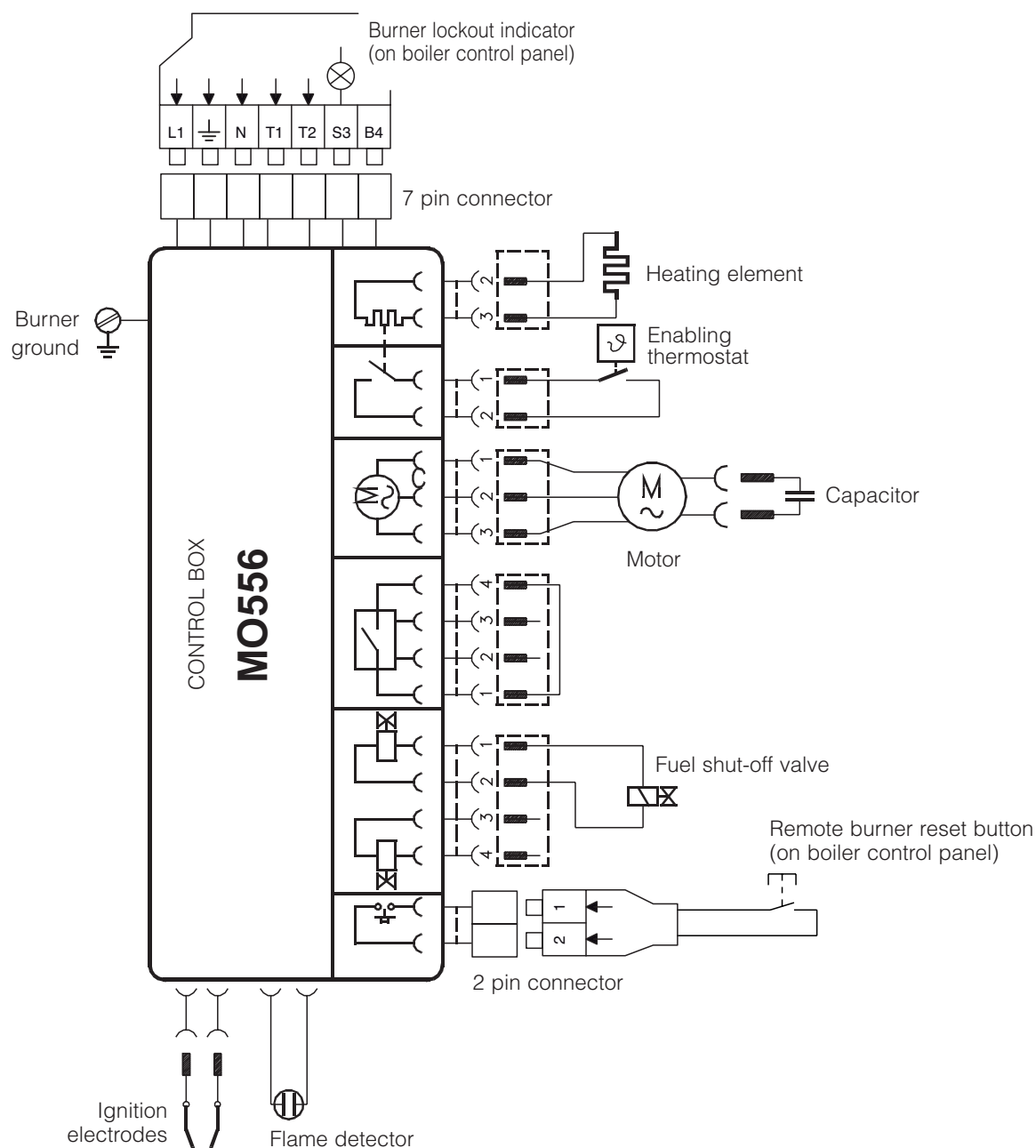
The burner must be shut down and power and fuel disconnected before the control box is removed.

ACCESSING THE FLAME DETECTOR

Remove the control box from the burner. Disconnect the connector (2) and pull the flame detector (3) out from its seat.

