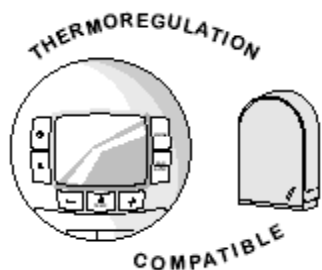


## TRAINING MODULE



**Product group** : Wallhung boiler  
**Group** : instantaneous  
**Project Name** : MX2 COMFORT  
**Sales designation** : MIRA COMFORT  
**Production unit** : ST BRIEUC (France)

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Version 1.0, Jan 2006



## Update

Version 1.0 eng.






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## 1. DESCRIPTION

Combination boiler with:

-  AEMF type gas regulating valve
-  Electronic board with microprocessor
-  Variable speed extractor fan (model FF)
-  24-plate insulated heat exchanger
-  Programmable plate exchanger preheating

Terminology:

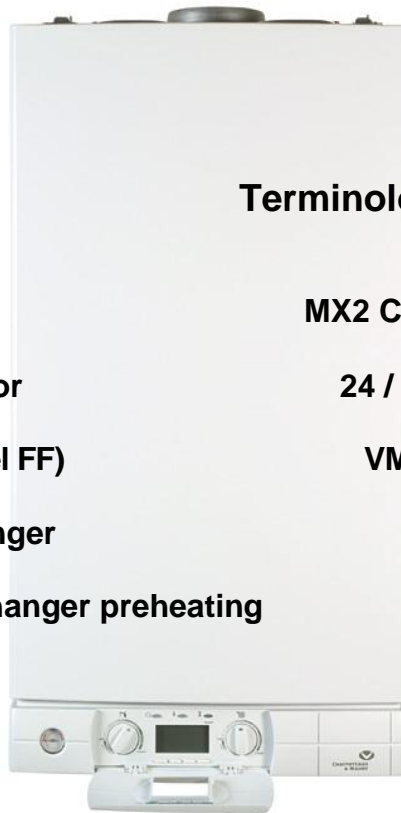
**MX2 COMFORT:** Project name

**24 / 30 :** Power output in Kilowatts

**VMC :** VMC = Mechanically Controlled Ventilation

**CF :** Flue duct

**FF :** Forced Flow



### 1.1 RANGE

Type	C F	F F		VMC
Gas	24 kW	24 kW	30 kW	24 kW
Nat				
LPG				

## 1.2 BENEFITS

### → INSTALLERS:

- Compact size: 720 x 390 x 296
- Easy to transport
- Weight: 29 Kg for the CF and VMC versions  
32 and 33 Kg for the 24 kW and 30 kW FF version
- Can be used to replace all models due to its reduced size
- All possible types of water drainage, C12, C32, C42, C52
- Temperature control
- Automatic by-pass
- Frost protection

### → REPAIRER:

- ¼ turn tap on the pre-fabricated panel
- 1 front panel that can be removed by releasing the lever clips
- LED for fault self-diagnosis (21 or 25 faults)  
depending on version CF or FF)
- Domestic hot water filter
- Motorised three-way valve on the backflow
- Variable speed extractor fan
- Automatic by-pass
- All components can be accessed via the front
- Temperature control
- Flow rate control on the primary circuit by  $\Delta T$
- Degumming the pump and 3-way valve
- Frost protection
- Cleaning function for combustion control

### → USER:

- Diagnostic help
- Compact size boiler
- Settings button incorporating the ON/OFF function
- Programmable plate exchanger temperature holding function
- Mode selection – heating only / heating + Domestic hot water (DHW) / Domestic hot water only / standby / OFF
- Frost protection
- Easy-to-use control panel. LCD Display

### 1.3 TECHNICAL DATA

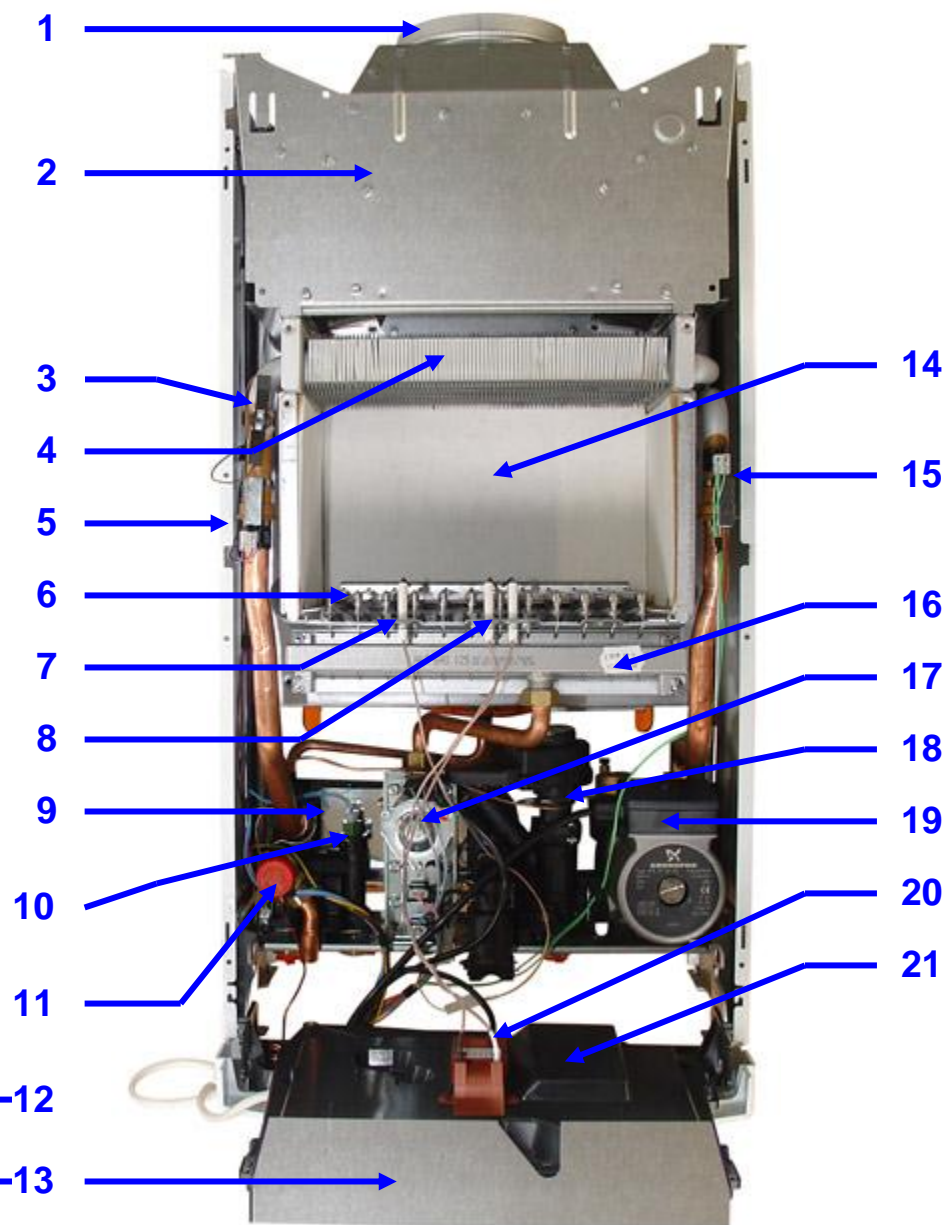
General Specifications	24 CF / 24 VMC	24 FF	30 FF
RT2000 classification	Low temperature		
Weight	29 kg	32.5 kg	33 kg
Dimensions H x w x D (mm)	720 x 390 x 296		
Gas			
Gas category FR / BE	II <sub>2E+3+</sub> (FR), I <sub>2E+</sub> (BE) or I <sub>3+</sub> (BE)		
Gas category ES – IT – GB – IE – PT / LU	II <sub>2H3+</sub> (ES,IT,GB,IE,PT)/ I <sub>2E</sub> (LU)		
Minimum useful output	7.75 kW	10 kW	12 kW
Heating power rating	7.75 - 24 kw	10 - 24 kw	12 - 28 kw
Domestic hot water power rating	24 kW	24 kW	30 kW
Gas flow rate in G20 at 20 mb (min – max)	0.95 to 2.75 m³/h	1.27 to 2.75 m³/h	1.50 to 3.44 m³/h
Gas flow rate in G20 at 25 mb (min – max)	1.47 to 3.21 m³/h	1.47 to 3.21 m³/h	1.74 to 3.99 m³/h
Gas flow rate in G30 at 29 mb (min – max)	0.71 to 2.05 kg/h	0.95 to 2.05 kg/h	1.12 to 2.56 kg/h
Gas flow rate in G31 at 37 mb (min – max)	0.70 to 2.02 kg/h	0.93 to 2.02 kg/h	1.10 to 2.52 kg/h
NAT / LPG injector diameter	1.25 mm	1.35 mm	1.30 mm
Diameter of LPG injector	0.77 mm	0.80 mm	0.80 mm
NAT / LPG diaphragm	8 mm / none	6.7 mm / none	9 mm / none
Number of injectors	12	11	14

Electrical	24 CF / 24 VMC	24 FF	28 FF
Power supply	230 V 50 HZ	230 V 50 HZ	
Power consumption	90 W	150 W	
Protection	IP X4D	IP X4D	
Heating			
Maximum water temperature	85 °C	85 °C	
Heating outlet temperature	35 to 85 °C	35°C to 85°C	
Minimum heating flow rate	300 l/h	300 l/h	
Heating circuit maximum pressure	3 bar	3 bar	
Expansion vessel capacity	7 l	7 l	
Expansion vessel pressure	0.7 bar	0.7 bar	
Domestic hot water			
DHW temperature	40 to 60 °C	40 to 60 °C	
Activation flow rate	2 litres /min	2 litres / min	
Specific water flow at ΔT 30°C	12 litres / min	11.4 litres / min	14.3 litres / min
Domestic hot water minimum operating temperature	0.1 b	0.1 b	
Domestic hot water system maximum pressure	7 bar	7 bar	
Flue gases			
Fresh air flow rate required for combustion	48 m³/h	43 m³/h	54 m³/h
Flow mass of combustion products	20 g/s		
Average temperature for combustion products	120 °C		

## 1.4 LAYOUT

### CF Version

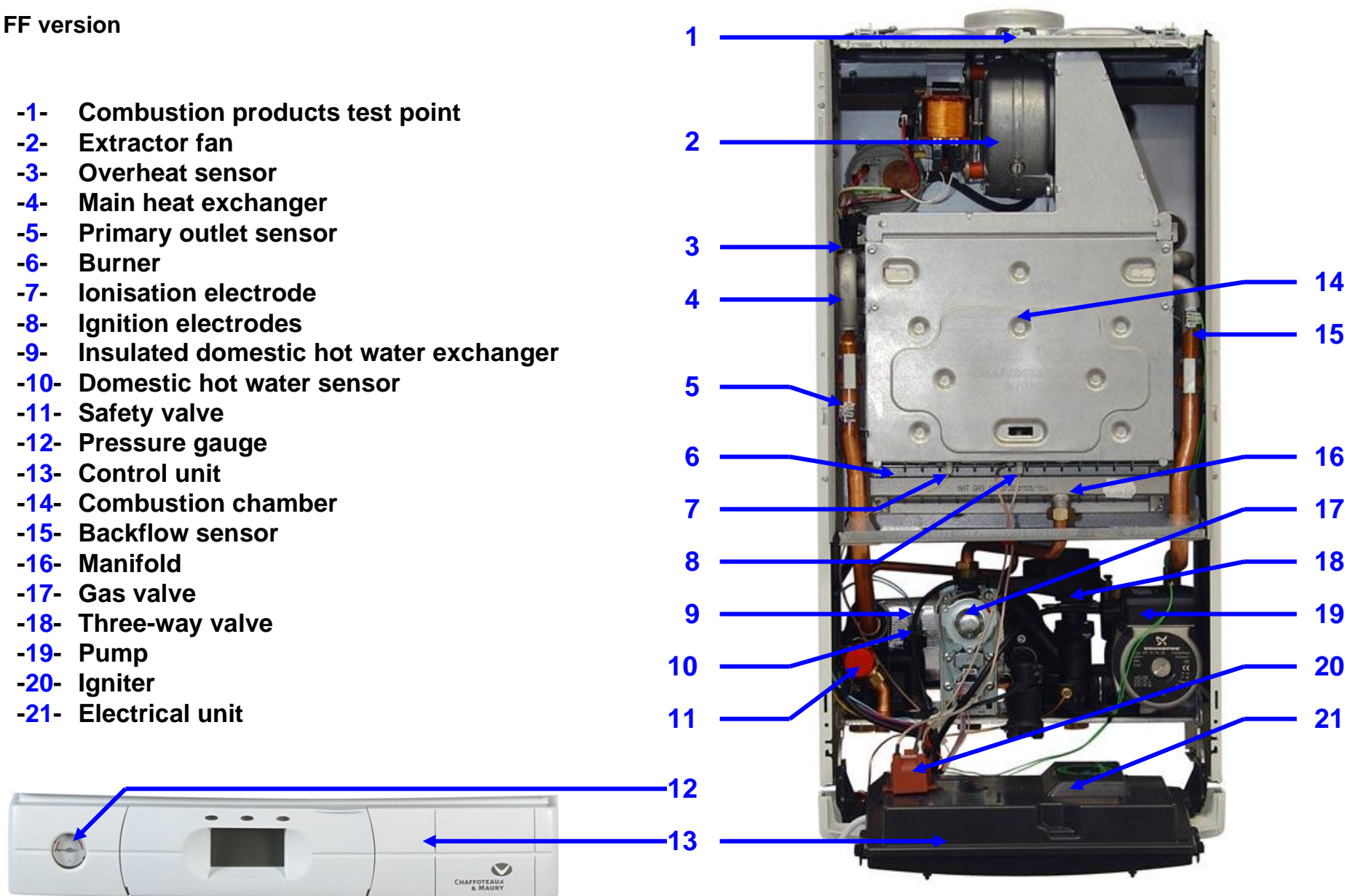
- 1- Flue gas outlet
- 2- Draught diverter
- 3- Overheat sensor
- 4- Main heat exchanger
- 5- Primary outlet sensor
- 6- Burner
- 7- Ionisation electrode
- 8- Ignition electrodes
- 9- Insulated domestic hot water exchanger
- 10- Domestic hot water sensor
- 11- Safety valve
- 12- Pressure gauge
- 13- Control unit
- 14- Combustion chamber
- 15- Primary backflow sensor
- 16- Manifold
- 17- Gas valve
- 18- Three-way valve
- 19- Pump
- 20- Igniter
- 21- Electrical unit





**FF version**

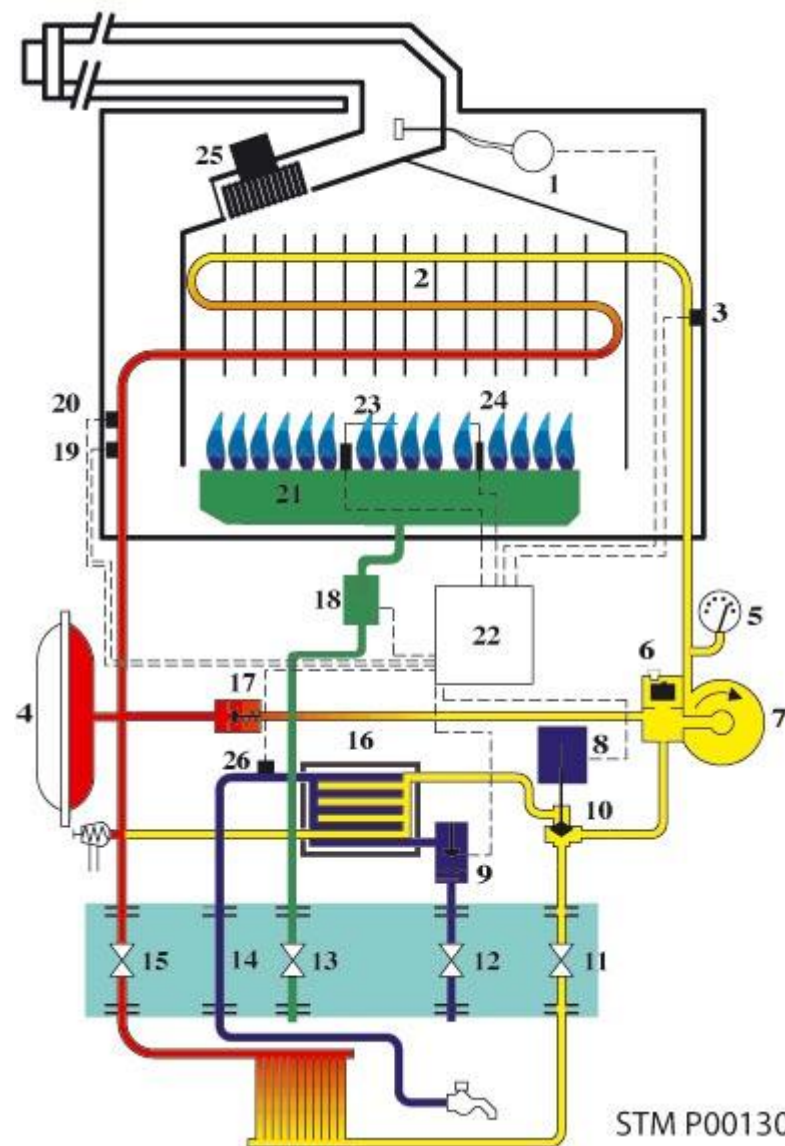
- 1- Combustion products test point
- 2- Extractor fan
- 3- Overheat sensor
- 4- Main heat exchanger
- 5- Primary outlet sensor
- 6- Burner
- 7- Ionisation electrode
- 8- Ignition electrodes
- 9- Insulated domestic hot water exchanger
- 10- Domestic hot water sensor
- 11- Safety valve
- 12- Pressure gauge
- 13- Control unit
- 14- Combustion chamber
- 15- Backflow sensor
- 16- Manifold
- 17- Gas valve
- 18- Three-way valve
- 19- Pump
- 20- Igniter
- 21- Electrical unit



## 1.5 PRINCIPLE DIAGRAM

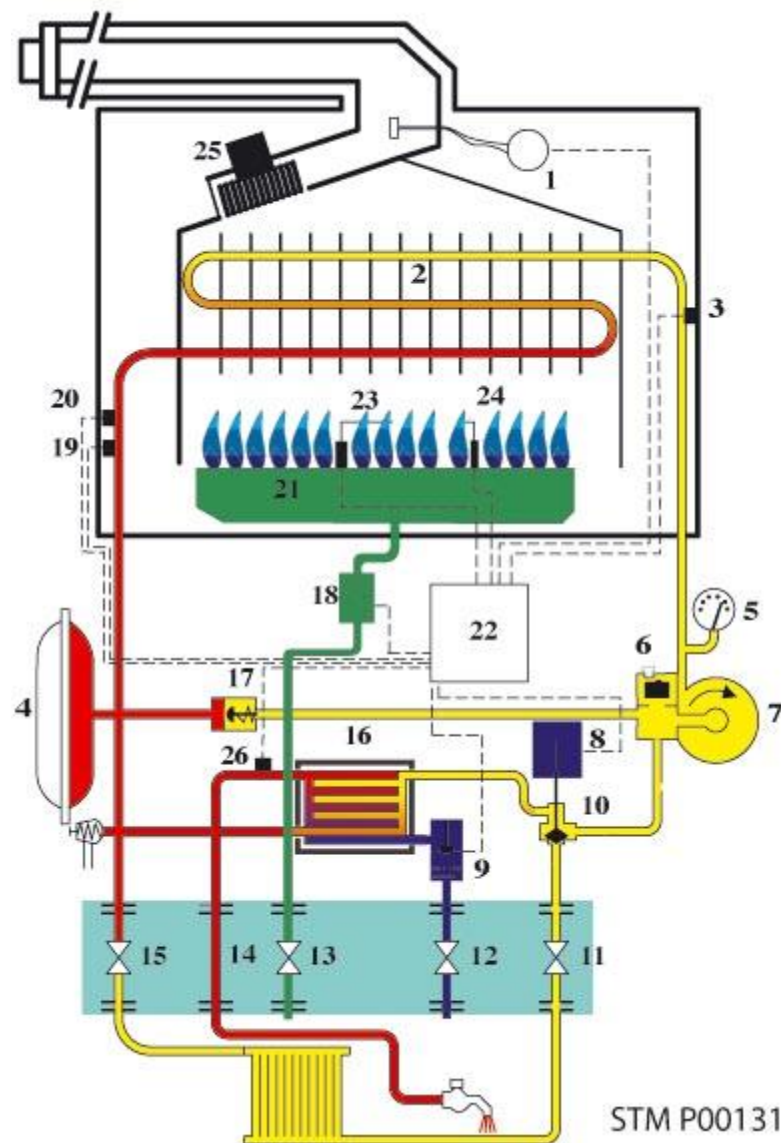
### IN HEATING MODE

- 1 - Pressure switch
- 2 - Primary heat exchanger
- 3 - Backflow sensor
- 4 - Expansion vessel
- 5 - Pressure gauge
- 6 - Automatic deaerator
- 7 - Pump
- 8 - Three way valve motor
- 9 - Flow rate controller
- 10 - Three-way valve
- 11 - Heating backflow
- 12 - Cold water inlet
- 13 - Gas supply
- 14 - Domestic hot water (DHW) outlet
- 15 - Heating outlet
- 16 - Secondary plate heat exchanger
- 17 - By-pass
- 18 - Gas valve
- 19 - Overheat safety sensor
- 20 - Outlet sensor
- 21 - Burner
- 22 - Electrical unit
- 23 - Ionisation electrode
- 24 - Ignition electrode
- 25 - Flue gas outlet with extractor
- 26 - Domestic hot water sensor



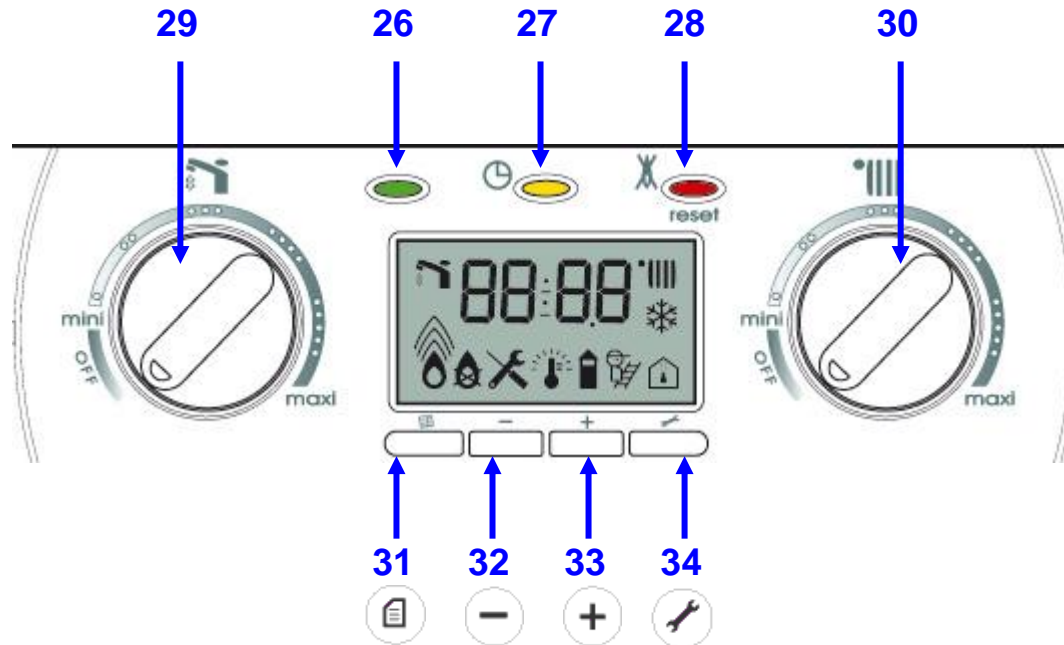
## IN HOT WATER MODE

- 1 - Pressure switch
- 2 - Primary heat exchanger
- 3 - Backflow sensor
- 4 - Expansion vessel
- 5 - Pressure gauge
- 6 - Automatic deaerator
- 7 - Pump
- 8 - Three way valve motor
- 9 - Flow rate controller
- 10 - Three-way valve
- 11 - Heating backflow
- 12 - Cold water inlet
- 13 - Gas supply
- 14 - Domestic hot water (DHW) outlet
- 15 - Heating outlet
- 16 - Secondary plate heat exchanger
- 17 - By-pass
- 18 - Gas valve
- 19 - Overheat safety sensor
- 20 - Outlet sensor
- 21 - Burner
- 22 - Electrical unit
- 23 - Ionisation electrode
- 24 - Ignition electrode
- 25 - Flue gas outlet with extractor
- 26 - Domestic hot water sensor



