DIDACTIC MANUAL

FAMILY:	Wall-hung boilers
GROUP:	Instantaneous, natural draught, forced draught
MODELS:	PANAREA COMPACT VELA COMPACT
VERSIONS:	Indoor
CODICE:	AST 14C157/00

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ENGLISH

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BRAND NAME

NOVA FLORIDA

Content

CHAPTER 1
TECHNICAL CHARACTERISTICS

1.1 MODELS

PANAREA COMPACT CTFS 24 AF
PANAREA COMPACT CTN 24 AF
VELA COMPACT CTFS 24 AF
VELA COMPACT CTN 24 AF

KEY CHART:
C : combination boiler
TFS : forced draught, sealed chamber
AF : still water
TN : natural draught

MAIN CHARACTERISTICS :
PANAREA - VELA CTFS 24 AF: combination boiler, DHW + CH water, forced draught, sealed chamber, still water, bi-thermal exchanger;
PANAREA - VELA CTN 24 AF: combination boiler, DHW + CH water, natural draught, still water, bi-thermal exchanger;

1.2 DIMENSIONS

Height H = 700 mm

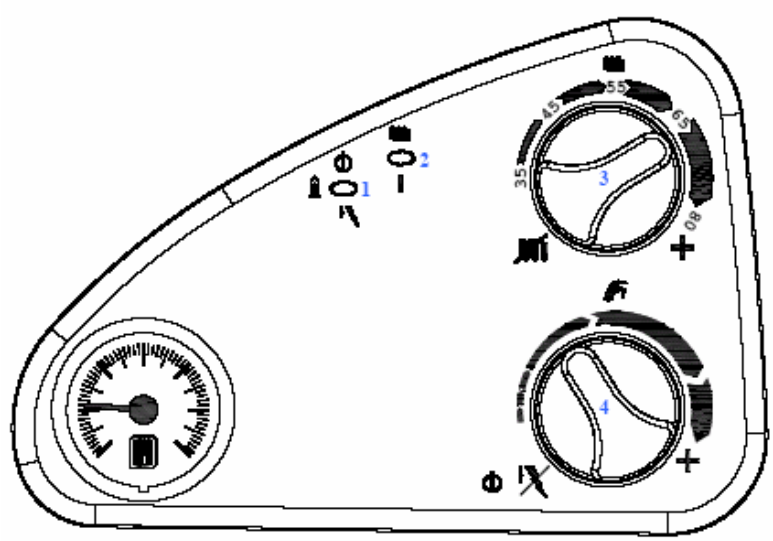
Width L = 400 mm

Depth P = 250 mm

Panarea

Vela

1.3 DIAGNOSTICS



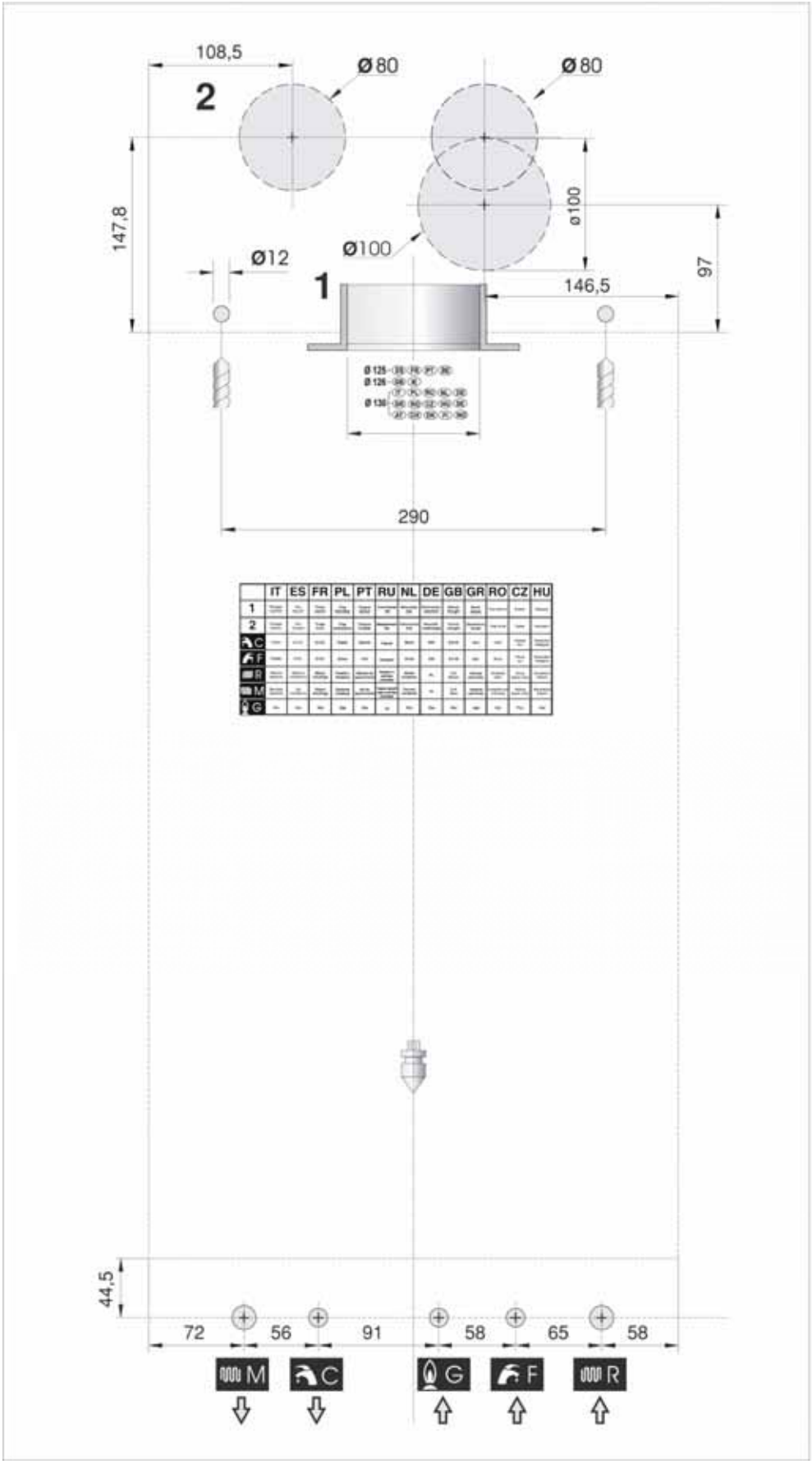
CH KNOB [3]: allows setting desired CH temperature and, fully turned counter-clockwise , ,allows for CH deactivation.

DHW KNOB [4]: allows to set desired DHW temperature and, fully turned counter-clockwise , allows for boiler reset or stand-by mode activation.

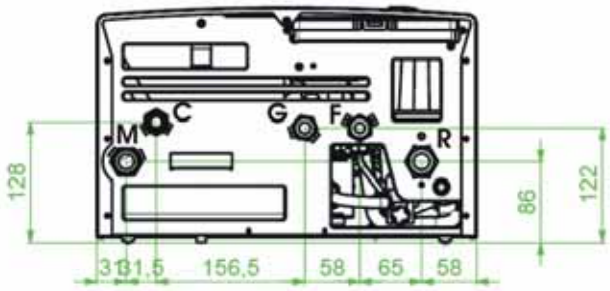
DIAGNOSTIC
The boiler status or shutdown type are detectable via three 3-colored LED's (RED, GREEN, YELLOW).

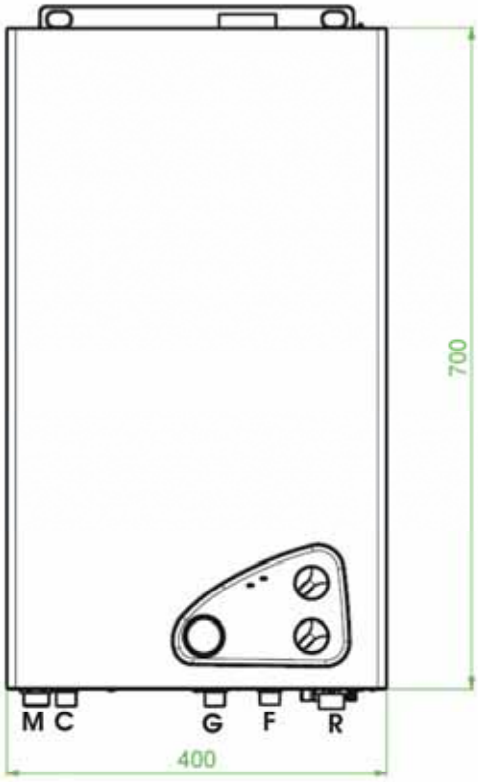
	LED1	LED 2
Electric power supplied to boiler	GREEN	OFF
Flame presence	YELLOW	OFF
No flame shutdown	RED	OFF
Active CH mode	n/a	GREEN
Flue gas thermostat shutdown (CTN) **Flue gas pressure switch shutdown (CTFS)**	n/a	YELLOW
Safety thermostat shutdown	n/a	RED
Gas valve modulation device faulty operation	n/a	Flashing GREEN
Water pressure switch alarm **Flow alarm (〉85°C)** **Flow probe alarm** **DHW probe alarm**	n/a n/a n/a n/a	Flashing YELLOW Flashing RED Flashing YELLOW/RED Flashing GREEN/RED

1.4 INSTALLATION DIMENSIONS

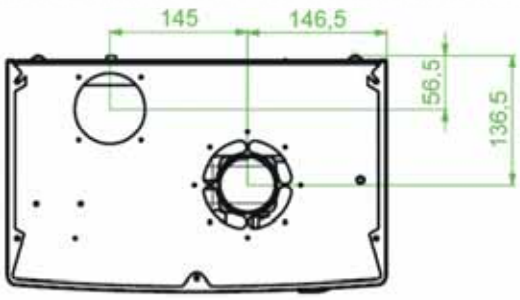


CTFS DIMENSIONS AND ENCUMBRANCES



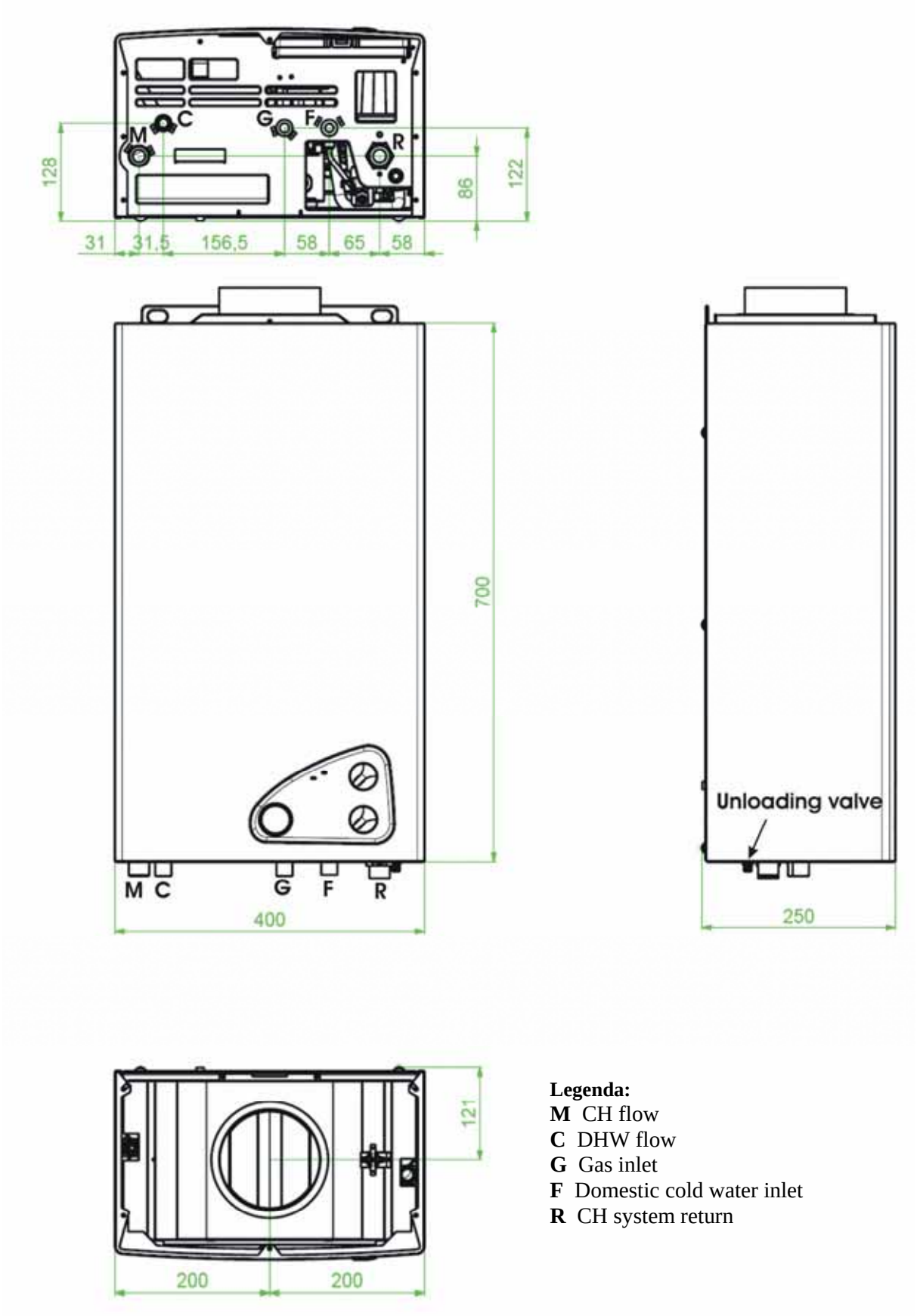


Loading tap



Legenda:
M CH flow
C DHW flow
G Gas inlet
F Domestic cold water inlet
R CH system return