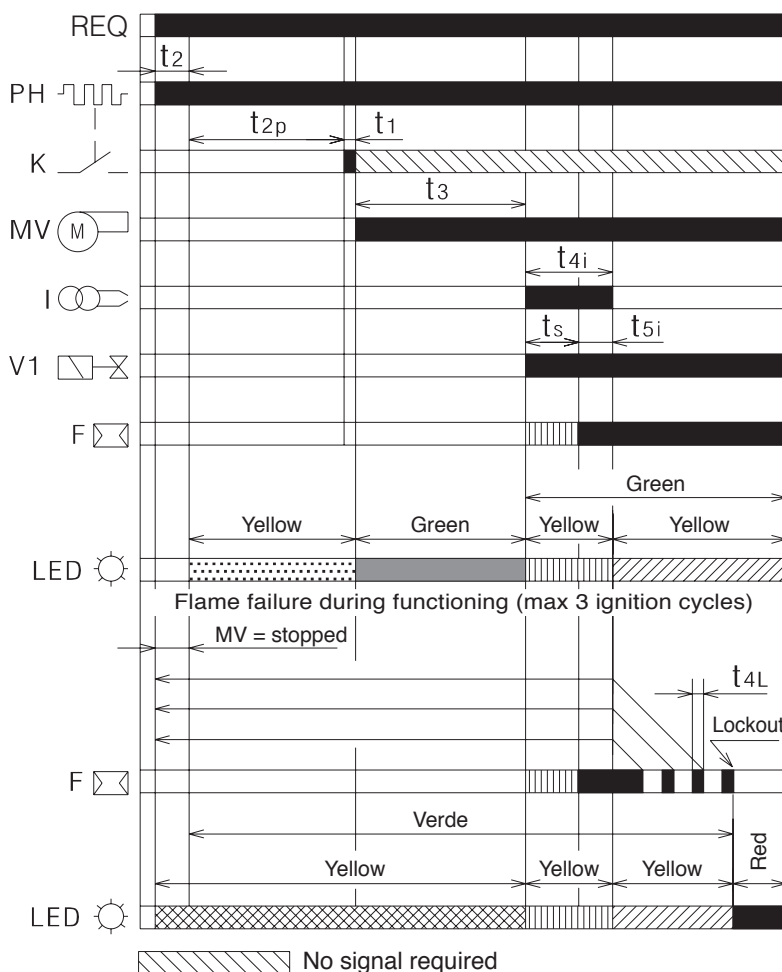


BURNER ELECTRICAL CONNECTIONS



FUNCTIONING PROGRAM

NORMAL FUNCTION WITH PRE-HEATING



F - Flame detector
I - Ignition transformer
K - Enabling thermostat for start-up after pre-heating
LED - Functioning status indication from reset button
MV - Fan motor
PH - Oil heater
REQ- Ignition request from boiler controller

V1 - Oil valve

	Red
	Green + Yellow slow flashing
	Green + Yellow fast flashing
	Yellow
	Green
	Green + Yellow medium flashing
	Red + Yellow fast flashing
	Yellow fast flashing

OPERATING TIMES

t1	max	1
t1l	max	30
t2	-	3
t2l	max	30
t2p	max	600
t3	-	15
t3l	max	1

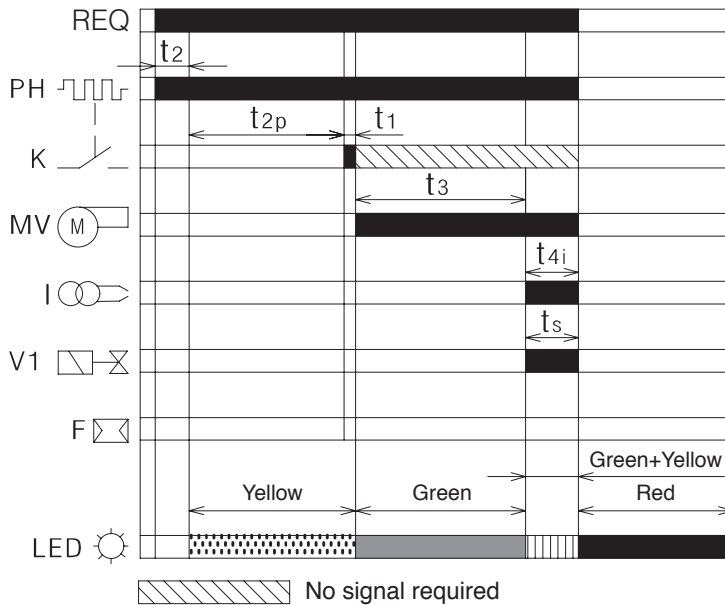
ts	-	5
t4i	-	8
t5i	-	3
t4l	max	1
t6	max	360
t6l	max	30
t7	-	120

Times are expressed in seconds.

t1	Wait time for incoming signal: reaction time, the burner remains off for the duration of time t1 .
t1l	Extraneous light before heat request: if this light lasts for time t1l , the burner enters lockout.
t2	Wait time after a heat request: the burner remains off for the duration of time t2 .
t2l	Presence of extraneous light during oil pre-heating: if this light lasts for time t2l , the burner enters lockout.
t2p	Maximum pre-heating time: if thermostat K does not trip within time t2p , the burner enters lockout; the burner remains off for the duration of time t2p .
t3	Pre-purge time: fan motor starts.
t3l	Presence of extraneous light during pre-purging: the burner enters lockout immediately.