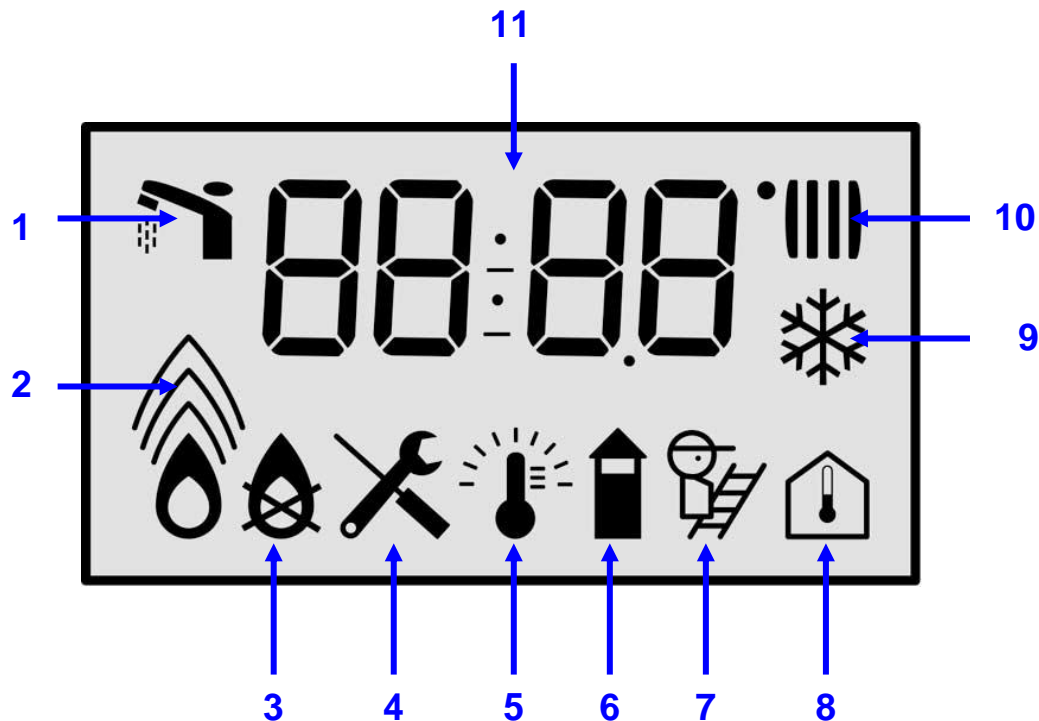
## 1.6 CONTROL PANEL

- 12- Pressure gauge
- 25- LCD Display
- 26- ON/OFF button with indicator light
- 27- Plate exchanger temperature holding programming button
- 28- Reset button and locked boiler red diode
- 29- Domestic hot water settings button + OFF position. 40°C - 60°C
- 30- Heating settings button + OFF position. 25°C - 85°C or 25°C - 50°C
- 31- Button for selecting the 6 menus
- 32- - Button
- 33- + Button
- 34- Settings button



## 1.7 LCD DISPLAY DESCRIPTION


- 1- Domestic hot water request active
- 2- Burner flame and power indicator
- 3- Ionisation safety function
- 4- In "settings" mode menus No.3 or No.4
- 5- Overheat safety lockout
- 6- Inactive
- 7- In "settings" mode menu No.5
- 8- Room thermostat request present
- 9- Frost protection operation
- 10- Heating request active
- 11- Display











## 1.8 USING THE LCD DISPLAY

### Setting the time and programming the domestic hot water temperature holding function

Pressing the **settings**  key for more than 5 seconds causes the time to flash on the display.

This can then be adjusted by pressing key  or .



Pressing the **settings**  key confirms the time value and causes the minutes to flash on the display.

The minutes can then be adjusted by pressing key  or  then press the **settings** key  to confirm.




The time is now set and flashes at the start of the programming time to programme the held temperature of the domestic hot water heat exchanger.

there are 2 possibilities:

#### **- retain the factory setting: 6.00 – 23.00**


Press the key twice  to accept the time then the minutes for domestic hot water held temperature start time and press the key twice again  to confirm the time then the minutes for the end of programming


#### **- changing the programming for the domestic hot water exchanger temperature holding function**

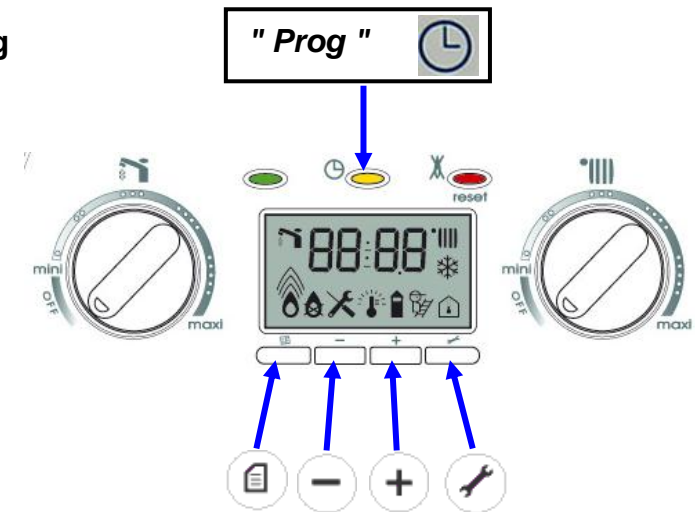
Once the boiler time is confirmed, the programming start time for the domestic hot water exchanger held temperature flashes. Change the value by pressing keys  or  then confirm by pressing the  key.

Then the minutes flash; change the value by pressing keys  or  then confirm by pressing the  key.


The end time for the tank reheating phase is then displayed and can be changed in the same way.

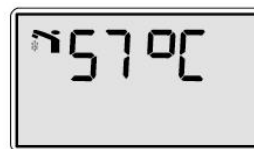
When the  key is not active, the DHW exchanger held temperature is permanent.

When the  key is active (orange indicator light on) the held temperature will be as per the set programming.

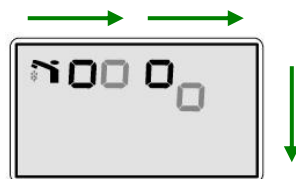


### Domestic hot water mode:

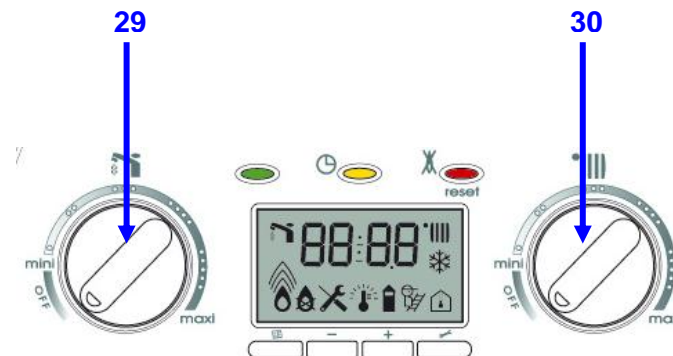
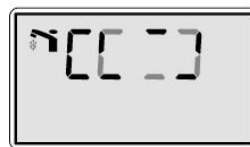
Turn switch **29** to between the min and max positions.  
 When turning the switch, the  pictogram and the domestic hot water setting flashes and scrolls through in stages of 1°C.




If water is drawn, this symbol appears  
 (stylised water drops scroll through)



During the held temperature phase, the letter  
**C** appears and the segments on the right are  
 scrolled through.

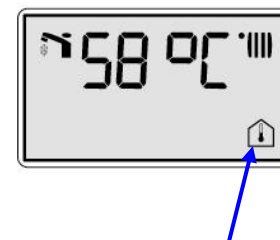


### Heating mode:

Turn switch **30** to between the min and max positions.  
 When turning the switch, the  pictogram and the heating setting  
 flashes and scrolls through in stages of 1°C.  
 The pictogram and the instruction stop flashing a few seconds  
 after operating the switch.

The following is then displayed:

- the temperature of the main exchanger outlet when a room thermostat request is present.
- the time if the room thermostat is not requested



**Symbol for the room  
 thermostat request**

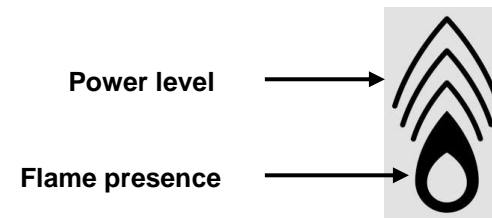
## Indication of "flame presence and gas power rate":



This symbol appears in the lower left-hand section of the display when the burner is in operation.

It gives 2 pieces of information:

- Flame presence
- Burner power level (segment number)

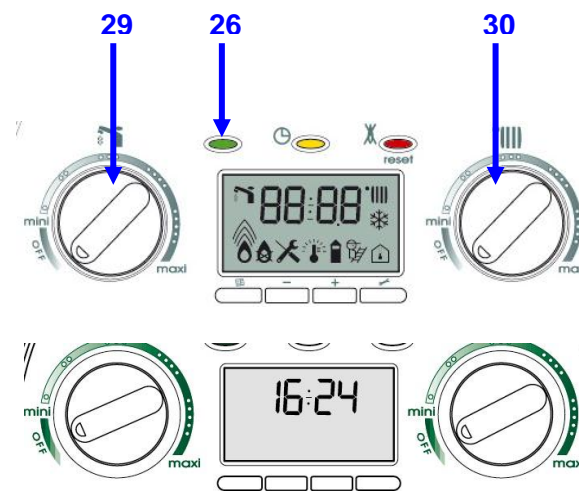


## Standby mode:

Turn hot water switch **29** and heating switch **30** to the OFF position to switch off these functions, but leave the ON/OFF button **26** pressed in (green indicator light on)

***In this mode, only frost protection and degumming operations are permitted.***

The screen displays the time only.

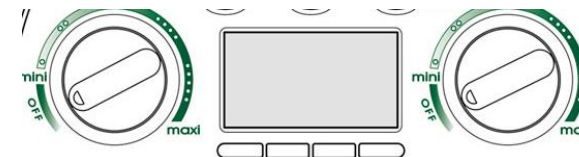


## Total Stop Mode:

Press ON/OFF button **26** (green light off).

Nothing appears on the display

The frost protection, pump degumming and V3V functions are not active. If the boiler continues to be supplied with power, the clock time and the held temperature programming will remain set. If the boiler is no longer supplied with power, these times will need to be reprogrammed after one hour. However, all the information set in menus 3, 4 and 6 will be saved irrespective of the period of time the boiler is without power.



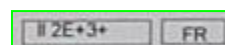
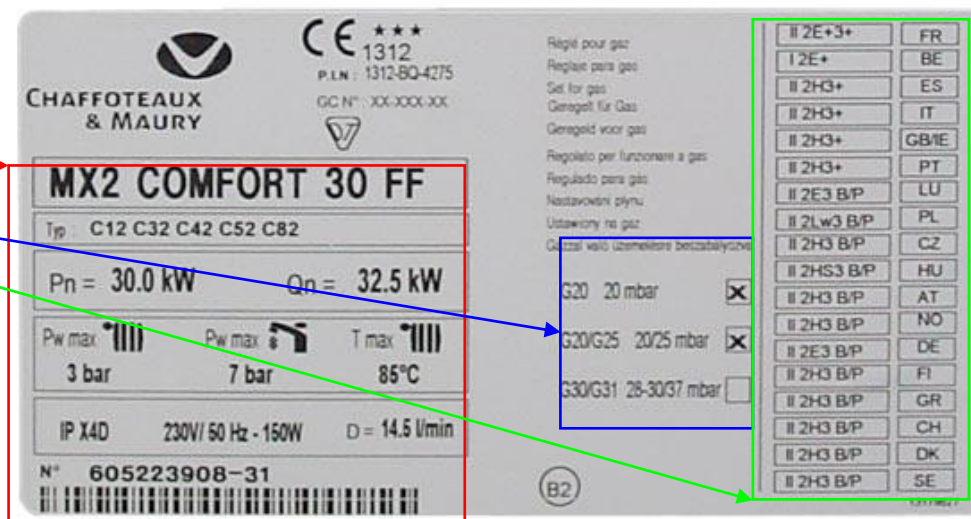


## 1.9 DATA PLATE

- Appliance main specifications
- Type of gas the appliance is designed for
- Country for which the appliance is approved

This plate is fixed to the electrical unit

### Type of boiler

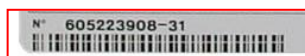


### Gas approval

- II : 2 types of gas
- 2E+ : all natural gas
- 3P : Propane gas

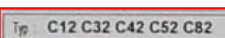


### Electrical protection rating



### Appliance serial number

- 6 : Month of manufacture  
O, N, D for October,  
November and December.
- 05 : Year of manufacture
- 223908 : Order number
- 31 : Technical suffix number



### Fume evacuation

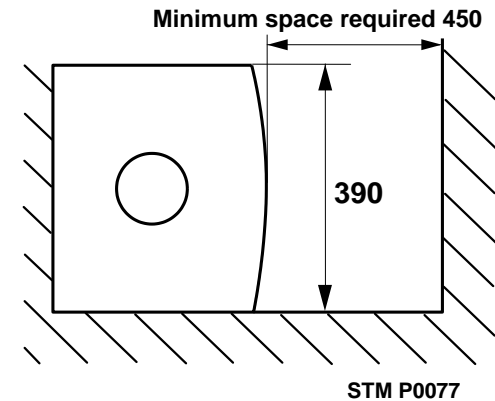
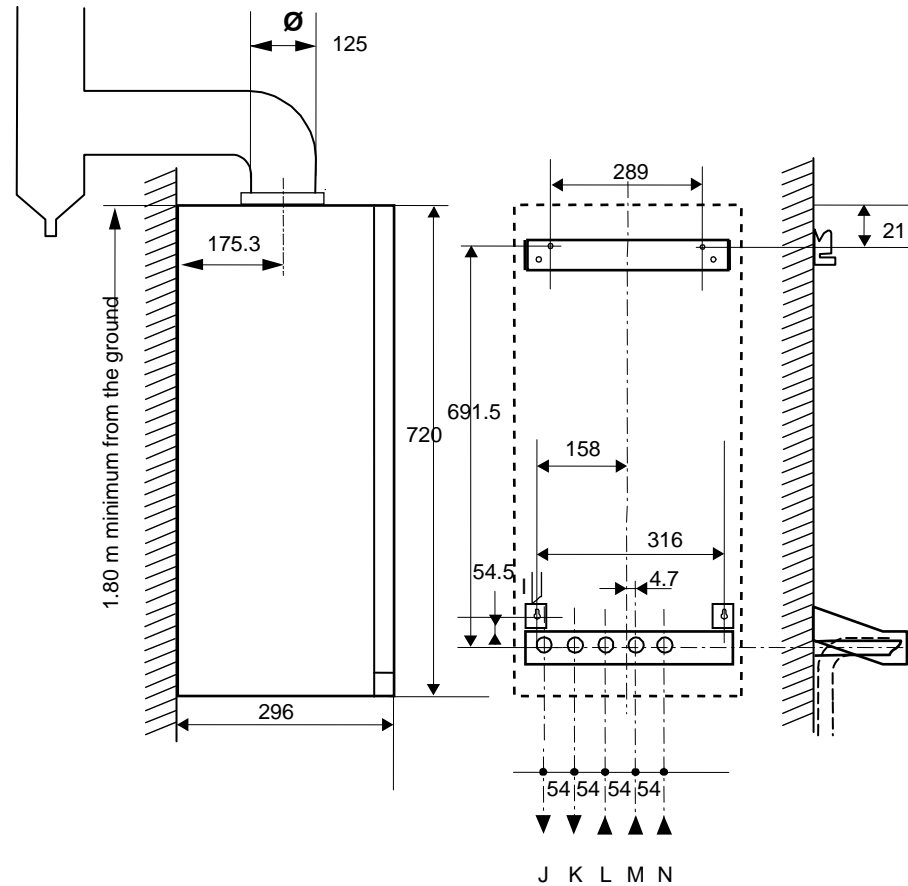
- C12 : Horizontal terminal
- C32 : Vertical terminal
- C42 : 3 CE
- C52 : Twin flue terminal

## 2. INSTALLATION

### 2.1 WALL PREPARATION (Viewed without wall spacing)

#### CF & VMC Versions

dimensions in mm



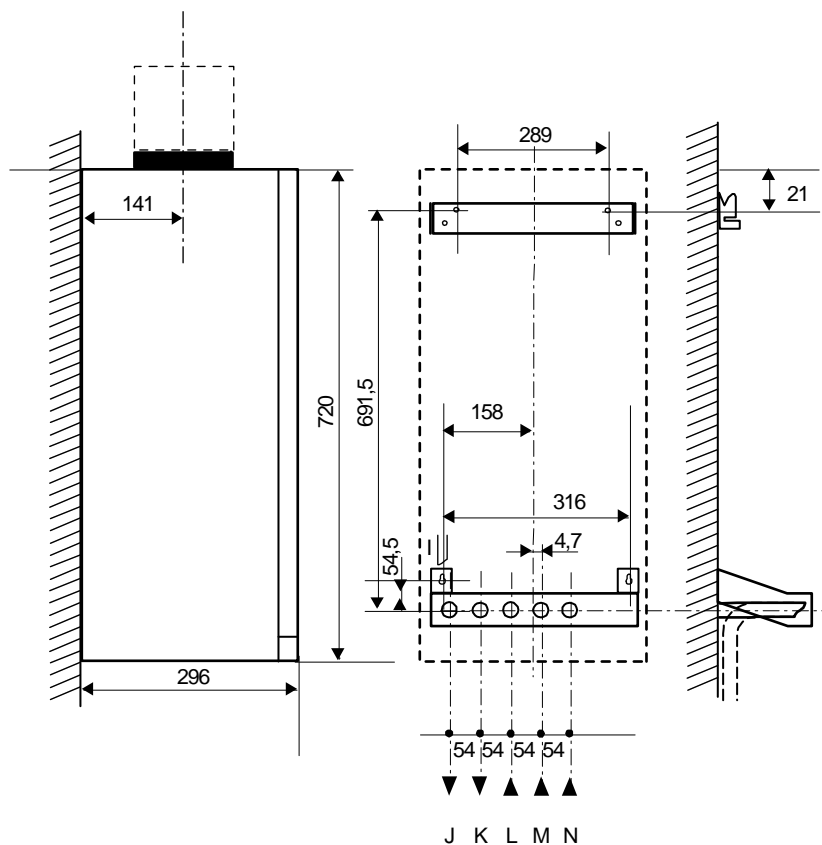
Installation by routing the connections behind the boiler only using a wall spacing kit

#### LEGEND

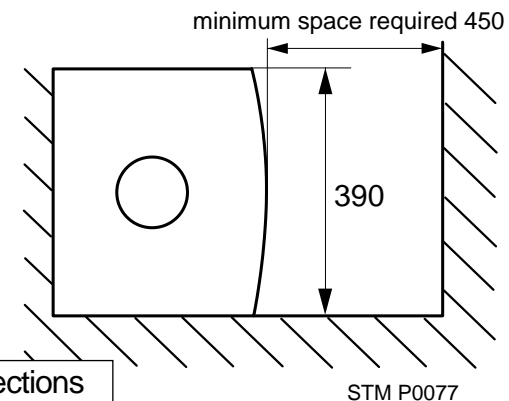
- I Safety valve
- J Heating outlet
- K DHW outlet
- L Gas supply
- M Cold water inlet
- N Heating backflow

## FF version

dimensions in mm



Installation by routing the connections behind the boiler only using a wall spacing kit

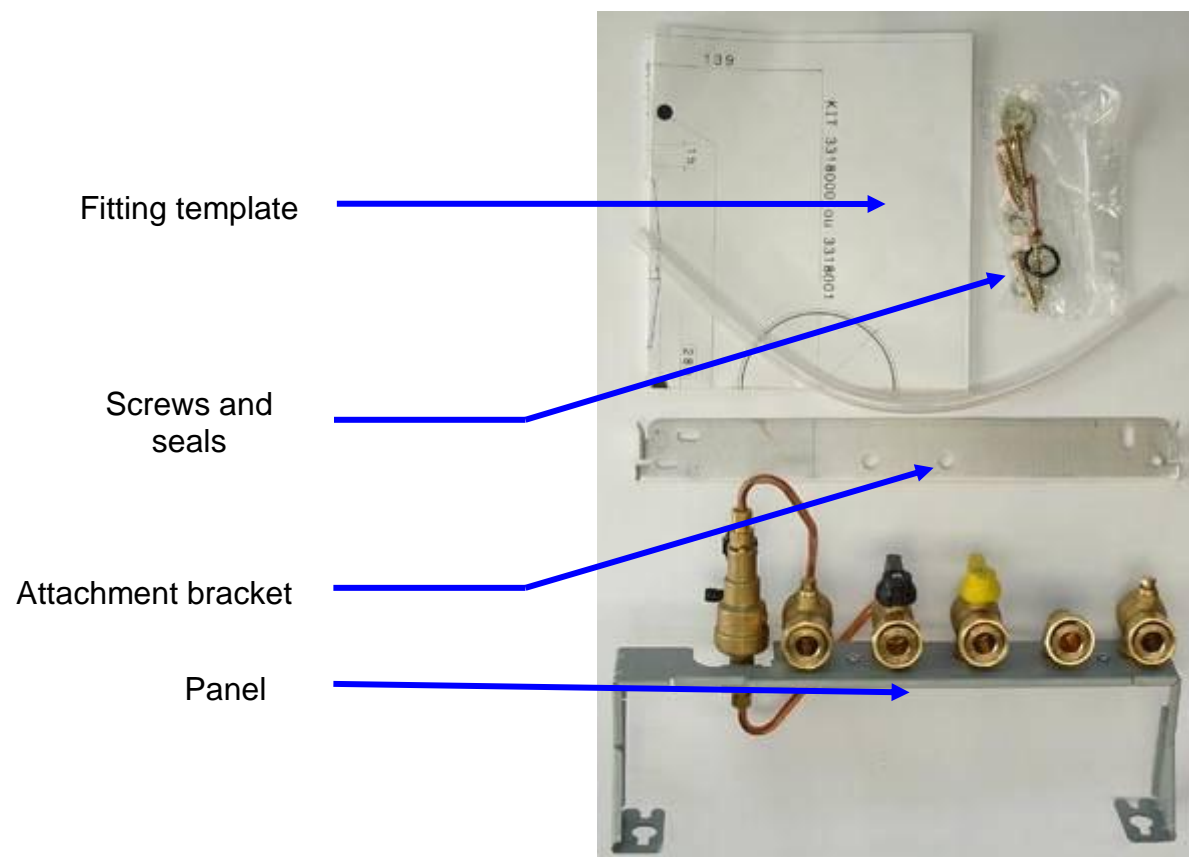


## LEGEND

- I** Safety valve
- J** Heating outlet
- K** DHW outlet
- L** Gas supply
- M** Cold water inlet
- N** Heating backflow

