DIDACTIC MANUAL

FAMILY:	Wall-hung boilers
GROUP:	Instantaneous, natural draught, forced draught, and CH only
MODELS:	Tahiti DUAL - Flores DUAL Pictor DUAL - Aries DUAL
VERSIONS:	Indoor, outdoor, encased
CODE:	AST 14 C151/00

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ENGLISH

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BRAND NAME

NOVA FLORIDA

Content

CHAPTER 1
TECHNICAL CHARACTERISTICS

1.1 MODELS

FLORES-ARIES DUAL CTFS 24 AF
FLORES-ARIES DUAL CTN 24 AF
TAHITI-PICTOR DUAL CTFS 24 - 28
TAHITI-PICTOR DUAL CTN 24
TAHITI-PICTOR DUAL RTFS 24 - 28
TAHITI-PICTOR DUAL RTN 24

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

MAIN CHARACTERISTICS :
FLORES-ARIES dual CTFS 24 AF: combination boiler, DHW + CH water, forced draught, sealed chamber, still water, bi-thermal exchanger;
FLORES-ARIES dual CTN 24 AF: combination boiler, DHW + CH water, natural draught, still water, bi-thermal exchanger;
TAHITI-PICTOR dual CTFS 24-28: combination boiler, DHW + CH water, forced draught, sealed chamber, mono-thermal with plate exchanger;
TAHITI-PICTOR dual CTN 24: combination boiler, DHW + CH water, natural draught, mono-thermal with plate exchanger;
TAHITI-PICTOR dual RTFS 24-28: CH only boiler, sealed chamber, forced draught, mono-thermal exchanger;
TAHITI-PICTOR dual RTN 24: CH only boiler, sealed chamber, forced draught, mono-thermal with plate exchanger;

1.2 DIMENSIONS

Height H = 750 mm

Length L = 450 mm

Depth P = 330 mm

1.3 CONTROL PANEL

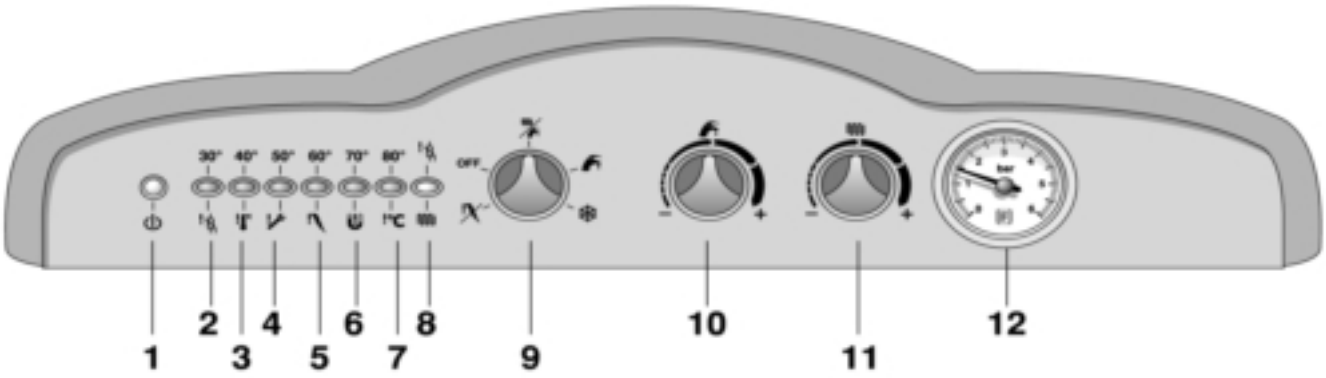


CHART A – Normal operation

Condition	2 Red	3 Red	4 Red	5 Red	6 Red	7 Red
20° or below flow temperature	OFF	OFF	OFF	OFF	OFF	OFF
30° flow temperature	**ON**	OFF	OFF	OFF	OFF	OFF
40° flow temperature	OFF	**ON**	OFF	OFF	OFF	OFF
50° flow temperature	OFF	OFF	**ON**	OFF	OFF	OFF
60° flow temperature	OFF	OFF	OFF	**ON**	OFF	OFF
70° flow temperature	OFF	OFF	OFF	OFF	**ON**	OFF
80° flow temperature	OFF	OFF	OFF	OFF	OFF	**ON**
90° or above flow temperature	OFF	OFF	OFF	OFF	OFF	**ON L**

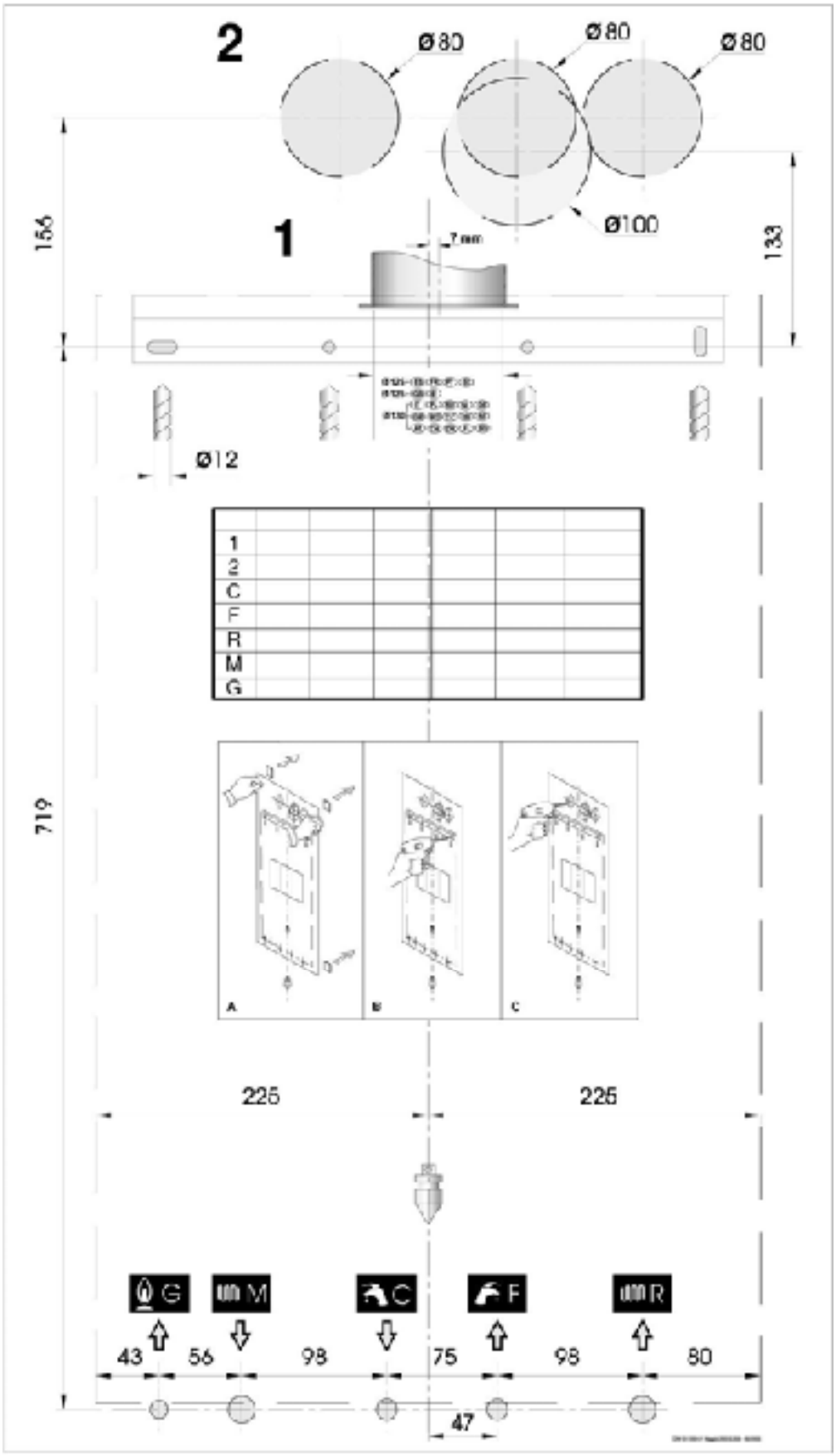
Key chart:
OFF = Led off
ON = Led fixed on
ON L = led on and flashing

CHART B – Faulty operation

Condition	1 Green	2 Red	3 Red	4 Red	5 Red	6 Red	7 Red	8 Red
Flame sensing shutdown	X	OFF	OFF	OFF	**ON L**	OFF	OFF	OFF
Safety thermostat shutdown	X	OFF	**ON L**	OFF	OFF	OFF	OFF	OFF
Water pressure switch shutdown	X	OFF	OFF	OFF	OFF	**ON L**	OFF	OFF
Thermostat/flue gas pressure switch shutdown	X	OFF	OFF	**ON L**	OFF	OFF	OFF	OFF
Flow probe malfunction	X	**ON L**	OFF	OFF	OFF	OFF	OFF	**ON L**
DHW probe malfunction	X	**ON L**	OFF	OFF	OFF	OFF	OFF	OFF
Boiler probe malfunction	X	**ON LA**	OFF	OFF	OFF	OFF	OFF	**ON LA**
Gas modutation malfunction	X	OFF	**ON L**	OFF	OFF	OFF	OFF	**ON L**
Remote control cable malfunction	X	OFF	OFF	**ON L**	OFF	OFF	OFF	**ON L**
Heating system water temperature higher than 90°C	X	OFF	OFF	OFF	OFF	OFF	**ON L**	X
Boiler is working for heating system	X	X	X	X	X	X	X	**ON**
Power supply presence	**ON**	X	X	X	X	X	X	X

Key chart:
OFF = Led off
ON = Led fixed on
ON L = led on and flashing
ON LA = Led on alternate flashing

1.4 INSTALLATION DIMENSIONS



1.5 TECHNICAL DATA

Dual CTFS 24 AF

	Heat input	Heat output MIN-MAX	Gas mains pressure	Nozzle diameter	MIN-MAX burner pressure
	(kW)	(kW)	(mbar)	(mm)	(mbar)
natural gas G20	25.5	10.8 – 23.66	20	1.25	3.3-13.5
butane gas G30	25.5	10.8 – 23.66	29	0.77	6.2 – 27.0
propane gas G31	25.5	10.8 – 23.66	37	0.77	7.7 - 35.5

Dual CTN 24 AF

	Heat input	Heat output MIN-MAX	Gas mains pressure	Nozzle diameter	MIN-MAX burner pressure
	(kW)	(kW)	(mbar)	(mm)	(mbar)
natural gas G20	25.7	9.8 - 23.18	20	1.25	2.5 – 13.0
butane gas G30	25.7	9.8 - 23.18	29	0.77	5.3 - 27.0
propane gas G31	25.7	9.8 - 23.18	37	0.77	6.5 - 35.5

Dual CTFS 24

	Heat input	Heat output MIN-MAX	Gas mains pressure	Nozzle diameter	MIN-MAX burner pressure
	(kW)	(kW)	(mbar)	(mm)	(mbar)
natural gas G20	25.5	9.9 - 23.77	20	1.25	2.5 - 13.5
butane gas G30	25.5	9.9 - 23.77	29	0.77	5.3 - 27.0
propane gas G31	25.5	9.9 - 23.77	37	0.77	6.6 - 35.5

Dual CTFS 28

	Heat input	MIN-MAX Heat output	Gas mains pressure	Nozzle diameter	MIN-MAX burner pressure
	(kW)	(kW)	(mbar)	(mm)	(mbar)
natural gas G20	30.7	11-28.3	20	1.35	2.0-11.5
butane gas G30	30.7	11-28.3	29	0.80	4.5-25.5
propane gas G31	30.7	11-28.3	37	0.80	6.0-33.0

Dual CTN 24

	Heat input	MIN-MAX Heat output	Gas mains pressure	Nozzle diameter	MIN-MAX burner pressure
	(kW)	(kW)	(mbar)	(mm)	(mbar)
natural gas G20	25.7	9.85 - 23.31	20	1.25	2.5 - 13.0
butane gas G30	25.7	9.85 - 23.31	29	0.77	5.3 - 27.0
propane gas G31	25.7	9.85 - 23.31	37	0.77	6.5 - 35.5

Dual RTFS 24

	Heat input	MIN-MAX Heat output	Gas mains pressure	Nozzle diameter	MIN-MAX burner pressure
	(kW)	(kW)	(mbar)	(mm)	(mbar)
natural gas G20	25.5	9.9 - 23.77	20	1.25	2.5 - 13.5
butane gas G30	25.5	9.9 - 23.77	29	0.77	5.3 - 27.0
propane gas G31	25.5	9.9 - 23.77	37	0.77	6.6 - 35.5

Dual RTFS 28

	Heat input	MIN-MAX Heat output	Gas mains pressure	Nozzle diameter	MIN-MAX burner pressure
	(kW)	(kW)	(mbar)	(mm)	(mbar)
natural gas G20	30.7	11-28.3	20	1.35	2.0-11.5
butane gas G30	30.7	11-28.3	29	0.80	4.5-25.5
propane gas G31	30.7	11-28.3	37	0.80	6.0-33.0

Dual RTN 24

	Heat input	MIN-MAX Heat output	Gas mains pressure	Nozzle diameter	MIN-MAX burner pressure
	(kW)	(kW)	(mbar)	(mm)	(mbar)
natural gas G20	25.7	9.85 - 23.31	20	1.25	2.5 - 13.0
butane gas G30	25.7	9.85 - 23.31	29	0.77	5.3 - 27.0
propane gas G31	25.7	9.85 - 23.31	37	0.77	6.5 - 35.5

DUAL CTN 24 AF - CTFS 24 AF

		CTN 24 AF	CTFS 24 AF
Boiler category		II2H3+	
Burner nozzles	n°	12	
Minimum CH flow rate	litre/h	550	
Minimum CH pressure	bar	0.5	
Max CH pressure	bar	3	
Minimum DHW pressure	bar	0.5	
Max DHW pressure	bar	6	
DHW specific flow rate (Δt 30°C)	litre/min	11.3	
Electrical power supply: voltage/frequency	V / Hz	230-50	
Power mains fuse	A	2	
Protection rating of control panel	IP	44	
Maximum power consumption	W	90	130
Net boiler weight	kg	34.5	38.5
Natural gas consumption *	m^3/h	2.72	2.70
Butane gas consumption*	kg/h	2.02	2.01
Propane gas consumption*	kg/h	1.99	1.98
Max CH working temperature	°C	83	
Max DHW working temperature	°C	58	
Total capacity of expansion vessel	liter	5	
Maximum recommended CH system capacity (**)	liter	100	
(*) Value related to 15°C - 1013 mbar condition			
(**) Calculated for max temperature 83°C, expansion vessel pressure pre-charge 1 bar			

DUAL CTN 24 - RTN 24

		CTN 24	RTN24
Boiler category		II2H3+	
Burner nozzles	n°	12	
Minimum CH flow rate	Litre/h	550	
Minimum CH pressure	bar	0.5	
Maximum CH pressure	bar	3	
Minimum DHW pressure	bar	0.3	-
Maximum DHW pressure	bar	8	-
DHW specific flow rate (Δt 30°C)	litre/min	11.3	-
Electrical power supply: tension/frequency	V / Hz	230-50	
Power mains fuse	A	2	
Protection rating of control panel	IP	44	
Maximum power consumption	W	90	
Net boiler weight	kg	36.5	34.5
Natural gas consumption *	m^3/h	2.72	
Butane gas consumption*	kg/h	2.02	
Propane gas consumption*	kg/h	1.99	
Maximum CH working temperature	°C	83	
Maximum DHW working temperature	°C	62	-
Total expansion vessel capacity	liter	8	
Maximum recommended CH system capacity (**)	liter	160	
(*) Value related to 15°C - 1013 mbar condition			
(**) Calculated for max temperature 83°C, expansion vessel pressure pre-charge 1 bar			