CTN DIMENSIONS AND ENCUMBRANCES



Legenda:
M CH flow
C DHW flow
G Gas inlet
F Domestic cold water inlet
R CH system return

1.5 TECHNICAL DATA

NOMINAL DATA		CTFS	CTN
Nominal heat input (Qn)	kW	25,5	24,5
Nominal heat output (Pn)	kW	23,7	22,2
Reduced heat input (Qr)	kW	12,5	12
Reduced heat output (Pr)	kW	11,2	10,8
100% heat output efficiency	%	93	90,6
30% heat output efficiency	%	90,2	90
CH temperature adjustment range	°C	35 – 78	35 – 78
Maximum CH temperature	°C	78 + 5	78 + 5
Maximum/minimum CH pressure (PMS)	bar	3 – 0,5	3 – 0,5
Nominal DHW flow rate (Qns)	kW	25,5	24,5
Reduced DHW flow rate (Qnr)	kW	12,5	12
Specific flow rate (D) Δt 30K	liters/min	11,4	10,8
Maximum/minimum DHW pressure	bar	8 – 0,5	8 – 0,5
DHW temperature adjustment range	°C	35 – 50	35 – 50
DHW maximum temperature	°C	50	50
Height	mm	700	700
Width	mm	400	400
Depth	mm	250	250
Weight	kg	27,5	24,85
Gas coupling	---	G1/2	G1/2
CH coupling	---	G3/4	G3/4
DHW coupling	---	G1/2	G1/2
NOx rating		3	2
Supply tension	V	230	230
Frequency	Hz	50	50
Electric power	W	140	80
Protection rating	---	IPX4D	IPX4D

COUNTRY OF DESTINATION	CATEGORY	GAS TYPE	PRESSURE (mbar)
ITALIA	**II_{2H3+}**	**G20 - G30/G31**	**20 – 28-30/37**
AT – CH	$II_{2H3B/P}$	G20 - G30/G31	20 – 50/50
DE	$II_{2ELL3B/P}$	G20-G25 / G30-G31	20/20 – 50/50
NL	$II_{2L3B/P}$	G25 - G30/G31	25 – 30/30
BE - FR	II_{2E+3+}	G20/G25 - G30/G31	20/25 – 28-30/37
DK – EE – FI – LV – LT CZ – SK – SI - SE - NO	$II_{2H3B/P}$	G20 - G30/G31	20 – 30/30
EE – GB – GR – IE – LV LT – PT – ES – CH	II_{2H3+}	G20 - G30/G31	20 – 28-30/37
LU	I_{2E}	G20	20
PL	$II_{2ELwLs3B/P}$	G20/GZ41.5/GZ350 – G30/G31	20/20/13 – 36/36
HU	$II_{2HS3B/P}$	G20/G25.1 – G30/G31	25/25 – 30/30
CY – IS – MT	$I_{3B/P}$	G30/G31	30/30
CY	I_{3+}	G30/G31	28-30/37

Panarea/Vela CTFS 24 AF

Family	Gas	Diaphragm	Burner nozzle	Nozzle Pressure Maximum	Nozzle Pressure Minimum	No.of nozzles	Co2 Qn/qmin
		mm	mm/100	mbar	mbar	n°	%
2H	G20	---	135	12,5	3	11	6,3 / 2,7
3+ - 3B/P	G30	---	80	28	7	11	7,2 / 3,3
3+ - 3B/P	G31	---	80	36	9,5	11	7,0 / 3,2
2Ls	GZ350	---	180	8,5	2,4	11	6,2 / 2,7
2Lw	GZ41.5	---	160	9,1	2,5	11	6,2 / 2,7
2L	G25	---	150	11,5	2,9	11	6,3 / 2,7
2LL	G25	---	150	11,5	2,9	11	6,3 / 2,7
2HS	G25.1	---	150	12	3,3	11	7,0 / 3,1
2HS	G20	---	135	12,5	3	11	6,3 / 2,7
2E	G20	---	135	12,5	3	11	6,3 / 2,7
2E+	G20	5.5	135	18,6	4,8	11	6,3 / 2,7

Data for Project Engineers			
		Maximum output - CH	Minimum output
Casing heat loss with burner on	%	1,2	0,4
Casing heat loss with burner off	%	0,2	
Chimney heat loss with burner on	%	5,8	11,7
Chimney heat loss with burner off	%	---	
92/42 CEE Directive efficiency rating		★★★	

Calculating air/flue gas system dimensions			
		Maximum output - DHW	Minimum output
CO2	%	{see gas chart}	{see gas chart}
Flue gas T – air T	°C	107	77
Flue gas mass Flow rate	g/s	16,0	16,9
Available residual head	Pa	90	90

Panarea/Vela CTN 24 AF

Family	Gas	Diaphragm	Burner nozzle	Nozzle Pressure Maximum	Nozzle Pressure Minimum	No.of nozzles	Co2 Qn/qmin
		mm	mm/100	mbar	mbar	n°	%
2H	G20	---	130	12,5	3,2	11	5,7 / 2,7
3+ - 3B/P	G30	---	78	27,5	6,6	11	7,4 / 3,8
3+ - 3B/P	G31	---	78	35,5	8,5	11	7,3 / 3,7
2Ls	GZ350	---	180	7,9	2,2	11	6,3 / 3,2
2Lw	GZ41.5	---	160	8,3	2,2	11	5,7 / 2,9
2L	G25	---	150	10,1	2,8	11	6,3 / 3,3
2LL	G25	---	150	10,1	2,8	11	6,3 / 3,3
2HS	G25.1	---	150	9,9	2,7	11	6,5 / 3,3
2HS	G20	---	130	12,5	3,2	11	5,7 / 2,7
2E	G20	---	130	12,5	3,2	11	5,7 / 2,7
2E+	G20	5.7	130	18,4	4,7	11	5,7 / 2,7

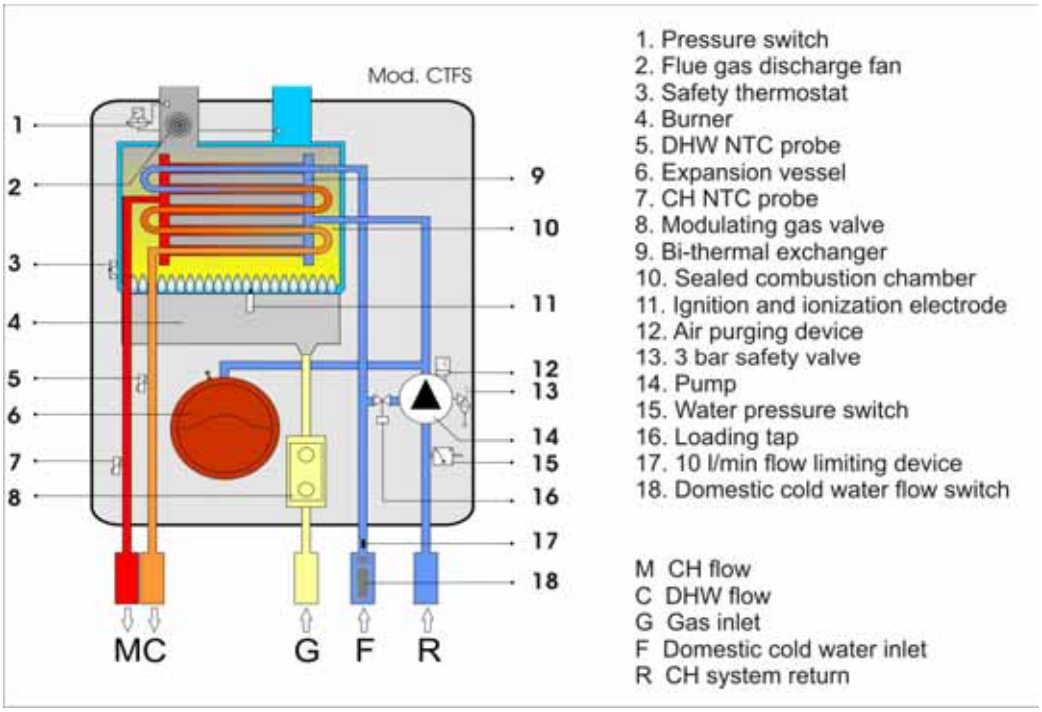
Data for Project Engineers			
		Maximum output - CH	Minimum output
Casing heat loss with burner on	%	3,2	2,7
Casing heat loss with burner off	%	0,6	
Chimney heat loss with burner on	%	6,1	9,4
Chimney heat loss with burner off	%	---	
92/42 CEE Directive efficiency rating		★★	

Calculating air/flue gas system dimensions			
		Maximum output - DHW	Minimum output
CO2	%	{see gas chart}	{see gas chart}
Flue gas T – air T	°C	85	
Flue gas mass Flow rate	g/s	16,7	16,5
Available residual head	Pa	-2	

CHAPTER 2
COMPONENTS

2.1 HYDRAULIC LAYOUTS

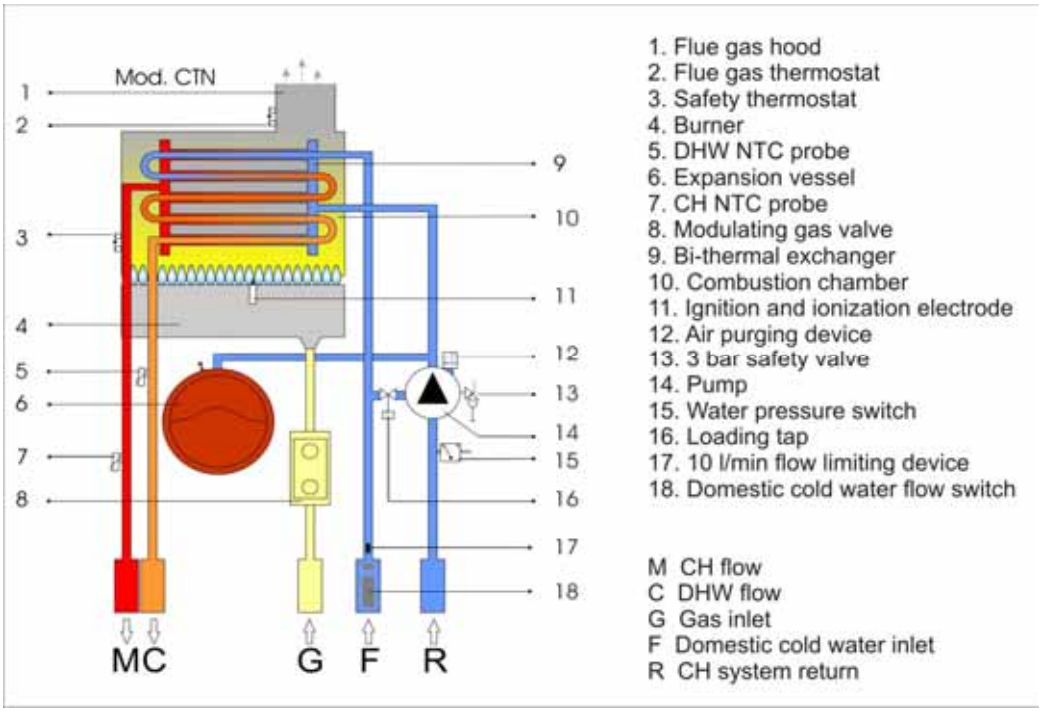
Bi-thermal CTFS - AF



1. Pressure switch
2. Flue gas discharge fan
3. Safety thermostat
4. Burner
5. DHW NTC probe
6. Expansion vessel
7. CH NTC probe
8. Modulating gas valve
9. Bi-thermal exchanger
10. Sealed combustion chamber
11. Ignition and ionization electrode
12. Air purging device
13. 3 bar safety valve
14. Pump
15. Water pressure switch
16. Loading tap
17. 10 l/min flow limiting device
18. Domestic cold water flow switch