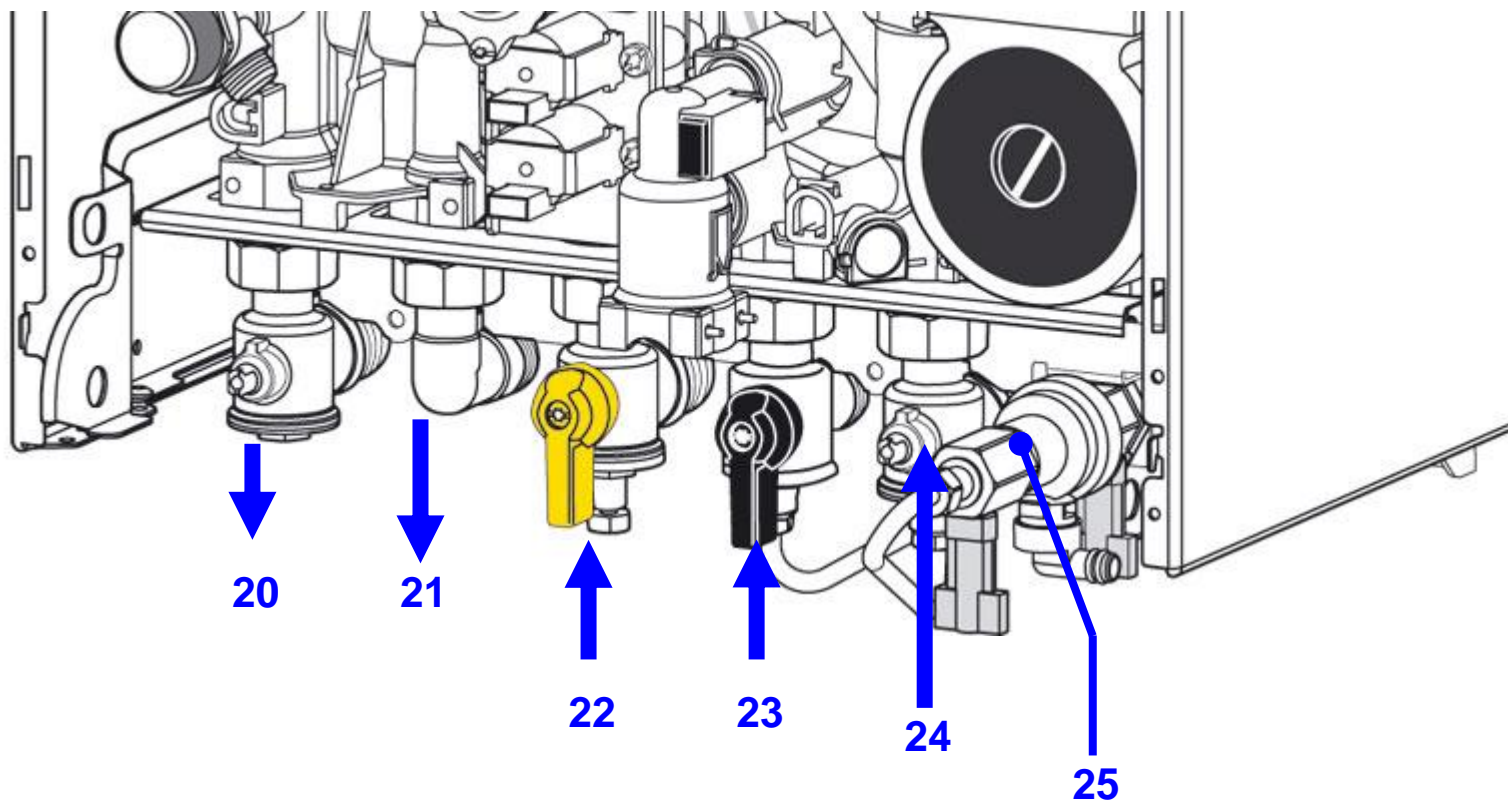
## 2.2 WATER CONNECTIONS

In France, the boiler is provided with a pre-fabricated panel in a separate pack and the 45 mm wall spacing kit.



See paragraph on accessories

- <b>CELTIC</b>	ref. <b>3678131</b>
- <b>NECTRA</b>	ref. <b>3678132</b>
- <b>ELM</b>	ref. <b>3678133</b>
- <b>Saunier Duval</b>	ref. <b>3678134</b>



- 20.** Heating outlet
- 21.** DHW outlet
- 22.** Gas supply

- 23.** Cold water inlet
- 24.** Heating backflow
- 25.** Disconnector

## 2.3 THERMOSTAT & ELECTRICAL CONNECTIONS

### Electrical connections:

The boiler is equipped with a **1 m** electrical mains connection cable. On the boiler side the connection is already made to connector **J1**. All that remains is for the technician to connect it to the installation.

The cables must be connected to 230 V – 50 Hz, wired to the correct polarity and earthed.

### Connecting a room thermostat:

The connection is made to connector **D** located on the boiler electronic circuit. The information from the room thermostat should only be one contact. It is vital not to send a voltage over terminal block **D** as this will damage the boiler printed circuit.

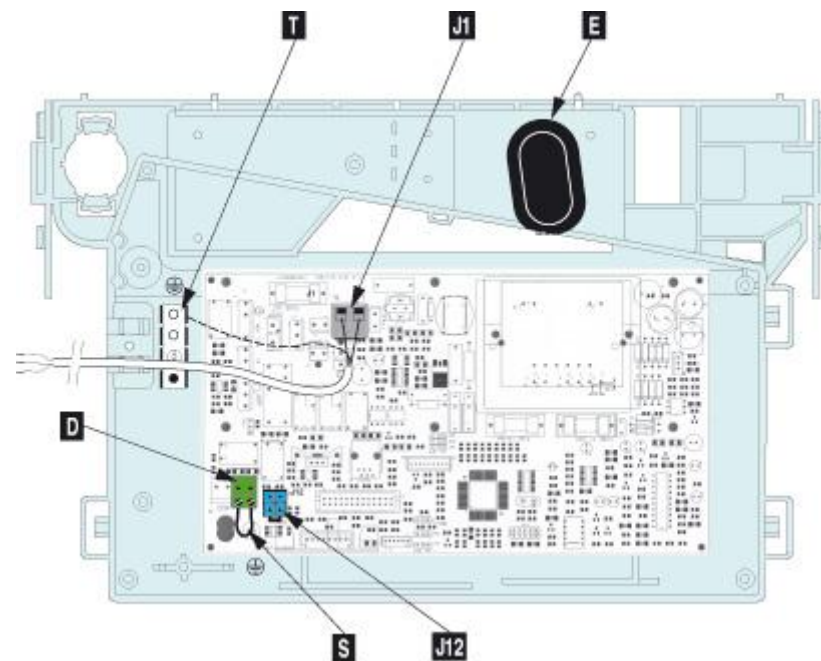
All the settings needed for operation of the room thermostat are described in the paragraph on *SETTINGS AND ADJUSTMENTS* in menu **4**.

**J1 & T**: 230 V and connection to earth using the cable supplied

**D & S**: Room thermostat.

**J12**: Optional programmer connector.

**E**: Not used

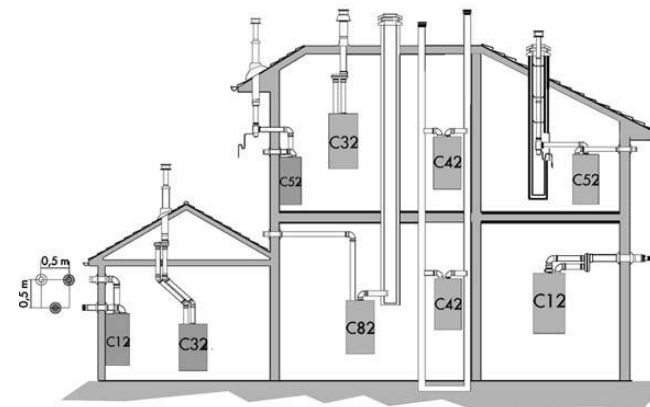
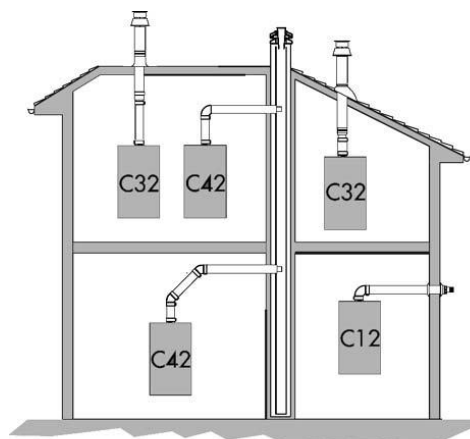
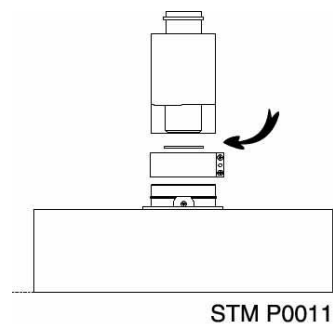
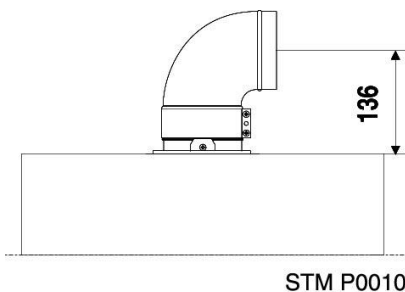
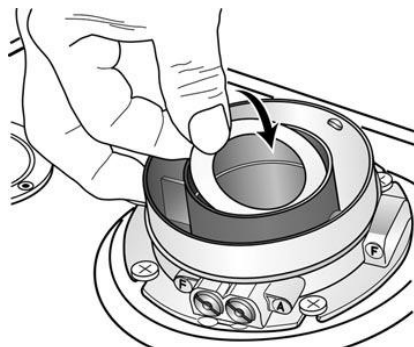
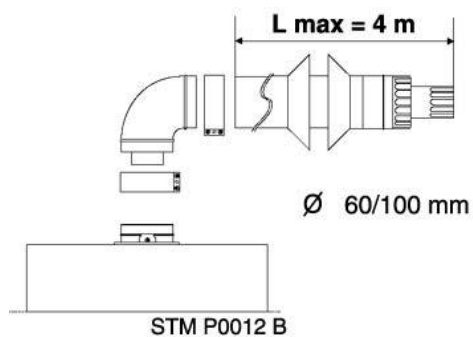


## 2.4 FLUE GAS CONNECTIONS

### 2.4.1 Conditions to be observed

The boiler must be installed so that the terminal is exposed to the free flow of air at all times.  
The minimum requirements are given in the installation manual and differ depending on the country:

### 2.4.2 Co-axial output (C12, C32, C42) xx



Concentric output 60/100	Restrictor Ø 41 – 24 kW Ø 42 – 30 kW	Restrictor Ø 45	Without restrictor
<b>24 kW</b>	L = 0.3 m to 0.75 m	L > 0.75 m to 2.5 m	L > 2.5 m to 4 m
<b>30 kW</b>	L = 0.3 m to 0.5 m	L > 0.5 m to 2 m	L > 2 m to 4 m



The lengths in the table allow for the flue/air terminal and an elbow.

Flue duct accessories are supplied in a separate package from the boiler.

The equipment for flue duct C12 (60 / 100) carries the reference **3318001**. For other configurations, refer to the Accessories catalogue.

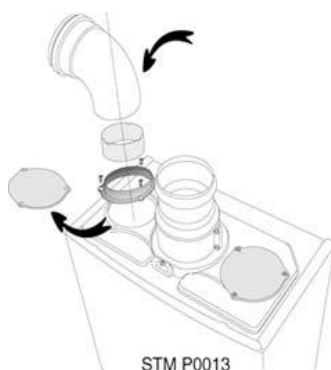
**The kit contains:**

- 1 double elbow
- 2 clamps
- 1 x 750 mm terminal
- 2 seals (1 inner + 1 outer)
- 1 instruction sheet





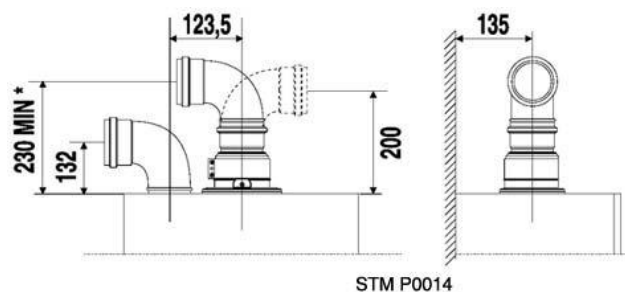
### 2.4.3 Twin flue outlet (C12, C32, C42, C52, C82) xy



Twin flue 24 kW	Restrictor Ø 41	Restrictor Ø 45	Without restrictor
C12, C32, C42 80/80	L min. > 0 m Lmax. = 5.5 m	L min. > 5.5 m Lmax. = 21 m	L min. > 21 m Lmax. = 33 m
C52, C82 80/80 Fresh air Length 1m	L min. > 0 m Lmax. = 9 m	L min. > 9 m Lmax. = 43 m	L min. > 43 m Lmax. = 67 m

L = Total length of the fresh air and flue gas pipes.

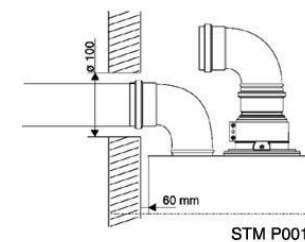
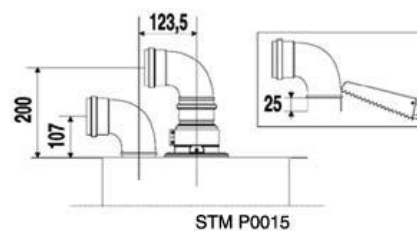
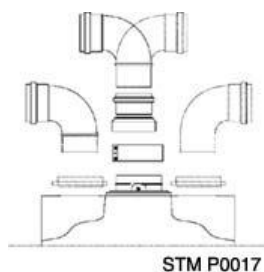
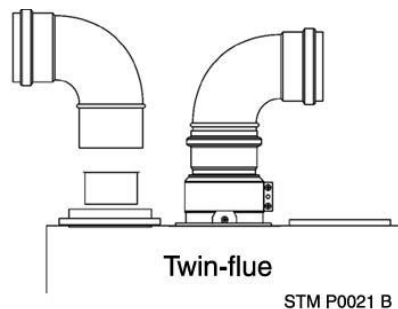
If the length of the flue gas pipes exceeds 5.5 m, a condensate sump is required.



Twin flue 30 kW	Restrictor Ø 44	Without restrictor
C12, C32, C42 80/80	L min. > 0 m Lmax. = 5.5 m	L min. > 5.5 m Lmax. = 20 m
C52, C82 80/80 Fresh air Length 1m	L min. > 0 m Lmax. = 17 m	L min. > 17 m Lmax. = 43 m

L = Total length of the fresh air and flue gas pipes.

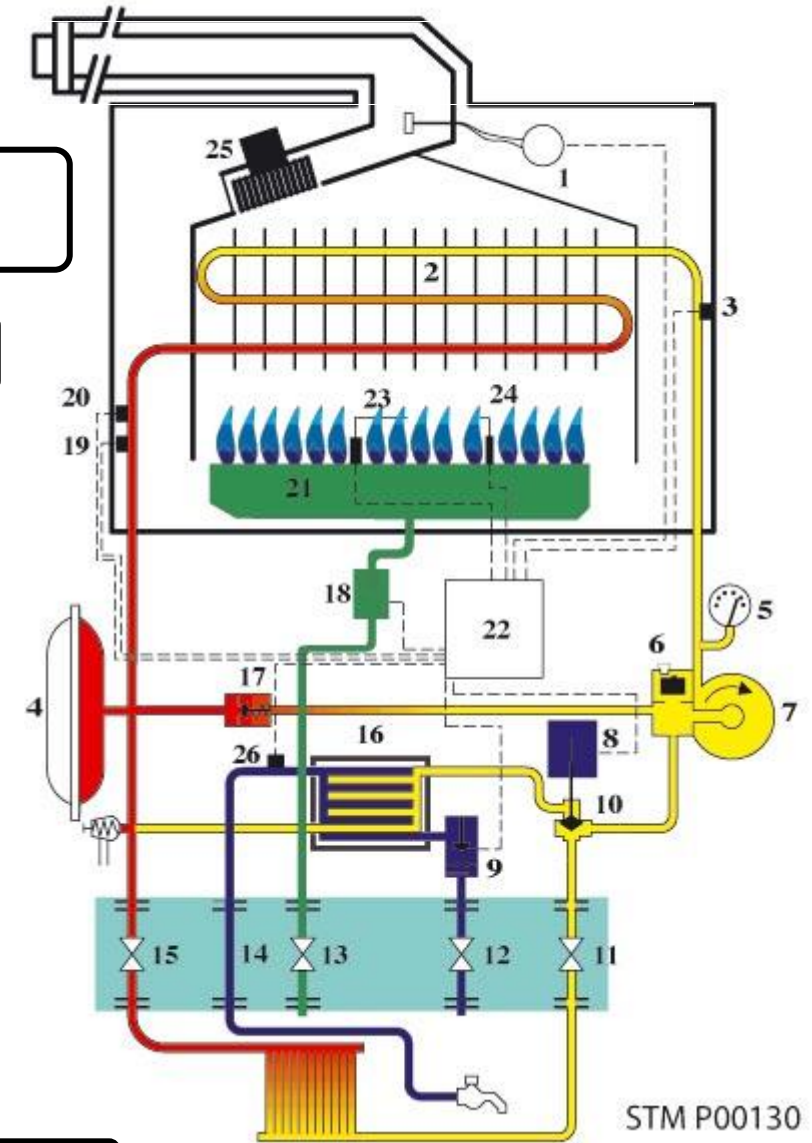
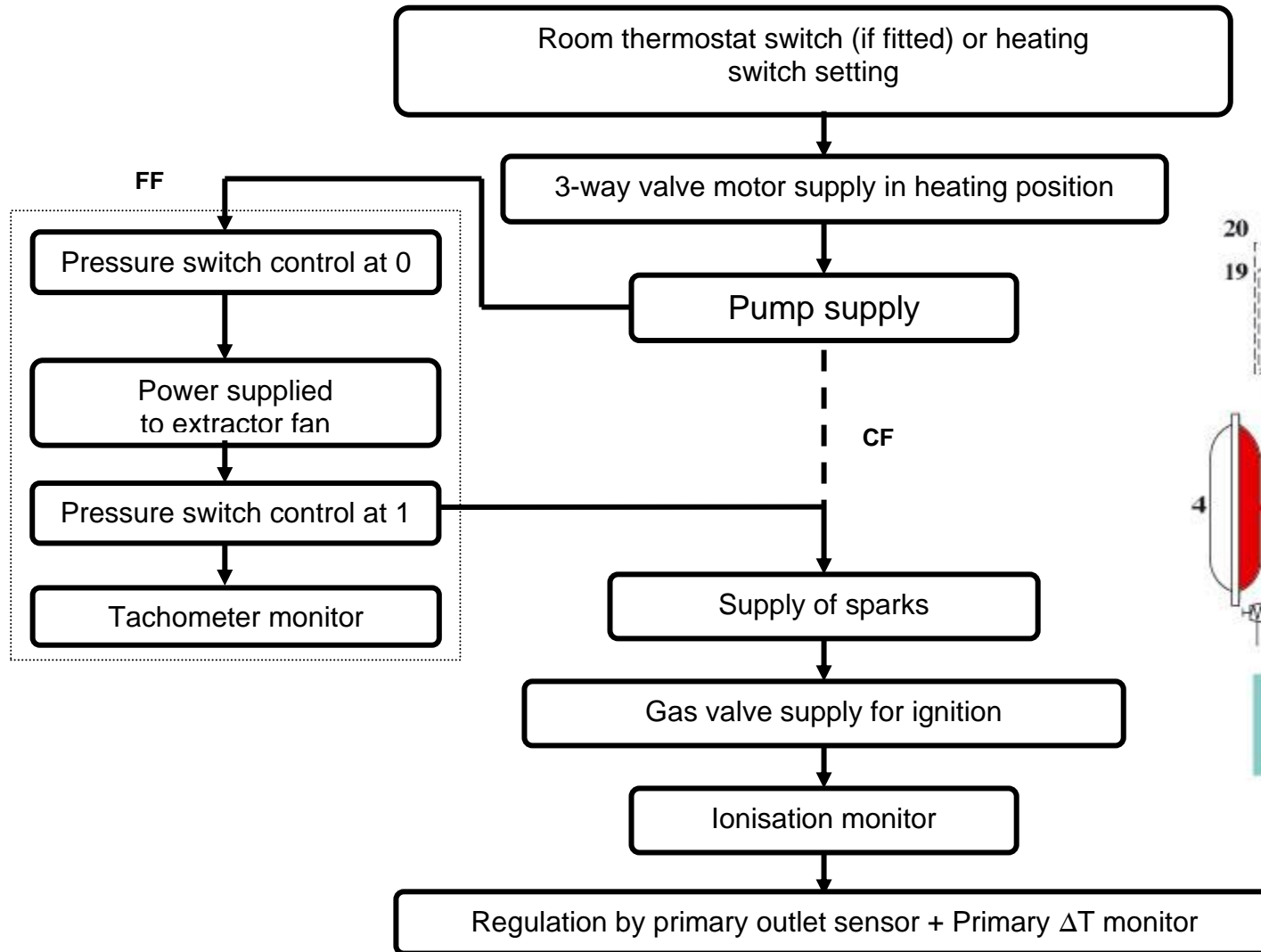
If the length of the flue gas pipes exceeds 7.5 m, a condensate sump is required.



### **3. OPERATION**

### 3.1 HEATING MODE

### Starting sequence



### Heating setting

**Set by the user** using the settings button on the heating flow temperature control panel: 25°C to 90°C. A temperature value is given on the control panel LCD display by the sensor at the outlet of the heating body.

**Set by a technician** in Menu **4** on the control panel:

- **Line 0:** Pump cut-off operation (No/Yes)
- **Line 1:** Pump speed (Fast / Variable)
- **Line 2:** Post-circulation time (0 to 5 min)
- **Line 4:** Maximum heat setting (50°C to 90°C)
- **Line 5:** Minimum heat setting (35°C to 50°C)
- **Line 7:** Burner operation (On/Off / Normal)
- **Line 8:** Anti-cycle delay ( 0 to 7 min )
- **Line 9:** Maximum heating output level (between Pmin and Pmax)

See "Settings" section for details.

During each start up phase in heating mode the pump is activated for 20 seconds before the burner is ignited to ensure a good mix in the primary circuit.



### Heating regulation

The heating regulation is controlled by the primary outlet sensor only. It sends a temperature reading to the heating body outlet every 0.5 seconds.

The micro-controller performs a calculation between the value read and the setting to calculate the current to be sent to the modulating gas valve.

This regulation system: **modulates the output between minimum and maximum when the demand is higher than 7 kW and from 0 to minimum output when the demand is lower than 7 kW.**

The display on the control panel indicates the temperature at the main exchanger outlet.

After the burner has been cut off by the primary outlet sensor, there is a time delay set using Menu **4** (Anti-cycle time delay). If this happens, the pump continues to operate and the extractor fan is cut off after post-ventilation operation.

The primary backflow sensor is used to monitor the flow.