DUAL CTFS 24 – RTFS 24

		CTFS 24	RTFS 24
Boiler category		II2H3+	
Burner nozzles	n°	12	
Minimum CH flow rate	Litre/h	550	
Minimum CH pressure	bar	0.5	
Maximum CH pressure	bar	3	
Minimum DHW pressure	bar	0.3	-
Maximum DHW pressure	bar	8	-
DHW specific flow rate (Δt 30°C)	litre/min	11.3	-
Electrical power supply: voltage/frequency	V / Hz	230-50	
Power mains fuse	A	2	
Protection rating of control panel	IP	44	
Maximum power consumption	W	130	
Net boiler weight	kg	40.3	38.0
Natural gas consumption *	m^3/h	2.7	
Butane gas consumption*	kg/h	2.01	
Propane gas consumption*	kg/h	1.98	
Max CH working temperature	°C	83	
Max DHW working temperature	°C	62	-
Total expansion vessel capacity	liter	8	
Maximum recommended CH system capacity (**)	liter	160	
(*) Value related to 15°C - 1013 mbar condition			
(**) Calculated for max temperature 83°C, expansion vessel pressure pre-charge 1 bar			

DUAL CTFS 28 – RTFS 28

		CTFS 28	RTFS 28
Boiler category		II2H3+	
Burner nozzles	n°	13	
Minimum CH flow rate	Litre/h	670	
Minimum CH pressure	bar	0.5	
Maximum CH pressure	bar	3	
Minimum DHW pressure	bar	0.3	-
Maximum DHW pressure	bar	8	-
DHW specific flow rate (Δt 30°C)	litre/min	13.3	-
Electrical power supply: voltage/frequency	V / Hz	230-50	
Power mains fuse	A	2	2
Protection rating of control panel	IP	44	44
Maximum power consumption	W	130	130
Net boiler weight	kg	41.0	38.5
Natural gas consumption *	m^3/h	3.25	
Butane gas consumption*	kg/h	2.42	
Propane gas consumption*	kg/h	2.38	
Maximum CH working temperature	°C	83	
Maximum DHW working temperature	°C	62	-
Total expansion vessel capacity	liter	8	
Maximum recommended CH system capacity (**)	liter	160	
(*) Value related to 15°C - 1013 mbar condition			
(**) Calculated for max temperature 83°C, expansion vessel pressure pre-charge 1 bar			

DUAL CTN 24 AF

		Max. output	Min. output	30 % output
Outer casing heat loss	%	0.8	0.8	-
Flue system heat loss with burner ON	%	9.3	10.9	-
Flue gas mass capacity (natural gas)	g/sec.	16.2	13.3	-
Flue temp. – Air temp.	°C	86.0	52.0	-
CO_2 value	%	6.2	3.0	-
Boiler efficiency rate	%	90.2	89.1	88.3

DUAL CTFS 24 AF

		Max. output	Min. output	30 % output
Outer casing heat loss	%	0.23	-	-
Flue system heat loss with burner ON	%	7.2	9.5	-
Flue gas mass capacity (natural gas)	g/sec.	13.3	15.7	-
Flue temp. – Air temp.	°C	101.0	60.0	-
CO_2 value	%	7.4	2.8	-
Boiler efficiency rate	%	92.8	90.5	90.2

DUAL CTN 24 – RTN 24

		Max. output	Min. output	30 % output
Outer casing heat loss	%	0.8	0.8	-
Flue system heat loss with burner ON	%	9.3	10.5	-
Flue gas mass capacity (natural gas)	g/sec.	16.2	13.7	-
Flue temp. – Air temp.	°C	85	50	-
CO_2 value	%	6.2	3.0	-
Boiler efficiency rate	%	90.7	89.5	88.7

DUAL CTFS 24 – RTFS 24

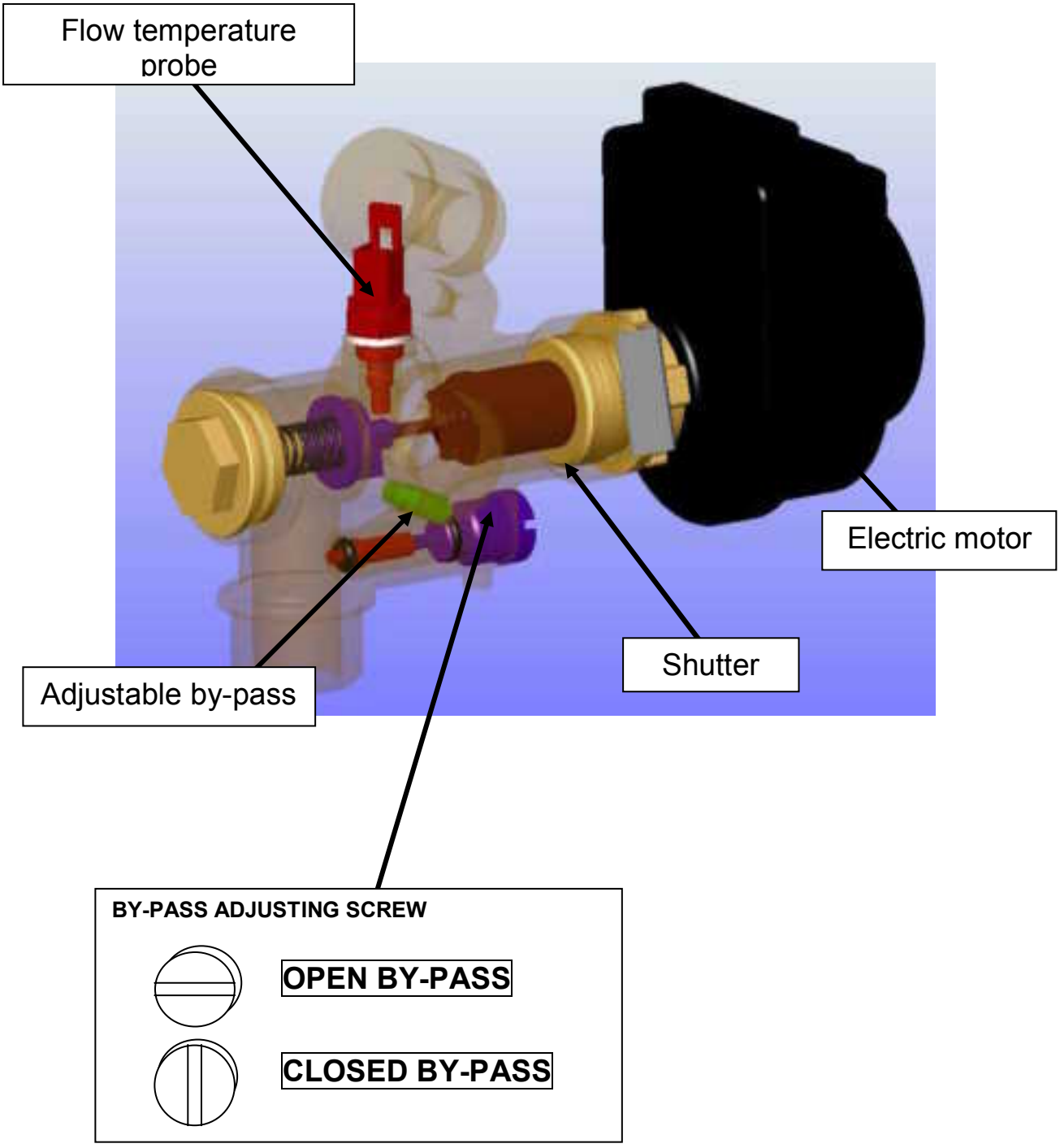
		Max. output	Min. output	30 % output
Outer casing heat loss	%	0.23	0.23	-
Flue system heat loss with burner ON	%	6.8	9.5	-
Flue gas mass capacity (natural gas)	g/sec.	12.9	14	-
Flue temp. – Air temp.	°C	98	60	-
CO_2 value	%	7.7	2.9	-
Boiler efficiency rate	%	93.2	90.5	90.2

DUAL CTFS 28 – RTFS 28

		Max. output	Min. output	30 % output
Outer casing heat loss	%	0.3	0.3	-
Flue system heat loss with burner ON	%	7.8	12.1	-
Flue gas mass capacity (natural gas)	g/sec.	17.5	18	-
Flue temp. – Air temp.	°C	101	64	-
CO_2 value	%	7	2.5	-
Boiler efficiency rate	%	92.2	87.9	87.6

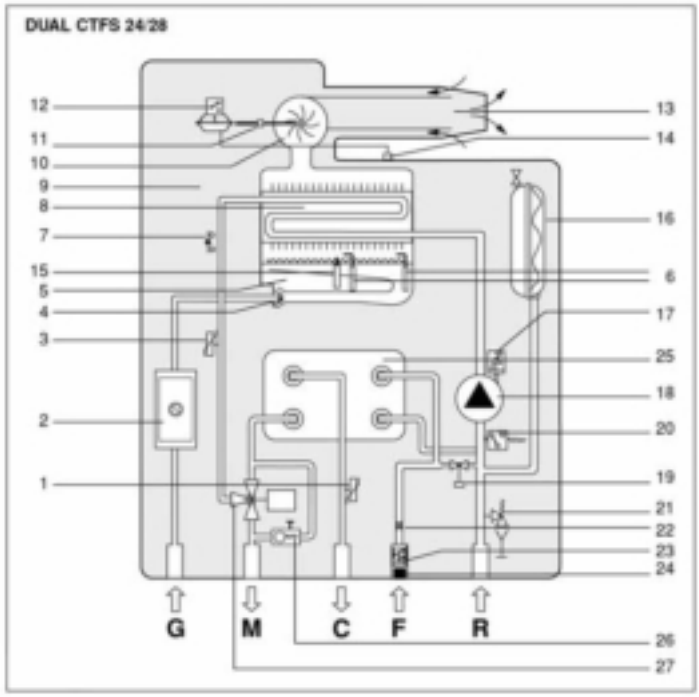
CHAPTER 2
FUNCTIONAL CHARTS

2.1 THREE-WAY MOTORIZED VALVE



2.2 HYDRAULIC LAYOUTS

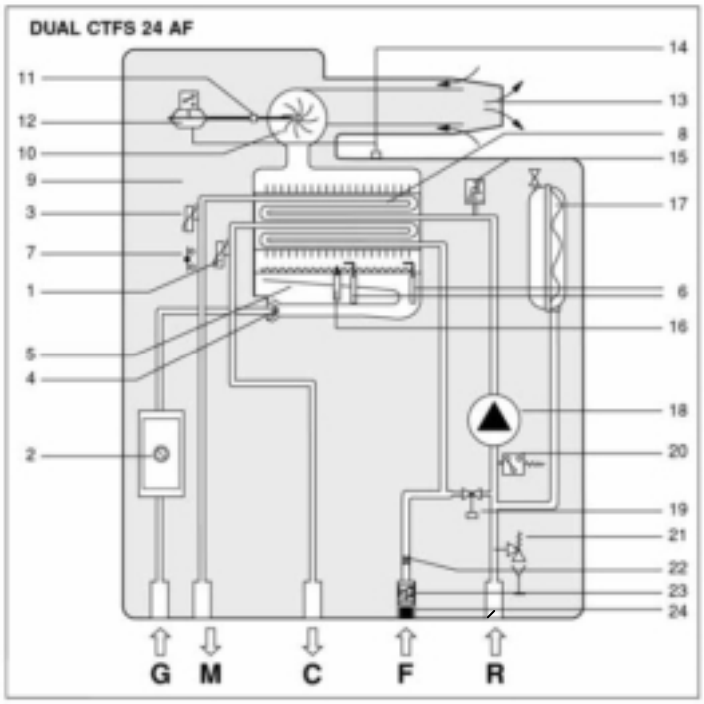
Mono-thermal CTFS



1. DHW temperature probe
2. Gas valve
3. CH water temperature probe
4. Burner nozzles
5. Burner
6. Ignition electrodes
7. Safety thermostat
8. Mono-thermal main heat exchanger
9.Sealed combustion chamber
10. Flue gas discharge fan
11. Pressure check on flue gas system
12. Flue gas safety pressure switch
13. Flue gas and combustion air pipe system
14. Flue gas pressare check
15. Flame sensing electrode
16. Expansion vessel
17. Air purging device
18. Pump
19. Loading tap
20 Water pressure switch
21. Safety valve
22. 12 liter/min flow rate limiting device
23. Flow switch
24. Domestic cold water filter
25. Secondary plate heat exchanger
26. Adjustable by-pass
27. Three-way valve

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

Bi-thermal CTFS - AF

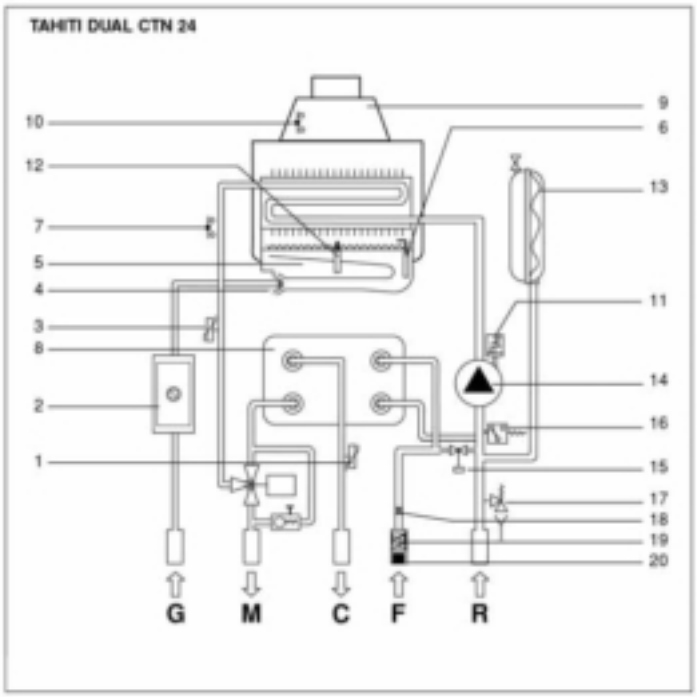


1. DHW temperature probe
2. Motorized gas valve
3. CH water temperature probe
4. Burner nozzles
5. Burner
6. Ignition electrodes
7. Safety thermostat
8. Bi-thermal heat exchanger
9. Sealed combustion chamber
10. Flue gas discharge fan
11. Pressure check on flue gas system
12. Flue gas safety pressure switch
13. Flue gas and combustion air pipe system
14. Flue gas pressare check
15. Flame sensing electrode
16. Air purging device
17. Expansion vessel
18. Pump
19. Loading tap
20 Water pressure switch
21. Safety valve
22. 12 liter/min flow rate limiting device
23. Flow switch
24. Domestic cold water filter