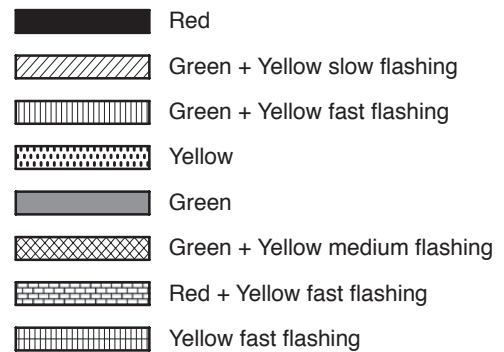
ts	Safety time: the burner enters lockout if no flame is detected by the end of time ts .
t4i	Transformer on time: total ignition time: ts + t5i .
t5i	Post-ignition transformer on time: supplementary ignition time after ts .
t4l	Flame failure during functioning: the maximum reaction time before the oil shut-off valve closes; the burner enters lockout after 3 ignition cycles.
t6	Post-purge time: supplementary purge time on opening of heat request limit thermostat contacts (TL).
t6l	Presence of extraneous light during post-purging: if this light lasts for time t6l , the burner enters lockout.
t7	Long pre-purge time: a pre-purge time longer than t3 .

LOCKOUT BECAUSE OF IGNITION FAILURE

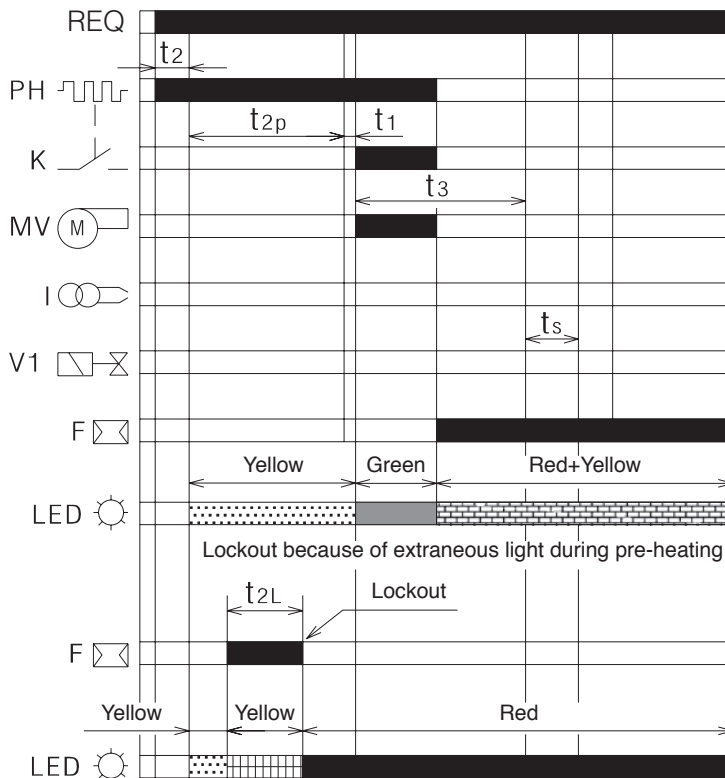


F - Flame detector
 I - Ignition transformer
 K - Enabling thermostat for start-up after pre-heating
 LED - Functioning status indication from reset button
 MV - Fan motor
 PH - Oil heater
 REQ - Ignition request from boiler controller

V1 - Oil valve



LOCKOUT BECAUSE OF EXTRANEIOUS LIGHT DURING PRE-PURGING



OPERATING TIMES

t1	max	1
t1l	max	30
t2	-	3
t2l	max	30
t2p	max	600
t3	-	15
t3l	max	1

ts	-	5
t4i	-	8
t5i	-	3
t4l	max	1
t6	max	360
t6l	max	30
t7	-	120

Times are expressed in seconds.

Colour codes for burner reset button LED

Functioning status	LED colour code	Speed of flashing	Seconds	
			ON	OFF
Waiting	○ Led off			
Pre-heating	○ Yellow			
Pre-purging	● Green			
Long pre-purging	● Green			
Transformer on	● ○ Green + Yellow flashing	Fast	0,3	0,3
Regular flame	● ○ Green + Yellow flashing	Slow	0,3	2
Post-purging	● ○ Green + Yellow			
Ignition recycling	● ○ Green + Yellow flashing	Medium	2	1
Continuous purging (*)	● Green			
Extraneous light during pre-heating or waiting	○ Yellow flashing	Fast	0,3	0,3
Extraneous light during post-purging or continuous purging (*)	● ○ Red + Yellow flashing	Fast	0,3	0,3
Extraneous light during lockout	● ○ Red + Yellow flashing	Fast	0,3	0,3
Lockout	● Red			
Lockout with continuous purging (*)	● ○ Red + Green			

(*) Only for specific applications.

BURNER FAULT LOCKOUT TYPES AND TIMES

Description of fault	Lockout
Oil heater fault: the startup thermostat (K) is not tripping.	After max 6 minutes
Presence of extraneous light on burner startup or shutdown.	After max 30 seconds
Presence of extraneous light during oil pre-heating.	After max 30 seconds
Presence of extraneous light during pre-purging.	Within 1 second
Presence of extraneous light during post-purging or continuous purging. (*)	After max 30 seconds
Flame failure during functioning.	After 3 ignition cycles
Flame not detected by end of safety time.	Immediate

(*) Only for specific applications.