### **Frost protection function**

Frost protection:

The primary outlet sensor monitors the system temperature (including in monitoring mode).

When the frost protection phase is activated, the corresponding code is displayed with the snowflake pictogram



**At 4°C, the burner ignites until the primary temperature reaches 30°C with:**



- the 3-way valve in the heating position
- the pump at high speed
- the burner at minimum power

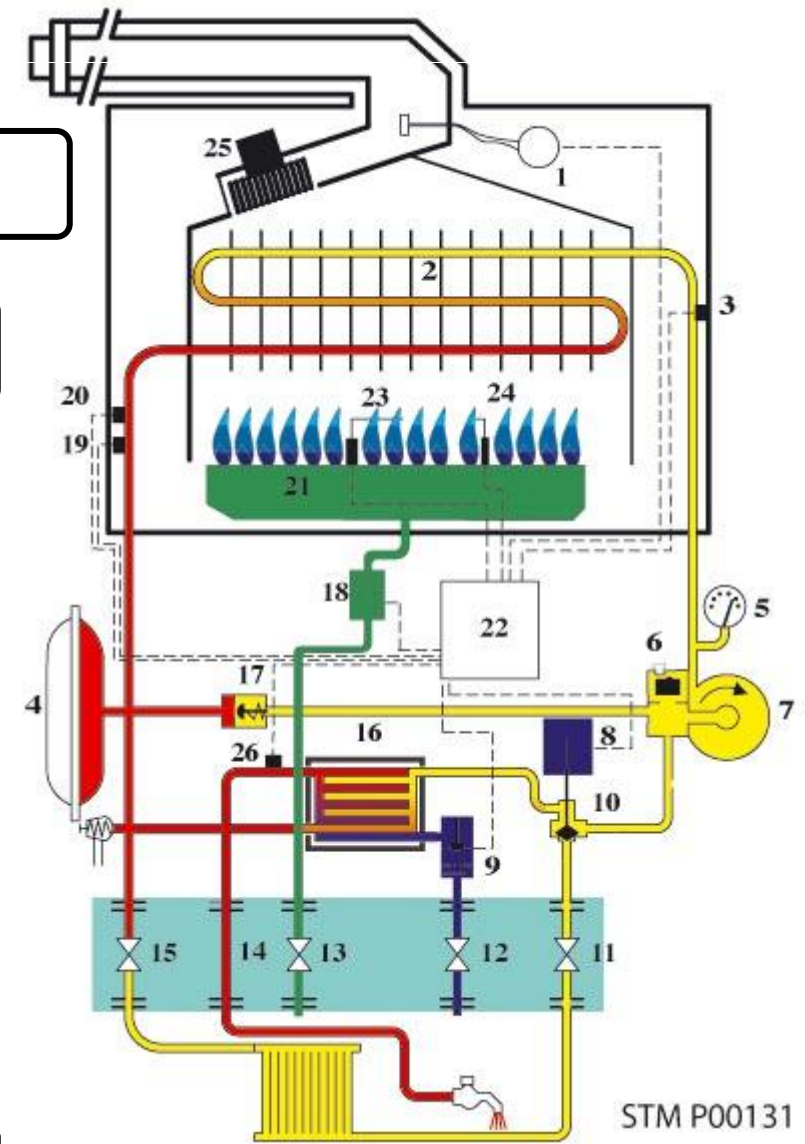
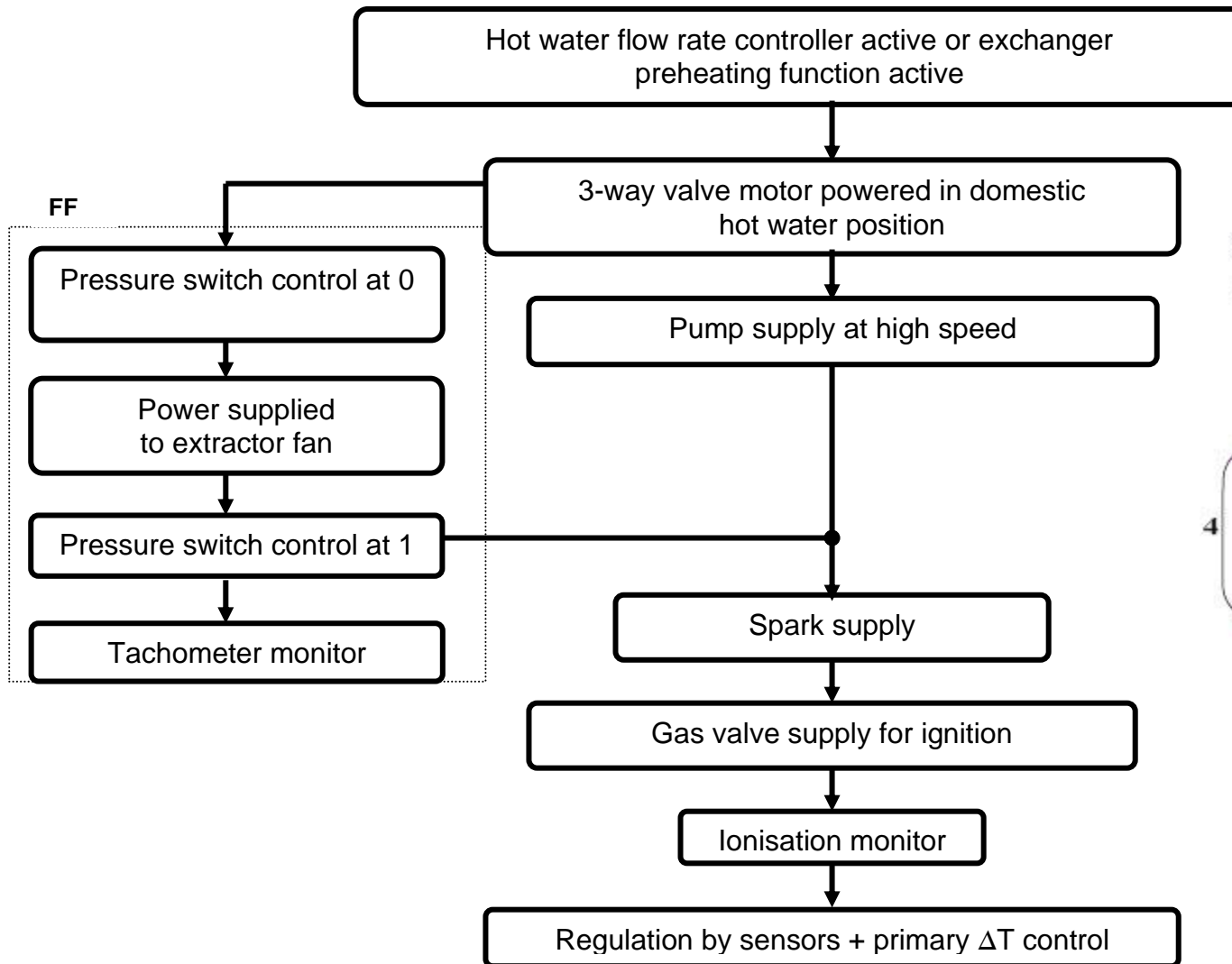
Frost protection monitoring is effective in all of the boiler operating modes. If the temperature drops below 4°C, the distributor valve switches to the heating position, if it was not already in this position and the pump runs at high speed. If the safety conditions permit it, the burner operates at minimum power until the water reaches the temperature of 30°C. This is followed by a post operation of the pump for 3 minutes.

If a heating or hot water request is made during this function, it takes priority.

The frost protection function is active for 45 seconds after switching on or after resetting if the primary outlet sensor is open.

### 3.2 Domestic Hot Water MODE

#### Operating sequence



STM P00131

### Domestic hot water regulation:

**Set by user** between 40°C and 60° C via the button on the control panel

**Set by technician** in Menu **3**:

- **Line 1:** Boiler equipped with a Celectic, the setting is set at 65°C. The TIC is at 0
- **Line 2:** Action of an optional programmer
- **Line 3:** Nominal power output level from 70°C to P nominal
- **Line 5:** Hot water time delay (TIC) from 0 to 5 minutes in 1/2 minute intervals
- **Line 6:** Time delay for hot water flow rate controller (Anti-rebound). From 0 to 2 seconds



### LED display on the control panel:

**When preheating the plate exchanger:** The segments scroll through one by one with the letter "C" on the left of the display.



**When the domestic hot water flow rate controller is activated (Flow rate > 1.9 l/min)** the square indicators scroll two at a time.



### Domestic hot water adjustment

**Drawing > 1.9 l/min.**

This is regulated by the domestic hot water flow rate controller.

A 0 to 2-second anti-rebound device, which can be adjusted in menu **3** on the flow rate controller prevents inadvertent starting associated with "water hammering".



Then:

The domestic hot water sensor maintains the setting. If a considerable amount of water is drawn, regulation is modulated between the min. and max. power outputs; if not, the burner alternates between the stop and minimal operation output phases.

In both cases, the primary outlet sensor monitors the temperature and shuts off the boiler at 80°C.



## "Plate exchanger temperature holding" operation

### PRINCIPLE

This function enables the user to obtain hot water more quickly. To do this, the primary flow temperature is held at a temperature close to the domestic hot water setting set on the control panel.

This function can be programmed by the user by pressing the **programming** button on the control panel. This action is shown by the button lighting up orange.

The micro-controller for the electronic board manages this function via the sensor at the outlet of the heating body and compares it to the hot water setting:



**BURNER LIT:** when the temperature read by the primary sensor is 15°C lower than the hot water setting.

**BURNER OFF:** when the temperature read by the primary sensor is 4°C higher than the hot water setting.

When the boiler is operating in this mode, the letter "C" and the segments flash on the display. **The heating request takes priority for this function.**

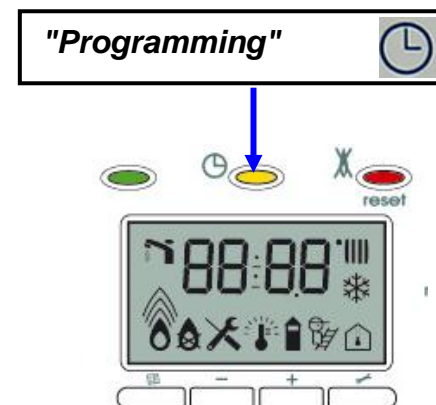
The burner then operates at the minimum power level.

Two situations may arise:

- 1- **"Timer"** Button  off : the "plate exchanger temperature holding" function is permanent
- 2- **"Timer"** Button  on : the "plate exchanger temperature holding" function is programmed

### PROGRAMMING THE "plate exchanger temperature holding" FUNCTION

It is possible to change this tank preheating time as shown in § 1.8 page 14:



In the situation where the customer does not wish to use the "plate exchanger preheating" function, it is necessary to program the preheating start time identical to the end time, using the "Timer" button.



### **3.3 FLOW RATE MONITOR**

The flow rate is monitored by the difference between the readings of the 2 primary circuit sensors.

It operates as soon as the burner is ignited, irrespective of the operating mode.

#### **Two types of check**

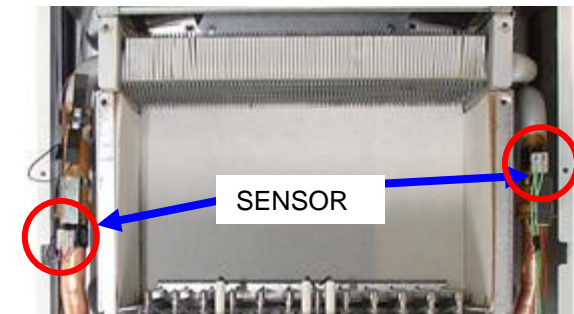
Measurement by  $\Delta T$  between the outlet sensor and the primary backflow:

#### ***No water circulation: Fault no. 7:***

If the difference between the outlet and the backflow is  $> 40^{\circ}\text{C}$ : Fault no. **7** flashes on the control panel display until  $30^{\circ}\text{C}$  is reached.

#### ***Primary circulation fault: Fault no. 8:***

If the backflow temperature is  $> 10^{\circ}\text{C}$  different from that at the outlet: Fault no. **8** flashes on the control panel display until the temperature of the water leaving the heat exchanger is above that of the water entering.



## 4. COMPOSITION

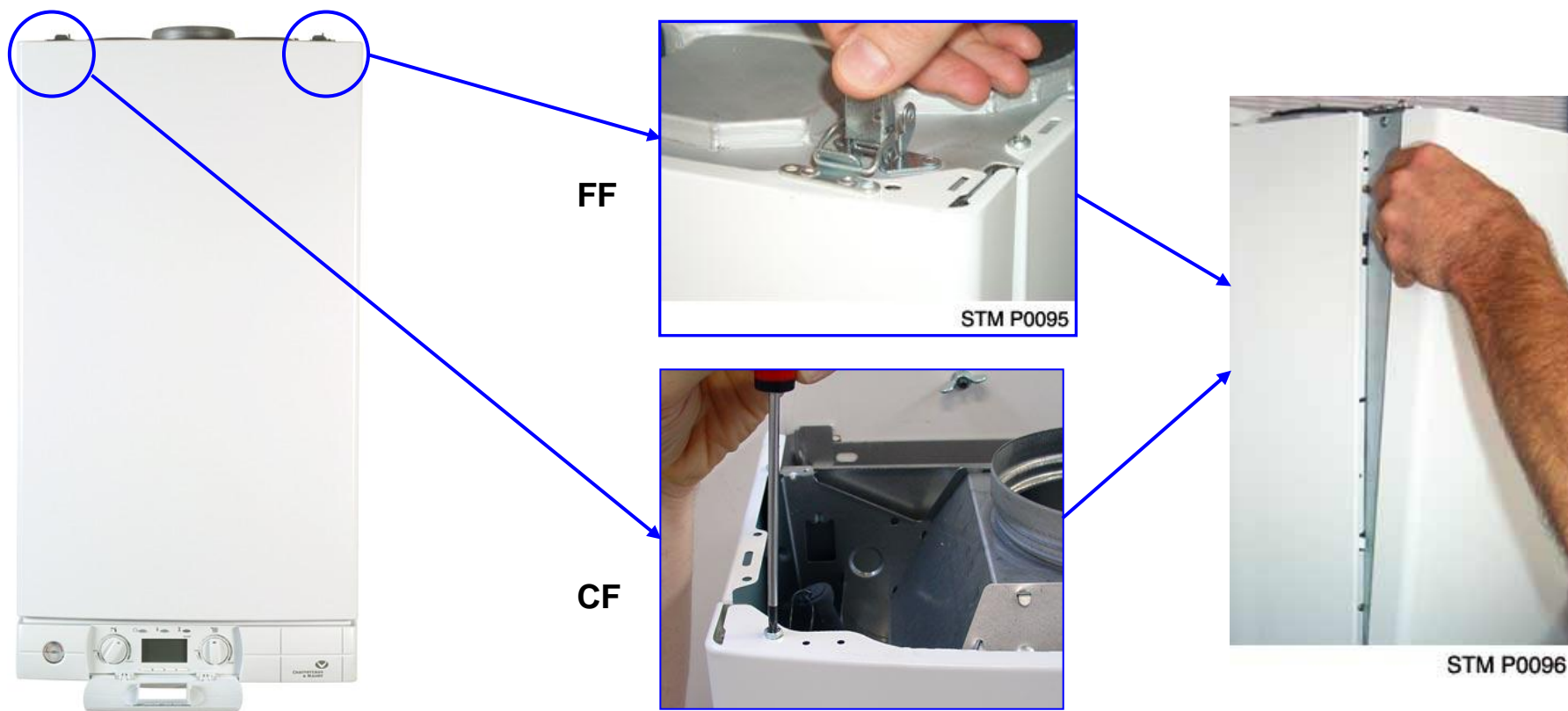
### 4.1 REMOVING THE FRONT PANEL

A single front panel forms the structural casing and seals the combustion chamber (for the FF model).

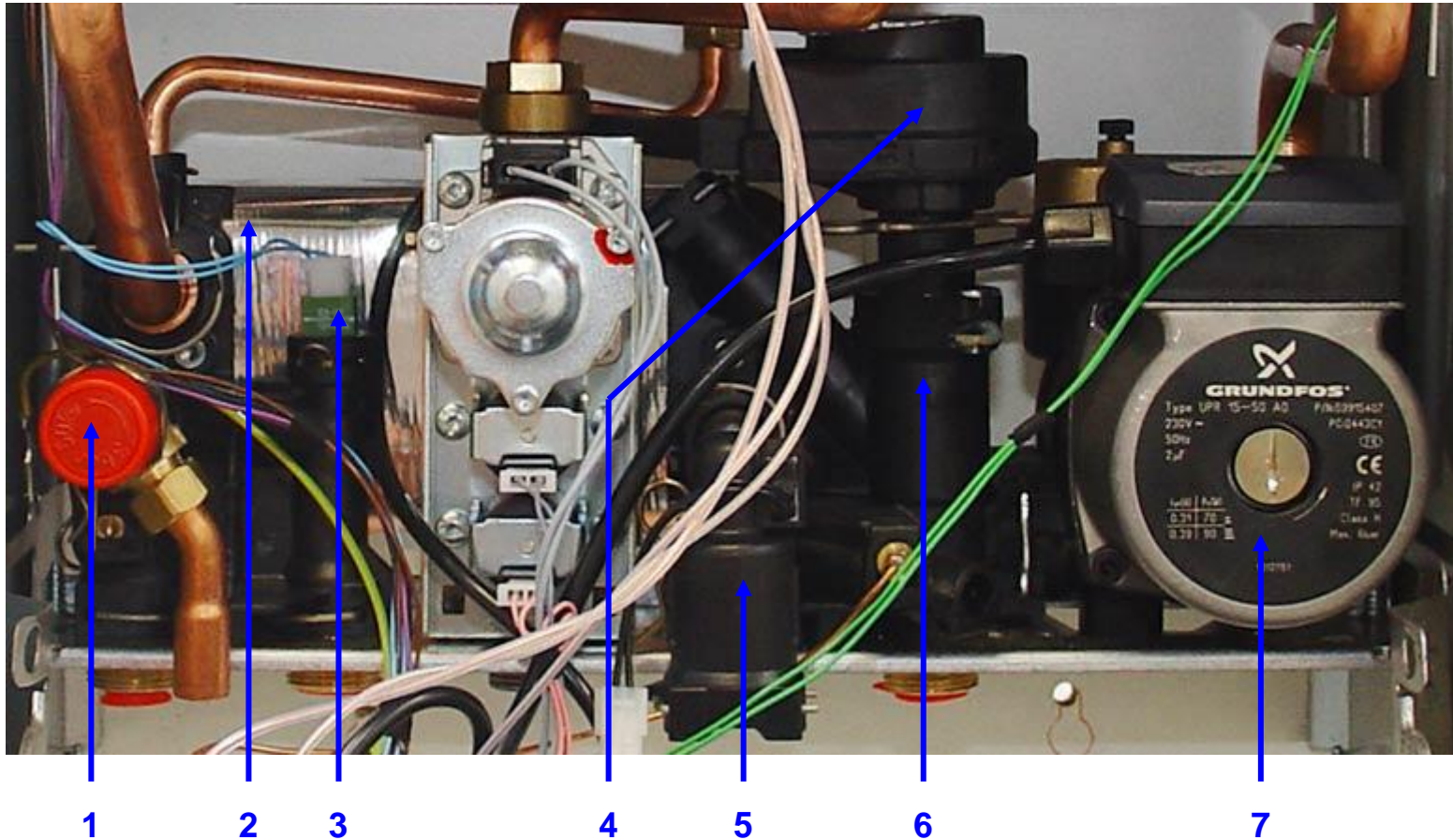
**To remove this panel:**

FF Model: Release the two lever clips and remove the front panel from the rest of the boiler.

CF Model: Remove the two screws on the top of the boiler and remove the front panel.



## 4.2 WATER SECTION



- 1- Safety valve 3b
- 2- Secondary insulated plate exchanger
- 3- Domestic hot water sensor
- 4- Three-way valve motor

- 5- Flow rate controller
- 6- Motorised 3-way valve
- 7- Pump with deaerator

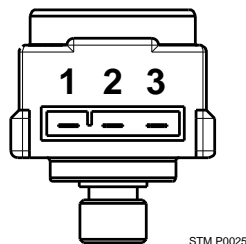
### 4.3 THREE-WAY VALVE

**Location:** Fitted on the backflow circuit and fixed to the right-hand water unit

To replace the 3-way valve motor, it is not necessary to drain the boiler. Simply remove the clip after having disconnected the electrical supply from the motor.

**Data:**

Electrical supply	: 230 V
2-1: DHW coil	: 9.5 K $\Omega$
2-3: CH (heating) coil	: 9.5 K $\Omega$
Switchover time:	
from DHW to CH (heating)	: 6.5 seconds
from CH (heating) to DHW	: 4.5 seconds



**Operation:**

When the boiler is lit, or after a Reset, the valve is in the heating position.

**Summer Mode**

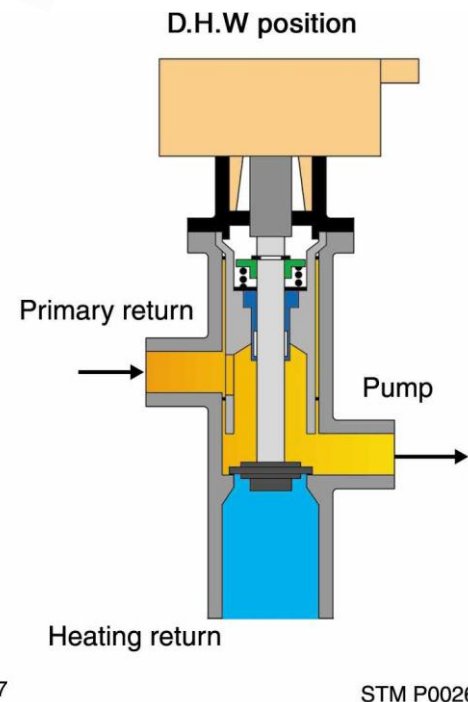
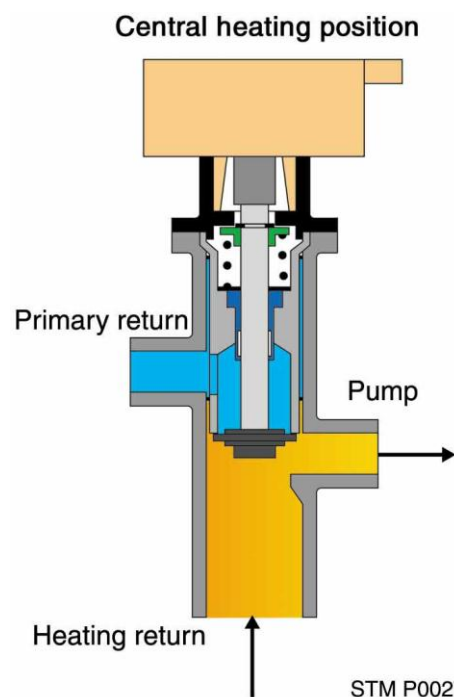
The 3-way valve is always in the DHW position while the degumming system is not activated.

**Winter Mode**

After drawing hot water, the 3-way valve remains in the DHW position while the room thermostat or the degumming system functions are not activated.

***DEGUMMING FUNCTION:***

*After 23 hours, the processor changes the position of the CH (heating) 3-way valve to DHW and vice versa.*





#### 4.4 AUTOMATIC BY-PASS

##### **Location:**

Built into the left-hand water unit.

A copper pipe is used to transport the water from the primary circuit to the right-hand water unit.