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

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

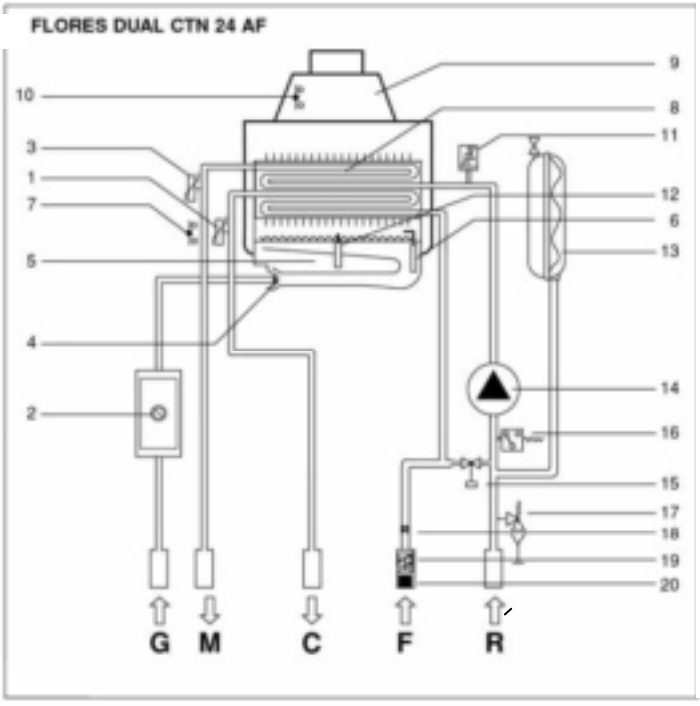
Mono-thermal CTN



1. DHW temperature probe
2. Gas valve
3. CH water temperature probe
4. Burner nozzles
5. Burner
6. Ignition electrodes
7. Safety thermostat
8. Secondary plate heat exchanger
9.Flue gas hood
10. Flure gas anti-overflow thermostat
11. Air purging device
12. Flame sensing electrode
13. Expansion vessel
14. Pump
15. Loading tap
16. Water pressure switch
17. Safety valve
18. 12 liter/min flow rate limiting device
19. Flow switch
20 Domestic cold water filter

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

Bi-thermal CTN - AF

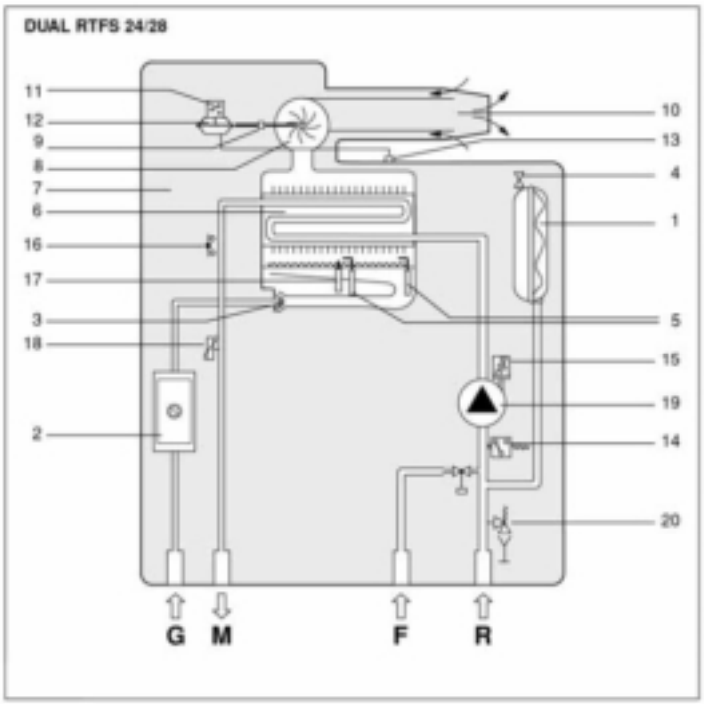


1. DHW temperature probe
2. Motorized gas valve
3. CH water temperature probe
4. Burner nozzles
5. Burner
6. Ignition electrodes
7. Safety thermostat
8. Bi-thermal heat exchanger
9.Flue gas hood
10. Flure gas anti-overflow thermostat
11. Air purging device
12. Flame sensing electrode
13. Expansion vessel
14. Pump
15. Loading tap
16. Water pressure switch
17. Safety valve
18. 12 liter/min flow rate limiting device
19. Flow switch
20. Domestic cold water filter

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

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

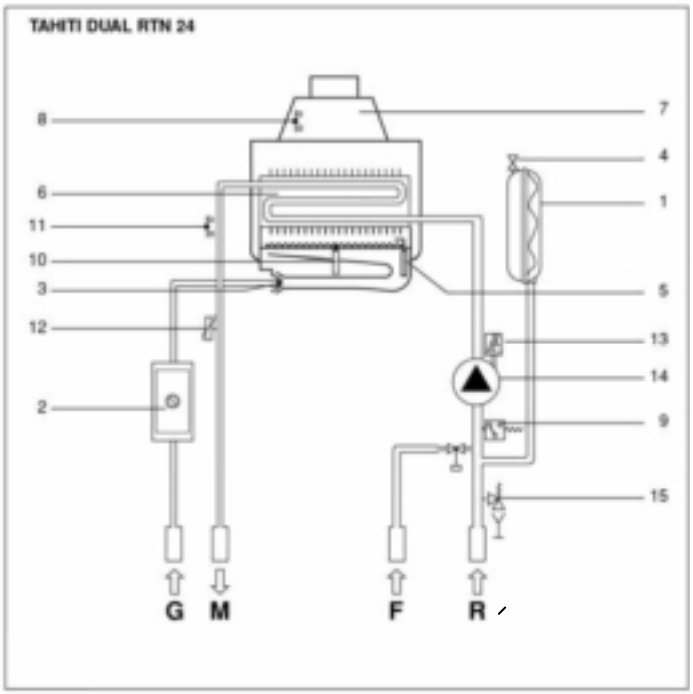
Mono-thermal RTFS



1. Expansion vessel
2. Gas valve
3. Burner nozzles
4. Expansion vessel loading valve
5. Ignition electrode
6. Heat exchanger
7. Sealed combustion chamber
8. Flue gas discharge fan
9.Pressure check on flue gas system
10. Flue gas and combustion air ducts
11. Flue gas pressure micro-switch
12. Flue gas safety pressure switch
13. Flue gas pressure check
14. Pump
15. Loading tap
16. Water pressure switch
17. Flame sensing electrode
18. CH temperature probe
19. Pump
20 CH system safety valve

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

Mono-thermal RTN

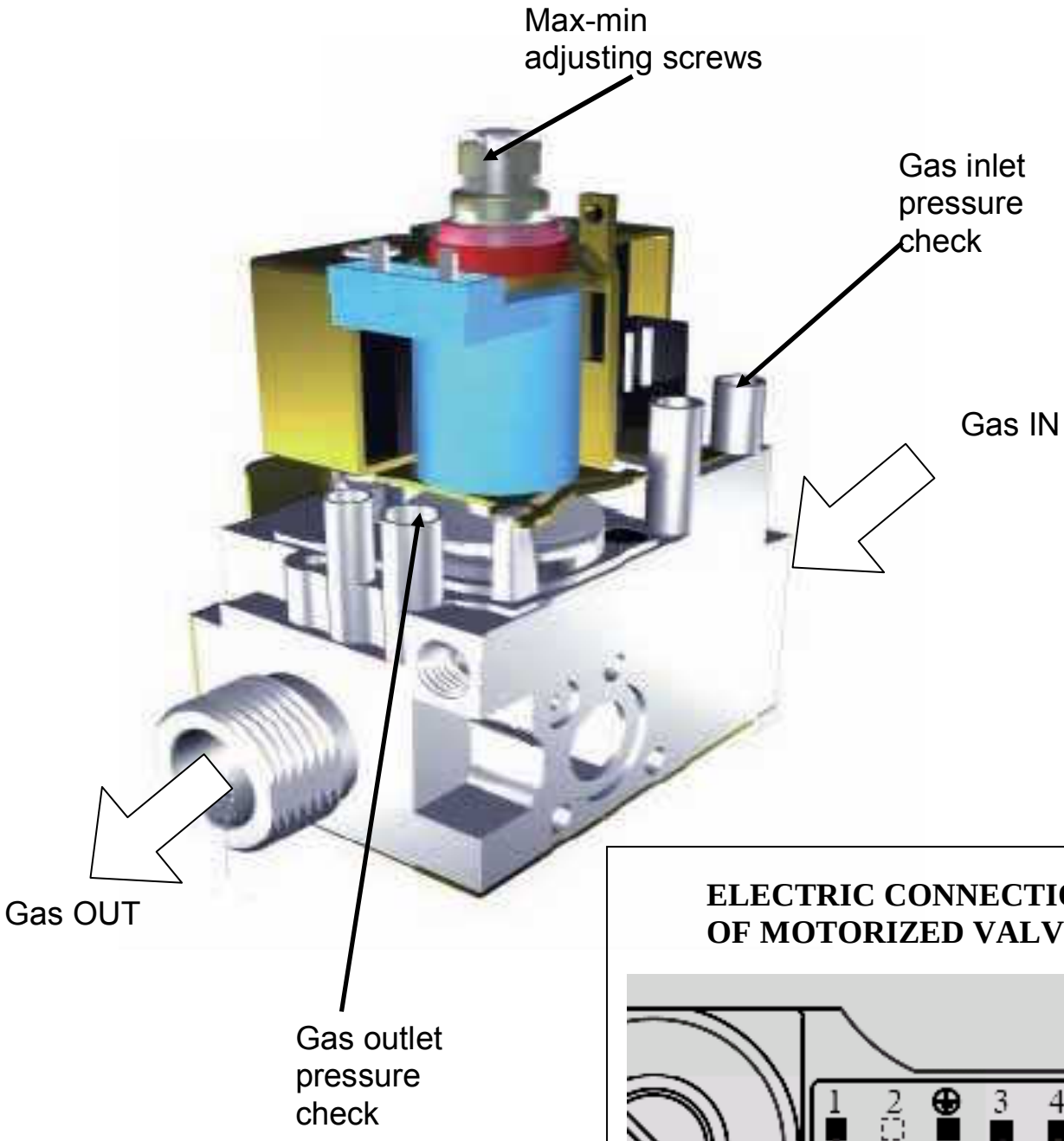


1. Expansion vessel
2. Gas valve
3. Burner nozzles
4. Expansion vessel loading valve
5. Ignition electrode
6. Heat exchanger
7. Flue gas hood
8. Flue gas anti-overflow thermostat
9.Water pressure switch
10. Flame sensing electrode
11. Safety thermostat
12. CH water temperature probe
13. Air purging device
14. Pump
15. CH system safety valve

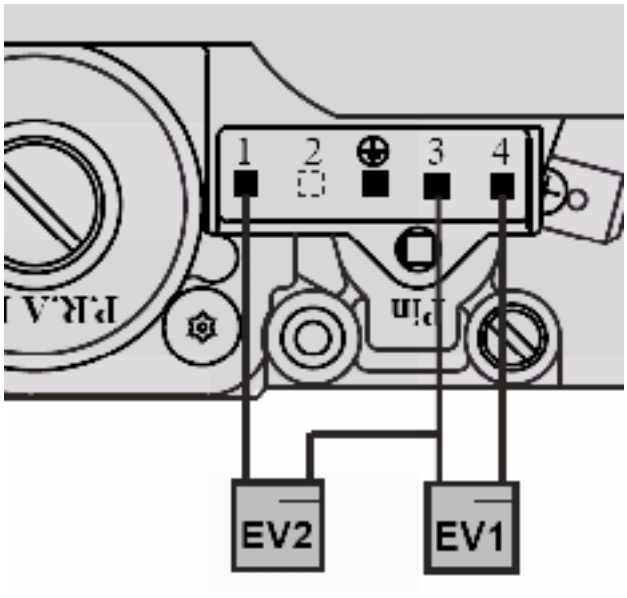
G Gas inlet
M CH flow
C DHW flow
F Domestic cold water inlet
R CH return