RESETTING THE BURNER

Proceed as follows to reset the burner.

- Press and hold the reset button for between 1 and 2 seconds. If the burner does not restart, Check that the boiler controller is actually requesting ignition.
- **If the burner reset button continues to flash to indicate a fault (red LED), press and hold the reset button again for no longer than 2 seconds.**

THE IGNITION RECYCLING FUNCTION

The burner is able to recycle, i.e. repeat the entire startup program, for a maximum of 3 attempts if the flame fails during normal functioning.

If the flame fails again, the burner enters lockout.

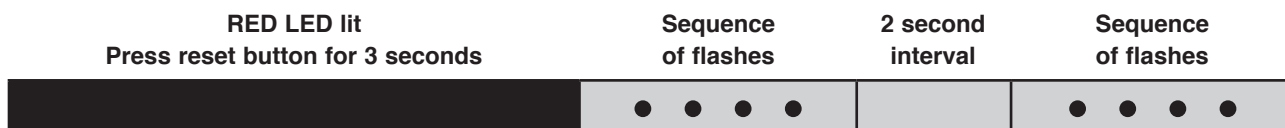
If the boiler controller sends a new heat request and burner ignition signal during the course of ignition recycling, the total of 3 attempts is restored.

VISUAL DIAGNOSTICS

The burner control box has a diagnostic function that can be used to identify the causes of faults (flagged by the **RED LED**).

To use the diagnostic function, press and hold the reset button for at least 3 seconds as soon as the burner performs a safety shutdown (**lockout**).

The control box generates a sequence of flashes and repeats them at a constant interval of 2 seconds.



The sequence of flashes generated by the control box identifies the possible cause of the fault. Refer to the table below.

Signal	Probable cause
2 flashes ● ●	Stable flame signal not detected at end of safety time: <ul style="list-style-type: none"> - Flame detector faulty or dirty. - Oil valve faulty or dirty. - Ignition transformer faulty. - Burner badly adjusted.
4 flashes ● ● ● ●	Light in the combustion chamber before ignition or after shutdown: <ul style="list-style-type: none"> - Presence of extraneous light before or after limit thermostat trips. - Presence of extraneous light during pre-purging. - Presence of extraneous light during post-purging.
7 flashes ● ● ● ● ● ● ●	Flame failure during functioning: <ul style="list-style-type: none"> - Burner badly adjusted. - Oil valve faulty or dirty. - Flame detector faulty or dirty.
8 flashes ● ● ● ● ● ● ● ●	Check oil heater (if fitted): <ul style="list-style-type: none"> - Heater or control thermostat faulty.



To reset the burner control box after displaying diagnostic signals, simply press the reset button.

IGNITION FAULTS

Fault	Possible cause	Possible solution
The burner does not start when enabled by boiler controller.	No electrical power.	Check presence of voltage at terminals L1 – N of the 7 pin connector.
		Check the condition of the fuses.
		Check that the safety thermostat has not tripped.
	Heating element or enabling thermostat faulty.	Change as necessary.
	The control box connectors are not correctly inserted.	Check and push home all the connectors.

Fault	Possible cause	Possible solution
The burner goes into lockout before or during pre-purging.	The flame detector is reading extraneous light.	Eliminate the light source.
The burner performs pre-purging and ignition correctly but shuts down about 5 seconds later.	The flame detector is dirty.	Clean the flame detector.
	The flame detector is faulty.	Change as necessary.
	The flame detaches or fails.	<ul style="list-style-type: none"> - Check fuel oil pressure and flow rate. - Check the air flow. - Change the nozzle. - Check the solenoid valve coil.
The burner starts only after late ignition.	The ignition electrodes are incorrectly positioned.	Adjust the electrodes properly.
	The air flow is too high.	Adjust the air flow.
	The nozzle is dirty or worn.	Change as necessary.

FUNCTIONING FAULTS

Fault	Possible cause	Possible solution
The burner enters lockout during functioning.	No flame has been detected for 4 times.	Clean or replace the flame detector.
		Clean or replace the nozzle.
	Shutdown failure.	Check the efficiency of the flame detector.
		Check the efficiency of the pressure regulator piston.
		Check the efficiency of the pump shut-off valve.

DISASSEMBLING AND CLEANING THE BOILER

Perform the following operations before beginning any maintenance or cleaning.

- Switch the electricity supply OFF at the system's main switch and at the control panel.

EXTERNAL CLEANING

Clean the boiler's casing panels and control panel with a soft cloth damped in soapy water.

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

Wipe the boiler dry after cleaning it.



Do not use abrasive products, petrol or triethylene.

INTERNAL CLEANING

Close the fuel shut-off cocks before removing any part of the boiler.