M CH flow
C DHW flow
G Gas inlet
F Domestic cold water inlet
R CH system return

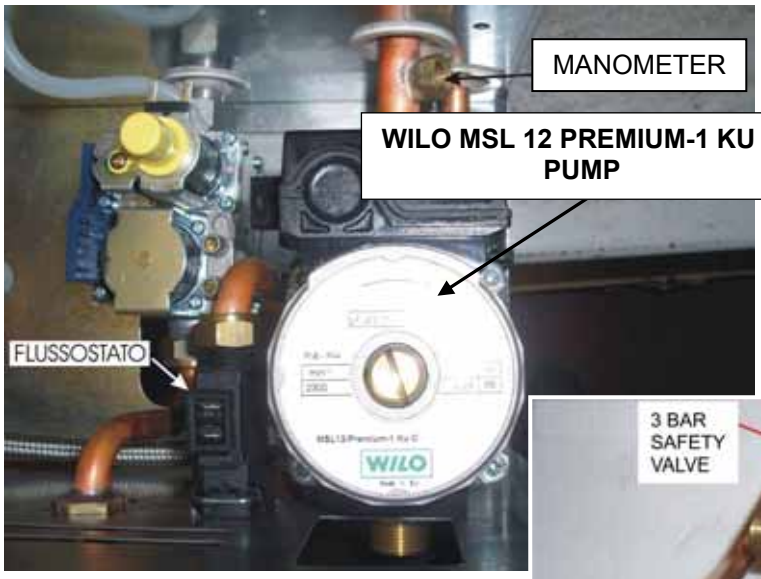
Bi-thermal CTN - AF

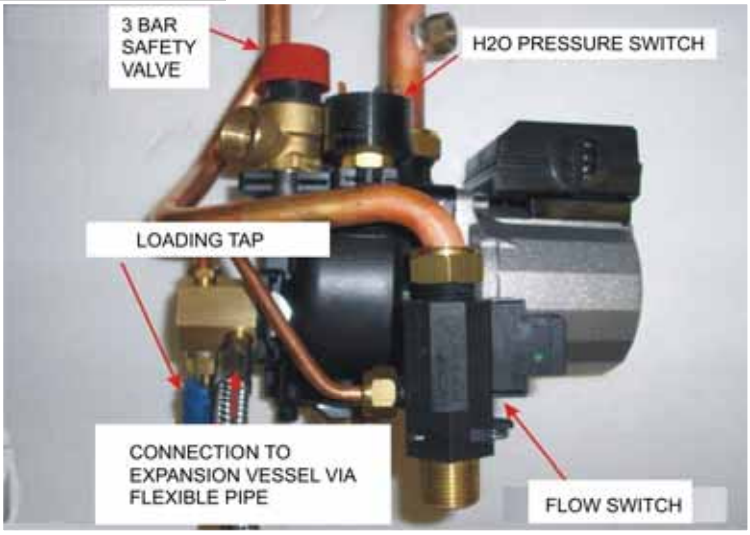


1. Flue gas hood
2. Flue gas thermostat
3. Safety thermostat
4. Burner
5. DHW NTC probe
6. Expansion vessel
7. CH NTC probe
8. Modulating gas valve
9. Bi-thermal exchanger
10. Combustion chamber
11. Ignition and ionization electrode
12. Air purging device
13. 3 bar safety valve
14. Pump
15. Water pressure switch
16. Loading tap
17. 10 l/min flow limiting device
18. Domestic cold water flow switch

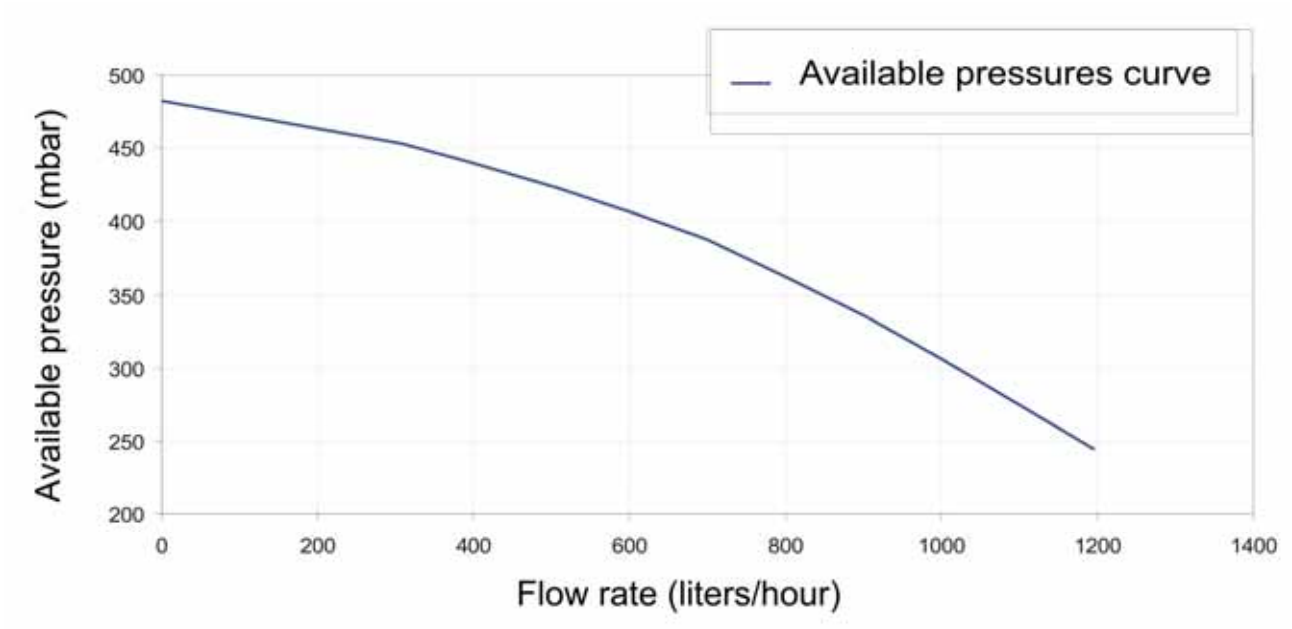
M CH flow
C DHW flow
G Gas inlet
F Domestic cold water inlet
R CH system return

2.2 HYDRAULIC ASSEMBLY

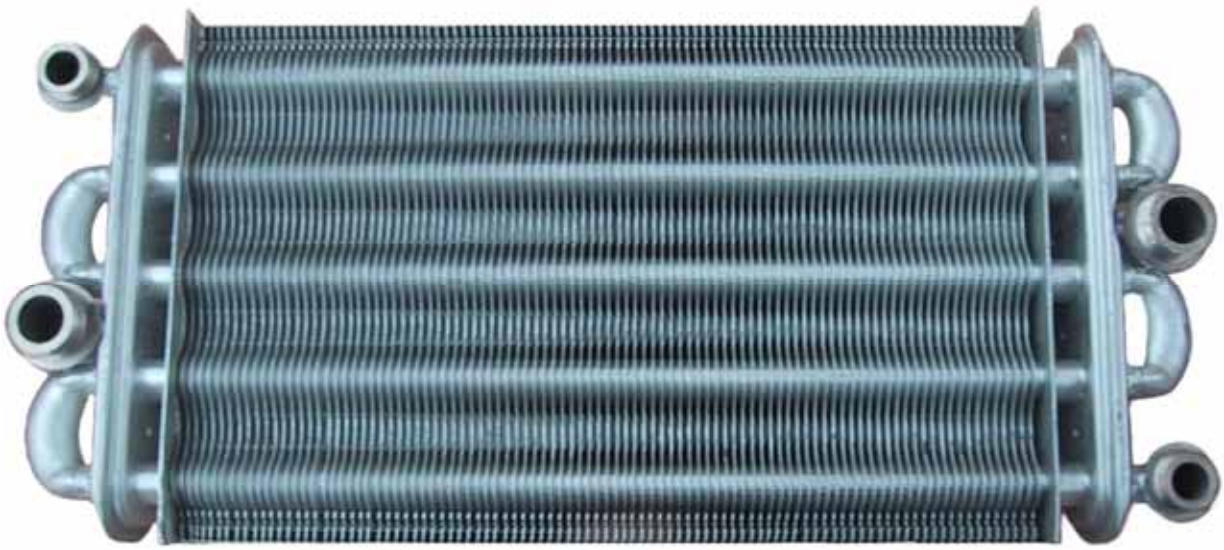




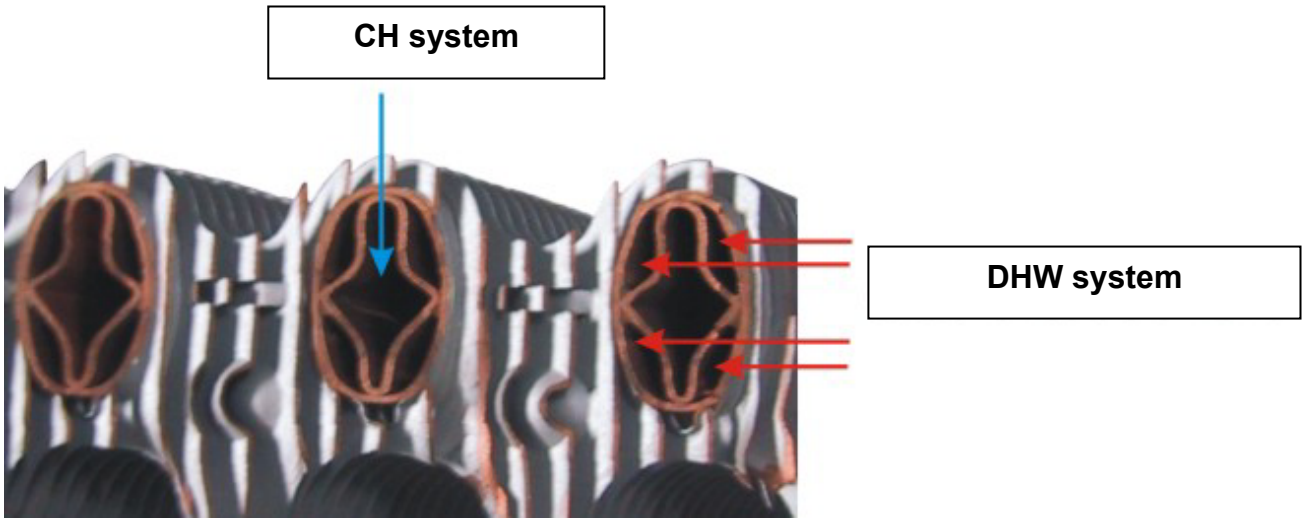
2.3 PUMP PRESSURE



2.4 BI-THERMAL EXCHANGER



The bi-thermal exchanger, made of copper, is designed with two coaxial systems (CH and DHW).

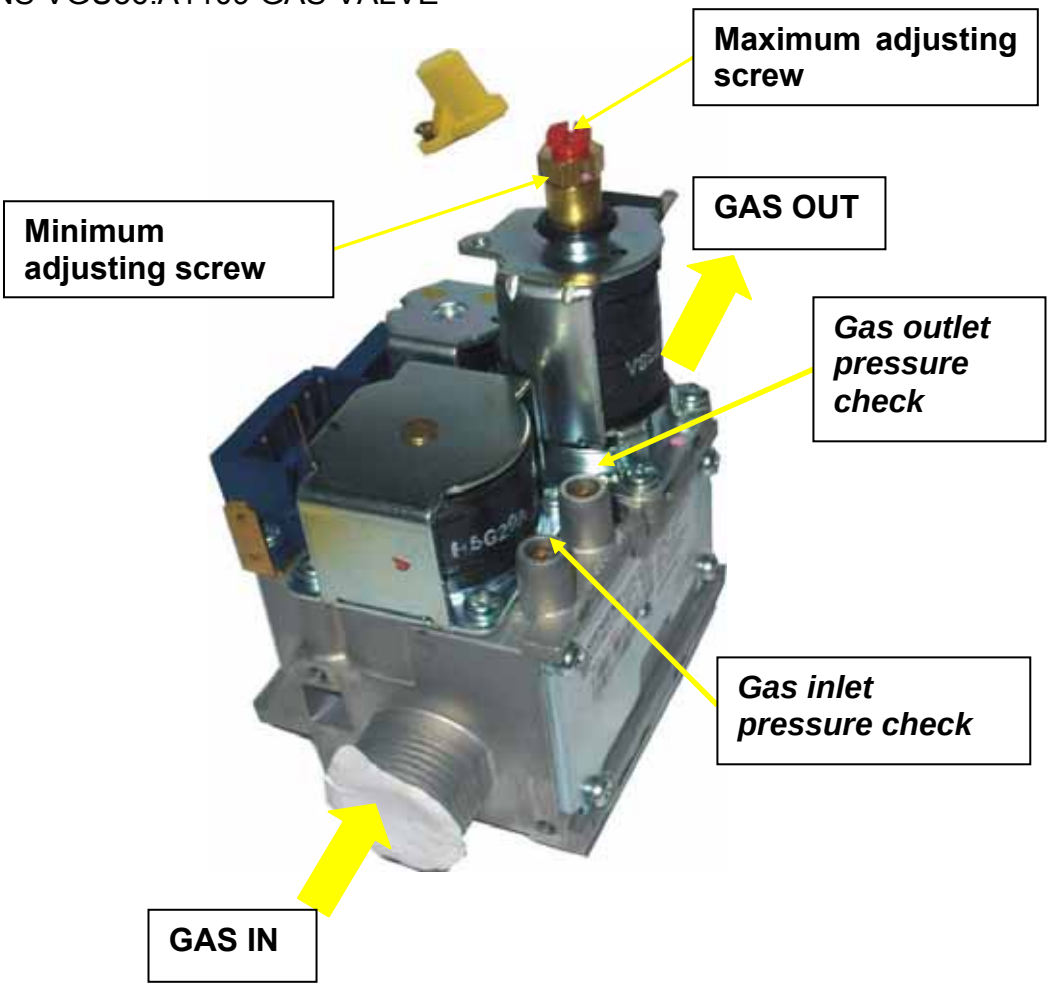


The pump is operating in CH mode only, while in DHW mode it is off. That's why the operation is called still water (AF).