M **CH flow**
G **Gas inlet**
F **Domestic cold water inlet**
R **CH return**

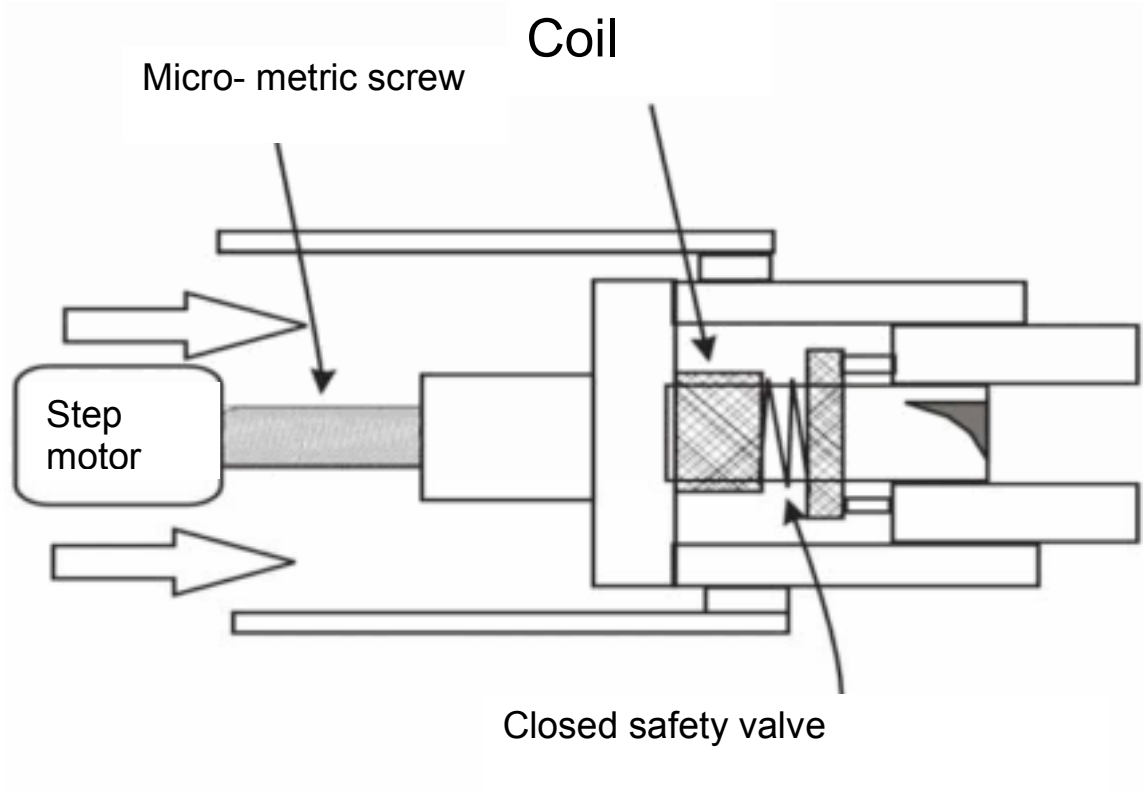
2.3 SIT 845 GAS VALVE

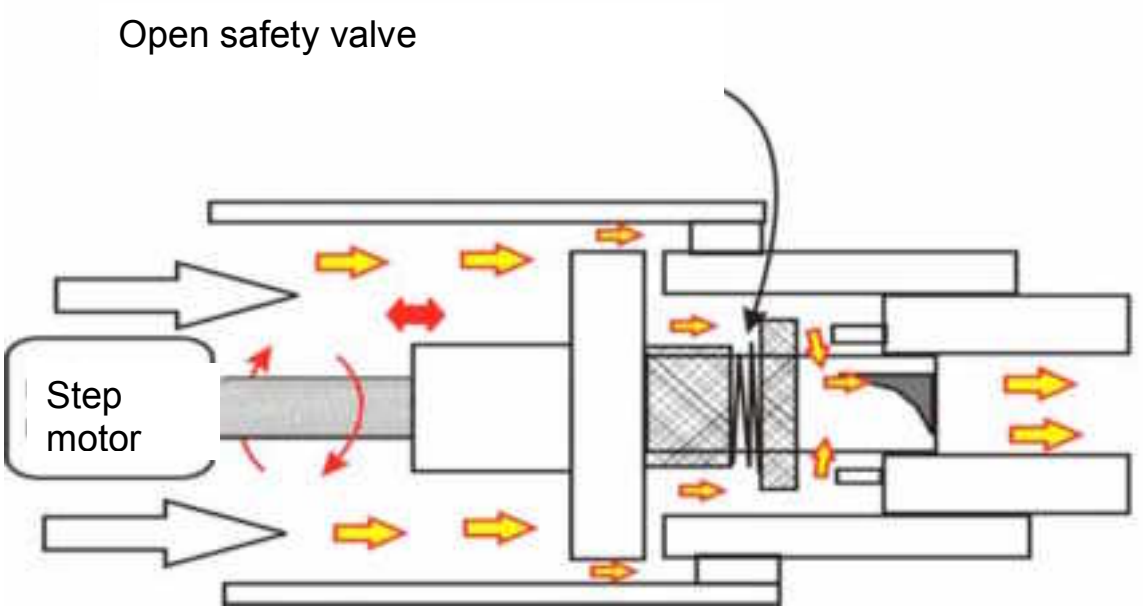


ELECTRIC CONNECTIONS OF MOTORIZED VALVE



2.4 NORDGAS GAS VALVE





CHP.3

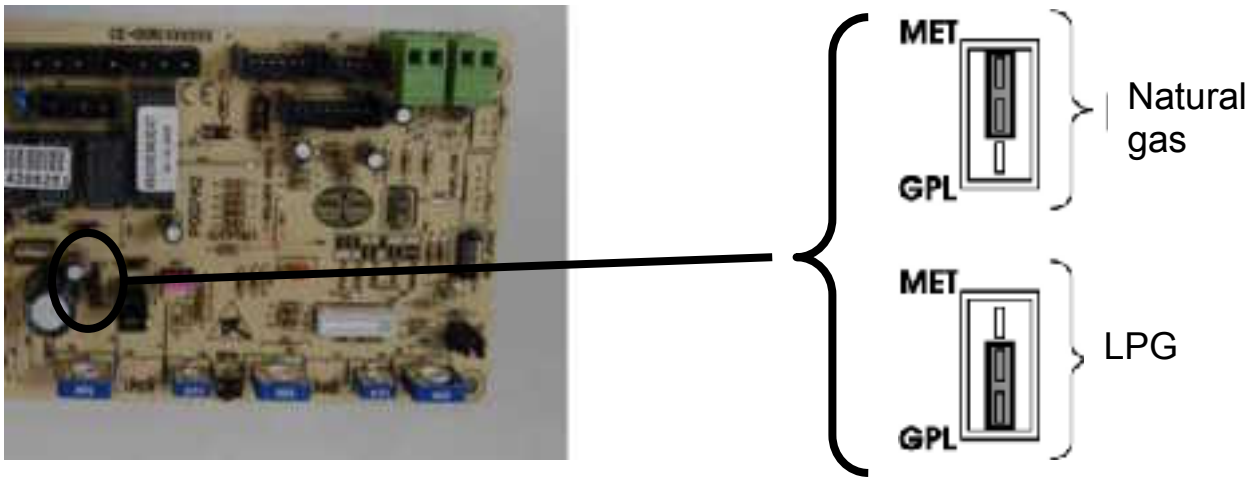
ADJUSTMENTS

3.1 CONVERSIONS

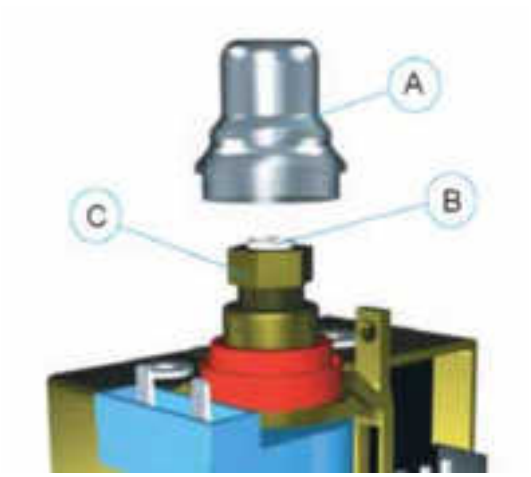
- Check that the boiler is disconnected from the mains;
- remove the main burner;
- remove the main burner nozzles and replace them with those bearing the correct diameter in relation to the new gas type (see charts in chapter 3.3 “Operational data”) - WARNING: it is mandatory to install the copper seals;
- 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 in the LPG position (see the photo below);
- now adjust the gas valve (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 3.3 “Operational data”) - WARNING: it is mandatory to install the copper seals;
- 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 in the MET position (see the photo below);
- now adjust the gas valve (next page).

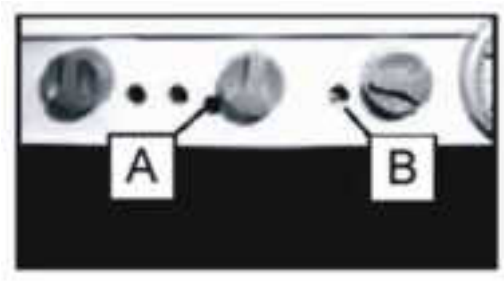


3.2 ADJUSTMENT OF SIT 845 GAS VALVE



- Remove the gas inlet pressure check screw by means of a small screwdriver, and connect a manometer in order to verify correct pressure from the network;
- connect a manometer to the gas outlet pressure check after removing the screw of the gas outlet check by means of a small screwdriver;
- start the boiler in CH mode and to max output (see paragraph 4.4 “Chimney sweep function);
- remove the plastic protective cap A, act on screw C clockwise to increase pressure and anti-clockwise to decrease it (fully turn the screw clockwise in LPG fuelled boilers);
- after adjusting max pressure, disconnect the blue coil wire in order to operate the boiler at minimum output;
- adjust minimum pressure by acting on the internal screw of the gas (holding still the external screw);
- check correct operation of the burner verifying that the ignition is normal and quiet, act on PACC trimmer of the electronic board when necessary in order to adjust ignition power (clockwise to increase, anti-clockwise to decrease);
- check for gas leaks;
- seal once more the cap screw;
- once the above procedure is complete, fill in the tag enclosed with the kit and affix it to the side of the technical data label of the boiler.

3.3 “CHIMNEY SWEEP” FUNCTION

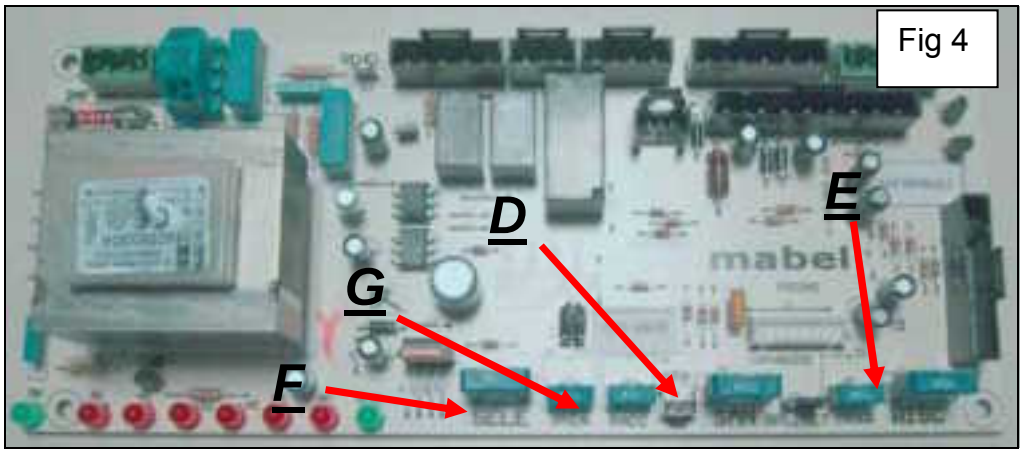


The boiler has a “chimney sweep” function in order to test boiler combustion efficiency and to adjust the burner.
Set the boiler selector knob to WINTER mode and the room thermostat to ON (if available). While the boiler is operating, press the SPA button with a pointed tool (A in the picture below); the boiler will turn OFF and then resume ignition sequence and proceed operating with a maximum output.
The “Chimney sweep” function running time is 15 minutes.
In order to deactivate the “chimney sweep” function, turn the selector to any position other than WINTER.

3.4 ADJUSTMENT OF NORDGAS GAS VALVE

ADJUSTMENT OF MAX PRESSURE

- Check max pressure (SEE NOZZLES-PRESSURES CHART) through port **A** on the gas valve (picture 1).
- Connect to electric power the electronic board paying attention to correct PHASE and NEUTRAL sequence (picture 2) and verify the contact of the room thermostat **T AMB** to be closed through the relevant clamps.
- Turn the boiler ON through selector **SELE (pic. 4-F),** setting it to CH/DHW position  .
- Once the boiler ha turned ON, press button **SPA (pic.4-D)** (chimney sweep) until the flame goes OFF, and then release it: the boiler will re-start at max output and in the next 15 minutes it'll be possible to perform all the necessary adjustments.



- Adjust max pressure through the flow rate adjuster on the gas valve (SEE NOZZLE-PRESSURE CHART) by acting on screw **B (picture 1)** turning CLOCKWISE in order to increase , ANTI-CLOCKWISE to decrease.
- Install the boiler casing and check max pressure keeping the manometer connected to the pressure check**,** and eventually, should it not be correct, adjust as above illustrated.

MINIMUM OUTPUT ADJUSTMENT

- Fully Turn **MAXR** trimmer **(pic.4 E)** and adjust minimum pressure through **PMIN** trimmer **(pic.4 G)** turning CLOCKWISE to increase, ANTI-CLOCKWISE to decrease (SEE NOZZLE-PRESSURE CHART).
- Turn MAXR trimmer fully clockwise and check max pressure ((SEE NOZZLE-PRESSURE CHART).

IGNITION OUTPUT ADJUSTMENT

Act on **P ACC** trimmer (**fig 4 G**) in order to adjust ignition output (clockwise to increase, anti-clockwise to decrease).

WARNING

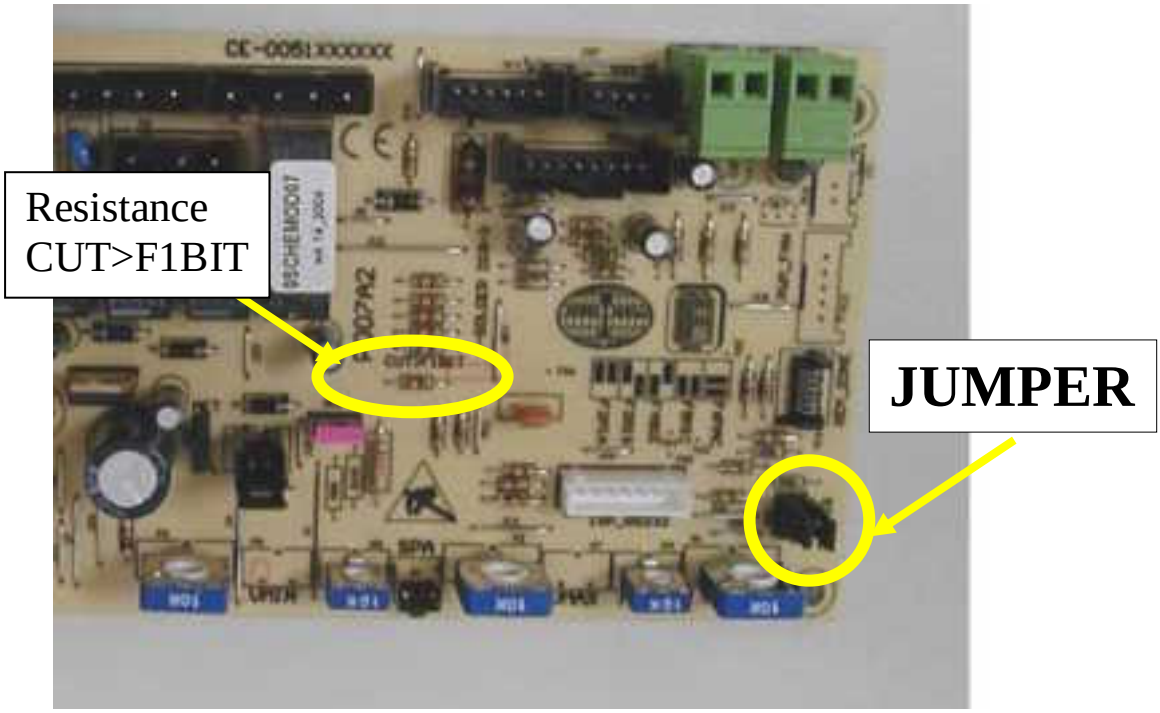
After any intervention on the gas valve (such as removal or replacement) it is necessary to disconnect power to the boiler for a few seconds and then reconnect it. That procedure in order to reset the boiler electronics which will recognize the exact open position of the gas valve.

CHAPTER.4
OPERATION CRITERIA AND DIAGNOSTICS

4.1 ELECTRONIC BOARDS MANAGING “DUAL” INSTANTANEOUS BOILER

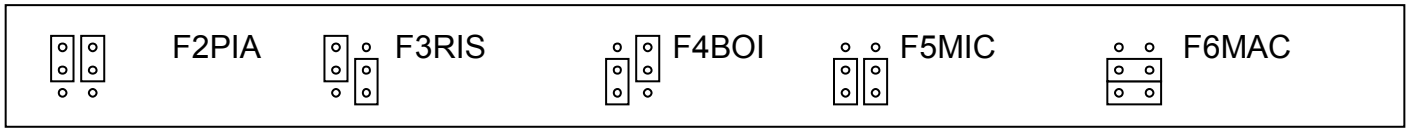
Code 6SCHEMOD07 (DUAL with Sit gas valve)

►► In installations on **bi-thermal boilers** it is MANDATORY to cut resistance (CUT>F1BIT) which is positioned approximately in the middle area of the board.