The other role is to act as an anti-return valve in the case of a U-bend thermal circulation

The By-Pass is active in DHW (domestic hot water) mode and in Heating mc

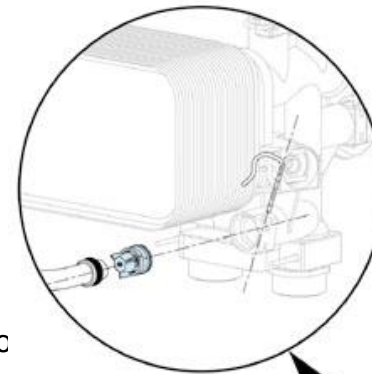
By-pass fitting direction



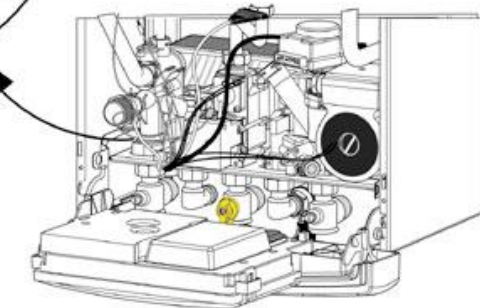
Access to the By-pass



Access to the By-pass



STM P0059



## 4.5 PUMP WITH DEAERATOR

### Location:

Fitted on the return circuit and fixed to the right-hand water unit

### Data:

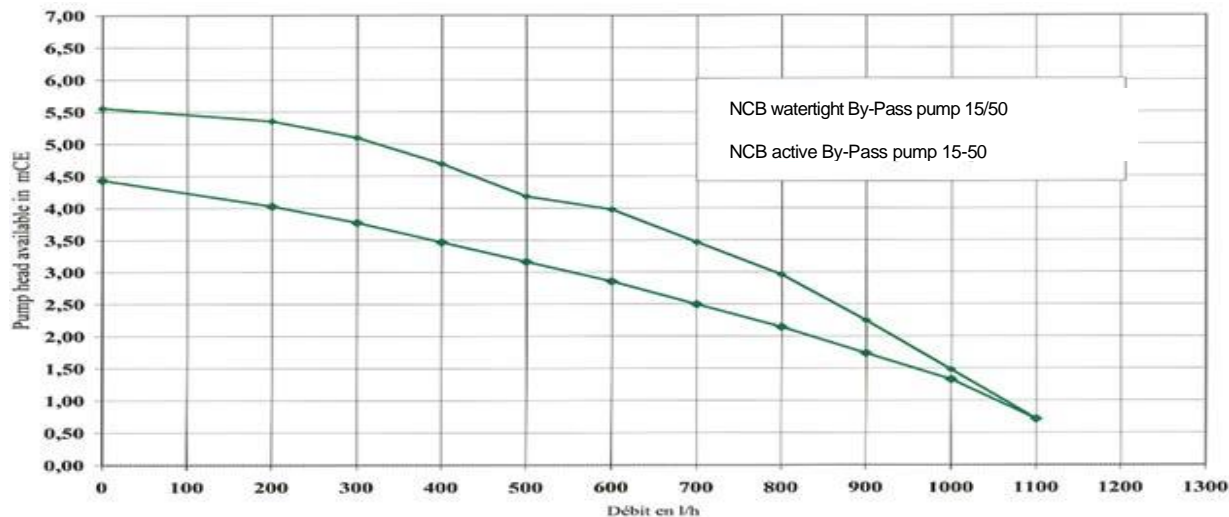
GRUNDFOS UP 15/50 for the 24 kW } (depending on country)  
GRUNDFOS UP 15/60 for the 30 kW }

Capacity: 2  $\mu$ F

Pump power supply 230 V single phase 50 Hz



STM P0028



**After 23 hours of no operation, the microcontroller for the electronic board commands the operation of the pump for 1 minute.**

## Operation:

Boiler status	Pump status
Hot water draw off	High speed
Frost protection	High speed
Pump degumming	High speed
Heating + GV + TA open + post circulation complete	Stop
Heating + GV + TA open + post circulation (continuous)	High speed
Heating + GV + TA closed	High speed
Heating + ADJ + TA open + post circulation complete	Stop
Heating + ADJ + TA open + post circulation (continuous)	Low speed
Heating + ADJ + TA closed + Burner out	Low speed
Heating + ADJ + TA closed + outlet sensor T° – backflow sensor T° > 20°C	High speed
Heating + ADJ + TA closed + outlet sensor T° – backflow sensor T° < 18°C	Low speed

**GV = High speed in settings mode**

**ADJ = Pump adjustment in the settings menu**

**TA = Room thermostat**

## 4.6 FILTERS

### HEATING FILTER

#### **Location:**

The heating filter is fitted between the ¼ turn heating backflow tap and the brass connection for the right-hand water unit.

It can be found in the boiler accessories wallet.



**or**  
(depending  
on country)



### DOMESTIC HOT WATER FILTER

#### **Location:**

The domestic hot water filter is located in the area of the hot water flow rate controller. It is fitted at the factory.



**Domestic hot  
water filter**



#### 4.7 HOT WATER FLOW RATE CONTROLLER AND FLOW LIMITER

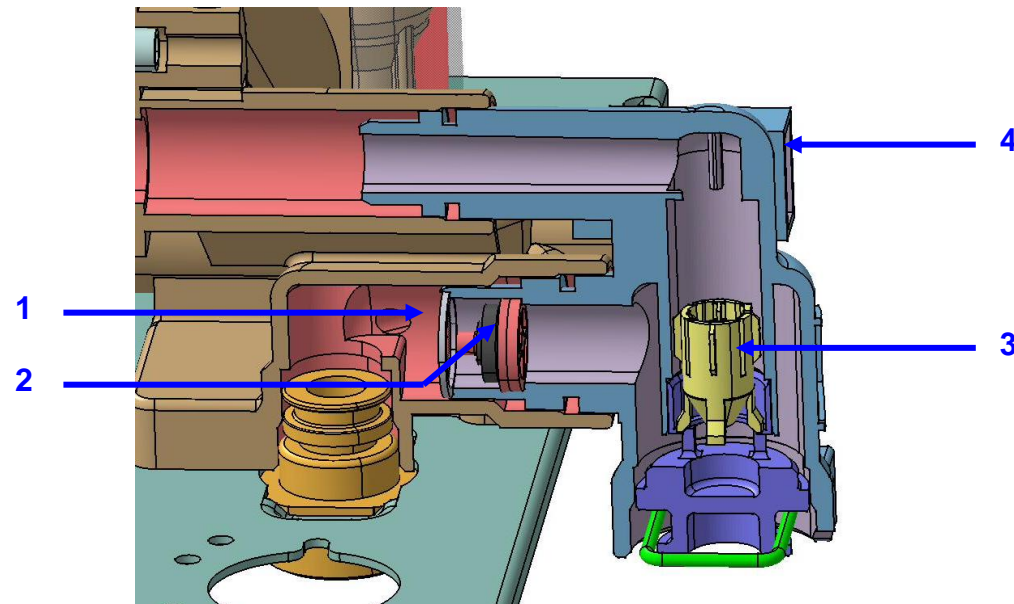
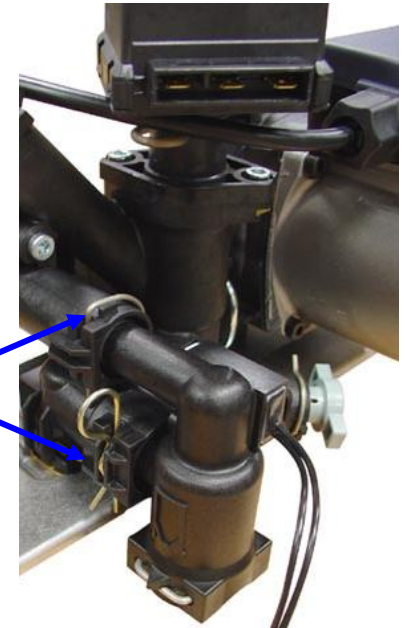
##### Location:

Fixed by 2 clips onto the right-hand water unit.

##### Description:

- 1- Domestic hot water filter
- 2- Flow limiter
- 3- Piston
- 4- Reed Bulb

2 clips



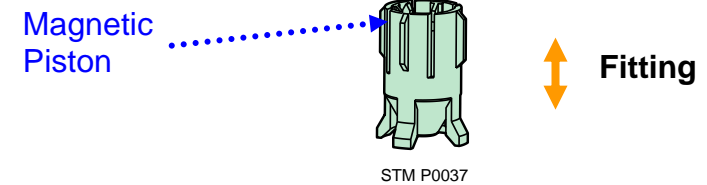
### **Flow limiter**

**Data:**      8 l/min              for the 24 kW (red)  
                 10 litres/min      for the 30 kW (white)



### **Magnetic Piston**

**Data:**      Activation flow rate > 2 l/min  
                 Minimum pressure: 0.2 b



### **Reed Bulb**

The reed bulb can be removed from its body. It must be refitted with the connector pin at the top.



Reed Bulb



## 4.8 PRIMARY HEAT EXCHANGER

### Location:

Inside the combustion chamber

### Data:

The copper exchanger is coated in an aluminium and silicon based protective paint, which is resistant to high temperatures.

### 3 VERSIONS:

24 kW CF: single layer, 74 plates

24 kW FF: double layer, 86 plates

30 kW FF: double layer, 94 plates



STM P0104



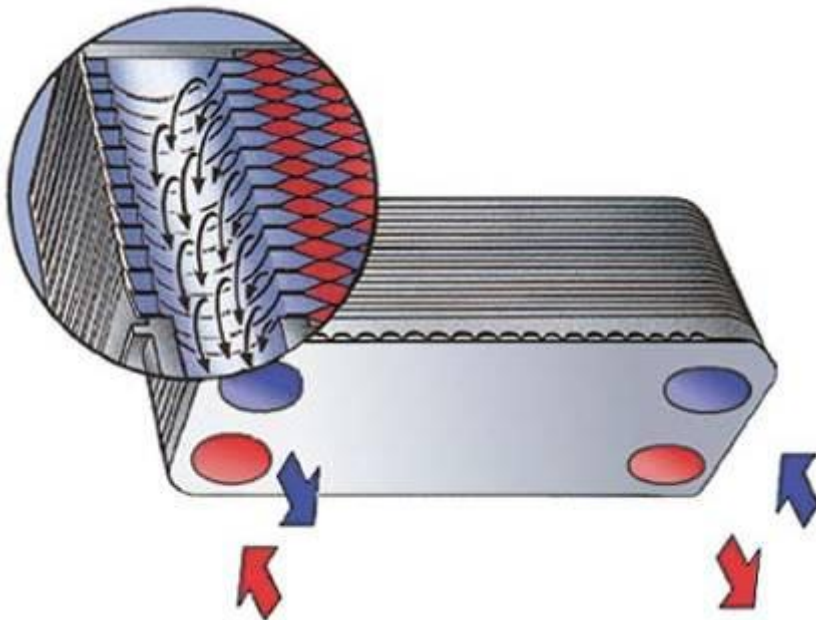
#### 4.9 PLATE EXCHANGER

##### Location:

Between the left and right-hand water units.

##### Data:

- 24 plates irrespective of the power output
- Fitted with an insulator
- Stainless steel plates fitted and brazed together

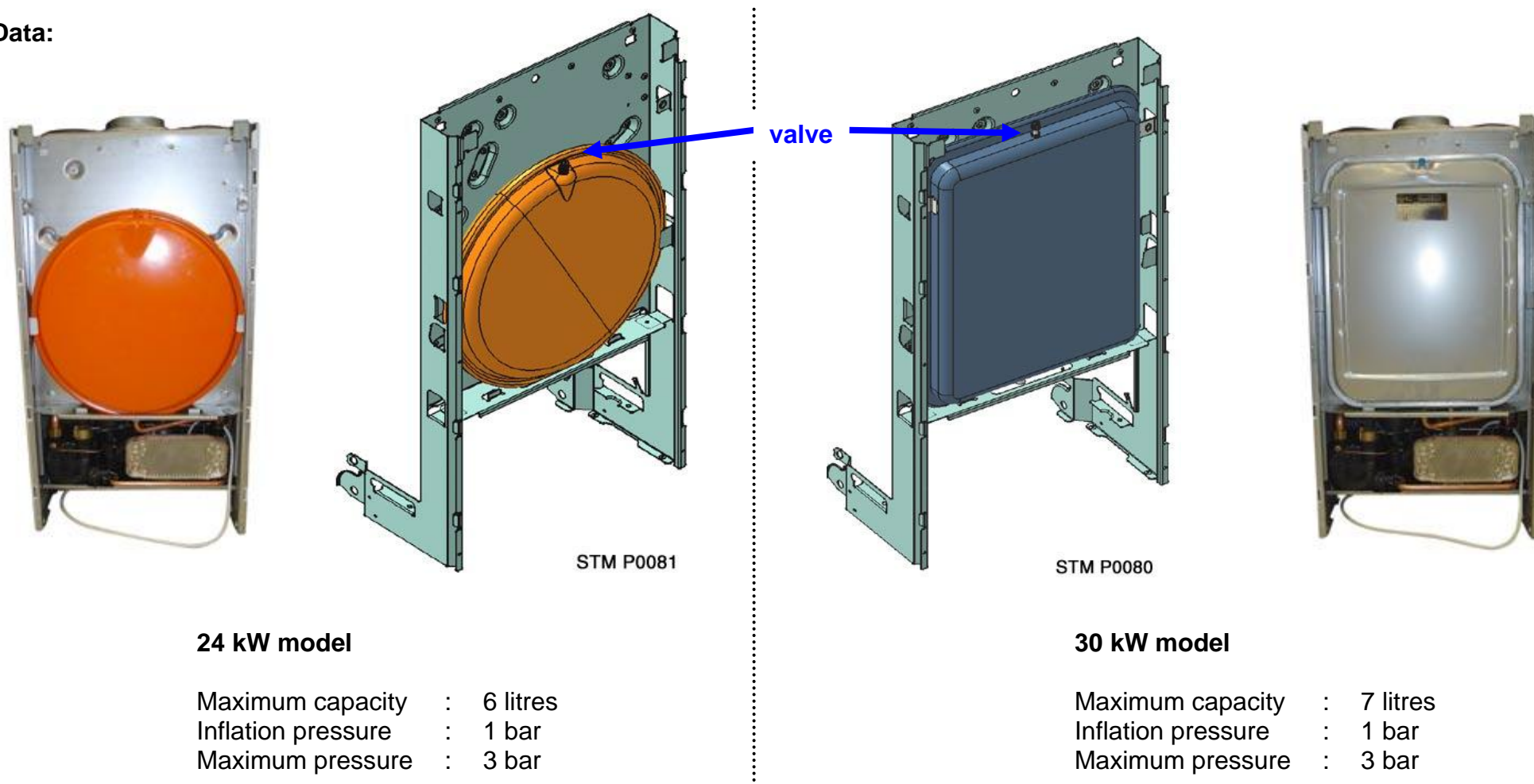


#### 4.10 EXPANSION VESSEL

**Location:** Built into the back of the base frame.

**Technology used:** Two crimped sheet steel panel half casings with a valve and cap.

**Data:**





## 4.11 SENSORS

### Location:

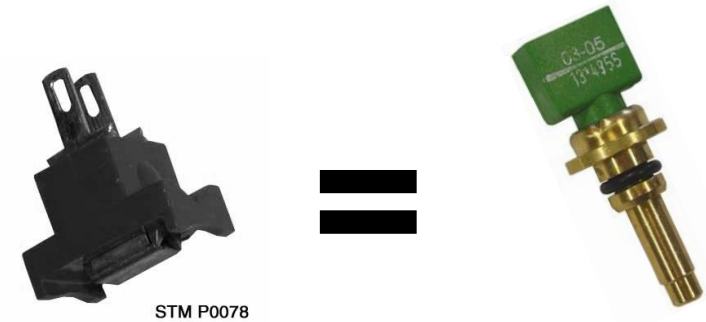
One on the main exchanger backflow: NTC switch technology

One on the main exchanger outlet: NTC switch technology

One on the domestic hot water outlet: NTC immersed technology

### Data:

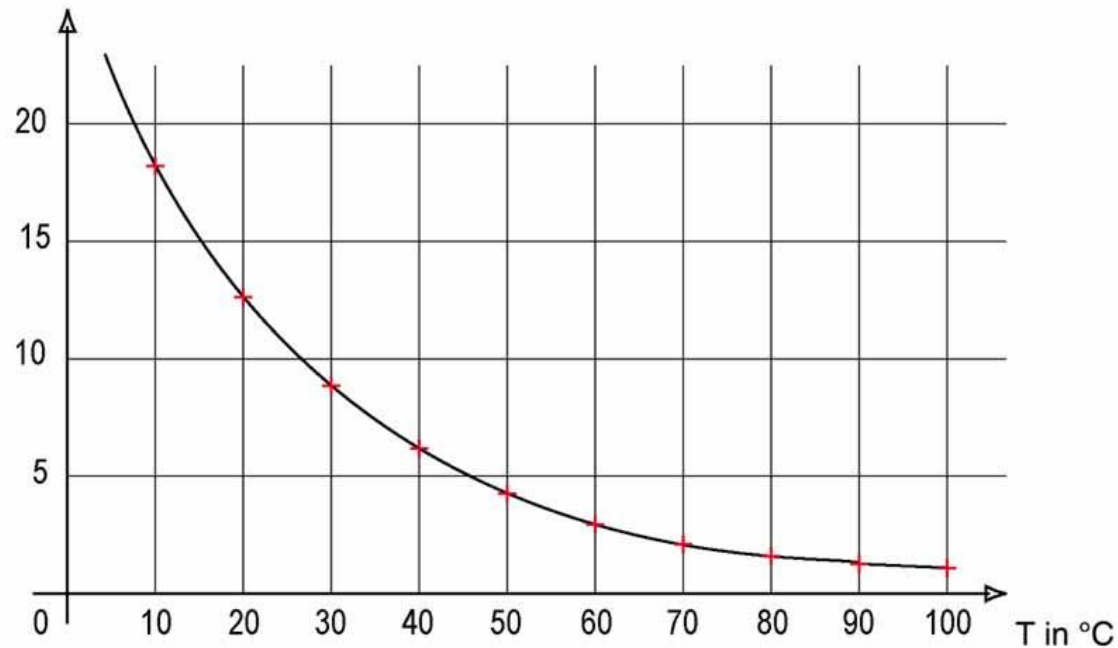
Specifications of the 3 sensors:



Contact sensor

Immersed sensor

Resistance in  $k\Omega$



Temperature (°C)	Resistance (kΩ)
0	27
10	17
20	12
25	10
30	8
40	5
50	4
60	3
70	2
80	1.5

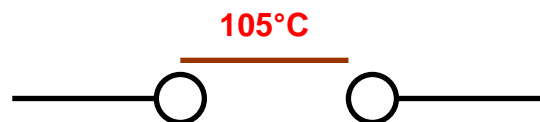
## 4.12 OVERHEAT SENSOR

**Location:** Clipped onto the main exchanger outlet tube,

**Technology:** Temperature switch

**Data:**

Cut-off temperature	:	<b>105 ± 4°C</b>
Re-activation temperature	:	<b>80°C + 10 -12°C</b>



Overheat sensor



STM P0033

Opening of the contact leads to an **A 01** fault on the LCD display.

In this case, the pump operates for 2 minutes and the 3-way valve is positioned in heating mode.

The fault only disappears when the temperature returns to the safety threshold value and the "Reset" button is pressed.



### 4.13 Gas valve

#### Location:

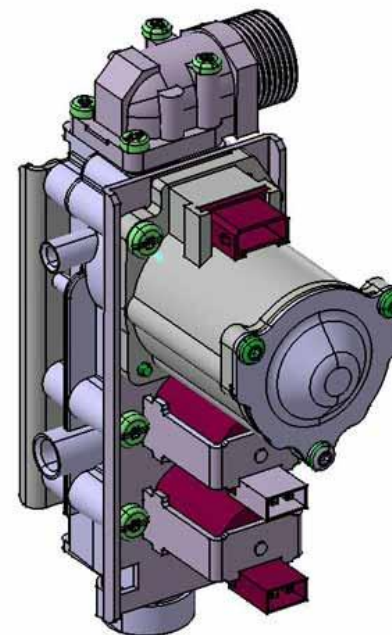
Between gas tap and manifold.

#### Composition:

Gas supply (1)  
 Safety solenoid valves (2)  
 Modulating solenoid valve (3)  
 Gas outlet (4)  
 Diaphragm (5)

#### Data:

Safety solenoid valves	: <b>110 Ohms 24 V</b>
Modulating solenoid valve	: <b>94 Ohms</b>
Starting current	: <b>85 mA</b>
Current when fully open	: <b>190 mA</b>



STM P0090

#### Operation:

##### *In ignition phase*

The current in the modulating solenoid valve is zero in the CF version but 110 mA (not adjustable) in the FF version. The two safety solenoids are supplied with power in both cases.

##### *In operating phase*

There are 2 types of mode:

0/P min intermittent mode for low demand.

Pmin and Pmax continuous mode for output demands above P min.

## Gas valve principles of operation

The electronic modulator controlled by the current (strength) causes the gas modulating valve to move and vary the size of the passage between the valve and its seat.

### Valve in stop position:

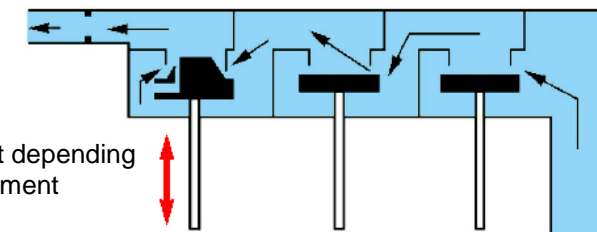
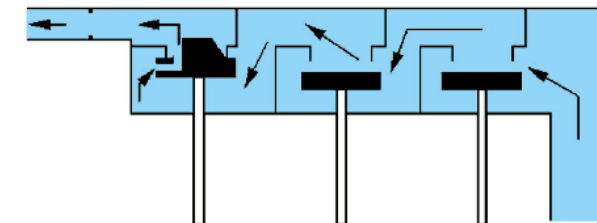
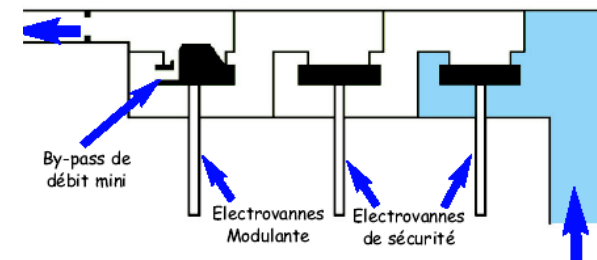
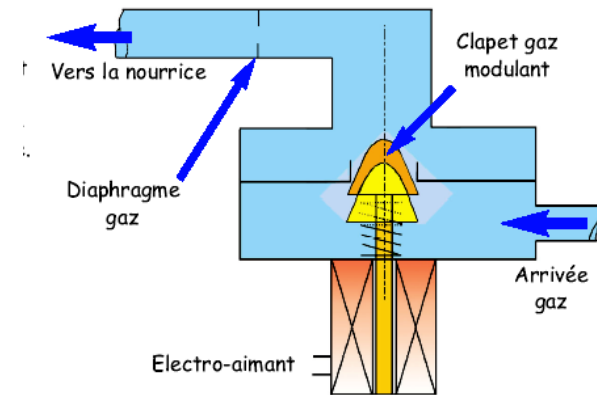
The gas is blocked by the two safety solenoid valves.

### Valve in minimum setting position:

The two safety solenoid valves are opened and the gas flows through the calibrated passage of the modulating valve (different for natural gas and LPG models).

### Valve in modulation position:

The gas flow varies depending on the gas valve opening.