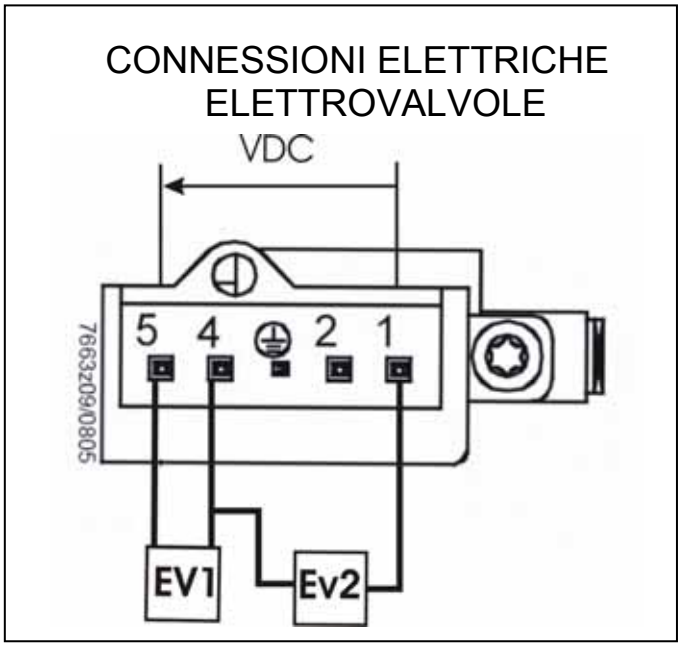
2.5 EXPANSION VESSEL

Capacity: 6 liters
Maximum working pressure: 3 bars
Loading pressure: 1 bar
Maximum CH system capacity: 100 liters

2.6 SIEMENS VGU56.A1109 GAS VALVE



The valve is equipped with a compensation check, which, in CTFS models only, is connected to the combustion chamber by means of a silicone pipe.
In that manner the valve senses the nozzle pressure, in case of pressure or
counter-pressure in the combustion chamber.
E.g. Upon ignition, when the fan turns on, a counter-pressure is induced in the combustion chamber, the valve (thanks to that check) will decrease pressure to the nozzles so to compensate the possible higher amount of gas provoked by the counter-pressure.



RESISTANCE VALUE OF THE MODULATION COIL ELECTRIC VALVES CONNECTIONS:
80 Ohm at 20°C VDC

THE RESISTANCE VALUES OF THE EV1 AND EV2 COILS ARE NOT DIRECTLY MEASURABLE BECAUSE A DIODE BRIDGE IS INTEGRATED TO THE VALVE

CHAPTER 3
ADJUSTMENTS

3.1 CONVERSIONS

CONVERSION FROM METHANE TO LPG

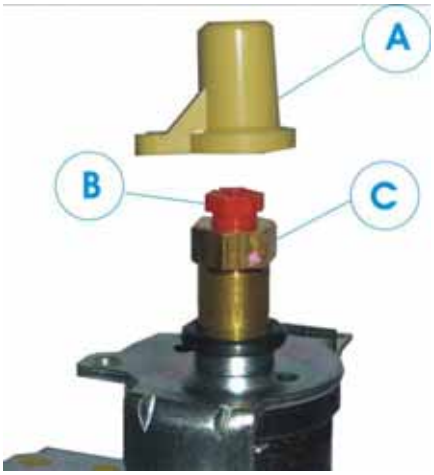
- Check that the boiler is disconnected from power mains;
- remove the main burner;
- remove the main burner nozzles and replace them with correct diameter in relation to the new gas type and family (see charts in chapter 1.5 “Technical data”)
  WARNING: it is mandatory to install the copper gaskets;
- re-install the main burner;
- access the main electronic board and position the MET-LPG jumper to LPG position (see the picture below);
- now adjust the gas valve (see next page).

CONVERSION FROM LPG TO NATURAL GAS

- Check that the boiler is disconnected from the mains;
- remove the main burner;
- remove the main burner nozzles and replace them with those bearing the correct diameter in relation to the new gas type (see charts in chapter 1.5 “Technical data”) WARNING: it is mandatory to install the copper gaskets;
- re-install the main burner;
- replace the connection pipe between the gas valve and the manifold of the burner nozzles;
- access the main electronic board and position the MET-LPG jumper to MET position (see the picture below);
- now adjust the gas valve (see next page).

Methane or LPG selector
CTN - CTFS selector

3.2 ADJUSTMENT OF SIEMENS VGU56.A1109 GAS VALVE



- After removing the sealing screw of the gas inlet pressure check by means of a small screwdriver, connect a manometer in order to verify correct pressure from the network;
- now connect a manometer to the gas outlet pressure check after removing its sealing screw by means of a small screwdriver;
- start the boiler to maximum CH output by withdrawing a large quantity of DHW and positioning the DHW temperature adjusting knob to maximum;
- after removing the yellow protective cap A, act on screw C clockwise to increase pressure and anti-clockwise to decrease it;
- after adjusting maximum pressure, disconnect electric power from the coil in order to set the boiler to minimum output operation;
- adjust minimum pressure by acting on internal screw B of the gas valve (while holding still external screw C);
- check correct operation of the burner verifying ignition sequence to be regular and noiseless;
- check for gas leaks;
- seal back the adjuster cap screw;
- once the above procedure is completed, fill in the tag enclosed with the kit and affix it aside of the technical data label of the boiler.

CHAPTER.4
CONTROL PANEL

4.1 GENERAL CHARACTERISTICS

Power supply (230Vac 50 Hz)
Room thermostat or remote control
Ignition – detection electrode
Available connectors

Fan: 230VAC
Pump: 230VAC

SIEMENS electric gas valve:
Operator = 230VAC
Modulating device = 0-13,2 VDC
H_2O pressure switch closed contact ›0,5 Bar 230 Vac
Flue gas pressure switch with 30V exchange contact
Flue gas thermostat with normally closed contact 250Vac

Closed Reed flow switch 2 liters per minute
Safety thermostat with normally closed free contact 250Vac
Flow probe: NTC 10k Ohm at 25°C
DHW probe: NTC 10k Ohm at 25°C

PROBE RESISTANCE VALUE CHART-Ohm

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

Room thermostat: potential free contact or BUS communication connection open_therm (6SCHEMOD12).

WARNING: remove the two screws indicated by the arrows shown in the middle picture, in order to rotate forward the electric panel.

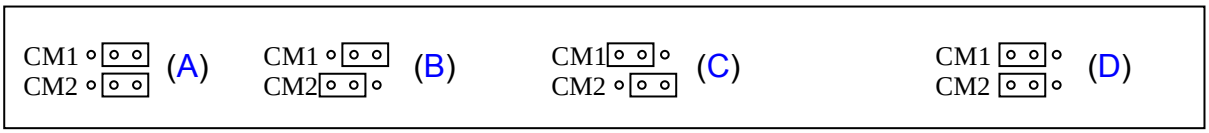
4.2 OPERATION AND DIAGNOSTIC LOGICS

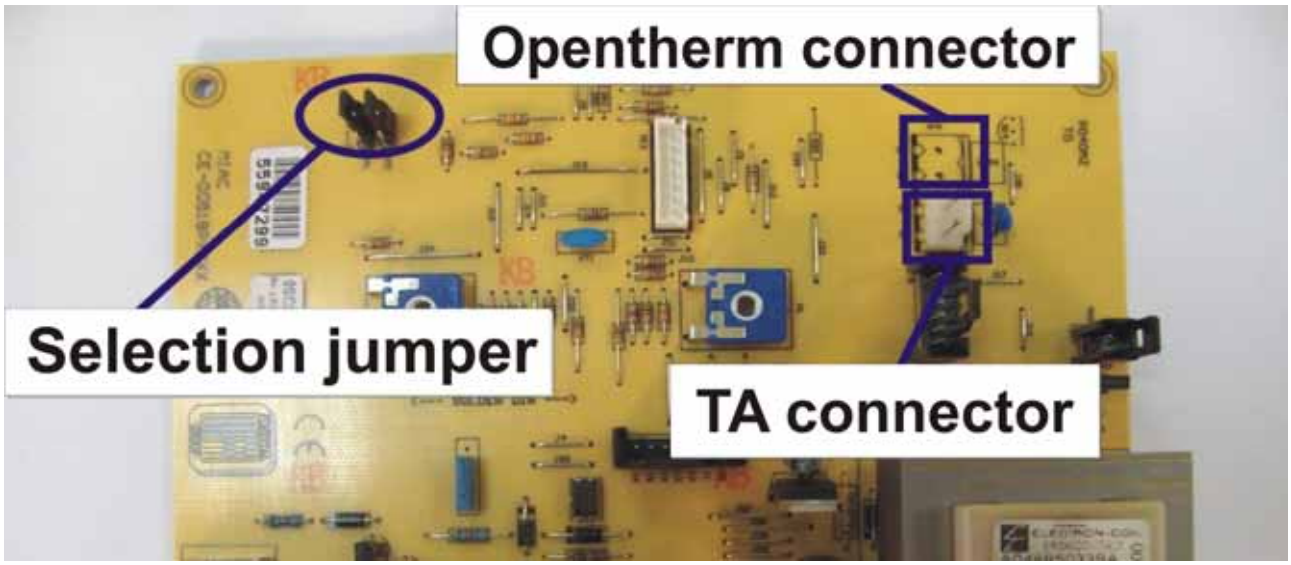
6SCHEMOD11 / 6SCHEMOD12

►► The 6SCHEMOD11 board can communicate with the room thermostat, while 6SCHEMOD12 is a communication opentherm board designed for a remote control connection as well. **The connection to a remote control is not available in the outdoor installation version.**

►► **By positioning the 2 jumpers**, shown in pic. 1, according to the instructions in the serigraphy, the type of boiler and gas can be selected:

A configuration shows LPG fired, forced draught (CTFS).
B configuration shows Methane fired, forced draught (CTFS).
C configuration shows LPG fired, natural draught (CTN).
D configuration shows Methane fired, natural draught (CTN).





PRIORITY OF FUNCTIONS

In the chart below are indicated the activation priority of the main functions, when two or more functions are requested at the same time.

Priority	Status
1	Shutdown (boiler can still operate anti-frost function, pump operation and pump anti-blocking functions)
2	DHW request
3	CH request in “winter” mode
4	CH anti-frost function both in “summer” and “winter” mode
5	Post-circulation function in “summer” and “winter” mode
6	Pump and deviating valve anti-blocking function
7	Available upon request

CH MODULATION TEMPERATURES:

- CH temperature adjusting range: 35° C- 78° C
- CH thermostat intervention temperature: OFF = **set point** + 5° C
- CH thermostat intervention temperature: ON = **set point** + 0° C
- CH thermostat timer: 240 seconds, only when flow temperature is > 40° C (time the burner is inactive after being turned off)
- Ignition ramp timer: 200 seconds.

Temperature **set point** is related to the position of the knob adjusting desired working temperature.

DHW MODULATION TEMPERATURES

- DHW temperature adjusting range: 35-50° C
- Temperature of intervention of DHW thermostat: OFF = 58°C fixed.
- Temperature of intervention of DHW thermostat: ON = 53°C fixed.
- Temperature of intervention of flow thermostat in DHW mode: OFF = 90°C.
- Temperature of intervention of flow thermostat in DHW mode: ON = 85°C.