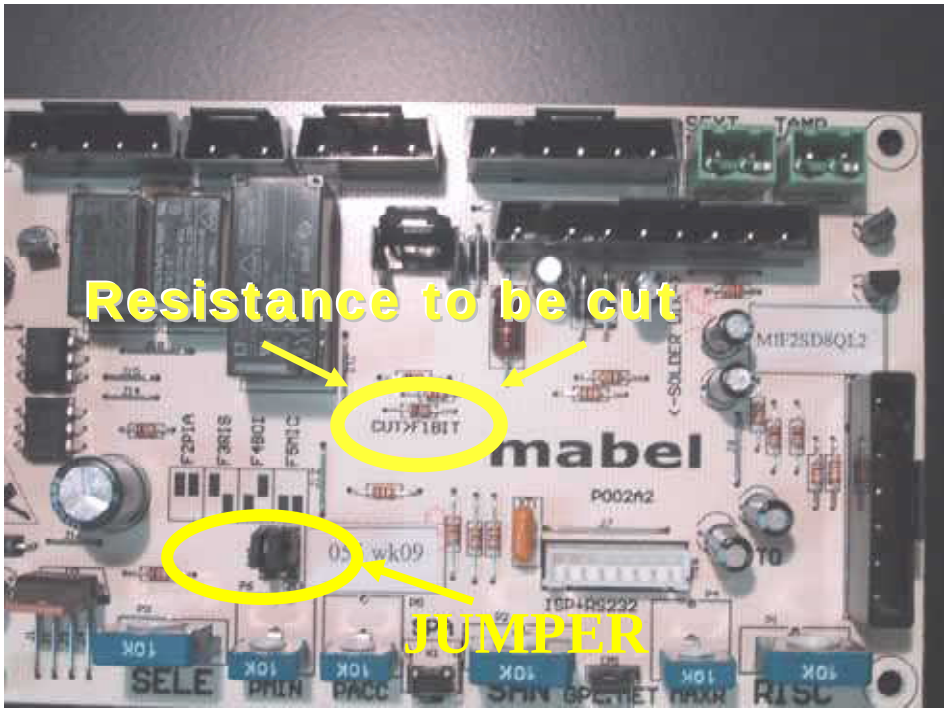
►► In installations on **mono-thermal boilers** it is MANDATORY to position the two jumpers in pic.1 as indicated below:

In position F2PIA mono-thermal combination boiler with plate heat exchanger.
In position F3RIS CH only boiler, ready for connection to external cylinder.
In position F4BOI combination boiler with water tank.
In position F5MIC combination boiler with micro water tank.
In position F6MAC reserved for future developments



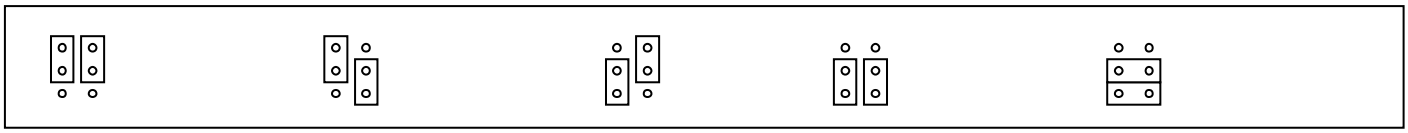
Code 6SCHEMOD05 (DUAL with NordGas gas valve)

►► In installations on **bi-thermal boilers** it is MANDATORY to cut resistance (CUT>F1BIT) which is positioned approximately in the middle area of the board.



►► In installations on **mono-thermal boilers** it is MANDATORY to position the two jumpers in pic.1 as indicated below:

In position F2PIA mono-thermal combination boiler with plate heat exchanger.
In position F3RIS Ch only boiler, ready for connection to external cylinder.
In position F4BOI combination boiler with water tank.
In position F5MIC combination boiler with micro water tank.



MAIN CHARACTERISTICS

- Modulation of CH with output ramp.
- Boiler max output in CH mode.
- Thermoregulation with outdoor temperature probe (option).
- DHW priority function.
- DHW modulation.
- Ignition procedure with pre-set and adjustable output.
- Flame propagation with pre-set and timer controlled output.
- Adjustable minimum burner output.
- Boiler anti-freeze function.
- Timer controlled post-circulation function.
- Timer controlled pump and deviation valve anti-locking function.
- Boiler diagnostics – Signal of malfunction.
- Timer controlled “chimney sweep” function.
- GPL-MET jumper.

PRIORITY OF FUNCTIONS

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

Priority	Status
1	Shutdown
2	Chimney sweep (in Winter mode only)
3	DHW request
4	CH request
4	CH anti-freeze function
5	Post-circulation
6	Pump and deviation valve anti-locking
7	Waiting for a 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

(the time the burner is inactive after being turned off)

- Ignition ramp timer : 50 seconds.

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

MODULATION TEMPERATURE AND DHW THERMOSTAT IN BI-THERMAL BOILER

- DHW temperature adjusting range in bi-thermal boiler: 35-50° C

When minimum output is larger than the output required for DHW.

- Temperature of intervention of DHW thermostat in bi-thermal boiler: OFF = 58° C fixed.
- Temperature of intervention of DHW thermostat in bi-thermal boiler: ON = 53° C fixed.

MODULATION TEMPERATURE AND DHW THERMOSTAT IN MONO-THERMAL BOILER:

- DHW temperature adjusting range in mono-thermal boiler: 35° C-57° C
- Temperature of intervention of DHW thermostat in mono-thermal boiler: OFF = set point + 5° C
- Temperature of intervention of DHW thermostat in mono-thermal boiler: ON = set point +3° C
- Temperature of intervention of flow thermostat in DHW mode and mono-thermal boiler: OFF 85°C
- Temperature of intervention of flow thermostat in DHW mode and mono-thermal boiler: ON 75

VARIOUS TEMPERATURES

DESCRIPTION	ON	OFF
Boiler anti-freeze function	5°C	30 °C(or working time >15')
Chimney sweep function	70°C	90°C
Correct working range of flow, DHW, water tank probes	-20°C/+120°C	
Correct working range of outdoor temperature probe	-40°C/+50°C	

General tolerance of temperatures	± 3°C

SELECTING THE GAS TYPE OF BOILER

GPL – MET SELECTOR

Position the jumper towards Gpl (Lpg) o Met (Natural gas) in order to set the boiler for the type of gas available.

PRE-SET AND ADJUSTABLE IGNITION SEQUENCE

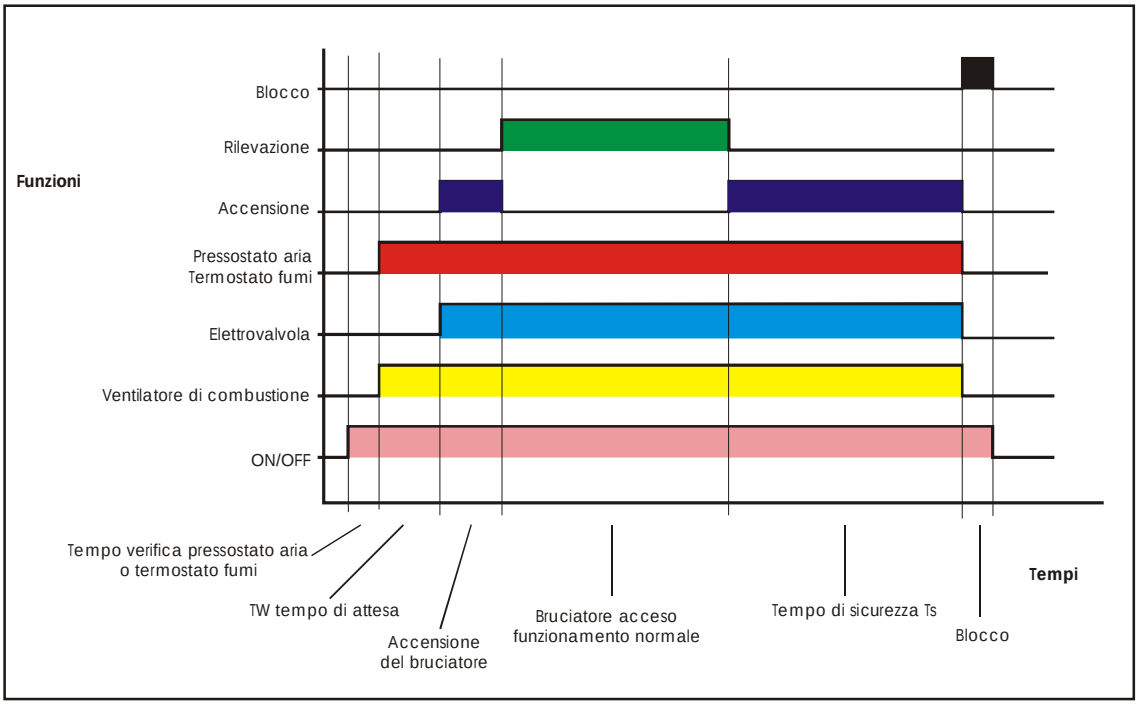
Whenever the ignition sequence of the burner, it is performed by supplying a quantity of gas set by the ignition output trimmer (P ACC). As soon as the flame is sensed, the propagation phase starts.

FLAME PROPAGATION PHASE WITH PRE-SET OUTPUT AND TIMER

During the timer controlled flame propagation phase, the gas flow rate is forced to the relevant value in order to obtain the flame propagation. Once the propagation time is over, the burner is managed through the pre-set output of modulation PID.

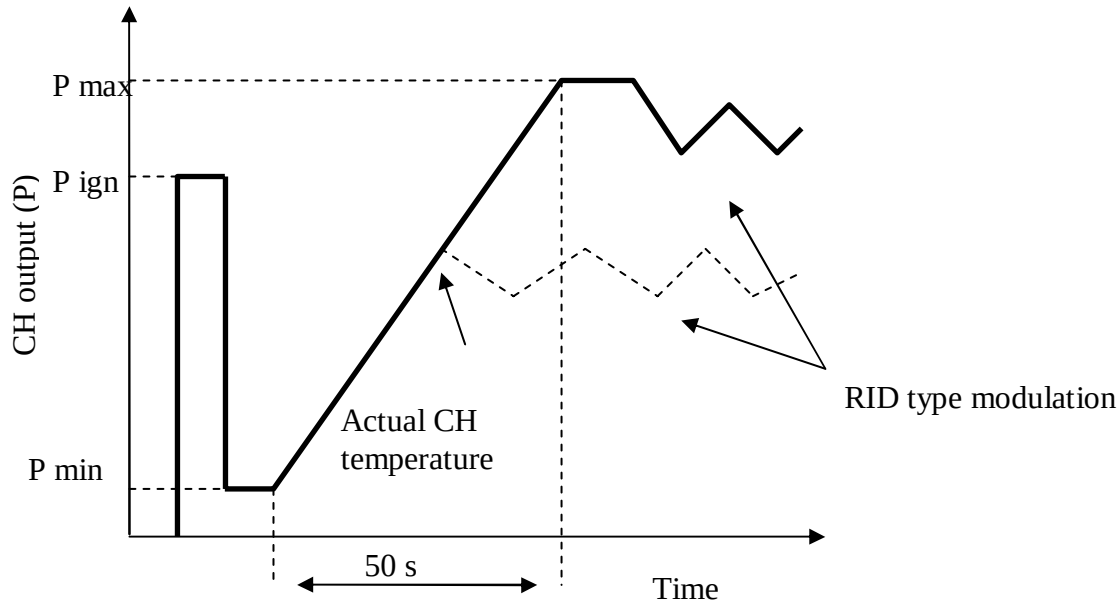
AUTOMATIC FLAME CONTROL

The section of automatic flame control, integrated in the electronic board, is operating as a command and flame sensing device in accordance to EN298 Regulation, designed for direct ignition of the burner (via an external igniter) and flame sensing through ionization.
The device is always active and continuously operates its self-checking function.
When the burner is requested to be turned on, after verification that the pressure switch contacts (**C type**) are properly positioned, the fan is turned on (**C type**): when the pressure switch (**C type**) or the flue gas thermostat (**B type**) consents to operation, the device starts counting the waiting time TW. Once the waiting time TW (1,5 seconds) is over, the gas valve and the igniter are powered on. As soon as the flame is sensed it is possible to keep the gas valve open. The igniter is turned off is a flame is sensed or the safety time TS is over. Should the flame disappear during normal operation, the flame sensing device, automatically repeats the ignition sequence.
The flame sensing device shuts the boiler down (**iono shutdown**) when the flame is not detected within a safety time TS (10 seconds), or if a parasitic flame is sensed for a time>TW+TS.(11,5 seconds).
The flame sensing device operates a flue gas shut down when the flue gas thermostat (**B type**) or the pressure switch (**C type**) does not consent to operation for a time >TW+TS, or the flue gas pressure switch contacts (**C type**) are in the wrong position for a time >TW+TS. In order to reset the boiler, turn the relevant knob to the reset position.



CH MODULATION WITH FLAME PROPAGATION RAMP

The CH water temperature potentiometer sets the value of CH water flow.
Following to a request of CH, when water flow temperature read by the NTC probe is less than the intervention temperature of the CH thermostat ON, the burner ignition sequence is started. Once the burner ignition sequence is over, the gas flow rate is reduced to minimum; the gas flow rate is further increased from minimum to maximum in a 50 sec. ramp.
CH water flow temperature is constantly read and the ramp interrupted once the flame modulation point (type PID) is reached, in order to achieve and maintain the pre-set CH water temperature. During CH mode the pump is on and the electric deviation valve is in CH position
Throughout CH mode operation, should DHW be requested, CH operation is halted as DHW has always priority over CH.

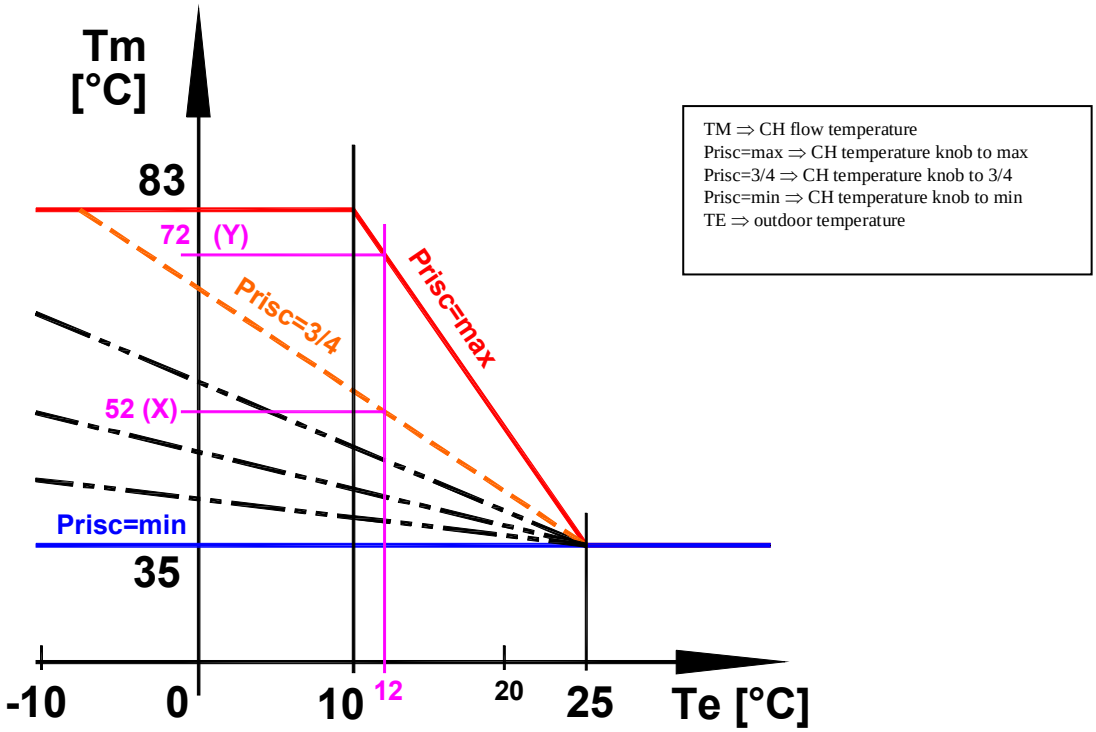


ADJUSTABLE MINIMUM BURNER OUTPUT

The minimum gas flow rate to the burner is set through the burner minimum output trimmer (Nordgas gas valve only).

TERMOREGULATION THROUGH OUTDOOR TEMPERATURE PROBE (SLIDING TEMPERATURE).