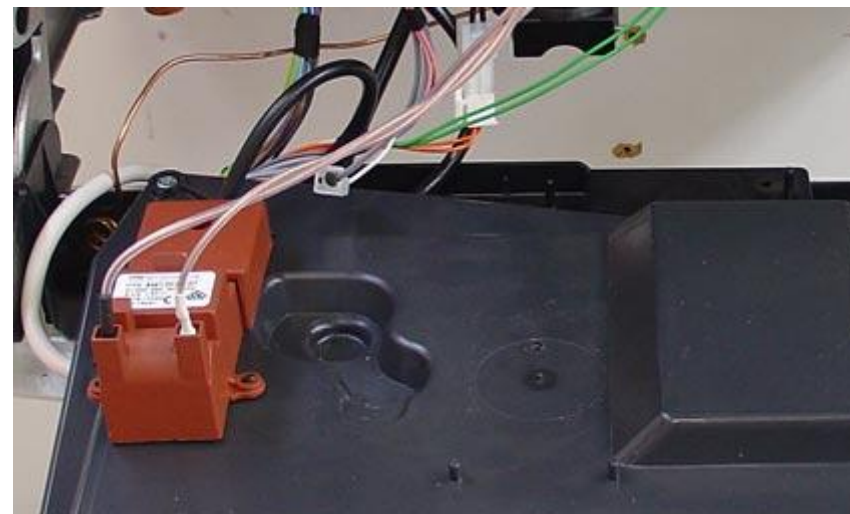


#### 4.14 IGNITER

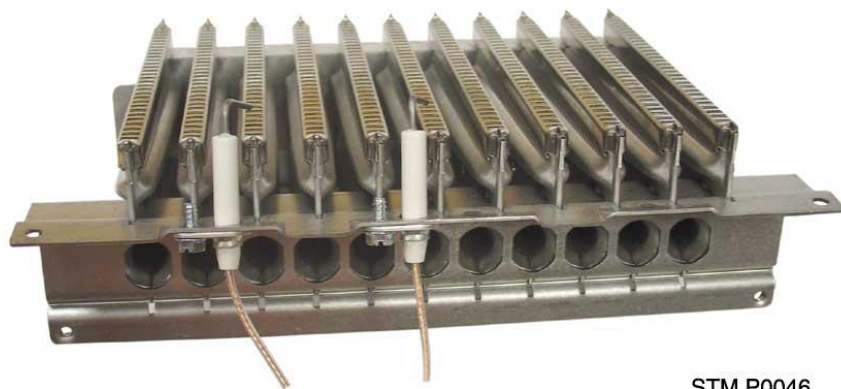
**Location:** Fixed onto the electrical unit

**Data:**

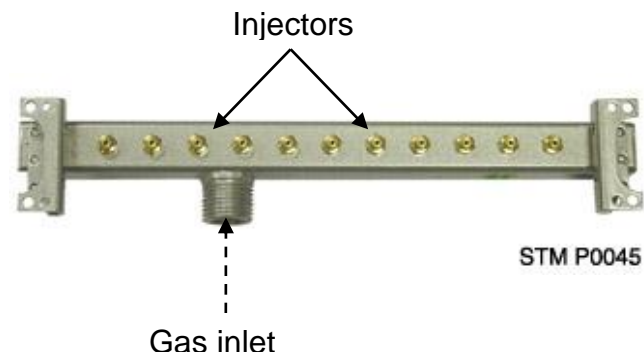
Input voltage:	:	<b>230 V</b>
Output voltage	:	<b>14 kV</b>
Consumption	:	<b>3 VA</b>



#### 4.15 BURNER



STM P0046



All of the injectors are screwed onto the aluminium manifold

There are three possible types of burner with the manifold on the front.

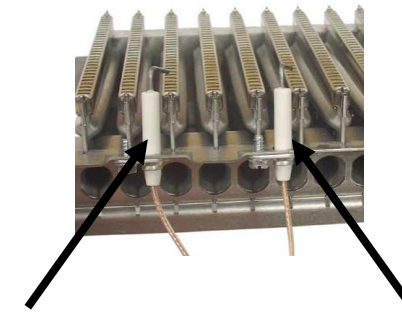
This depends on :  
 \_ the boiler model, CF or FF  
 \_ the boiler power output (24 or 30 kW)

	Number of injectors	Injector diameter G20 / G25	Injector diameter G30 / G31
<b>24 kW CF</b>	12	1.25	0.77
<b>24 kW FF</b>	11	1.35	0.80
<b>30 kW FF</b>	14	1.30	0.80

#### 4.16 IONISATION AND IGNITION ELECTRODES

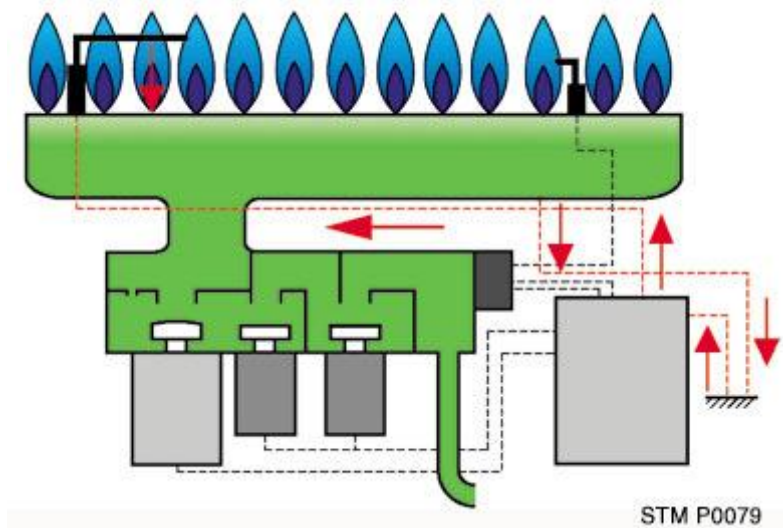
**Location:** On the front of the burner

A single ignition electrode,  
The spark from the ignition is created between the electrode and the burner.



Ionisation electrode

Ignition electrode



The minimum ionisation current is 0.5  $\mu$ A

#### 4.17 FLUE GASES

There are two possible boiler configurations:

- Flue duct
- Forced Flow

##### **FF Model:**

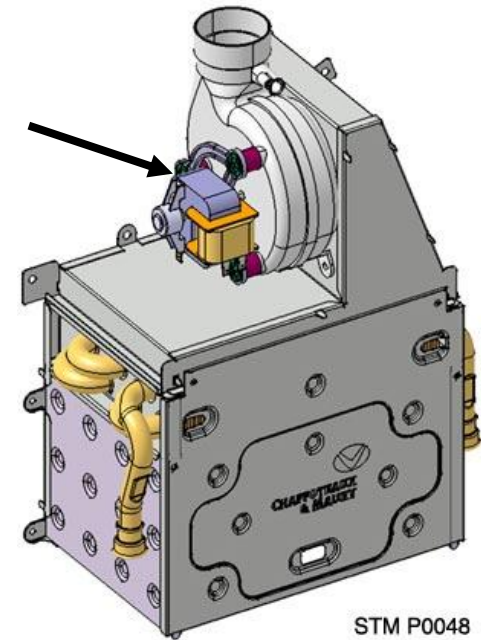
- Variable speed extractor fitted with a tachometer.
- Extraction control by pressure switch.

##### **CF & VMC Models:**

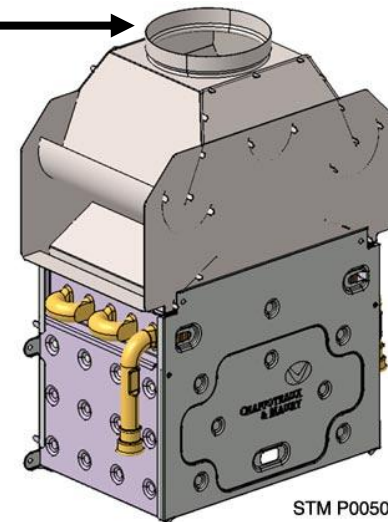
- Only 24 kW
  - Draught diverter with overflow safety device.

The upper section of the draught diverter is of diameter 130 mm and the lower section is 125 mm.

**Variable speed  
extractor fan**



**Diameter 130 / 125 mm**



#### 4.18 EXTRACTOR FAN (FF Model)

##### **Location:**

Fixed by a single bolt to the combustion chamber hood.

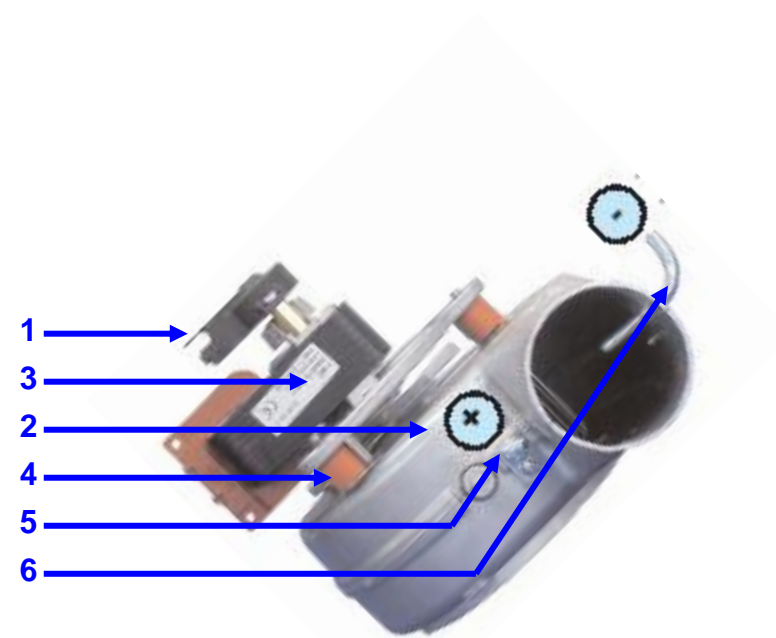
##### **Data:**

Power output: **35 W for the 24FF and 60W for the 30FF**

Variable speed extractor fan: **1600 to 2800 rpm.**

Speed required to activate the pressure switch: **2800 rpm**

Tachometer: **Hall-effect sensor**



- Tachometer (1)
- Cover (2)
- Motor (3)
- Silentbloks (4)
- Positive pressure tapping (5)
- Negative pressure tapping (6)



## Operation:

The speed of the extractor fan is directly proportional to the current supplied to the gas valve. The higher the current and the greater the power to the burner, the higher the speed of the extractor fan.

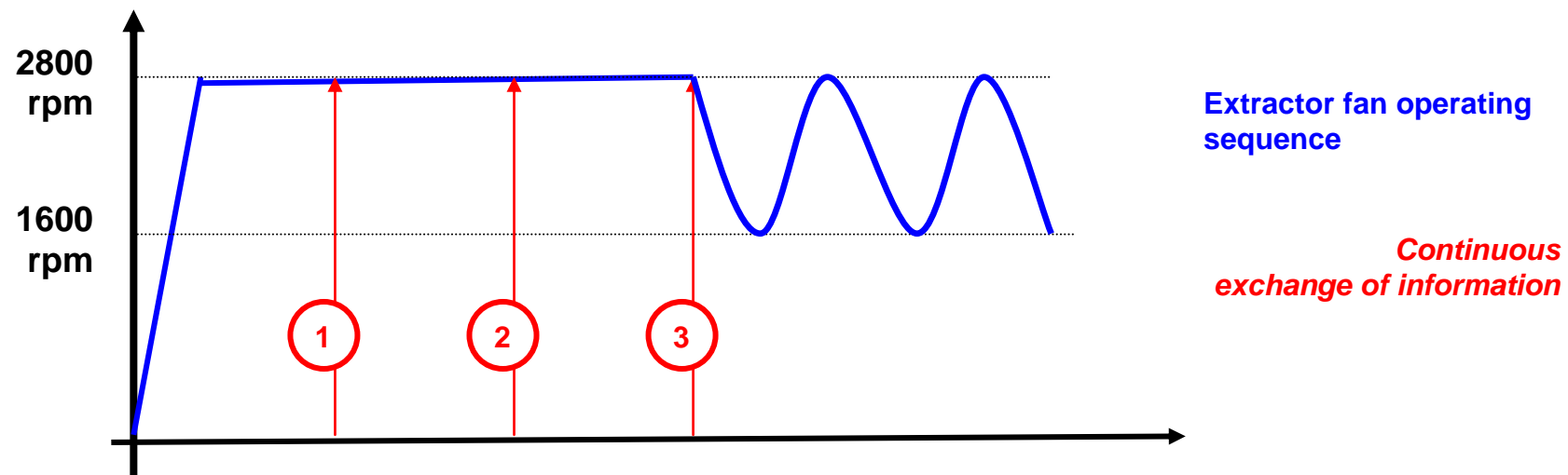
**On starting** : **-1-** The fan is supplied at the maximum speed of 2800 rpm. **-2-** As soon as the pressure switch is applied, the gas solenoids and the igniter are supplied. The extractor fan continues to operate at maximum speed until the ionisation signal is received.

**Operation** **-3-** As soon as the ionisation signal is correct the extractor fan speed is automatically linked to the power output of the burner in order to obtain a constant output. The speed then varies between 1600 and 2800 rpm.

When the burner is shut off, for regulation, in hot water mode the extractor fan continues to operate at maximum speed.

In heating mode, the fan stops until regulation is complete.

After the burner goes out, the fan continues operating if the temperature detected by the primary backflow sensor is higher than 85°C and until it drops to 80°C.



### **Tachometer (FF model only)**

#### **Location:**

Attached to extractor fan

#### **Data:**

Principle of a Hall-effect sensor on a 6-pole rotary magnet (3 positives / 3 negatives).

Frequency reading from a signal sent to the microcontroller.

The tachometer cannot be detached from the fan as a replacement part.

#### **Operation:**

##### *When starting*

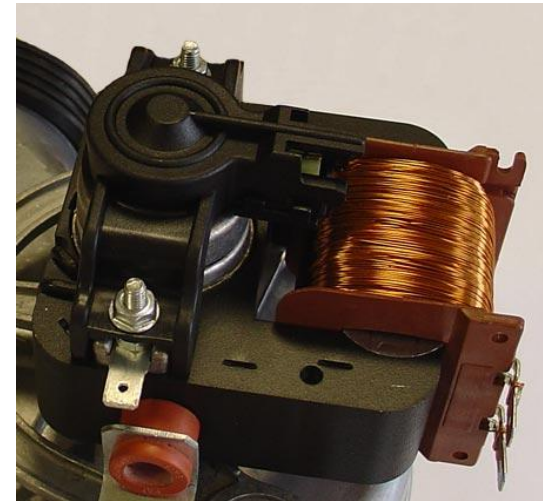
The electronic circuit must receive a signal from the speed sensor. If not, it is not possible to open the solenoid valves and fault code no. **24** appears on the control panel display for 4 seconds, after the command to operate the fan.

##### *In operation*

The microcontroller for the main circuit continuously compares the value read by the tachometer to the theoretical value of the burner output. After one minute's operation, if the difference is greater than 800 rpm for more than 10 seconds, fault code no. **23** flashes on the control panel.

#### Method of reading the fan speed:

The speed of rotation of the extractor fan is measured using a multimeter set to the frequency meter position.



## Method of checking the extractor fan speed

The speed of the extractor fan is governed by the following law:

$$\text{Extractor fan speed (rpm)} = 1/11 \times (120 \times I \text{ gas valve in mA} + 6800)$$

There are two possible methods of checking the extractor fan speed:

### A. By using a frequency meter:

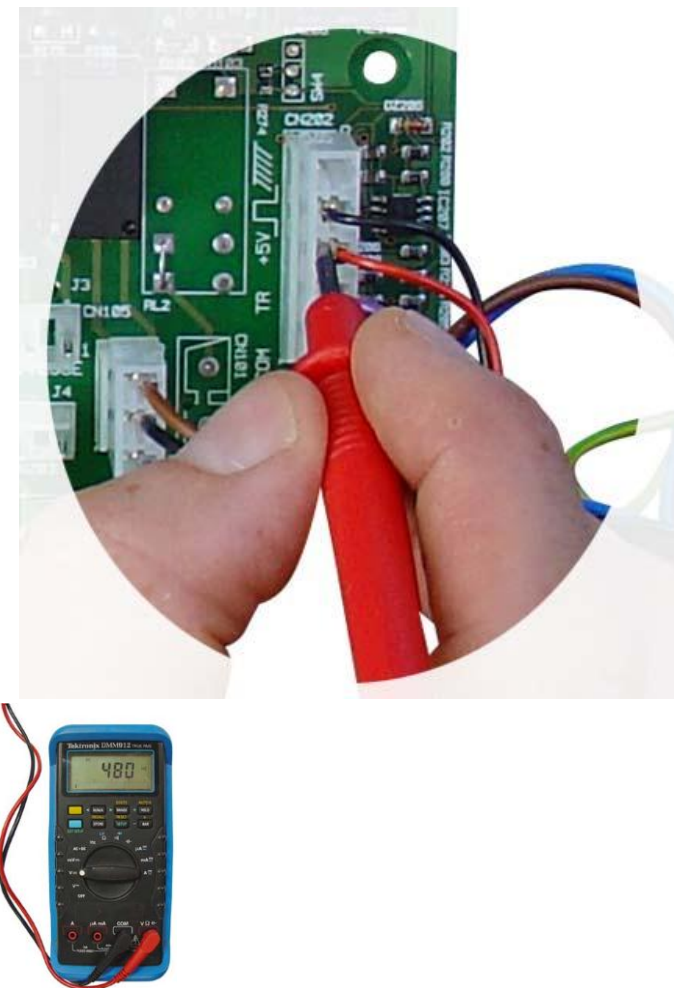
The extractor fan speed can be measured using a multimeter set to the frequency meter position.

Connect the + from the multimeter onto the third fan connector terminal on the main circuit (see photo).

Connect the – from the multimeter onto the earth connection block.

Multiply the value in Hz by **5** to obtain the speed in rpm.

The relationship between the extractor fan speed and the current to the gas valve is as follows:



### B. By reading the speed in menu 2

It is possible to instantly read the extractor fan speed. To do this, just go into menu **2** on line **2 3**. It then appears in hundredths of a turn per minute.

See the paragraph entitled "Settings / Adjustments"

Table of boiler output values in relation to the current of the gas valve and the speed of the extractor fan.

### 24 kW model

Power output (kW)	Gas valve current (mA)	Frequency (Hz)	Speed (rpm)
8	90	320	1600
10	103	350	1750
12	117	365	1900
14	131	410	2050
16	145	440	2200
18	158	470	2350
20	172	500	2502
22	186	531	2653
24	200	560	2800

*These are theoretical values. Some differences may appear for measurements relating to the components (tachometer, extractor fan, C.I) and to the supply voltage.*

### 30 kW model

Power output (kW)	Gas valve current (mA)	Frequency (Hz)	Speed (rpm)
8	90	320	1600
10	100	342	1712
12	110	364	1821
14	120	386	1931
16	130	408	2040
18	140	430	2149
20	150	452	2259
22	160	474	2368
24	170	595	2477
26	180	517	2587
28	190	539	2696
30	200	560	2800

#### 4.19 PRESSURE SWITCH (FF model)

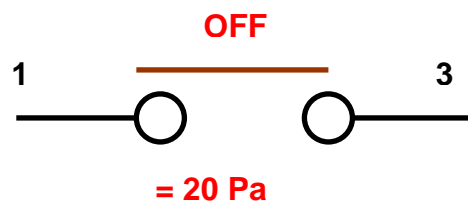
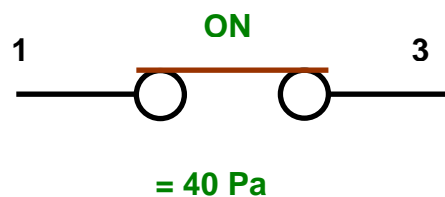
**Location:** At the top of the combustion chamber in the flow of burnt flue gases.

**Data:**

Two wire electrical connection

Operating position (**ON**) : burner supplied with gas

Rest position (**OFF**) : no gas supply to the burner



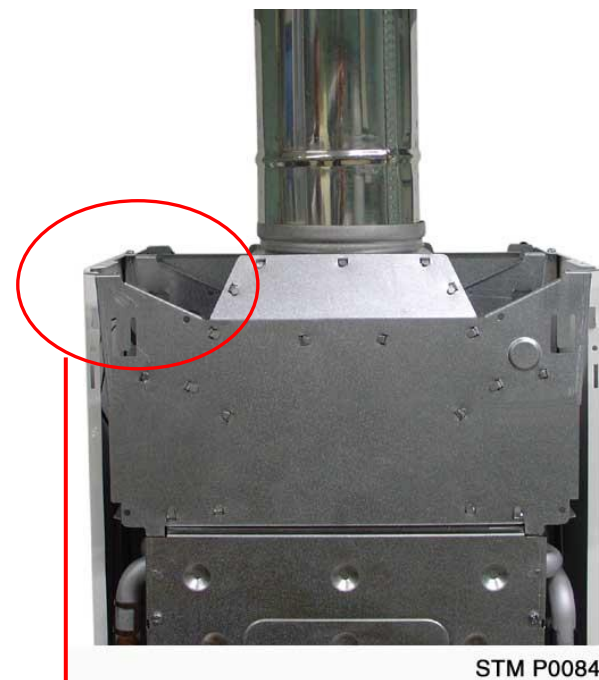
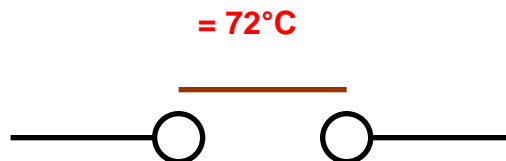
#### 4.20 OVERFLOW SAFETY DEVICE (CF model)

**Location:** Fitted near the draught diverter

**Technology used:** Temperature switch

Data:

Switch open	: $72^{\circ}\text{C} \pm 4^{\circ}\text{C}$
Switch closed	: $40^{\circ}\text{C} \pm 6^{\circ}\text{C}$
Switch Standby after opening	> 10 minutes





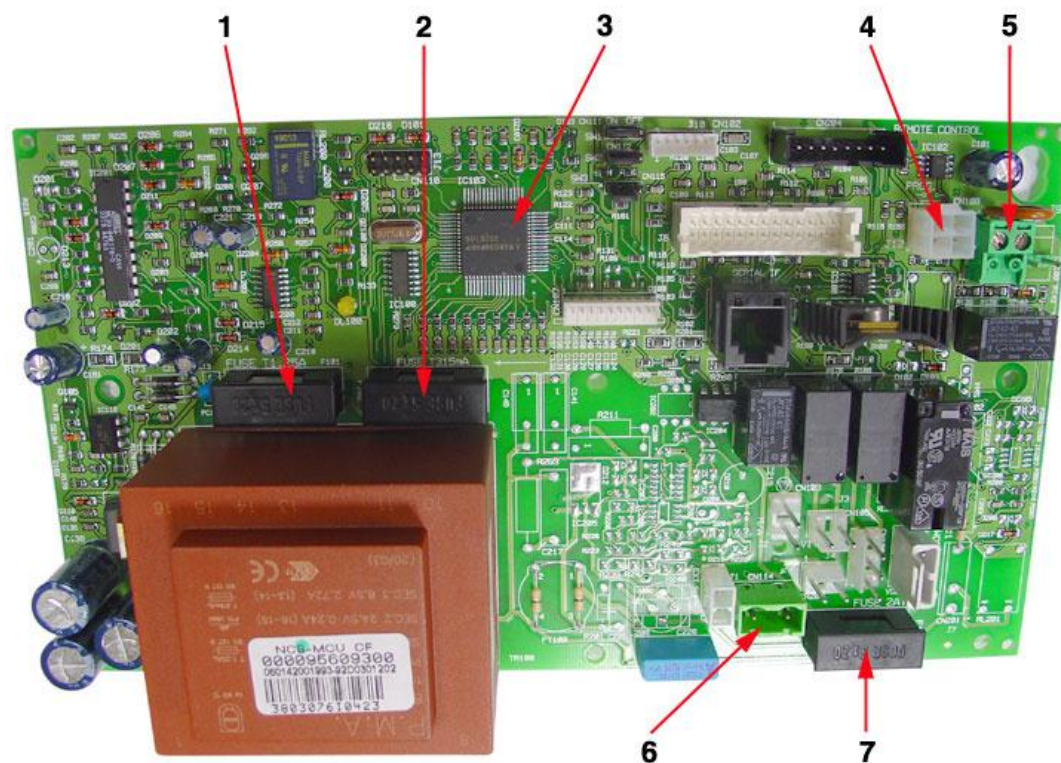
## 4.21 PRINTED CIRCUITS

### Location:

Inside the electrical unit (main board and display board)