VARIOUS TEMPERATURES AND TIMED OPERATIONS

DESCRIPTION	ON	OFF
Temperature of intervention of boiler anti-frost function	≤5°C	≥30 °C (or operation time =15')
Temperature of intervention of flow-DHW ventilation function	90°C	88°C
Temperature of intervention of flow temperature post circulation function	**ON** 80°C	
Correct working range of flow and DHW temperature probes	-20°C/+120°C	

Pump anti-blocking function timing	24 hours
Pump operation timing for anti-blocking function	30 seconds
Timing of post-circulation, CH-anti-frost functions	30 seconds
Timing of DHW post-circulation	6 seconds in "winter"mode 1 second in "summer"mode
Timing of DHW post-ventilation	10 seconds in "summer"mode only
Timing of DHW post-ventilation after shutdown or probe malfunction	1 minute
Timing of flame propagation, forced draught only	2 seconds

General temperature tolerance ± 3°C

SELECTING THE BOILER TYPE

GPL – MET SELECTOR

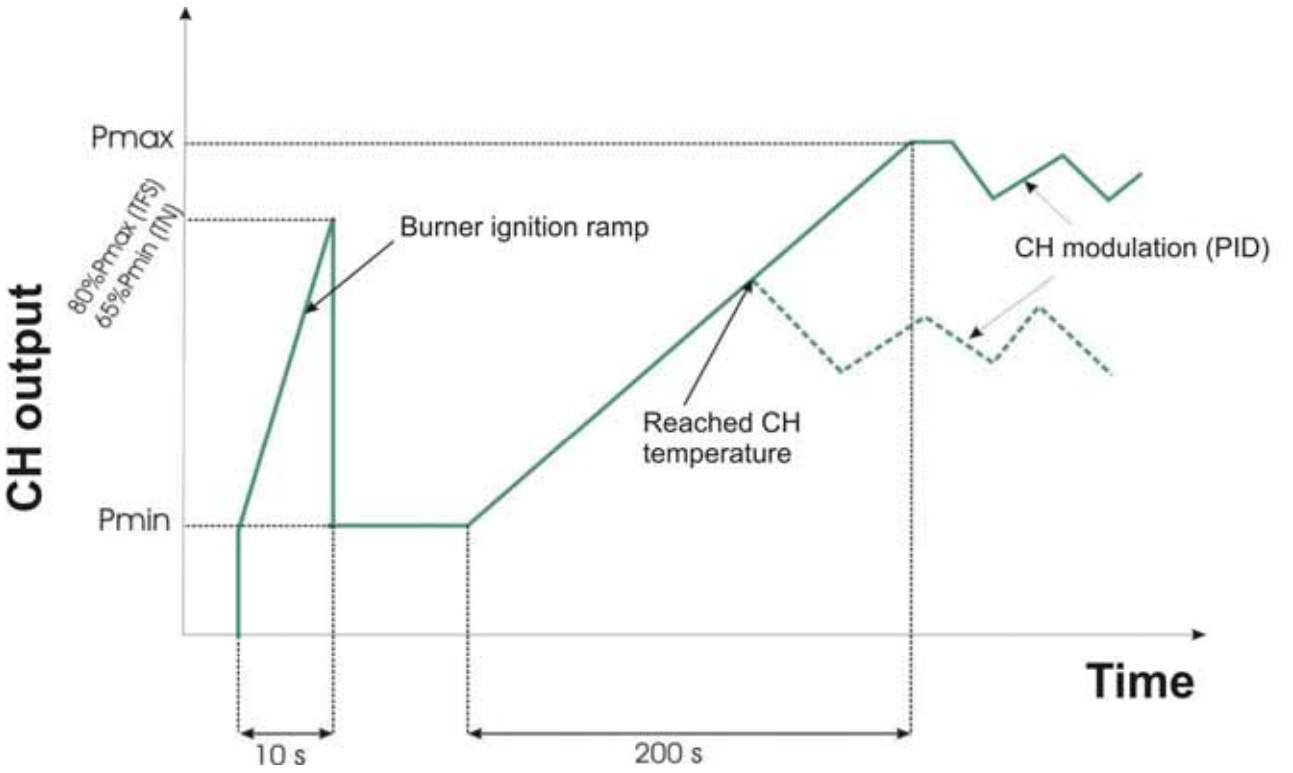
By acting on the jumper, the boiler can be set for operation with the available gas: the current to the modulation device is selected in relation to its position in order to obtain maximum output.

FORCED DRAUGHT – NATURAL DRAUGHT SELECTOR

By changing the bridge (jumper) position, the boiler type can be selected: forced draught boiler (CTFS) or natural draught (CTN).

CH MODULATION WITH OUTPUT FLAME PROPAGATION RAMP

Following to the closure of room thermostat contact, if the temperature sensed by the flow NTC probe is lower than the set temperature, the burner ignition sequence is initiated.



Once the burner ignition sequence is over, gas flow rate is reduced to minimum; the gas flow rate is further increased from minimum to maximum in a 200 second ramp to maximum output. CH water flow temperature is constantly checked and the ramp interrupted once the set temperature is reached. From now on the gas flow rate to the burner equals the flame modulation value, which via a PID type action, allow reaching and maintaining CH selected temperature. Once the minimum value of gas flow rate is reached (Pmin) and being the output larger than requested, as a direct consequence water temperature will increase. Once flow temperature will reach 5°C above the requested value, the burner is turned off and a count down starts, during which the burner will stay off (240 seconds antifast function); at the end of it the burner is eventually turned on.

“Antifast” timing is zeroed when:

- DHW is requested
- Flow temperature decreases below 40°C.

DHW PRIORITY FUNCTION

The closure of DHW flow switch contact (following a DHW withdrawal) puts the boiler in DHW mode, and starts the modulation.
DHW operation has priority over any other request.

DHW MODE OPERATION

The closure of DHW flow switch contact, (following a DHW withdrawal) puts the boiler in DHW mode, which has priority over any other request. Following the DHW request, when the water temperature, detected by the NTC probe is less than 53°C (DHW thermostat ON intervention temperature), the burner ignition sequence is initiated.
Once the burner is on, the gas flow rate equals the value of the flame modulation, which, through a PID type action, allows DHW to reach and maintain the selected temperature.
In DHW mode, the pump is not powered on.
In DHW modulation phase, once the minimum gas flow rate is reached, and being the output larger than requested, water temperature will increase. Should the balance point not be reached, once 58°C are reached (DHW thermostat intervention OFF temperature) the burner is turned off. Once the burner is turned off, it is turned back on when DHW goes below 53°C (DHW thermostat intervention ON temperature).

FLOW TEMPERATURE CONTROL IN DHW MODE

In DHW supply mode, flow temperature is constantly monitored and when reaches 90°C the ok is revoked to flame sensing section. As soon the flow reaches 85°C the ok is granted again to the flame sensing section.

BOILER ANTI-FROST FUNCTION

When the temperature sensed by the flow probe goes below 5°C an anti-frost function request is generated with consequent burner ignition. Once the burner ignition sequence is completed the gas flow rate to the burner is forced to CH minimum. The anti-frost function continues until the CH flow temperature reaches 30°C or 15 minutes of operation have elapsed. Any other request has priority and therefore halts the current function.
During a boiler anti-frost function the pump is on.
In case of flame sensing device shutdown, the anti-frost function continues operating the pump.
The anti-frost function is active both in “summer” and “winter” modes. In stand-by mode the burner does not ignite and the pump is active.

PRESSURE CHECK OF PRIMARY FLUID

Water pressure switch contact status is constantly checked during operation. When the contact is open an insufficient pressure signal is transmitted and operation requests are ignored (PUMP AND BURNER OFF).
When the contact is closed, insufficient pressure signal is immediately terminated and operation resumed.

PUMP POST-CIRCULATION FUNCTION

Upon termination of CH or anti-frost function, the burner is immediately turned off, while the pump keeps being powered for 30 seconds (post-circulation timing).
When the winter mode is activated, the pump is operated, independently from CH operation being requested or not, if flow temperature reaches 80°C.
As soon as flow temperature goes below 80°C, the pump post-circulates for 30 seconds and turns off.
Any CH, DHW, or anti-frost requests have priority and immediately halts post-circulation.

Once DHW operation request is terminated, the post-circulation function is activated:

► In winter mode (selector 3 in any position other than …), the pump post-circulates for 6 seconds

► In summer mode (selector 3 in position …), the pump post-circulates for 1 second and the fan for 10 seconds.

POST-VENTILATION FUNCTION

Only when boiler mode selector is positioned to summer, once a DHW request is terminated, the burner, if on, is immediately turned off while the fan keeps being electrically powered for 10 seconds (DHW post-circulation timing).
Post-ventilation is also activated when flow or DHW temperature reach 90°C; post-ventilation stops when both probes (flow + DHW) detect a temperature below 88°C.
Any request of CH, DHW, and anti-frost operation has priority and therefore halts the current post-ventilation function to perform the requested one.

PUMP INACTIVITY ANTI-BLOCKING FUNCTION

The electronic board calculates the time elapsed from the last pump operation: when the period equals 24 hours the pump is operated for 30 seconds. After each activation of the pump the anti-blocking timing is zeroed.
During anti-blocking function operation the burner is off.
Any request of CH, DHW or anti-frost function has priority and halts the current function in order to activate the requested mode. The first pump anti-blocking function operation is implemented 3 hours after the boiler electronics is powered for the first time, later on the function will operate as above described.

CHECKING OPERATION OF TEMPERATURE PROBES.

6SONDNTC01

The system checks the correct operation of NTC probes connected to the integrated modulation board. A malfunction occurs when the perceived temperature is out of the correct probe temperature detection range.

►Malfunction of flow probe during CH or anti-frost function operation: the burner is immediately turned off; the pump is stopped after performing a post-circulation cycle. The fan keeps being powered on for 1 minute.
Any CH or anti-frost operation request is ignored.

►Malfunction of flow probe in stand-by, or summer, or winter modes, or without any request: the boiler performs the pump post-circulation function (1 second in summer mode, 30 seconds in winter mode) and post-ventilation for 1 minute.

►Malfunction of flow probe during DHW request: the malfunction is signaled only, DHW supply is still provided.

►Malfunction of flow probe during DHW request: the burner is immediately turned off; the pump post-circulates for 1 second in summer mode and 30 seconds in winter mode. The fan keeps being powered on for 1 minute [post-ventilation function timing after shut-down or probe malfunction]. Any DHW request is ignored, while CH and anti-frost function are still guaranteed.

PROPORTIONAL GAS MODULATOR INTEGRITY CHECK

The system checks the malfunction of the proportional gas modulator. The malfunction occurs when the modulator results electrically disconnected or short-circuited. In case of modulator malfunction all boiler functions are still operated, but at minimum heat output.
Modulator malfunction signal is discontinued when its electric parameters revert to standard range.

AUTOMATIC FLAME CHECK

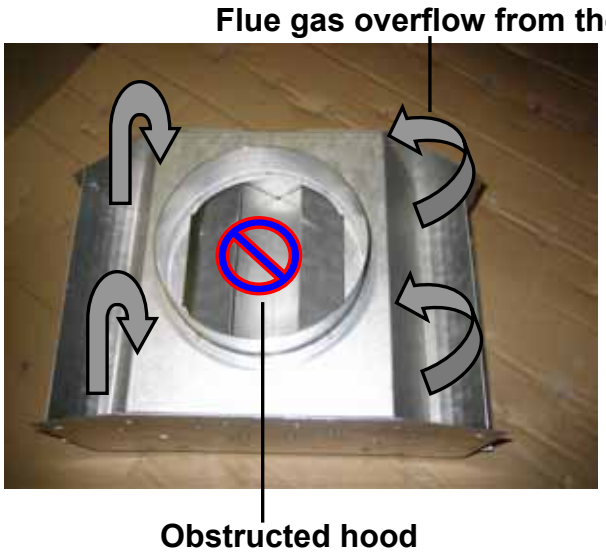
The device is always active and continuously implements flame detection procedure. Once operation is requested, after verifying the air pressure switch contact position (CTFS type), the fan is powered on: when the air pressure switch (C type) or the flue gas thermostat (TN type) gives the ok, the device starts calculating waiting time TW (1,5 seconds). Once waiting time TW (1,5 seconds) is over, gas valve and ignition transformer are powered on; when the flame is detected, the gas valve is kept open.

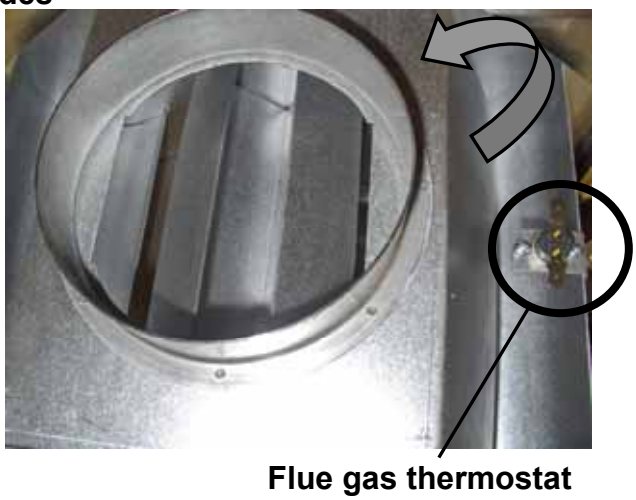
IGNITION RAMP: after the waiting time, the burner ignition sequence is initiated. The current to the modulator has a ramp progress lasting 10 seconds; starting value is minimum, final value is different in open chamber or sealed chamber boilers (open 65% of maximum, sealed 80% of maximum); the ignition ramp stops 1 second after the device has detected the flame. Now, in forced draught boilers only, flame propagation occurs, it consists in bringing maximum current to the modulator for two seconds. Once the flame propagation sequence is over, the boiler starts its normal operation.
The ignition transformer is stopped after 2 seconds from flame detection or at the end of the safety time.

Should the flame not be produced during an ignition attempt in cold conditions, the automatic flame check repeats the ignition sequence and implements up to 5 ignition attempts in forced draught boilers, 2 attempts in natural draught boilers. The attempts are spaced by pre-purging sequences of the chamber (10 seconds in forced draught boilers, 35 seconds in natural draught boilers).
Should the flame vanish the flame detection device operates a re-ignition attempt.
The flame detection device acquires the shut-down status when the flame is not detected, within the safety time TS (10 seconds), from the last ignition attempt, or when a parasitic flame is detected (with the gas valve powered off) for more than 1 minute. In order to reset the shut-down status, it is necessary, after a time at least equal to the alarm reset waiting timing, acting on the relevant selector by turning it to the reset position.

FLUE GAS THERMOSTAT (CTN ONLY)

The flue gas thermostat contact is normally closed. An increase of the temperature in the flue gas hood caused by flue gas overflow form its sides, due to discharge obstruction, triggers the opening of flue gas thermostat contact.