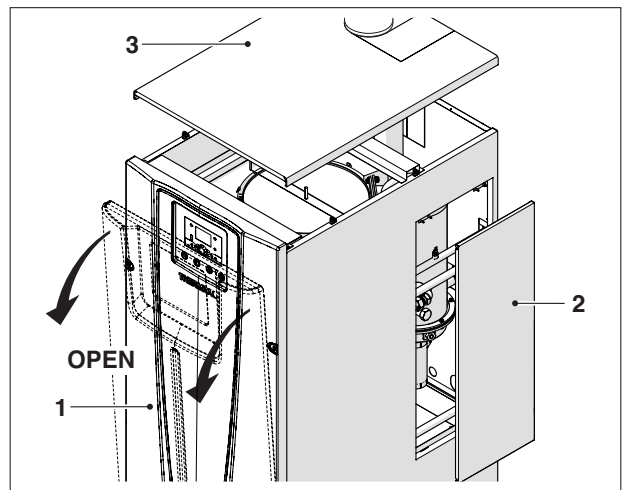
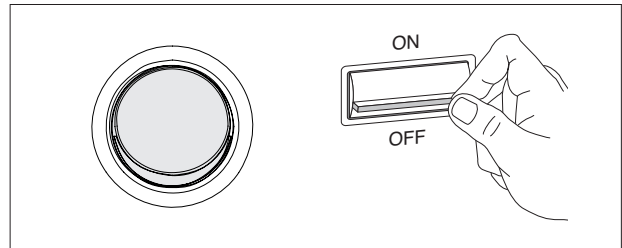


To ensure that the boiler remains efficient, change the burner nozzle and check the smoke scale reading at every annual maintenance.

Also check combustion conditions at regular intervals during normal functioning.

Removing the casing panels

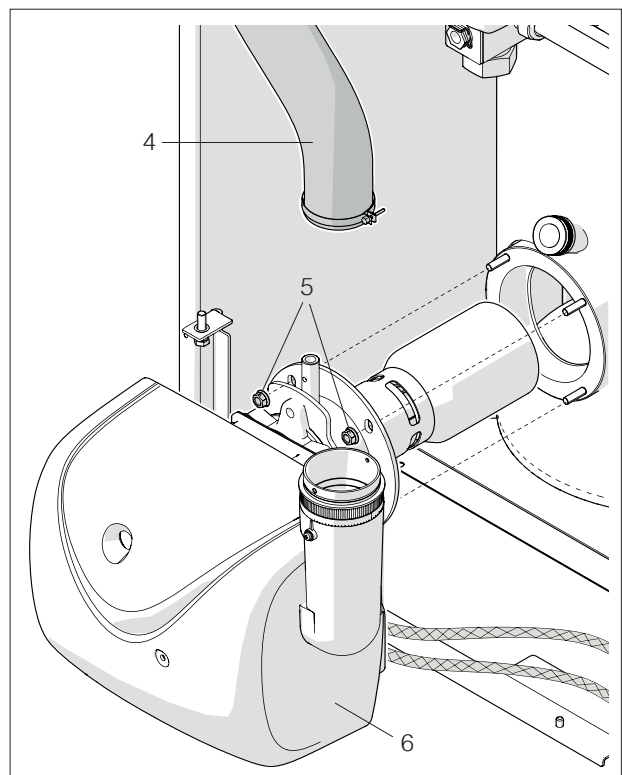
- Remove the front panel (1) and side panel (2).
- Remove the top panel (3).



Removing the burner

To remove the burner completely from the boiler, see the relevant sections on page 48.

- Disconnect the air inlet pipe (4).
- Unscrew and remove the four nuts (5).
- Pull the burner (6) out, taking care not to damage it.

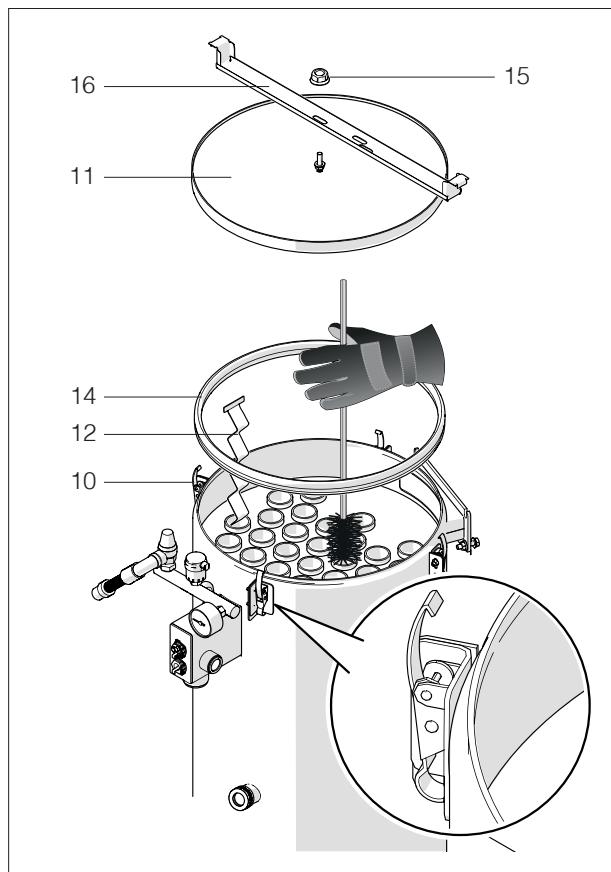


Cleaning the boiler body

- Release the clips (10) and remove the cover (11) from the flue gas box.
- Remove the turbulators (12) and check them for wear. Replace as necessary.
- Use a flue brush or other suitable tool to clean inside the flue gas pipes.
- Remove any displaced soot through the combustion chamber hole.