### Main board

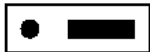
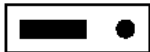





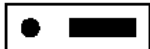

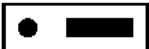
- |               |                         |                              |                             |
|---------------|-------------------------|------------------------------|-----------------------------|
| 1 1.25A fuse  | 3 Microprocessor        | 5 Room thermostat connection | 7 2A fuse (protection 230v) |
| 2 315 mA fuse | 4 Programmer connection | 6 230V power supply          |                             |



STM P0055



## Switch positions:

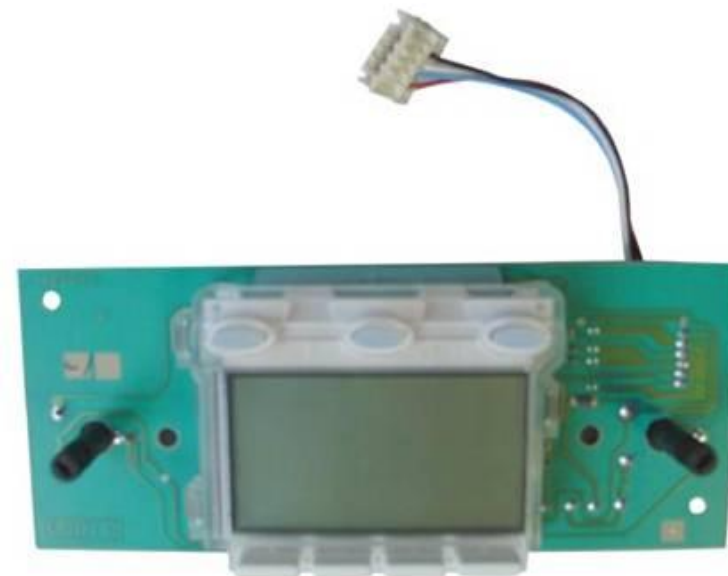
	<i>Vanne AEMF</i>	<i>Vanne Honeywell / Sit</i>		
SW1				
	<i>Type 2 (Mixte)</i>	<i>Type 3 (Système)</i>	<i>Type 1 (chauffage seul)</i>	<i>Type 4 (Echang. 24 pl.)</i>
SW2				
SW3				

## Display board

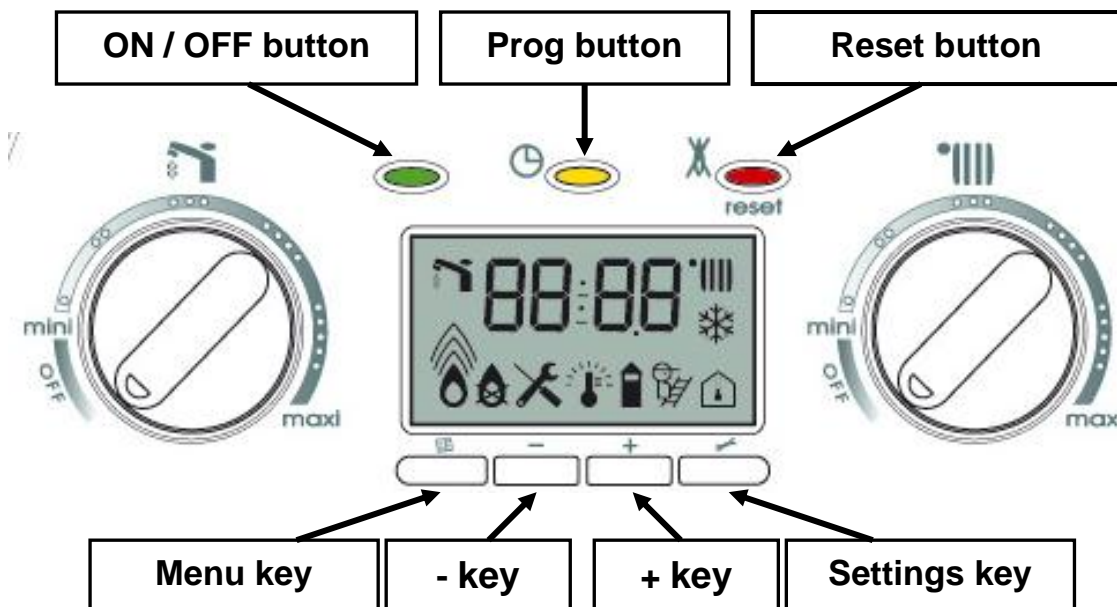
**Location:** Fixed by 2 screws to the cover of the unit

The circuit includes the heating and domestic hot water temperature setting potentiometers and the LCD display and its setting keys.

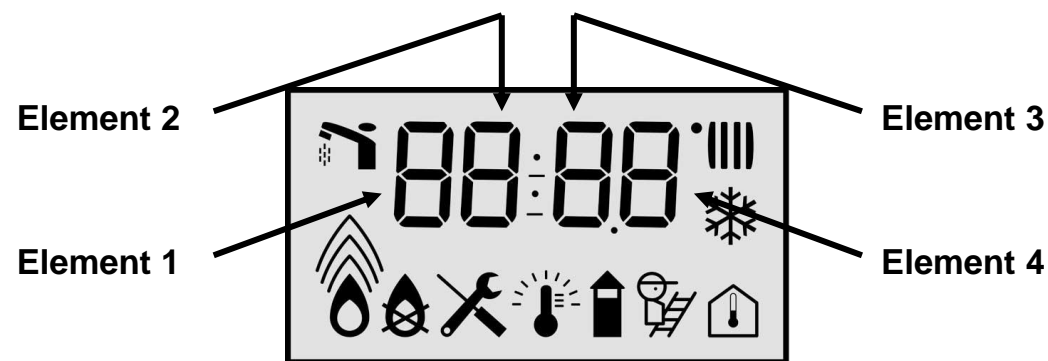
The connection between the circuits is made by 4-conductor wire link



## 5. SETTINGS AND ADJUSTMENTS

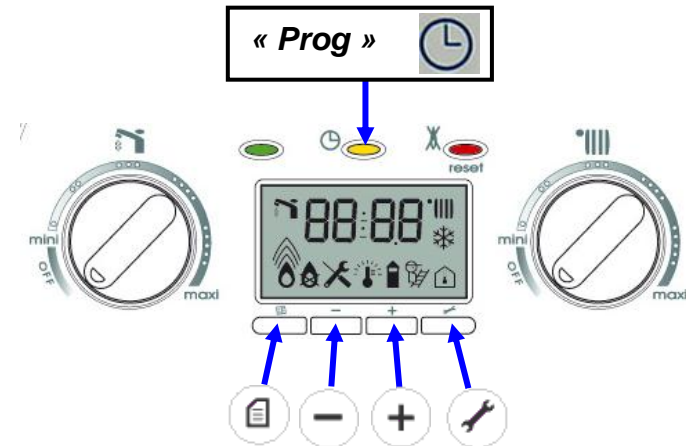


- Menu 1: History list of the 10 last faults
- Menu 2: Boiler status
- Menu 3: Boiler setting
- Menu 4: Boiler setting in heating mode
- Menu 5: Cleaning mode for combustion control
- Menu 6: External sensor setting



## 5.1 MENU NAVIGATION GUIDE

*Any action on the board (with the exception of pressing the "Stop" key) operates the LCD back light. This light goes out automatically 30 seconds after the last action.*



### To access the menus:

Press keys **+** and **-** for 5 seconds simultaneously. The figure 1 is displayed on the screen.

### Changing menus :

Press the **Menu** key

To access the next menu, press the **Menu** key again

### Scrolling through headings in a menu:

Press key **+** or **-** to go up or down through the headings.

### Changing the parameters of a heading (concerns only menus 3, 4, 5 and 6):

Press the **Settings** key + or **-** to change the parameters. Then press the **Settings**

### Returning to default settings:

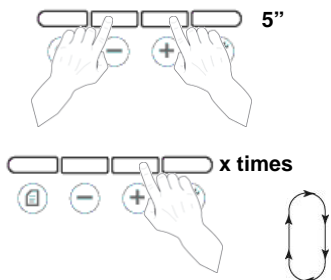
Go to menu **3, 4, 5 or 6** and press the **Settings** + keys simultaneously for 5 seconds. The display then flashes **CM**. Then simply press the **Menu**

### Resetting the stored "operating faults" memory in Menu 1:

Go to menu **1** and press the **Settings** + keys simultaneously for 5 seconds. The display then flashes **CM**. Then simply press the **Menu**

## 5.2 MENU 1 TABLE "Fault history"

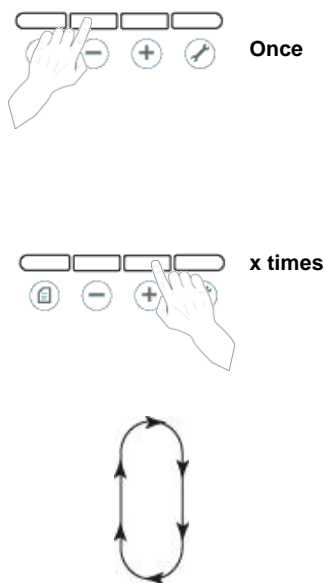
The history list of the boiler 10 last operating faults can be viewed in this menu.



Heading	Element 1	Element 2	Elements 3 & 4
Last fault detected	1	0	Code from <b>01</b> to <b>99</b>
Second-last fault detected	1	1	Code from <b>01</b> to <b>99</b>
...	1	...	Code from <b>01</b> to <b>99</b>
Last fault which appeared before the previous	1	9	Code from <b>01</b> to <b>99</b>

## 5.3 MENU 2 TABLE "Boiler Status"

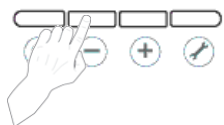
This menu indicates the status of the boiler.



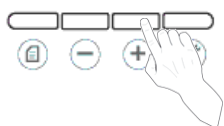
Heading	Element 1	Element 2	Elements 3 & 4
Software version on display board	2	0	Code from <b>01</b> to <b>99</b>
Software version on main board	2	1	Code from <b>01</b> to <b>99</b>
Type of flue gas extraction	2	2	<b>0:</b> CF <b>1:</b> FF <b>2:</b> VMC
Extractor fan speed (FF model only)	2	3	Code from <b>01</b> to <b>99</b>
Theoretical position of the 3-way valve	2	4	<b>0:</b> Domestic hot water position <b>1:</b> Heating position
Domestic hot water outlet temperature (in °C)	2	5	<b>01</b> to <b>99</b>
Not used	2	6	--
Primary outlet temperature (in °C)	2	7	<b>01</b> to <b>99</b>
Primary inlet temperature (in °C)	2	8	<b>01</b> to <b>99</b>
External temperature (in °C)	2	9	from <b>-99</b> to <b>99</b>

## 5.4 MENU 3 TABLE "Boiler settings"

This menu provides access to the boiler settings.



Once



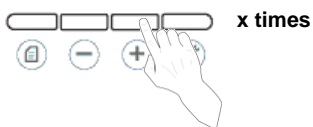
x times



Heading	Element 1	Element 2	Elements 3 & 4
Inactive	3	0	--
Celectic Domestic hot water setting set at 65°C and TIC at 0	3	1	0: No 1: Yes
Optional programmer action	3	2	0: on the heating and the exchanger preheating 1: on the exchanger preheating 2: on the heating
Boiler maximum power	3	3	between 0 and 10 (70% Pn) Pnom
Inactive	3	4	0: Domestic hot water position 1: Heating position
Domestic hot water time delay (TIC)	3	5	0 to 5 minutes in intervals of 30 seconds
Time delay for hot water flow rate controller (Anti-rebound).	3	6	0 to 20 tenths of a second
Inactive	3	7	--

## 5.5 MENU 4 TABLE "Boiler settings in heating mode"

This menu allows the boiler settings to be adjusted in heating mode.

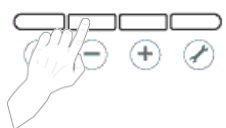
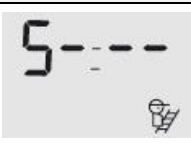
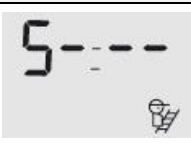
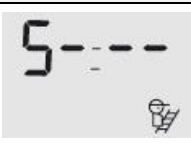
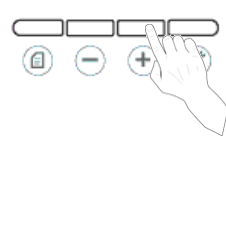
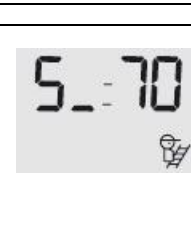
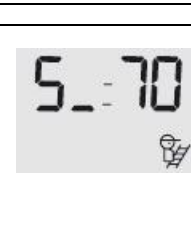
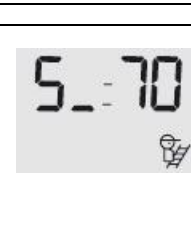
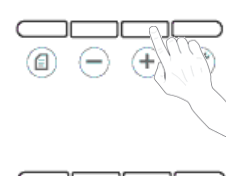
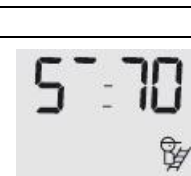
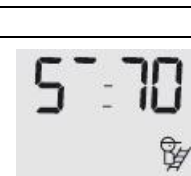
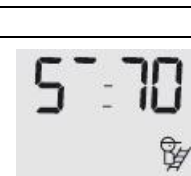
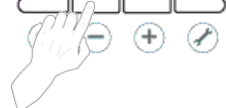


Heading	Element 1	Element 2	Elements 3 & 4
Pump shut-off operation	4	0	0: No 1: Yes
Pump speed	4	1	0: High 1: Adaptative
Duration of pump post-circulation	4	2	0 to 5 minutes in intervals of 30 seconds
Inactive	4	3	--
Maximum heating setting	4	4	50° to 90° in intervals of 1 degree
Minimum heating setting	4	5	25° to 50° in intervals of 1 degree
Inactive	4	6	--
Normal / On/Off operation	4	7	0: normal 1: On/Off control
Heating time delay	4	8	0 to 7 minutes in intervals of 30 seconds
Maximum gas power level in heating mode	4	9	Value from 0 to 10 Pmin and Pmax general

## 5.6 MENU 5 TABLE "Combustion Measurement"

This menu allows the technician to take combustion measurements by setting the heating setting first to Maximum Power and then to Minimum Power.

Measurements of CO<sub>2</sub> can therefore be taken and the settings made for these 2 levels.

 Once	<table border="1"> <thead> <tr> <th data-bbox="539 422 1081 518">EFFECT</th><th data-bbox="1081 422 2049 518">Display</th></tr> </thead> <tbody> <tr> <td data-bbox="539 518 1081 662">Cleaning mode not activated</td><td data-bbox="1081 518 2049 662">  </td></tr> </tbody> </table>	EFFECT	Display	Cleaning mode not activated	
EFFECT	Display				
Cleaning mode not activated					
 Once	<table border="1"> <tbody> <tr> <td data-bbox="539 662 1081 901">Cleaning mode activated by pressing the settings key</td><td data-bbox="1081 662 2049 901">           The temperature of the main exchanger outlet appears on elements 3 and 4 of the display.            The segment on item 2 of the display indicates the gas power level (at the top: maximum / at the bottom minimum)            </td></tr> </tbody> </table>	Cleaning mode activated by pressing the settings key	The temperature of the main exchanger outlet appears on elements 3 and 4 of the display. The segment on item 2 of the display indicates the gas power level (at the top: maximum / at the bottom minimum) 		
Cleaning mode activated by pressing the settings key	The temperature of the main exchanger outlet appears on elements 3 and 4 of the display. The segment on item 2 of the display indicates the gas power level (at the top: maximum / at the bottom minimum) 				
 x times	<table border="1"> <tbody> <tr> <td data-bbox="539 901 1081 1077">Changing the gas power level</td><td data-bbox="1081 901 2049 1077">           To change the gas power level, from minimum to maximum and vice versa, use the + and – keys            </td></tr> </tbody> </table>	Changing the gas power level	To change the gas power level, from minimum to maximum and vice versa, use the + and – keys 		
Changing the gas power level	To change the gas power level, from minimum to maximum and vice versa, use the + and – keys 				
	<table border="1"> <tbody> <tr> <td colspan="2" data-bbox="539 1077 2049 1184">Exit cleaning mode by pressing the <b>Menu</b> key</td></tr> </tbody> </table>	Exit cleaning mode by pressing the <b>Menu</b> key			
Exit cleaning mode by pressing the <b>Menu</b> key					

Conditions for deactivating or stopping the cleaning mode:

- Boiler on standby or safety stopped or locked
- Heating mode with no room thermostat request or heating flow temperature reaches the heating setting
- After resetting to zero or a mains power cut
- At the request of the technician when quitting menu 5
- Otherwise, after 15 minutes

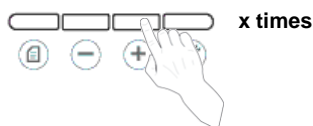


## 5.7 MENU 6 TABLE" Adjusting the temperature control settings"

The boiler electronic circuit is programmed to automatically manage the heating flow temperature setting depending on the external temperature and/or the room temperature.

Menu **6** allows the technician to adjust all the parameters required for thermal regulation.

The micro-controller then calculates the value of the temperature at the outlet of the heating body in order to reach the setting selected by the customer.



Heading	Element 1	Element 2	Elements 3 & 4
Type of control	6	0	<b>0:</b> Heating setting can be adjusted by the user <b>1:</b> Variable heating setting depending on the external temperature (T°) <b>2:</b> Variable heating setting depending on the room temperature (T°) <b>3:</b> Variable heating setting depending on the external and room temperatures (T°)
Compensation	6	1	If  60: 2 <sup>nd</sup> or  60: 3 <sup>rd</sup> 00 to 20 in intervals of 1
Slope	6	2	If  60: 1 <sup>st</sup> or  60: 3 <sup>rd</sup> 0.3 0.5 1.0 1.2 1.5 2.0 2.5 3.0
Parallel shift	6	3	If  60: 1 <sup>st</sup> or  60: 3 <sup>rd</sup> from -20 to 20 in 1 stages
Inactive	6	4	--
Inactive	6	5	0
Inactive	6	6	--
Inactive	6	7	--
Inactive	6	8	--
Inactive	6	9	--

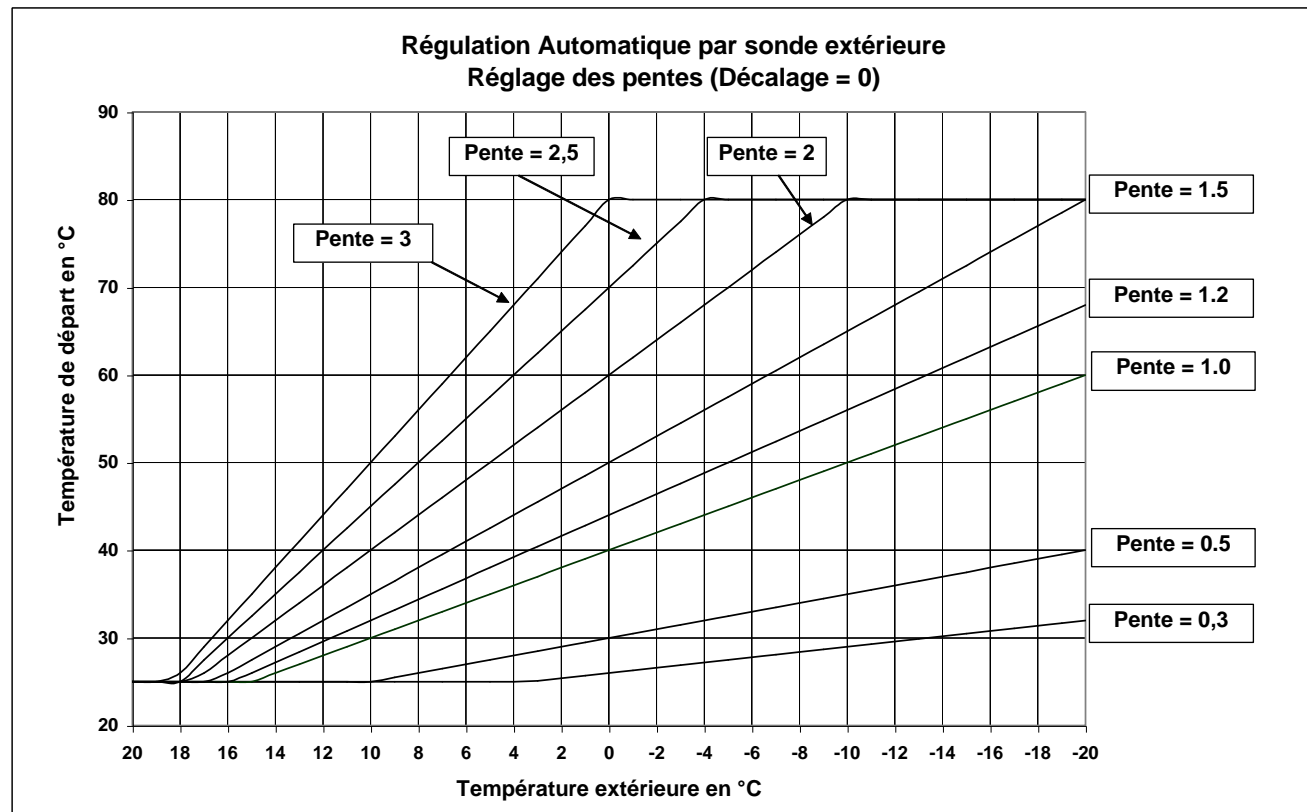
### A. SETTING the slope (line 6 2 in menu 6)

The slope setting adjusts the regulation to the type of installation. The greater the "slope" the higher the temperature value at the heating body outlet will be for low external temperatures.

This setting depends on the heating installation:

**Table A**

Type of heating installation	SLOPE
Convection heater	<b>From 2.5 to 3</b>
High temperature radiator	<b>From 1.5 to 2</b>
Low temperature condensing radiator	<b>From 1 to 1.2</b>
Direct underfloor heating	<b>0.3 - 0.5</b>



To optimise the regulation, it is very important to set the max. and min. heating flow temperatures in menu 4 .