►When the contact opens the gas valve is powered off and after 2 seconds after the contact opening, the electronic board shuts down (if within 2 seconds the thermostat reinstates the contact, the board resumes its regular operation). After the shut-down the pump operates a post-circulation sequence. Once shut down and after 10 seconds have elapsed since the opening of flue gas thermostat contacts, if it closes its contacts the boiler can re-start. The 10 minutes timing can be zeroed if the boiler is reset via the DHW selector.

►Ignition start: if within 2 seconds since the beginning of the ignition sequence, the flue gas thermostat is open, the board shuts down, and operate the pump post-circulation function.
Once in shut-down status and elapsed 10 minutes since the flue gas thermostat contacts opening [flue gas thermostat timing] the board can automatically re-start if the flue gas thermostat closes its contacts. The 10 minute timing can be zeroed if the boiler is reset via the DHW selector.

In order to reset the shut-down status, it is necessary, after waiting for 5 seconds, acting on the relevant selector by turning it to the reset position.

AIR/FLUE GAS PRESSURE SWITCH

The air/flue gas pressure switch is managed directly by the electronic board, and its contact is normally open.

The n.o.(normally open) contact of the pressure switch is to be open before the fan is powered on and closed when the fan is powered on.

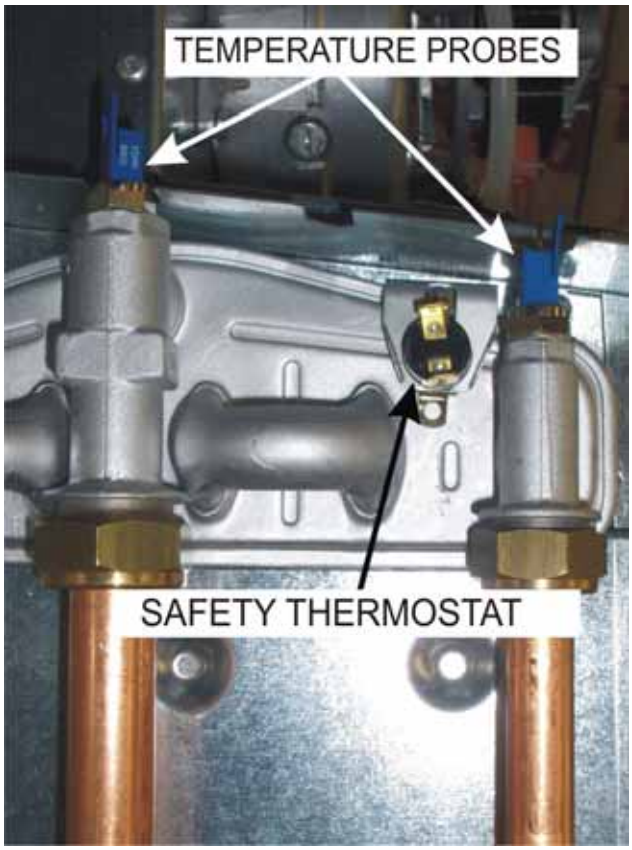
	Open pressure switch contact	**Closed** pressure switch contact
BOILER STATUS	“Stand-by”	“Operation”

When the pressure is open the gas valve cannot be powered on.
After 10 seconds following the combustion fan is powered on, if the pressure switch contact is still open, a shut-down signal is produced, it does not require a reset procedure.
The same shut-down signal which does not require a reset procedure is produced if the pressure switch is in an incorrect position during operation or waiting status.
Should the pressure switch be in an incorrect position for more than 1 minute, the boiler acquires a permanent shut-down status which needs a rest procedure to be implemented.

Pressure switch: 45/35 Pascal Pmax=1500 Pa

SAFETY THERMOSTAT

The safety thermostat contact is normally closed. When the detected temperature is above 95°C, it opens, interrupting power to the gas valve and switching the burner off.
The safety thermostat intervention while the gas valve is powered on, generates the boiler shut-down status.
The safety thermostat intervention while the gas valve is not powered on (while a demand is requested) or the boiler is in stand-by, produces a malfunction signal (red no.2 LED on)
And it does not need a reset procedure. Burner ignition is delayed until closure of the safety thermostat.



Safety thermostat with normally closed free contact 250Vac

Flow probe NTC 10k Ohm at 25°C

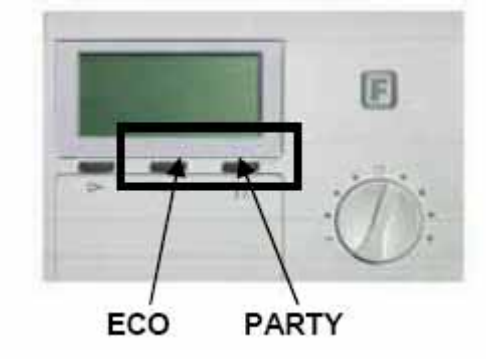
DHW probe NTC 10k Ohm at 25°C

Probe resistance values chart (Ohm)

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

REMOTE CONTROL

Available in outdoor installation version only (not available at time of printing).
code 0SCHEMOD12 board allows connecting an opentherm remote control on the terminals of the room thermostat.
When the remote control is not connected and/or does not communicate, all settings are programmed via the boiler control board.
The communication is active when DHW knob is not in the reset position. CH knob is not relevant.
A prospective communication fail includes the continuous attempt to re-instate it, but after 10 seconds, the board starts operating in local mode, following the position of the knobs, until the connection is restored.



The remote control can read from the boiler and display the temperature from CH and DHW probes, the CH and DHW selected temperatures, the actual modulation status, the error code.
The remote control can display the various operation modes such as DHW, CH, flame detection, malfunction and shut-down.
The remote control can reset the boiler maximum for 3 times within 24 hours.

MALFUNCTION – CAUSE – SOLUTION CHART

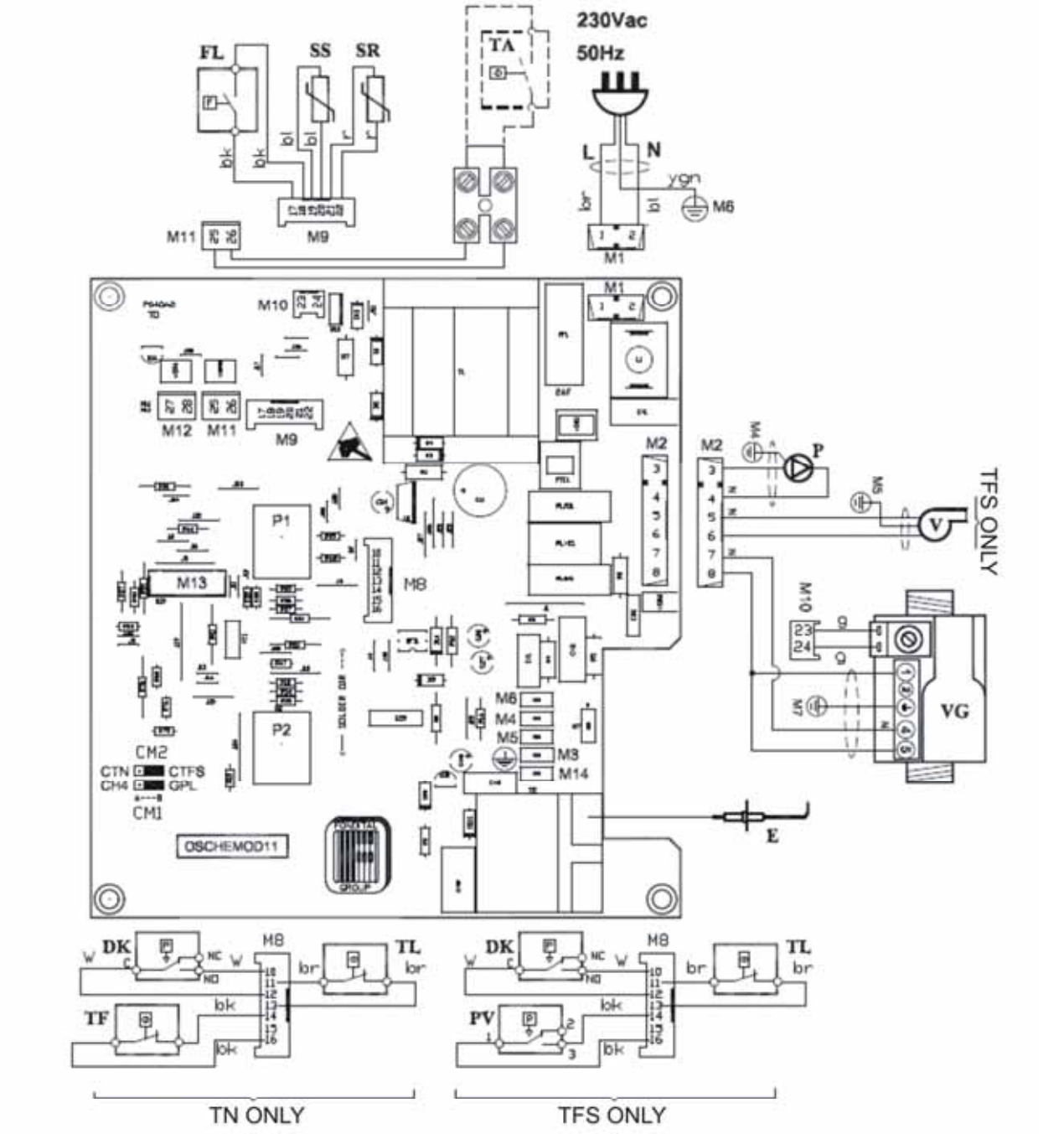
Boiler status	*Malfunction*	*Probable cause*	*Solution*
The boiler has shut down, no.1 LED is red	**The burner does not ignite**	There is no gas	Check gas presence (stopcocks to be open or safety valves intervention)
		The gas valve is disconnected	Reconnect it
		The gas valve is faulty	Replace it
		The electronic board is faulty	Replace it
	No spark	The ignition electrode is faulty	Replace it
		The ignition transformer is faulty	Replace it
		The electronic board does not turn on, it is faulty	Replace it
	The burner ignites for a few seconds and then turns off	The electronic board does not detects the flame: wrong phase and neutral connection sequence	Check the board for correct connection
		The flame detection electrode wire is interrupted	Reconnect or replace the wire
		The flame detection electrode is faulty	Replace it
		The electronic board does not detects the flame: it is faulty	Replace the board
		Minimum thermal input is not correctly set	Adjust the burner
The boiler has shut down, no.2 LED is yellow	**The air/flue gas pressure switch is not consenting to boiler operation (CTFS model)**	The air/flue gas pressure switch is faulty	Check the pressure switch: replace when faulty
		Silicone pipes are disconnected or damaged	Reconnect or replace them
		Air intake or flue gas discharge rate is not adequate	Check air intake and flue gas discharge ducts: clean or replace as necessary
		The fan is faulty	Replace it
		The electronic board is faulty	Replace it
	The flue gas thermostat has shut down the boiler (CTN model)	Not adequate chimney draught	Check the chimney and the protection grilles
		The flue gas thermostat is faulty	Replace it
The boiler has shut down, no.2 LED is red	**The safety thermostat has shut the boiler down**	The water does not flows in the CH: the pipes are clogged, the thermostatic valves are closed, intercepting valves in the system are closed	Check the CH system
		The pump is faulty	Replace it

The boiler has shut down, no.2 LED is flashing yellow	**Water pressure in the system is insufficient**	The system leaks	Check the CH system
		The water pressure switch is disconnected	Connect it
		The water pressure switch does not operate: it is faulty	Replace it
The boiler has shut down, no.2 LED is flashing yellow and red	**The flow probe is faulty**	The CH probe is disconnected or faulty	Connect or replace it
The boiler has shut down, no.2 LED is flashing red and green	**The DHW probe is faulty**	The DHW probe is disconnected or faulty	Connect or replace it
The boiler is not operating in DHW mode	**The DHW flow switch is not working**	Insufficient pressure or flow rate in the system	Check the system
			Check the flow switch filter
		The flow switch sensor is disconnected or faulty	Connect or replace it
Malfunction of the proportional gas modulator. No.2 LED is flashing yellow	**Gas input fixed and mechanically pre-set**	The modulator is not electrically connected or short circuited.	Check modulator connection
			Check modulation coil

SHOULD NONE OF THE ABOVE HYPOTHESIS BE VALID, THE MALFUNCTION IS TO BE ATTRIBUTED TO THE MAIN ELECTRONIC BOARD, CHECK THE CONNECTIONS OR REPLACE IT.