Clean the flue gas path with a flue brush or other suitable tool and remove any soot through the hole in the combustion chamber. Take care not to damage the flame guard (13).

⚠ Do not use chemical solvents or detergents to clean the heat exchanger.

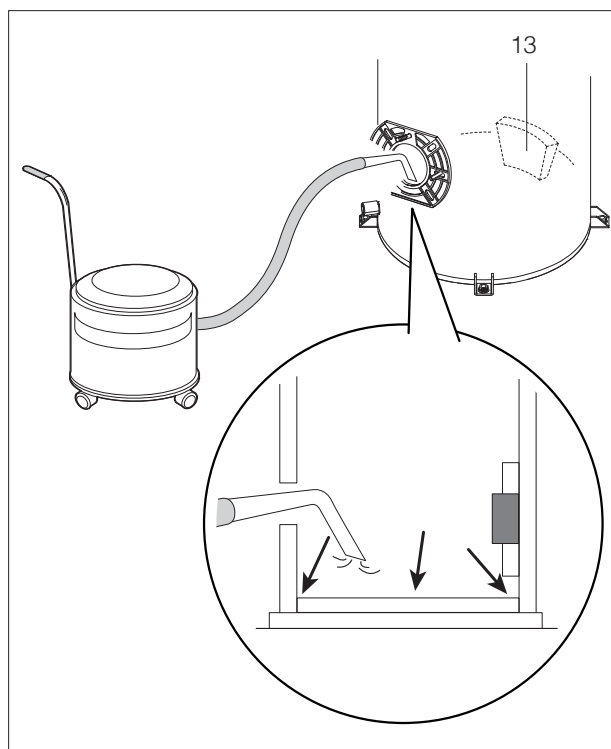


Proceed as follows on completion of cleaning.

- Refit the turbulators (12) in the flue gas pipes, making sure that they are correctly seated.
- Check the condition of the flame guard (13) and seal (14). Replace as necessary.

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

If necessary, adjust the closure of the flue gas box by loosening the nut (15) that holds the alignment bracket (16). Make sure that the cover sits firmly on the body, then tighten the nut (15).



Cleaning the secondary heat exchanger

Remove the flue then proceed as follows.

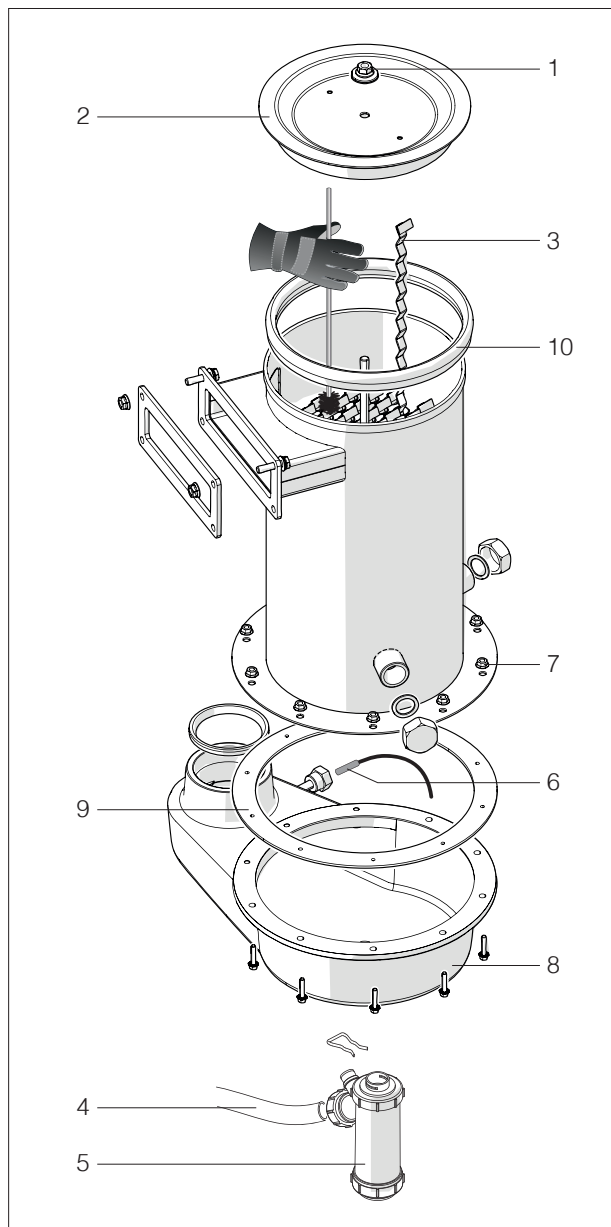
- Unscrew the screws (1) and remove the top cover (2).
- Remove the turbulators (3) and check them for wear. Replace as necessary.
- Use a flue brush or other suitable tool to clean inside the flue gas pipes.
- Remove the condensate drain hose (4) and the siphon (5).
- Remove the flue gas temperature sensor (6).
- Unscrew the nuts (7) and remove the bottom cover (8).
- Clean out any soot.