**Examples of slope and boiler outlet temperature settings:**

Type of heating equipment	Max. heating setting via menu 4.4	Min. heating setting via menu 4.5	Slope settings via menu 6.2
Convection heater	80 °C	50 °C	From 2.5 to 3
High temperature radiator	80 °C	45 °C	From 1.5 to 2.5
Low temperature condensing radiator	65 °C	35 °C	From 1 to 1.5
Direct underfloor heating	50 °C	25°C	From 0.3 to 1

**B. SETTING the slope parallel shift (line 6 3 in menu 6 ):**

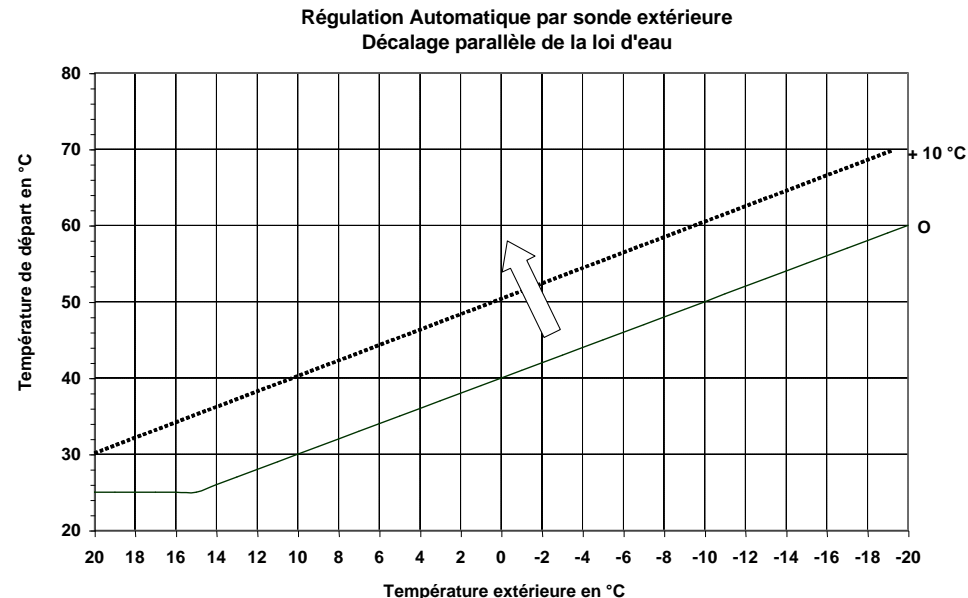
This setting allows the regulation to be adjusted depending on the building and especially on its level of thermal insulation and free provision of energy (large bays).

The greater the shift, the higher the temperature at the boiler outlet.

The factory setting is **10**.

**Examples of settings**

Building characteristics	Shift setting in °C
Low insulation	Shift = 15 to 20°C
Medium insulation	Shift = 5 to 15°C
High insulation	Shift = 0 to – 5°C



## HELP with SETTINGS

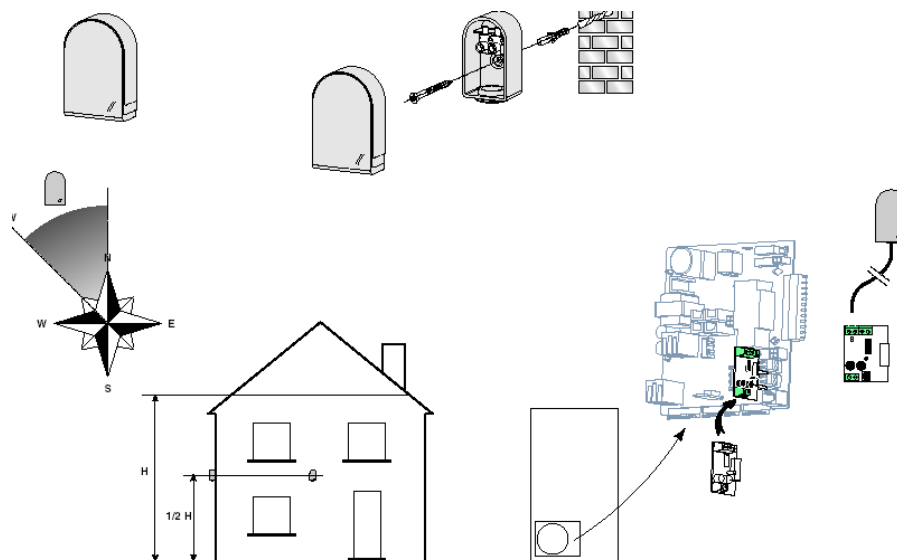
REGULATION BY EXTERNAL SENSOR	Climatic Conditions (External Temperature)		Slope adjustment	Parallel shift adjustment
	Cold ( $\cong 0^{\circ}\text{C}$ )	Mild ( $\cong 10^{\circ}\text{C}$ )		
	Impression inside building location			
	I'm cold	I'm cold	OK	Increase ++
	I'm cold	Correct	Increase	OK
	I'm cold	I'm too hot *	Increase ++	Decrease -
	Correct	I'm cold *	Decrease	Increase ++
	Correct	I'm too hot *	Increase	Decrease -
	I'm too hot *	I'm cold	Decrease -	Increase
	I'm too hot *	Correct	Decrease	OK
	I'm too hot *	I'm too hot *	OK	Decrease -

NB: I'm too hot\*  $\Rightarrow$  use of a room thermostat to provide optimum thermal comfort

## Fitting the external sensor

The kit comprises:

- The external sensor
- 1 screw + 1 rawl plug for the fixing
- 1 interface circuit for the connection
- 1 fittings instruction sheet



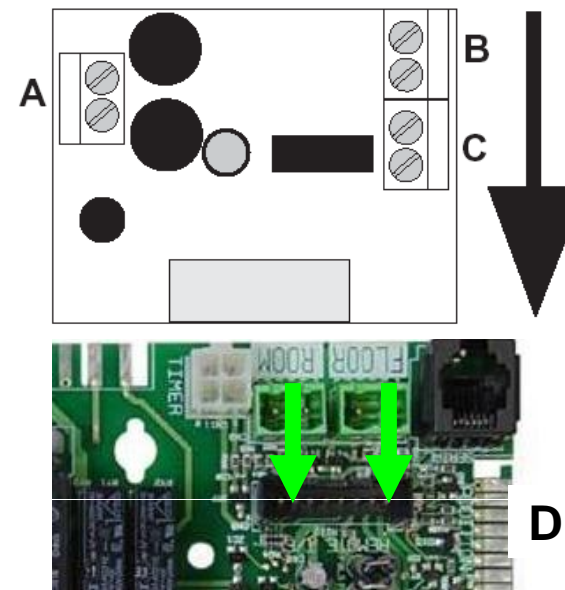
## External sensor electrical connection:

The sensor must be connected to connector **B**

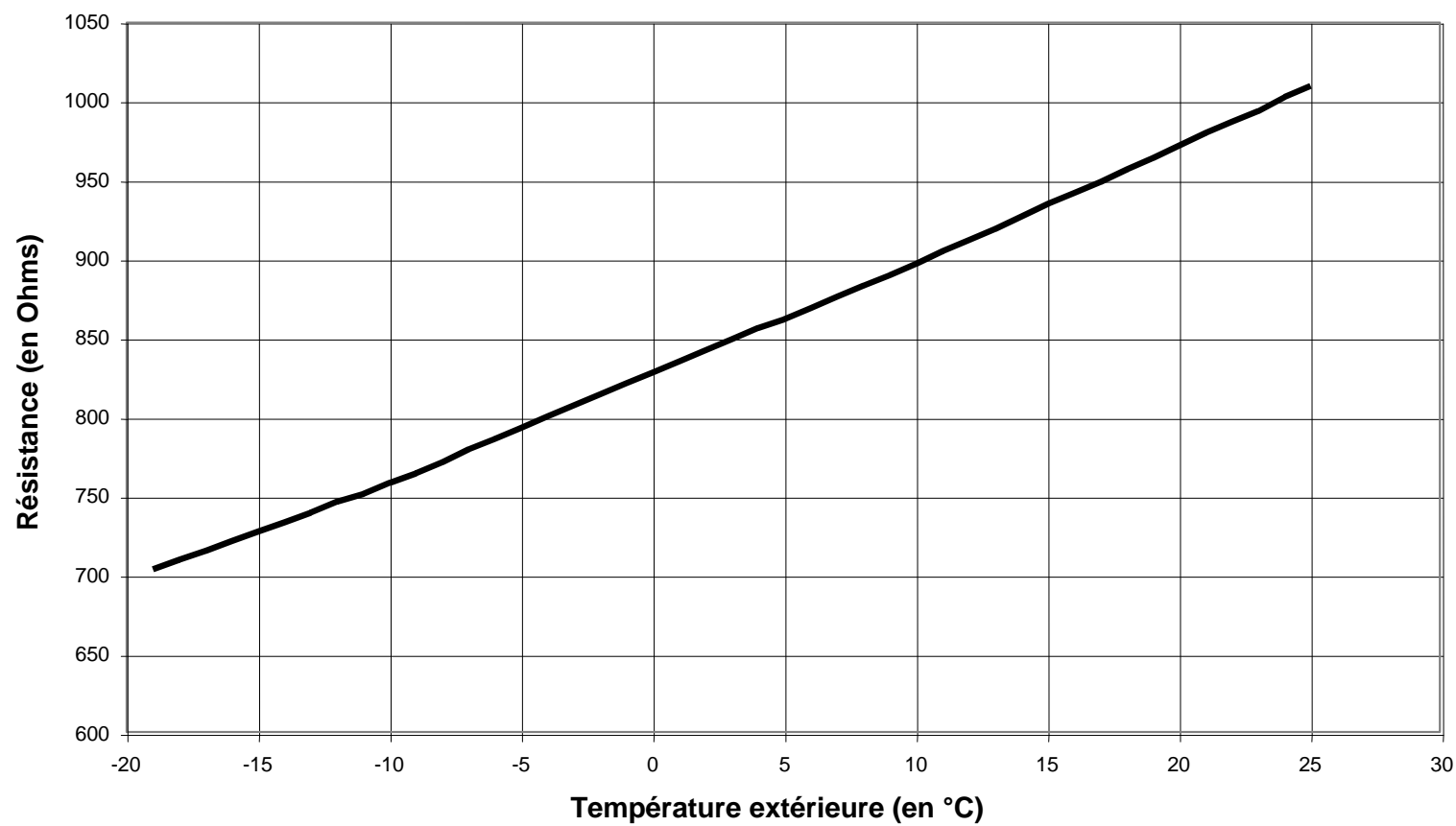
Connector **D** is connected to the boiler main circuit.

Connector **A** is used if connecting a separate "Clima Manager" type unit.

Connector **C** is a "dry contact" for an external actuator control (not used)



**Details of the external sensor**

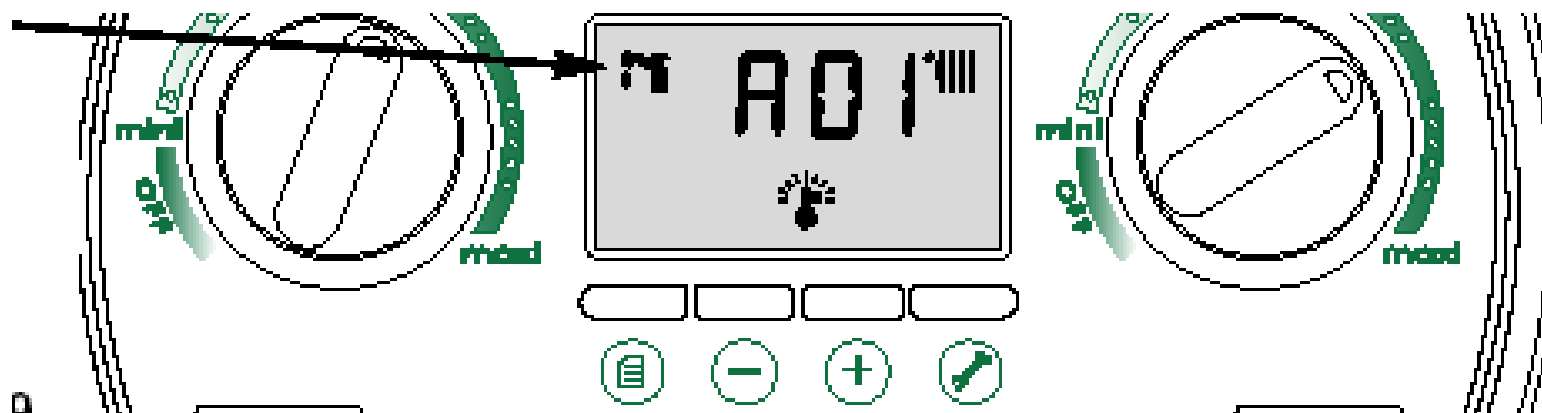


## 6. OPERATING FAULTS

A 2-digit code flashes on the display to indicate an operating fault or to provide information.

For **A** faults the red indicator light is also on. This relates to secure locking,

If the letter **E** appears in front of the code, this relates to a fault without locking, ie, if the fault disappears, the boiler is able to operate again.





## FAULT CODES

Code displayed	Fault description
A 01	Safety device activated by primary heat exchanger overheating
A 03	Safety device activated by ignition failure
E 06	Burner frost protection
E 07	No water circulation
E 08	Primary circulation fault
E 09	Domestic hot water sensor open
E 10	Domestic hot water sensor short-circuited
E 11	Primary backflow sensor open
E 12	Primary flow sensor short-circuited
E 13	Primary backflow sensor open
E 14	Primary backflow sensor short-circuited
E 15	External sensor open
E 16	External sensor short-circuited
E 17	Shut down by SPOTT (CF) flue gas backflow fault or 1.25A fuse
E 18	Attempted re-ignition during operation
E 19	Safety device activated by flue gas backflow. Mechanically Controlled Ventilation model
E 20	Wiring or 1.25 A fuse fault
E 21	No extractor fan flow (FF)
E 22	Extraction sensor fault (FF)
E 23	Extractor speed low
E 24	Extractor controller fault (FF)
E 28	Clima Manager memory card faulty
E 29	Clima Manager room sensor in open circuit
E 30	Clima Manager room sensor in short circuit
E 31	Communication fault with display board
E 32	Communication fault with main board

## DETAILS OF THE FAULT CODES

### **Fault no. 1: *Safety device actuated by overheating.***

Boiler locked by the triggering of the overheating sensor at the main heat exchanger delivery outlet. It only disappears when the temperature returns to the safety threshold value and the Reset button is pressed.

### **Fault no. 3: *Safety device activated by ignition fault***

Boiler locked. It appears when burner ignition is attempted but no flame is detected during the 7 seconds following the opening of the gas solenoid valves. It disappears only when the Reset button is pressed.

### **Fault no. 6: Burner frost protection**

It appears when the temperature measured by the primary outlet sensor is below 4°C. The pump is then supplied with current and the 3-way valve is in the heating position even if the boiler switch position is on O. The burner then ignites. It disappears when the temperature at the heating body outlet is above 15°C.

### **Fault no. 7: No water circulation**

It appears when the Temperature difference between the primary outlet sensor and the primary backflow sensor is more than 40°C. It disappears when the difference is less than 30°C.

### **Fault no. 8: Primary circulation fault**

It appears when the primary backflow sensor temperature is 10°C higher than that of the primary outlet sensor. It disappears when the backflow temperature is lower than the outlet temperature.

### **Fault no. 9: Domestic hot water sensor open**

It appears when the sensor is in open circuit or for a value close to 2°C.

### **Fault no. 10: Domestic hot water sensor short-circuited**

It appears when the hot water sensor is short-circuited or for a value close to 100°C.

### **Fault no. 11: Primary outlet sensor open**

It appears when the sensor is in open circuit or for a value close to 2°C.

**Fault no. 12: Primary outlet sensor short-circuited**

It appears when the hot water sensor is short-circuited or for a value close to 100°C.

**Fault no. 13: Primary backflow sensor open**

It appears when the sensor is in open circuit or for a value close to 2°C.

**Fault no. 14: Primary backflow sensor short-circuited**

It appears when the hot water sensor is short-circuited or for a value close to 100°C.

**Fault no. 15: External sensor open**

It appears when the sensor is in "open circuit" and the temperature is close to its min. value -159°C.

**Fault no. 16: External sensor short-circuited**

It appears when the sensor is in "short circuit" and the temperature is close to its max. value +252°C.

**Fault no. 17: Shut down by SPOTT (CF) flue gas backflow fault or 1.25A fuse**

It only appears on CF models. It is due to the opening of the backflow safety device contact in the draught diverter. It disappears after 10 minutes.

This fault can also appear if the 1.25 A fuse on the printed circuit board is faulty.

**Fault no. 18: Attempted ignition**

It appears when a flame is no longer detected during a burner operating phase. This causes an attempt at re-ignition. The fault disappears if a flame is once again detected; if not, fault no.3 appears.

**Fault no. 19: Safety device activated by flue gas overflow. VMC model**

It only appears on Mechanically Controlled Ventilation models. It is due to the opening of the backflow safety device contact in the draught diverter. The boiler is locked, red indicator light. It disappears when the safety device reaches reactivation temperature and after the Reset button is pressed.

**Fault no. 20: Wiring (FF) or 1.25A fuse fault**

It appears when there is no 24-volt feed to the microprocessor. One of the causes may be the wiring or the 1.25 A fuse.

**Fault no. 21: No extraction flow (FF)**

It appears 10 seconds after the command to switch on the extractor fan if the operating position is not detected. If the contact appears within one minute the fault disappears automatically; otherwise the reset button must be pressed.

**Fault no. 22: Extraction sensor fault (FF)**

It appears 15 seconds after the extractor fan is switched off if the pressure switch contact remains in the operating position. It disappears when the pressure switch contact is in the rest position.

**Fault no. 23: Extractor fan speed low**

It appears if the speed measured by the tachometer is more than 800 rpm higher than the theoretical speed calculated by the microprocessor for more than 10 seconds.

**Fault no. 24: Extractor fan controller fault (FF)**

It appears if no signal is recorded from the tachometer 4 seconds after an instruction was sent to the extractor.

**Fault no. 28: Clima Manager memory card faulty**

It appears when the main card has problems communicating with the Clima Manager Eeprom.

**Fault no. 29: Remote unit problem**

It appears when the Clima Manager room temperature sensor is disconnected.

**Fault no. 30: Remote unit problem**

It appears when the Clima Manager room temperature sensor is short-circuited.

**Fault no. 31: Communication problem with display board**

It appears if a problem is detected with the microprocessor after the power is turned on or the Reset button is pressed.

**Fault no. 32: Communication fault with the main board**

It appears when a message sent by the microprocessor is not received.

## 7. ACCESSORIES

### 7.1 CLIMA MANAGER 3318123

The Clima Manager is a remote control unit which communicates with the boiler. It provides information on the operating status of the boiler. It should be set in menu 6 of the boiler.

The control unit keys are used to manage the heating comfort level for the house and to control the domestic hot water.

It includes:

- A room thermostat function with weekly programming
- A room sensor used for temperature control

The connection to the boiler is made by two wires.

ON / OFF button

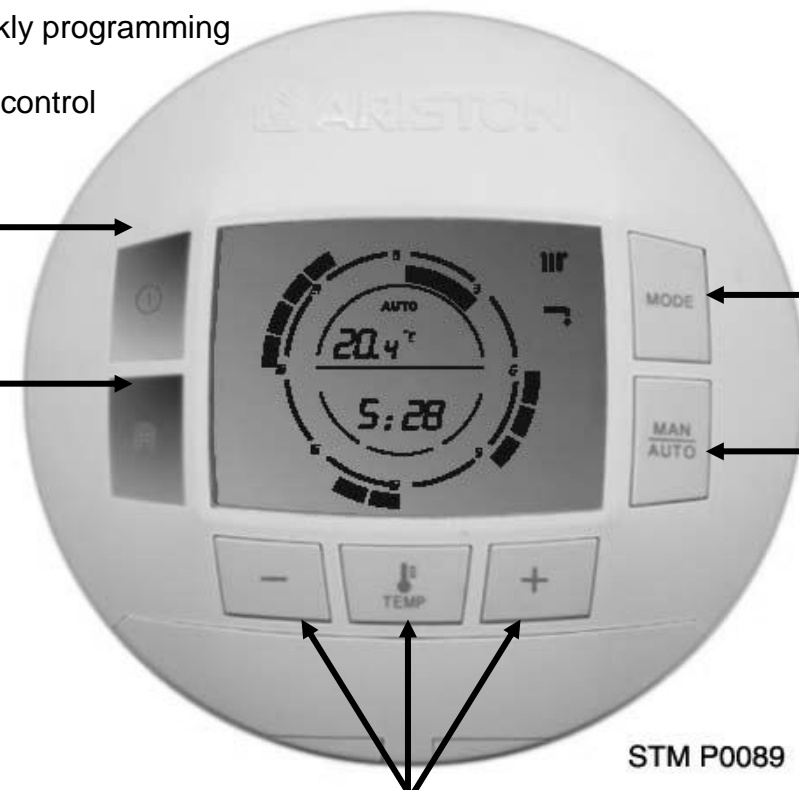
reset

Mode selection

Automatic or Manual operation key

The kit comprises:

- The CLIMA MANAGER
- 2 screws + 2 rawl plugs for the fixing
- 1 interface circuit for the connection
- 1 C.I module counter
- 1 fittings instruction sheet



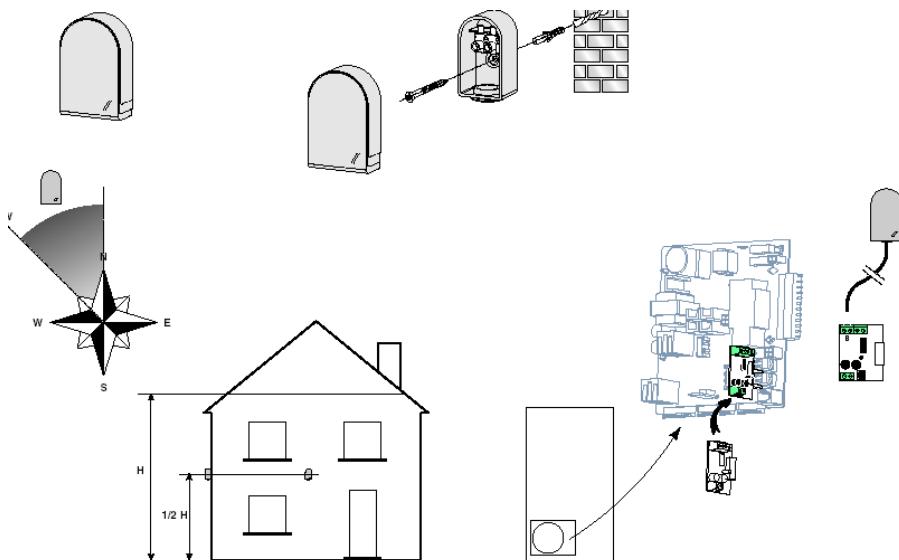
Temperature adjustment

## 7.2 EXTERNAL SENSOR 3318151

The boiler electronic unit is equipped to receive an external sensor. It should be set in menu 6 for the boiler.

### The kit comprises:

- The external sensor
- 1 screw + 1 rawl plug for the fixing
- 1 interface circuit for the connection
- 1 fittings instruction sheet



### 7.3 REPLACEMENT KIT

- To replace a CELTIC, NECTRA, ELM, or SD boiler, a 45 mm wall spacing kit, ref **3678135** needs to be installed and a set of connections depending on the type of boiler.

The wall spacing kit is supplied pre-fitted from the factory.

- CELTIC	ref. 3678131
- NECTRA	ref. 3678132
- ELM	ref. 3678133
- Saunier Duval	ref. 3678134





## Installing the wall spacing kit and the connection panel

- **Install** the wall spacer as indicated in the instruction sheet provided with the kit, then fit the connection panel.
- Fix the wall spacer using the fitting template. (1)
- Fit the connection panel (2a & 2b) onto the spacer
- Fit the set of connections between the connection panel and the installation
- Before installing the boiler, remove the two screws from the connection panel to free off the connections (3) and to make the connection easier