The boiler is designed for connection to an outdoor temperature probe which automatically modifies CH flow temperature in relation to the detected outdoor temperature; the correction depends on the setting of the thermoregulation coefficient KT (slope of the set curve). The boiler electronics recognize the presence of an outdoor temperature probe and activates the thermoregulation function. **When an outdoor temperature probe is installed the trimmer adjusting CH temperature looses its function and takes on the thermoregulation coefficient KT**. The flow temperature in CH mode, is therefore determined by the outdoor temperature and by the setting of the thermoregulation coefficient KT. The correcting range operated equals the range of CH temperature. E.g. When the outdoor temperature is 12°C, by positioning the CH temperature knob to max, max CH water flow temperature will 72°C while turning it ¾ the CH flow temperature will be 52°C.



DHW PRIORITY

When the boiler is set to Summer or Winter, the closure of the contacts of the DHW priority flow meter (following a DHW request) puts the boiler in DHW mode, and starts the modulation either through the bi-thermal exchanger or or the secondary plate exchanger or the micro storage.

DHW operation has priority over any other request. The request is halted when the above mentioned contacts are opened.

DHW MODULATION

Following to a DHW request (through the bi-thermal or plate exchanger), when the water temperature, detected by the NTC probe is less than the intervention temperature of the bi-thermal or plate ON thermostat, the automatic flame sensing device receives the ok for the burner ignition sequence.
Once the burner ignition sequence is over, the gas flow rate to the burner equals the value of the flame modulation, which, through a PID type action, allows DHW to reach and maintain the temperature set via the potentiometer.
In DHW mode the electro-actuated deviation valve is in DHW position.
In DHW bi-thermal mode, the pump is NOT on.
In DHW plate exchanger or micro-storage mode, the pump is on.

BOILER ANTI-FREEZE FUNCTION

The NTC probe on CH flow detects water temperature in the boiler: when it is below the intervention temperature of the anti-freeze function ON, the burner is ignited.
Once the burner ignition sequence is terminated the gas flow rate to the burner is reduced to minimum. The anti-freeze function continues until the CH flow temperature reaches the anti-freeze function OFF value or 15 minutes have elapsed. DHW or CH request have priority and therefore halt the anti-freeze function. During the boiler anti-freeze function, the pump is on and the electro-actuated deviation valve is in CH position.
In case of flame sensing device shutdown and inability to ignite the burner, the anti-freeze function keeps operating the pump.
The anti-freeze function is active when the boiler mode knob is set to summer, winter, Anti-freeze.
Warning: the anti-freeze function does not protect the whole CH system but only the boiler.

CHIMNEY SWEEP FUNCTION (TIMER CONTROLLED AND POWER ADJUSTABLE)

Set the boiler mode knob to Winter, act on the relevant switch (SPA), reserved to qualified personnel only, keep it pressed for at least 6 seconds, that activates the timer controlled chimney sweep function: the boiler performs the ignition sequence and after that keeps operating at a max output managed by the CH max output trimmer (MAXR); the limit temperature is forced to 90°C; in chimney sweep mode the pump is on and the deviation valve is in CH position.
The chimney sweep function stops after 15 minutes or when the boiler mode knob is moved to a different position from winter.

PUMP AND DEVIATION VALVE INACTIVITY ANTILOCKING FUNCTION

The electronic board counts the time elapsed from the last pump operation: when the period equals 24 hours the pump, together with the deviation valve, is operated for 6 seconds. During the pump antilocking function the burner is off. Any request of CH, DHW or anti-freeze function has priority and halts the current function in order to activate the requested status. The first pump antilocking function operation is implemented 3 hours after the boiler electronics is first powered, later on the function will operate as above described.

TEMPERATURE PROBE RELIABILITY CONTROL

The system checks the correct operation of NTC probes connected to the integrated modulation board, which are required for the implementation of the functions. A malfunction occurs when the perceived temperature is out of the correct probe temperature detection range. In case of flow probe failure, the burner is turned off; the pump is stopped after the post-circulation function.
Any boiler operation request is ignored. Should the malfunction involve the DHW probe, CH, and boiler anti-freeze functions are guaranteed.

Once a request for CH or DHW operation has terminated, the pump keeps operating for the time stated in the chart below (in boilers with plate exchanger, water tank, anti-freeze or chimney sweep).

Function	Time (sec)
CH, anti-freeze, chimney sweep	180
DHW through plate exchanger, water tank.	6
DHW through bi-thermal exchanger	6 (Winter only)

That function is active in SUMMER mode only.

The fan stays on even after the burner is turned off, following a DHW request through bi-thermal exchanger, for 6 seconds.

The above function is also activated when the temperature detected by the CH flow probe reaches 95°C. It will be halted when the temperature reaches 90°C.

The safety thermostat has contacts normally closed and operates at 105°C.
The device is installed in series to the gas valve and its intervention shuts the boiler down due to non-detection.

PRESSURE SWITCH

The flue gas pressure switch has contacts normally open, and it is managed directly by the electronic board.
When they are open, during any request, it cuts power to the gas valve and signals the shutdown.
When the contacts are closed in stand by mode, the appropriate shutdown signal is shown.

TECHNICAL MALFUNCTION CHART

Status	*Malfunction*	*Probable cause*	*Remedy*
The boiler has shut down, no.5 shutdown red light is flashing	The burner cannot be ignited	There is no gas	Check gas presence (stopcocks to be open or safety valves intervention)
		The gas valve is disconnected	Connect 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 to be correctly connected
		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
		Ignition output (PACC) is too low	Increase it
		Minimum thermal input is not correct	Adjust the burner
The boiler has shut down, no.4 shutdown red light is flashing	The flue gas pressure switch is not consenting to boiler operation (CTFS model)	The flue gas pressure switch is faulty	Check the pressure switch: replace when faulty
		Silicone pipes are disconnected or damaged	Reconnect or replace as necessary
		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.3 shutdown red light is flashing	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

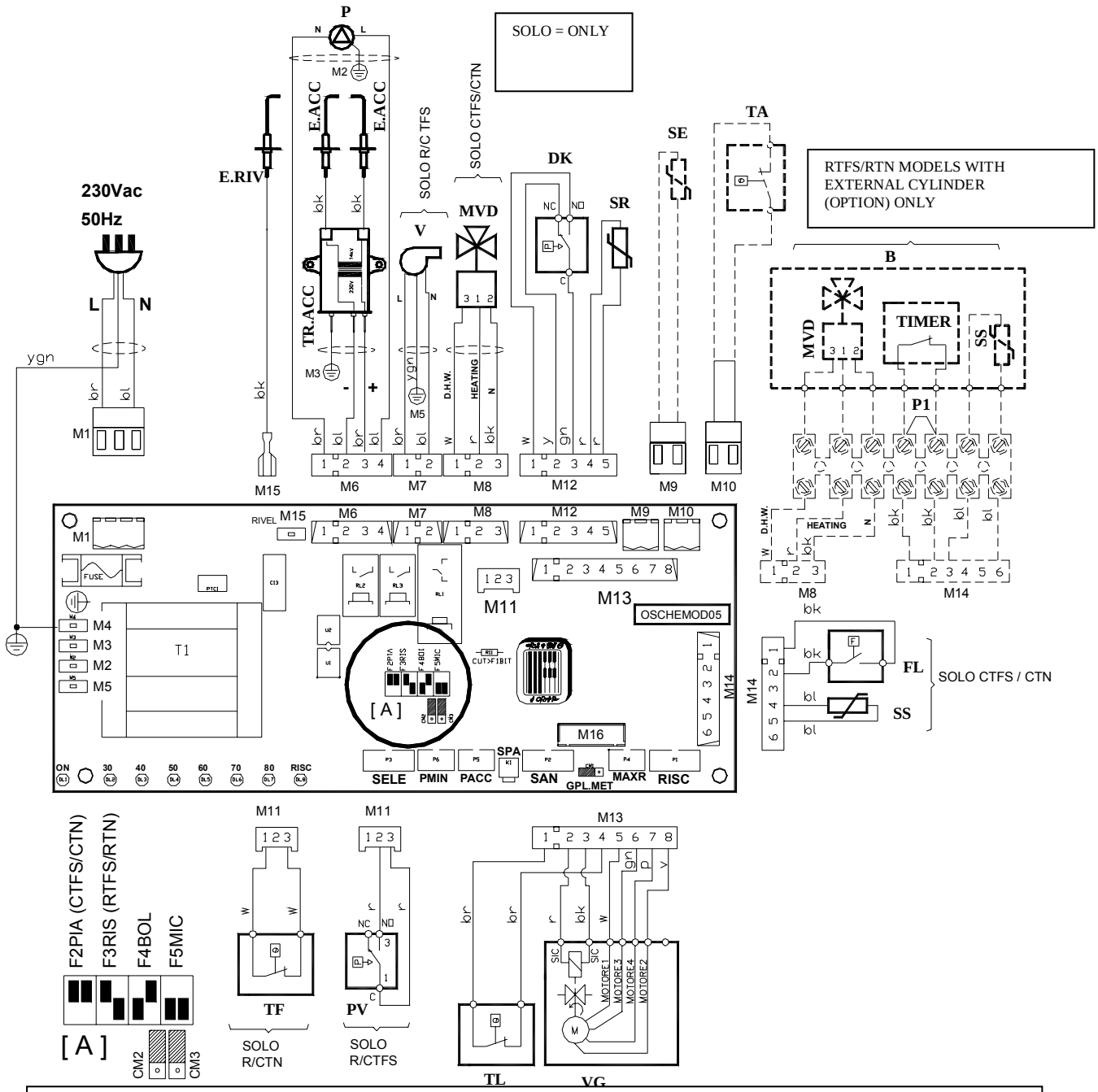
		The pump is faulty	Replace it
The boiler has shut down, no.6 shutdown red light is flashing	Water pressure in the system is insufficient	The system leaks	Check the CH system
		The water pressure switch is disconnected	Connect it
		The water pressure switch does not operate: it is faulty	Replace it
The boiler has shut down, no.2 red and no.8 green shutdown lights are flashing	The CH probe is faulty	The CH probe is disconnected or faulty	Connect or replace it
The boiler has shut down, no.2 shutdown red light is flashing	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 meter is not working	Insufficient pressure or flow rate in the system	Check the system
			Check the flow meter filter
		The flow meter sensor is disconnected or faulty	Connect or replace it

SHOULD THE ABOVE CHART NOT SOLVE THE PROBLEM, CHECK THE ELECTRONIC BOARD CONNECTIONS OR REPLACE IT.

CH AND DHW NTC PROBES : RESISTANCE (Ω) VALUE CHART IN RELATION TO TEMPERATURE.

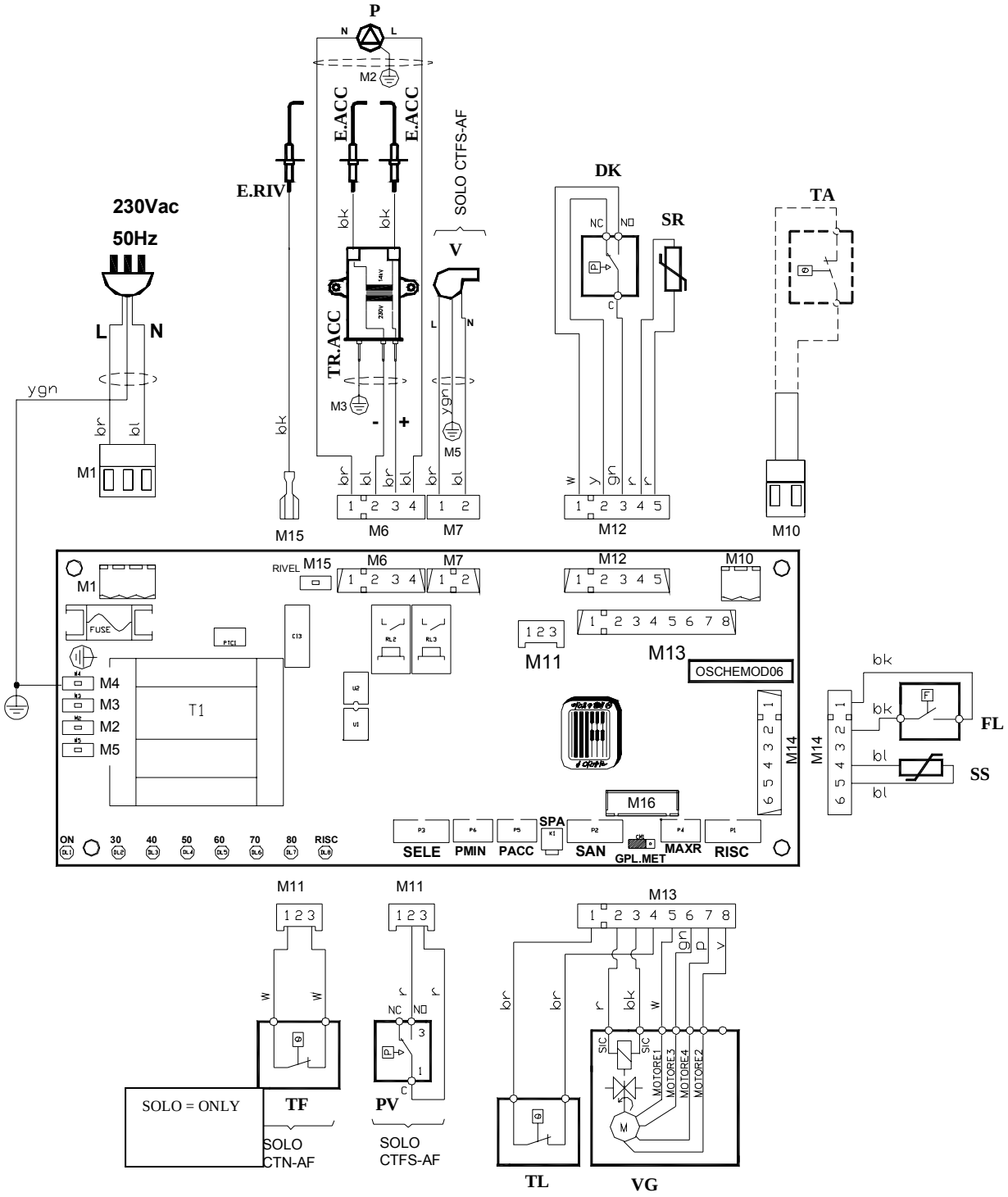
T °C	0	2	4	6	8
0	27203	24979	22959	21122	19451
10	17928	16539	15271	14113	13054
20	12084	11196	10382	9634	8948
30	8317	7736	7202	6709	6254
40	5835	5448	5090	4758	4452
50	4168	3904	3660	3433	3222
60	3026	2844	2674	2516	2369
70	2232	2104	1984	1872	1767
80	1670	1578	1492	1412	1336
90	1266	1199	1137	1079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

DUAL MONO-THERMAL EXCHANGER NORDGAS GAS VALVE code 6SCHEMOD05 (delivered as spare part for bi-thermal with Nordgas valve also)