BI-THERMAL COMPACT SIEMENS GAS VALVE 6SCHEMOD11/6SCHEMOD12

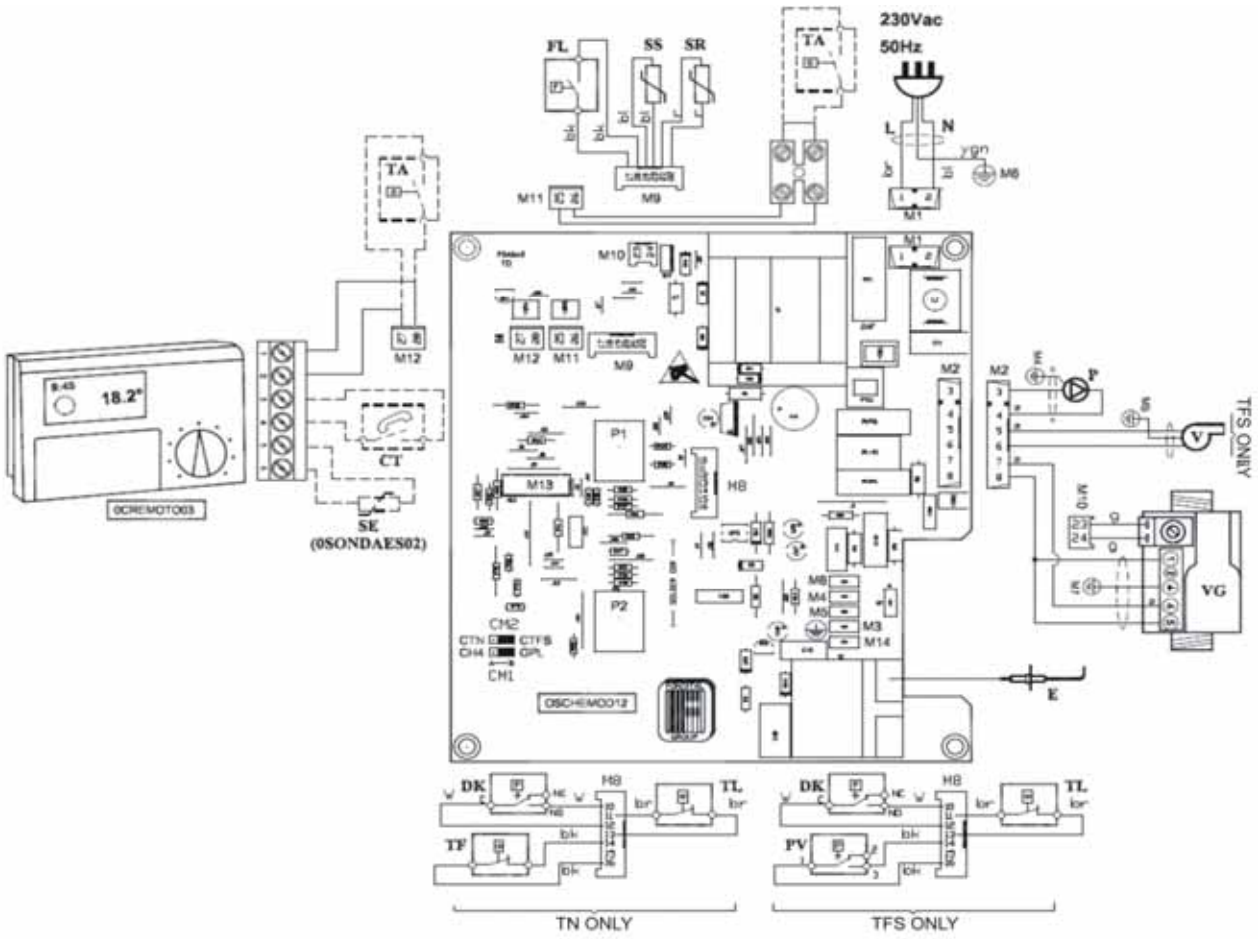
6SCHEMOD11: board supporting room thermostat only



6SCHEMOD11: ELECTRONIC BOARD
M3-M11: POWER CONNECTOR, TA
M13:TELEMETERING CONNETCTOR
M2-M12: AVAILABLE CONNECTORS
E: DETECTION, IGNITION ELECTRODE
P: PUMP
V : FAN (TFS ONLY)
TF: FLUE GAS ANTI-OVERFLOW THERMOSTAT (TN ONLY)
PV: FAN PRESSURE SWITCH (TFS ONLY)

DK: LOW WATER PRESSURE SAFETY SWITCH
SR: CH PROBE 10K Ohm at 25°C B = 3435
SS: DHW PROBE 10K Ohm at 25°C B = 3435
TA: ROOM THERMOSTAT (OPTION)
CM1 – CM2: JUMPERS FOR BOILER AND GAS TYPE SELECTION
FL: FLOW SWITCH
VG: GAS VALVE
TL: LIMIT THERMOSTAT

6SCHEMOD12: board supporting opentherm communication



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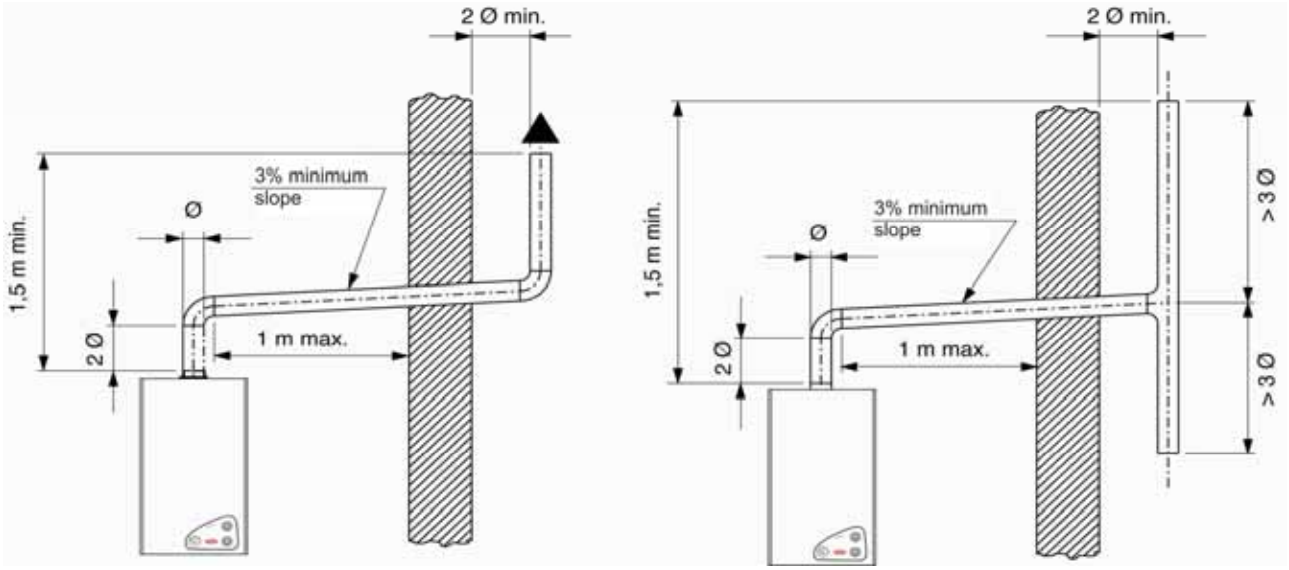
CHAPTER 5

DISCHARGE AND PIPING SYSTEMS

5.1 CTN AF

TYPE OF INSTALLATION	PIPE DIAMETERS (mm)
B11BS	∅ 125*/130

CTN chimney connections



* with reduction

5.2 CTFS AF

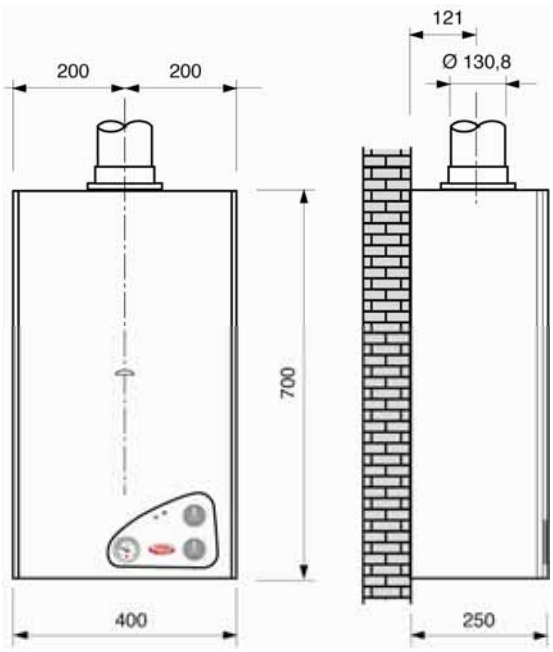
∅ 100/60 COAXIAL DUCTS

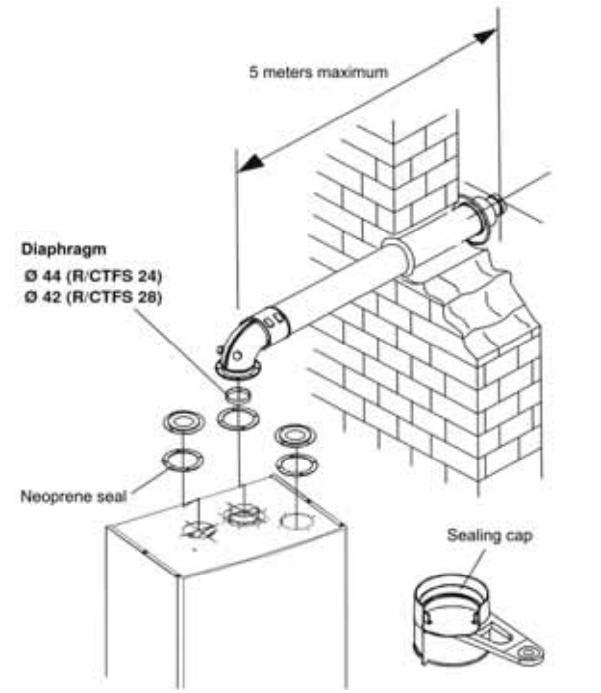
Type C12 – type C32

Pipe load loss ∅ 100/60 COAXIAL DUCTS	
Component	**CTFS 24 AF [m]**
Extension L = 1000 mm	1,0
Extension L = 500 mm	0,5
90° elbow	1,0
45° elbow	0,5
Condensate drain	1,0
Horizontal terminal	1,0
Roof terminal	1,5

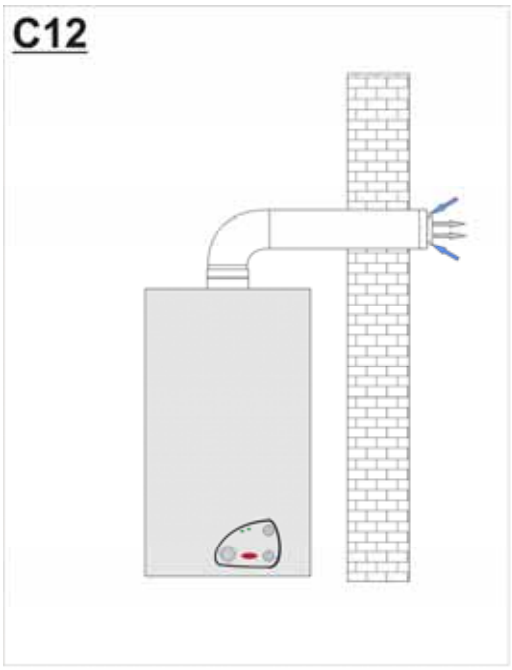
Maximum length of pipes 5 meters or 4 meters and one elbow, for each additional 90° elbow, as stated in the chart, reduce by one meter.

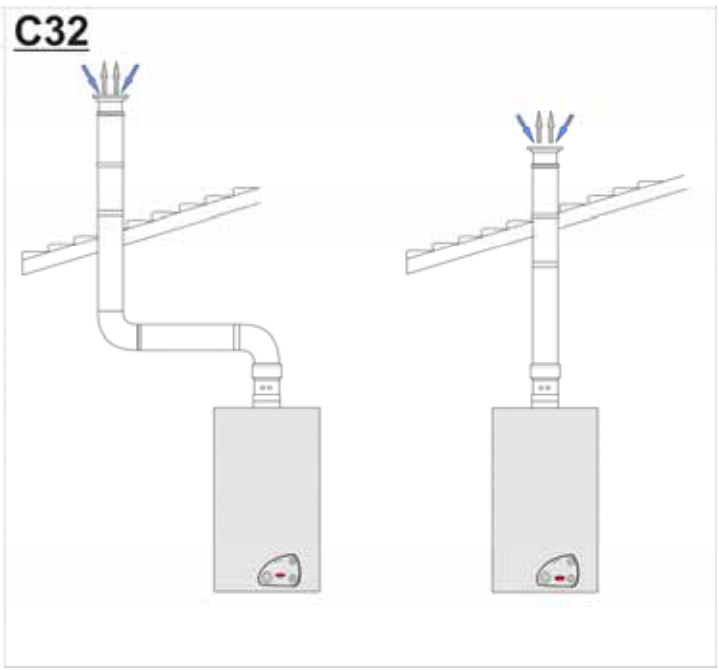
Type of installation	Pipe Material	Pipe length (m)	Diaphragm (mm)
C12 – C32	aluminum	L ≤ 3 (2 + 1 elbow)	∅ 42,5 discharge
C12 – C32	aluminum	3 (2 + 1 elbow) ≤ L ≤ 3 (2 + 1 elbow)	---