Proceed as follows on completion of cleaning.

- Refit the turbulators (3) in the flue gas pipes, making sure that they are correctly seated.
- Check the condition of the seals (9) and (10). Replace as necessary.

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

⚠ Chemical solvents or detergents may be used to clean the after-exchanger provided they are suitable for use with stainless steel.

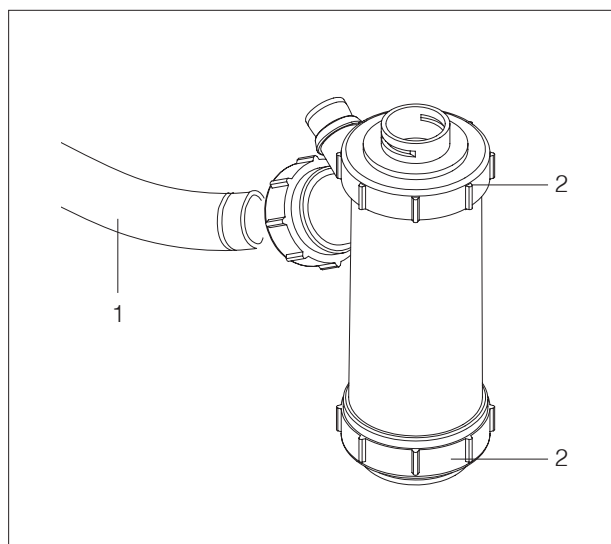


Cleaning the condensate drain siphon

- Detach the corrugated condensate drain hose (1), and remove the siphon. Unscrew the two caps (2) to disassemble the siphon.

⚠ IT IS MANDATORY TO CHECK AND CLEAN THE CONDENSATE DRAIN SIPHON AND PIPES AS FAR AS THE COLLECTOR/DRAIN POINT AT LEAST ONCE A YEAR.

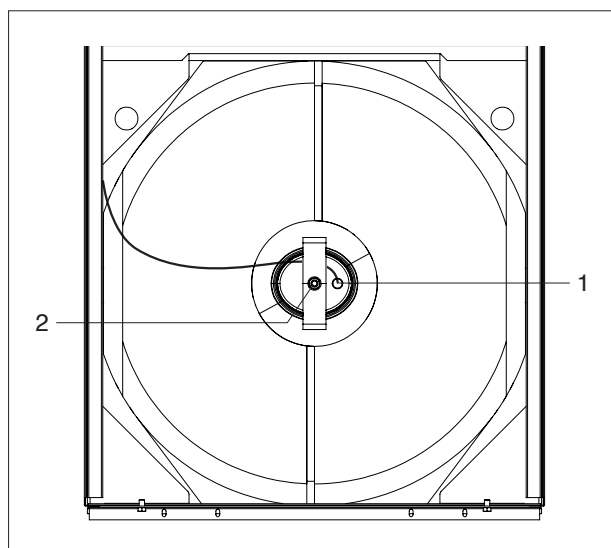
On completion of cleaning, follow the above steps in the reverse order to refit all removed parts.



Cleaning the storage cylinder **(THC V 28 BE OIL BLU)**

The storage cylinder should be serviced once a year to check the condition of the internal parts and the magnesium anode.

- Close the DHW circuit shut-off cock.
- Remove the front panel from the boiler.
- Empty the storage cylinder as instructed on page 40.
- Remove the storage cylinder's temperature sensor from its sheath (1) in the flange.
- Remove the nut (2) securing the inspection flange to the storage cylinder.
- Clean the inside surfaces and remove any residues through the access hole.
- Check the magnesium anode for wear. Replace as necessary.
- Check the condition of the seal.