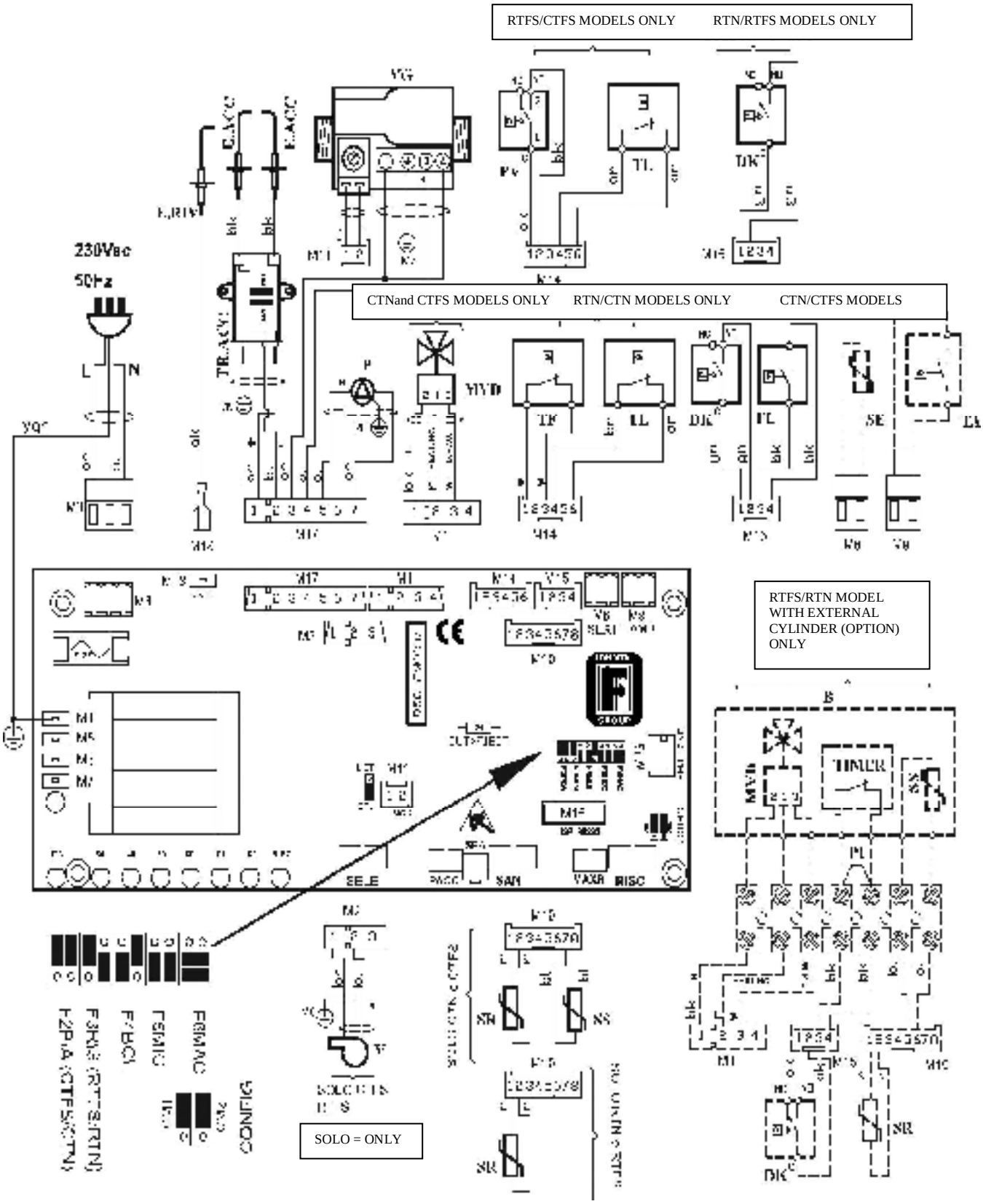
M1-M9-M10: POWER CONNECTOR, OUTDOOR PROBE, TA ROOM THERMOSTAT
M16: CONNECTOR FOR TELE-METERING
M2-M15: AVAILABLE CONNECTORS
E.RIV: FLAME SENSING ELECTRODE
E.ACC: IGNITION ELECTRODE
P: PUMP
V: FAN (TFS MODEL ONLY)
MVD: THREE-WAY VALVE MOTOR
DK: LOW WATER SAFETY PRESSURE SWITCH
SR: CH PROBE
SE. OUTDOOR TEMPERATURE PROBE (OPTION)
SS: DHW PROBE
TA: ROOM THERMOSTAT
(A) : TYPE OF BOILER INDICATION THROUGH JUMPERS CM2-CM3
FL: FLOW METER
VG: GAS VALVE
PV. FAN PRESSURE SWITCH (TFS MODEL ONLY)
TF: FLUE GAS ANTI-OVERFLOW THERMOSTAT (TN MODEL ONLY)
B: EXTERNAL CYLINDER (OPTION)
TIMER: PROGRAMMABLE TIMER (REMOVE P1 WHEN INSTALLING THE TIMER)
TR.ACC: IGNITION TRANSFORMER

DUAL BI-THERMAL EXCHANGER NORDGAS GAS VALVE code 6SCHEMOD06

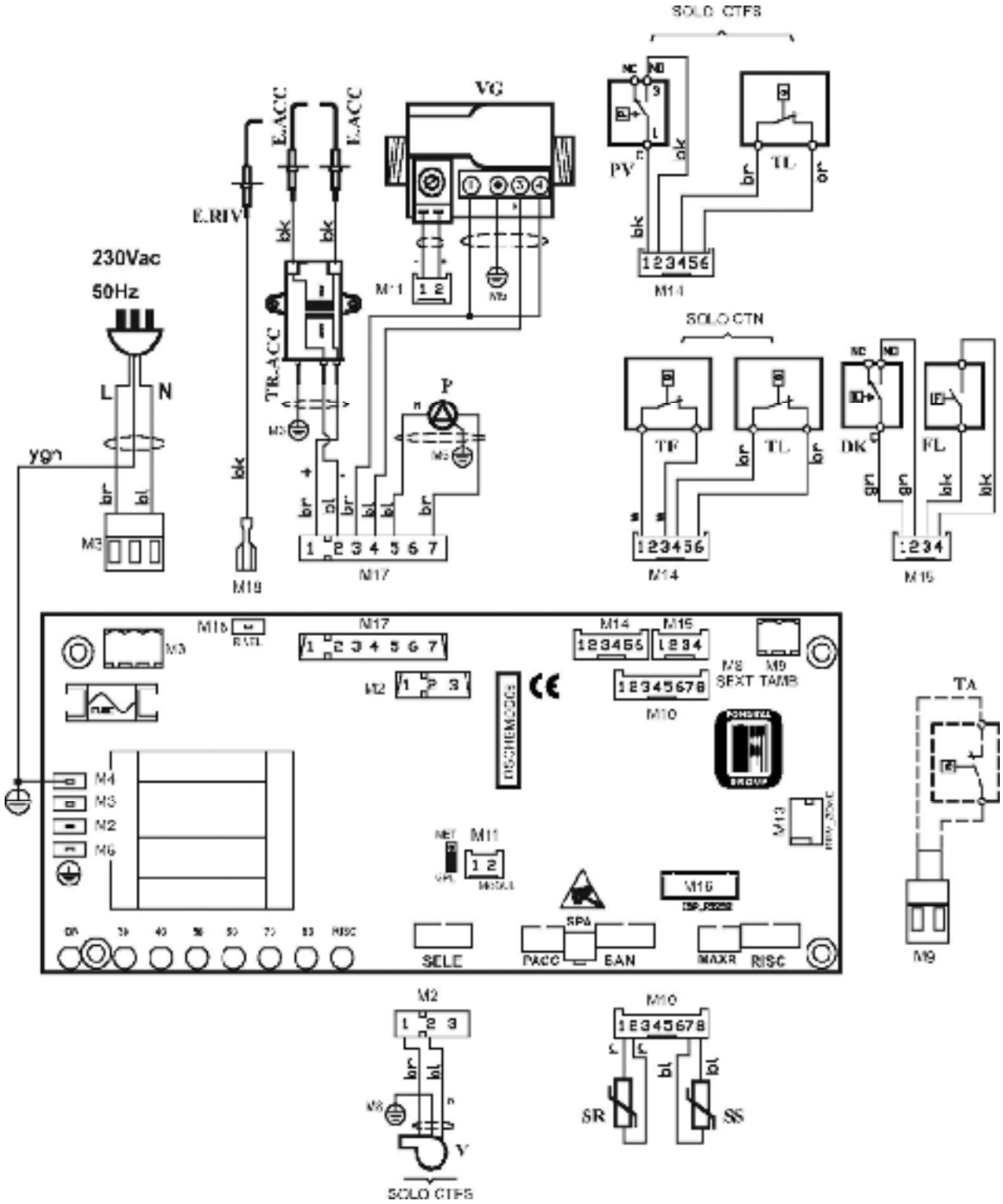


M1-M9-M10: POWER CONNECTOR, OUTDOOR PROBE, TA ROOM THERMOSTAT
M16: CONNECTOR FOR TELE-METERING
M2-M15: AVAILABLE CONNECTORS
E.RIV: FLAME SENSING ELECTRODE
E.ACC: IGNITION ELECTRODE
P: PUMP
V: FAN (TFS MODEL ONLY)
DK: LOW WATER SAFETY PRESSURE SWITCH
SR: CH PROBE
SS: DHW PROBE
TA: ROOM THERMOSTAT
FL: FLOW METER
VG: GAS VALVE
TL: LIMIT THERMOSTAT
PV. FAN PRESSURE SWITCH (TFS MODEL ONLY)
TF: FLUE GAS ANTI-OVERFLOW THERMOSTAT (TN MODEL ONLY)
B: EXTERNAL CYLINDER (OPTION)
TIMER: PROGRAMMABLE TIMER (REMOVE P1 WHEN INSTALLING THE TIMER)
TR.ACC: IGNITION TRANSFORMER

(delivered as spare part for bi-thermal with Sit valve also)



DUAL BI-THERMAL EXCHANGER SIT 845 code (6SCHEMOD08)



CHAPTER 5
DISCHARGE AND PIPING SYSTEMS

5.1 CTFS AF – CTN AF

COAXIAL DUCTS ∅ 100/60

Type C12

Minimum allowable horizontal coaxial pipe length is 0,5 meters. Max allowable horizontal coaxial pipe length is 4 meters, without including the first bend connected to the boiler; for each additional bend decrease by 1 meter the max allowable length; the duct has to have a 1% slope toward the exit, in order to avoid the entrance of rain.

In coaxial pipes with length between 0,5 and 2 meters, ∅ 40 diaphragm is to be installed.

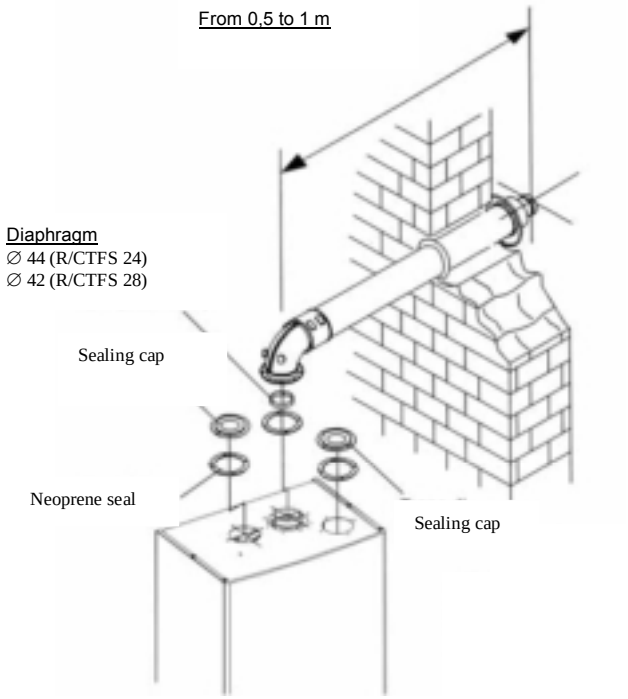
In coaxial pipes with length between 2 and 4 meters, ∅ 45 diaphragm is to be installed.

Type C32

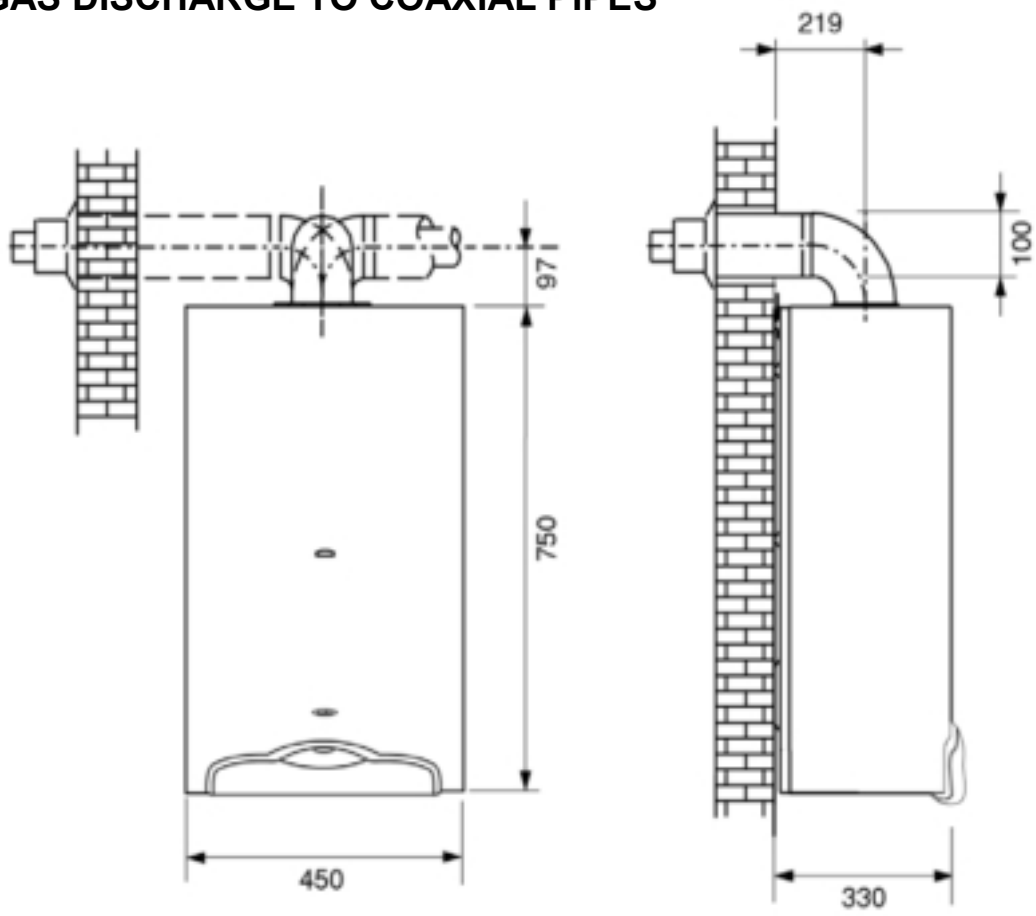
Minimum allowable vertical coaxial pipe length is 1 meter, that is the length of the chimney. Max allowable vertical coaxial pipe length is 4 meters, including the chimney; for each additional bend decrease by 1 meter the max allowable length.

In coaxial pipes with length up to 1 meter, ∅ 38 diaphragm is to be installed.

In coaxial pipes with length between 1 and 4 meters, ∅ 40 diaphragm is to be installed.