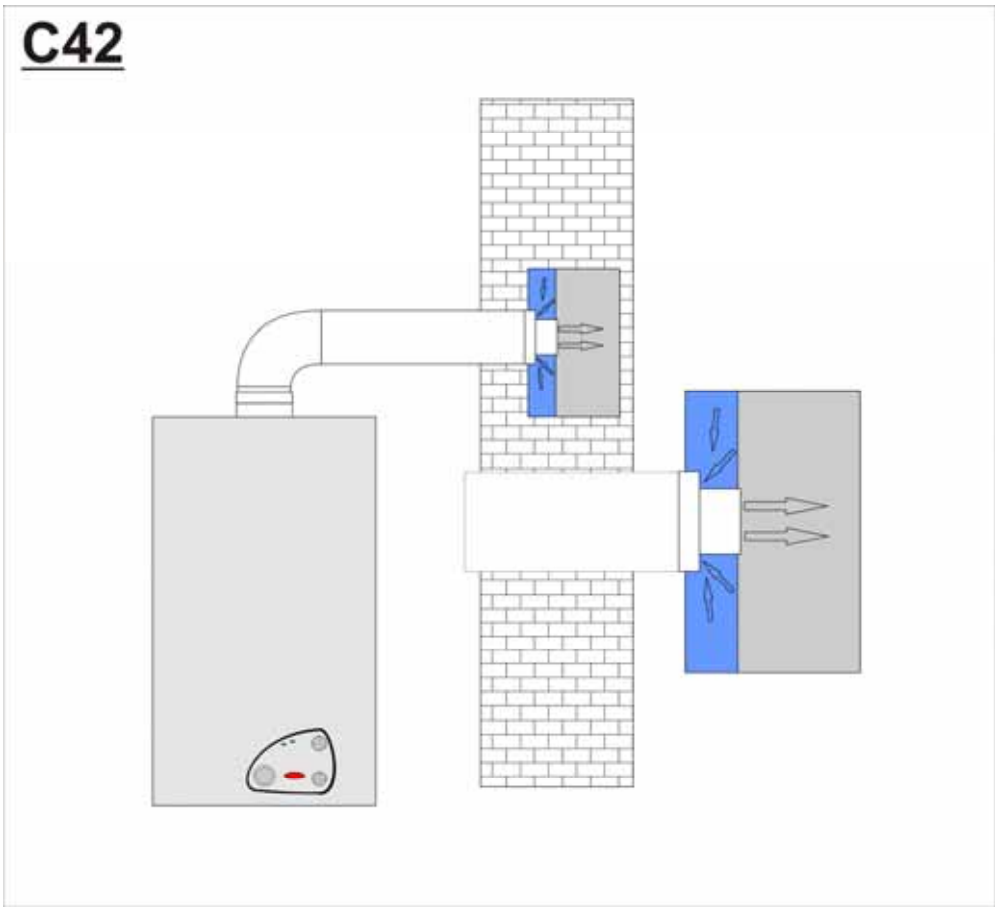




INSTALLATION SAMPLES







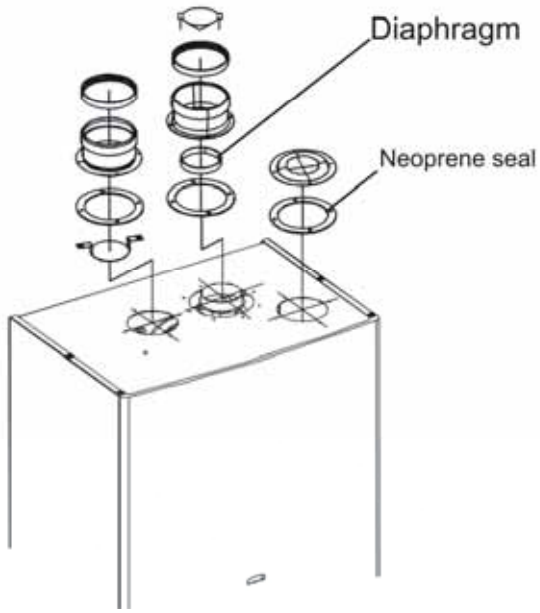
∅ 80 SPLIT PIPES

Type C42 – type C52 – type C82

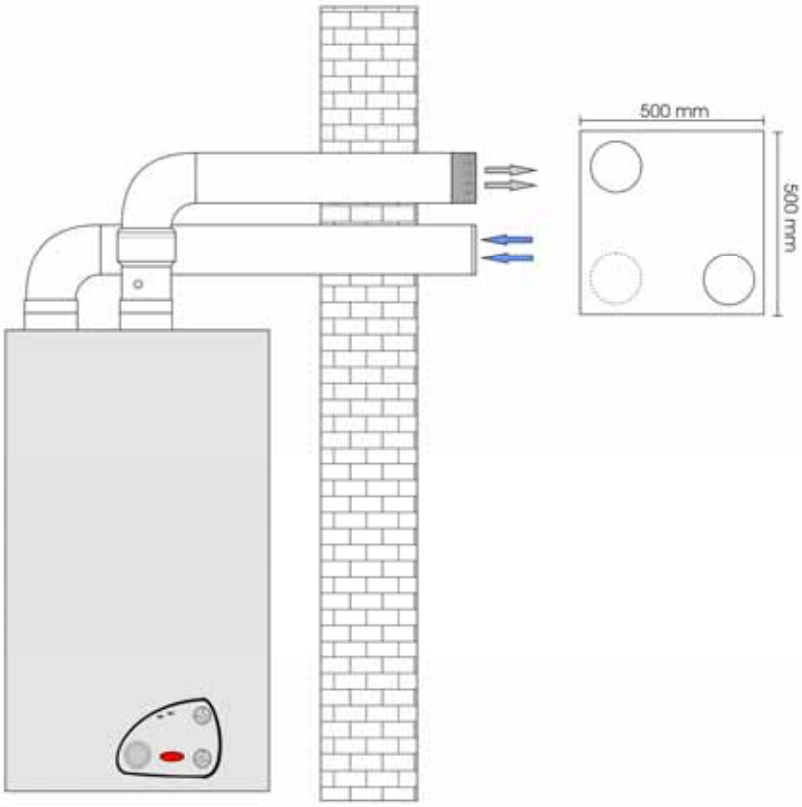
Pipe load loss ∅ 80 SPLIT PIPES	
Component	**CTFS 24 AF [m]**
Extension L = 1000 mm	1,0
Extension L = 500 mm	0,5
90° elbow (with opening for analysis)	2,5
90° elbow (narrow radius)	3,0
90° elbow (wide radius)	1,5
45° elbow	1,5
Condensate drain	2,0
Horizontal terminal	2,5
Roof terminal	1,5

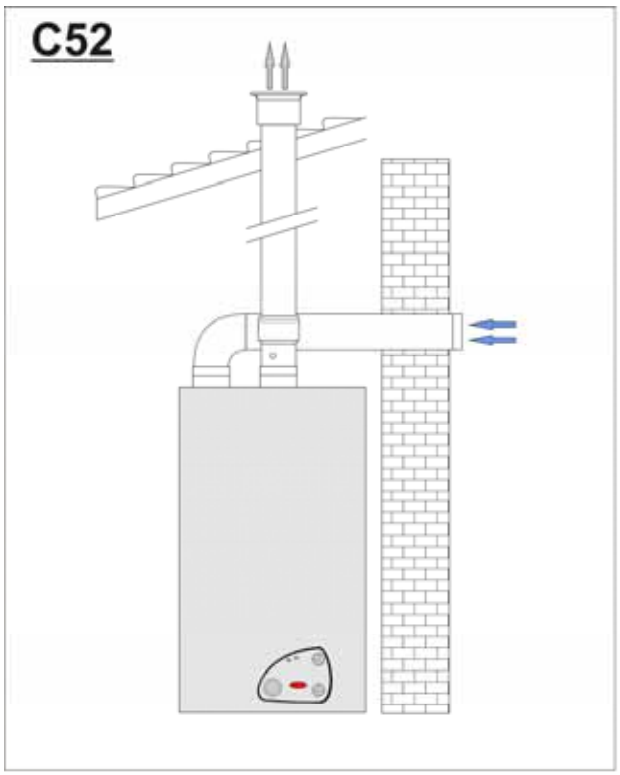
Maximum length of pipes 31 meters or 24 meters and two elbows.

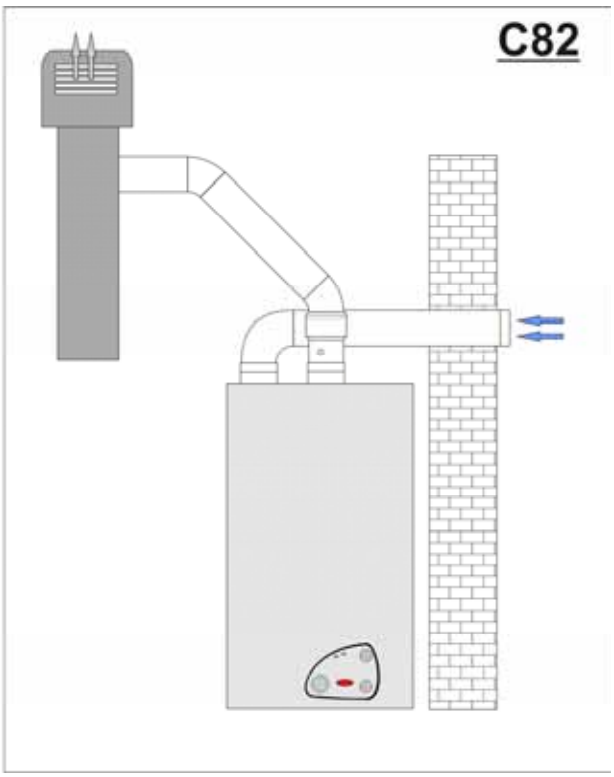
Type of installation	Pipe Material	Pipe length (m)	Diaphragm (mm)
C42 – C52 – C82	aluminum	L ≤ 15 (10 + 2 elbows)	∅ 42,5 discharge
C42 – C52 – C82	aluminum	15 (10 + 2 elbows) ≤ L ≤ 3 (26 + 2 elbows)	---



Split pipe system



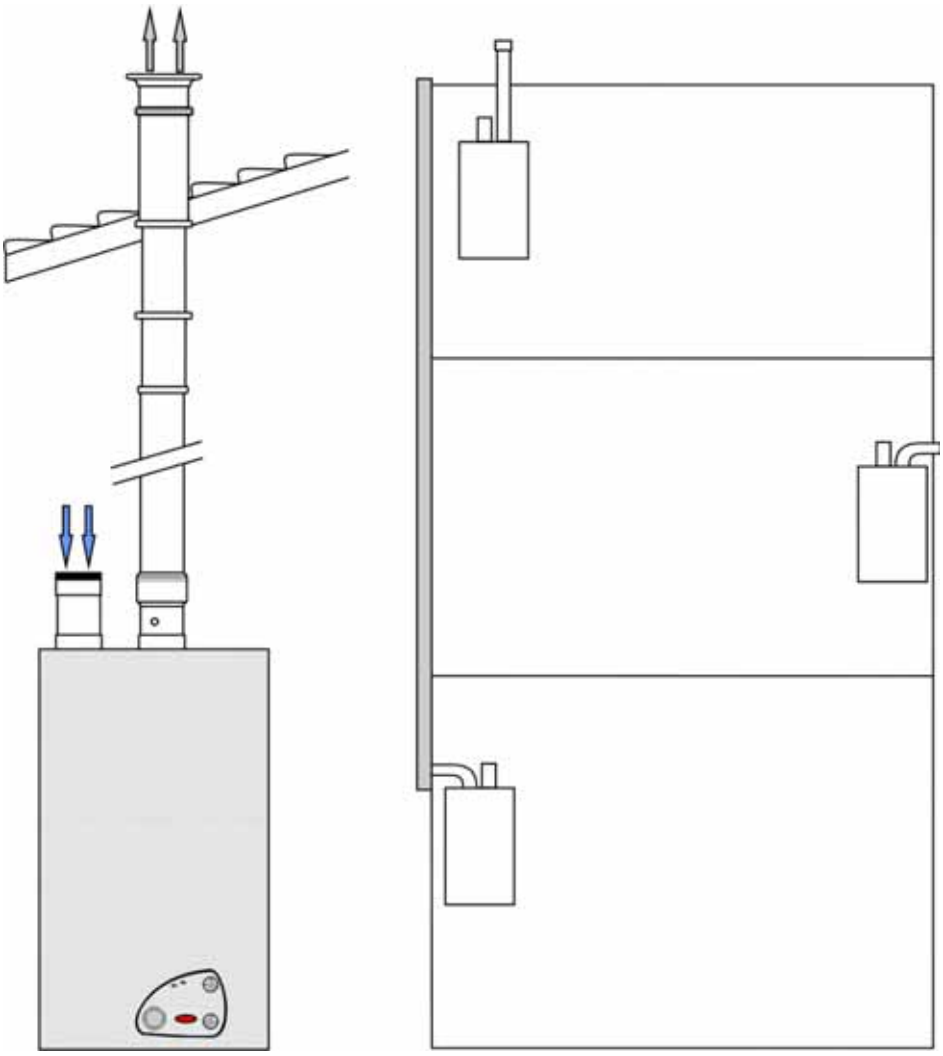




B22 type

Maximum length of pipes (∅ 80) 12,5 meters.

Type of installation	Pipe Material	Pipe length (m)	Diaphragm (mm)
B22	aluminum	L ≤ 12,5 (10 + 1 elbow)	81 in air intake



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Servizio Assistenza Clienti

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