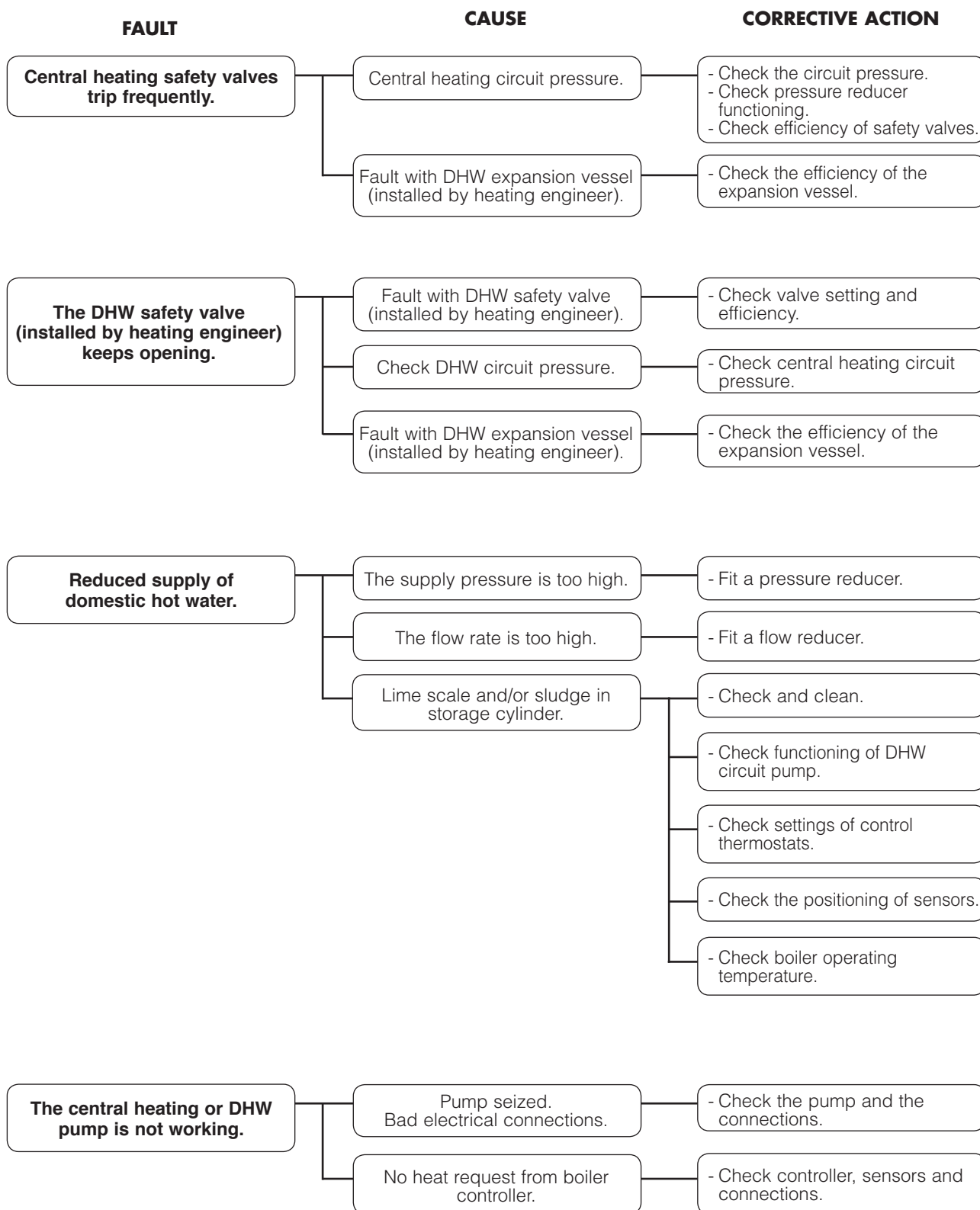
On completion of cleaning, refit all removed parts in the reverse order, taking care to ensure the efficiency of the seals.

TROUBLESHOOTING

⚠ The first time the boiler is started up and the first time it restarts after a burner lockout or temperature lockout, the burner performs fuel preheating for about 2 and a half minutes. On subsequent startups the motor starts as soon as the boiler controller requests heat.

⚠ For information on burner troubleshooting refer to the section of this manual dedicated to the burner.

FAULT	CAUSE	CORRECTIVE ACTION
There is a smell of fumes.	Fumes escaping into the air.	<ul style="list-style-type: none"> - Check that the boiler body is clean. - Check that the flue pipes are clean. - Check the condition of the boiler seals. - Check the quality of combustion.
The boiler gets dirty very quickly.	Burner badly adjusted.	- Check the adjustment of the burner (perform flue gas analysis).
	Blockage in flue.	- Clean the flue pipes.
	Burner air intake dirty.	- Clean the burner air intake.
The boiler reaches the set temperature but the radiators are still cold.	Air in the circuit.	- Bleed the circuit.
	Pump malfunctioning.	<ul style="list-style-type: none"> - Check/unseize the pump. - Change the pump.
The boiler does not reach its temperature setpoint.	Heat exchanger dirty.	- Clean the combustion chamber.
	Insufficient air/fuel flow to burner.	- Check and adjust the burner.
	Boiler control setpoint incorrect.	- Check the correct setting.
The boiler enters temperature safety lockout.	Boiler control setpoint incorrect.	<ul style="list-style-type: none"> - Check the temperature setting. - Check the electrical wiring. - Check the positioning of sensors.
	No water supply.	<ul style="list-style-type: none"> - Check the vent valve. - Check the circuit pressure.



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