DIMENSIONS FOR CONNECTION OF FLUE GAS DISCHARGE TO COAXIAL PIPES



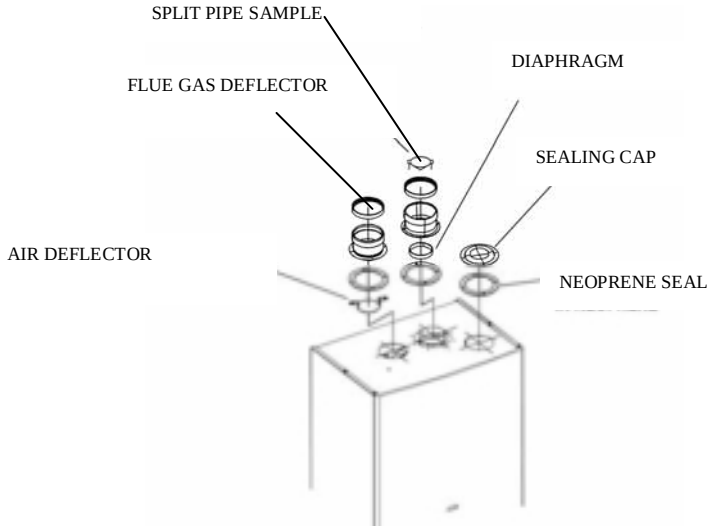
SPLIT PIPES ∅ 80

WARNING: max allowable load loss, regardless of the type of installation, **is not to exceed the conventional value of 42 Pa.**
In installation with load loss not larger than 15 Pa, ∅ **42 mm** diaphragm is to be installed.
In installation with load loss between 15 and 32 Pa, ∅ **45 mm** diaphragm is to be installed.
In installation with load loss larger than 32 Pa, no diaphragm is to be installed.

WARNING

In all installation with air/flue gas split pipes it is necessary to install the FLUE GAS DEFLECTOR, delivered with the pipe system kit, inside the flue gas socket-and-spigot collar.
In all types of installations with air/flue gas split pipes it is necessary to install the FLUE GAS DEFLECTOR, delivered with the pipe system kit, inside the boiler on the air intake duct.

Flue gas pressure switch intervention
The boiler is equipped with a device controlling flue gas discharge.
Should the air intake / flue gas discharge system malfunction, the device shuts down the boiler.



Calculation of load losses of air intake and flue gas discharge pipes.
Consider the following parameters when calculating the load losses:
- for each meter of Ø 80 pipe (both air intake and flue gas discharge) the load loss is 1 Pa;
- for each 90° wide radius bend Ø 80 (R=D), the load loss is 1 Pa;
- for each 90° narrow radius bend Ø 80, the load loss is 2 Pa;
- for each 45° bend the load loss is 0,5 Pa;
- for the horizontal air intake terminal Ø 80 L = 0,5 m, the load loss is 0,5 Pa;
- for the horizontal flue gas discharge terminal Ø 80 L = 0,6 m, the load loss is 1 Pa;

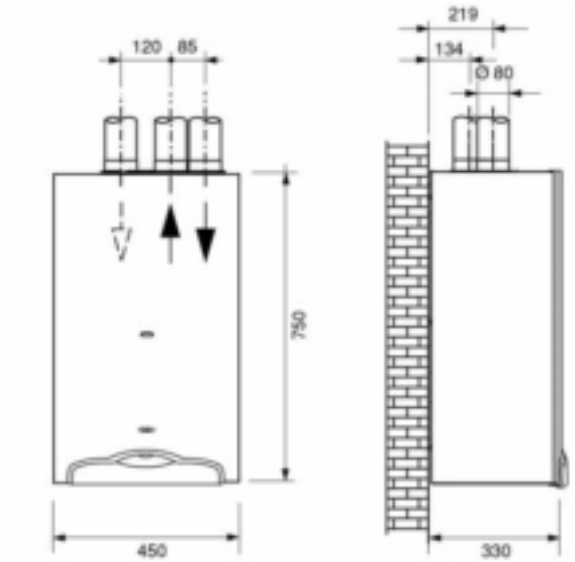
Socket-and-spigot collars attached to the boiler, the flue gas deflector, and the air deflector, are not to be included in the load loss calculation.
WARNING: such values are referred to a system implementing original, rigid and smooth pipes.

Verification sample:

-	4 wide radius Ø 80 bends:	4	Pa
-	12 meters of Ø 80 pipe:	12	Pa
-	1 air intake terminal:	0,5	Pa
-	1 flue gas discharge terminal:	1	Pa
	Total load loss	17,5	Pa

As the total conventional load loss is more than 15 Pa and less than 32 Pa, the Ø 45 mm diaphragm is to be installed.

DIMENSIONS FOR CONNECTION OF FLUE GAS DISCHARGE TO SPLIT PIPES



5.2 CTFS – CTN

COAXIAL DUCTS ∅ 100/60

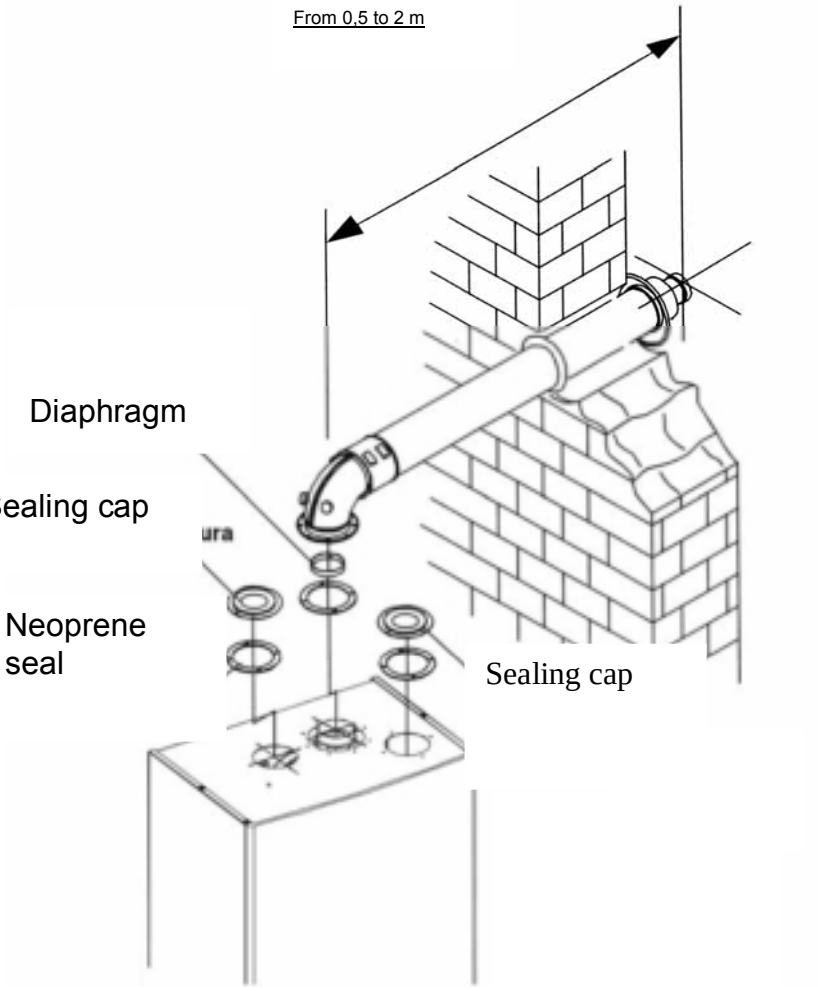
Minimum allowable horizontal coaxial pipe length is 0,5 meters. Max allowable horizontal coaxial pipe length is 4 meters, **without including the first bend connected to the boiler**; for each additional bend decrease by 1 meter the max allowable length; the duct has to have a 1% slope toward the exit, in order to avoid rain to enter.

In coaxial pipes with length between 0,5 and 2 meters, ∅ 38 mm diaphragm is to be installed.

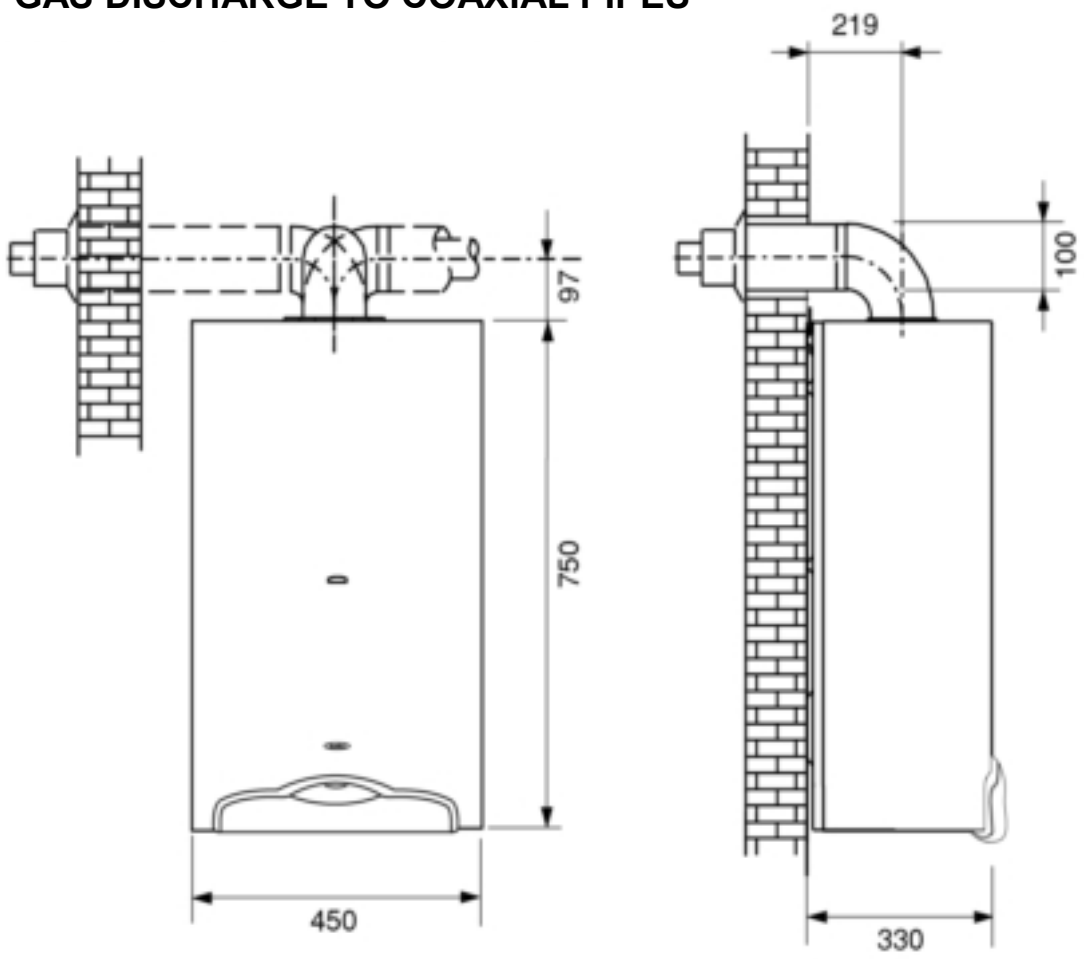
In coaxial pipes with length between 2 and 4 meters, ∅ 42 mm diaphragm is to be installed.
Minimum allowable vertical coaxial pipe length is 1 meter, that is the length of the chimney.
Max allowable vertical coaxial pipe length is 4 meters, including the chimney; for each additional bend decrease by 1 meter the max allowable length.

In coaxial pipes with length up to 1 meter, ∅ 36 mm diaphragm is to be installed.

In coaxial pipes with length between 1 and 4 meters, ∅ 38 mm diaphragm is to be installed.



DIMENSIONS FOR CONNECTION OF FLUE GAS DISCHARGE TO COAXIAL PIPES



SPLIT PIPES ∅ 80

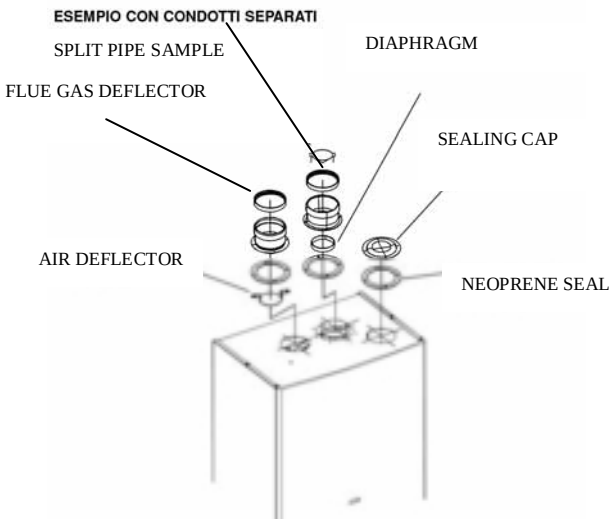
WARNING: Max allowable load loss, regardless of the type of installation, **is not to exceed the conventional value of 42 Pa.**
In all installation where the load loss does not exceed 15 Pa, the Ø 40 mm diaphragm is to be installed.
In all installation where the load loss is between 15 and 32 Pa, the Ø 45 mm diaphragm is to be installed.
In all installation where the load loss exceeds 32 Pa, no diaphragm is to be installed

WARNING

In all installation with air/flue gas split pipes it is necessary to install the FLUE GAS DEFLECTOR, delivered with the pipe system kit, inside the flue gas socket-and-spigot collar.
In all types of installations with air/flue gas split pipes it is necessary to install the FLUE GAS DEFLECTOR, delivered with the pipe system kit, inside the boiler on the air intake duct.

FLUE GAS PRESSURE SWITCH INTERVENTION

The boiler is equipped with a device controlling flue gas discharge.
Should the air intake / flue gas discharge system malfunction, the device shuts down the boiler.



Calculation of load losses of air intake and flue gas discharge pipes.
Consider the following parameters when calculating the load losses:
- for each meter of Ø 80 pipe (both air intake and flue gas discharge) the load loss is 1 Pa;
- for each 90° wide radius bend Ø 80 (R=D), the load loss is 1 Pa;
- for each 90° narrow radius bend Ø 80, the load loss is 2 Pa;
- for each 45° bend the load loss is 0,5 Pa;
- for the horizontal air intake terminal Ø 80 L = 0,5 m, the load loss is 0,5 Pa;
- for the horizontal flue gas discharge terminal Ø 80 L = 0,6 m, the load loss is 1 Pa;

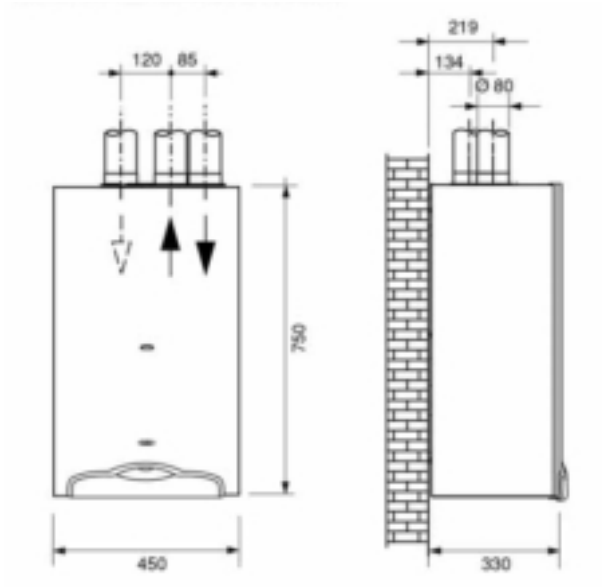
Socket-and-spigot collars attached to the boiler, the flue gas deflector, and the air deflector, are not to be included in the load loss calculation.
WARNING: such values are referred to a system implementing original, rigid and smooth pipes.

Verification sample:

-	4 wide radius Ø 80 bends:	4	Pa
-	12 meters of Ø 80 pipe:	12	Pa
-	1 air intake terminal:	0,5	Pa
-	1 flue gas discharge terminal:	1	Pa
	Total load loss	17,5	Pa

As the total conventional load loss is more than 15 Pa and less than 32 Pa, the Ø 45 mm diaphragm is to be installed.

DIMENSIONS FOR CONNECTION OF FLUE GAS DISCHARGE TO SPLIT PIPE SYSTEM



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