

Installation, use and maintenance manual

Gas unit heaters product line G Series

Condensing and modulating Gas Fired Unit Heaters
to heat medium large areas

Natural gas/LPG fired



EDITION: 02/2015

Code: D-LBR565

This manual has been written and printed by Robur S.p.A.; the reproduction even partial of this manual is forbidden.

The original is archived at Robur S.p.A.

Any use of this manual other than for personal consultation must be previously authorised by Robur S.p.A.

The rights of those who have legitimately filed the registered trademarks contained within this publication are not affected.

With the aim of continuously improving the quality of our products, Robur S.p.A. reserves the right to modify instructions, drawings and data contained in this manual without prior notice.

FOREWORD

This manual is intended for those people who need to install and use the Robur G Series condensing Gas Fired Unit Heaters.

In particular this manual is addressed to the hydraulic installation technician who shall install the generator, the electrical installation technician who shall connect the generator to the power supply and the final user who shall check its normal working. This manual is also addressed to the Technical Assistance Centres for the main service operations.

Summary

This manual is based on five sections

Section 1 is intended for **end user**, **plumber installer**, **electrical installer** and **technical assistance service**; it furnishes general instructions, technical data and general information of the Gas Fired Unit Heaters **G** series.

Section 2 is intended for **end user**; it furnishes all information for the correct use of Gas Fired Unit Heaters **G** series.

Section 3 is intended for **the plumber installer**; it furnishes the information for a correct installation of Gas Fired Unit Heaters **G** series.

Section 4 is intended for **electrical installer**; it furnishes the information for correct electrical connections of the Gas Fired Unit Heaters **G** series.

Section 5 is intended for **technical assistance service**; it furnishes the instructions to set the gas flow and to change the type of gas. It reports also information about maintenance.

Meaning of Icons

The icons placed on the margin of the pages of this manual have the following meaning:



Danger signal



Warning



Note



Start of operating procedure



Reference to another part of the manual or to another manual/book

Table 1 – Descriptive Icons.

TABLE OF CONTENTS

Section1: GENERAL INFORMATION AND TECHNICAL CHARACTERISTICS.....	2
1.1 GENERAL WARNINGS	2
1.2 OPERATION OF THE UNIT	3
1.3 CONSTRUCTIVE CHARACTERISTICS.....	5
1.4 TECHNICAL DATA	6
1.5 DIMENSIONS OF G SERIES GAS FIRED UNIT HEATER.....	7
section 2: END USER.....	9
2.1 FUNCTIONS OF CHRONOTHERMOSTAT	9
2.2 SETTING THE TIME AND DAY ON THE CHRONOTHERMOSTAT	10
2.3 SETTING THE COMFORT, ECONOMY AND ANTI- FREEZING TEMPERATURES ON THE CHRONOTHERMOSTAT	10
2.4 PROGRAMMING OF THE DAILY SET POINT ON THE CHRONOTHERMOSTAT	11
2.5 SELECTING A PRESET DAILY PROFILE ON THE CHRONOTHERMOSTAT	13
2.6 SELECTING A PRESET WEEKLY PROFILE ON THE CHRONOTHERMOSTAT	13
2.7 TIMED FUNCTIONS OF THE CHRONOTHERMOSTAT	15
2.8 KEYBOARD BLOCK	17
2.9 INFORMATION SCREEN OF THE CHRONOTHERMOSTAT.....	18
2.10 SELECTION MENU WINDOW	19
2.11 MALFUNCTION WARNINGS	20
2.12 TABLE OF ICON MEANINGS ON CHRONOTHERMOSTAT DISPLAY	23
2.13 HOW TO USE THE UNIT HEATER.....	24
2.14 HOW TO USE THE UNIT WITH THE CHRONOTHERMOSTAT	26
2.15 HOW TO USE THE UNIT WITHOUT A CHRONOTHERMOSTAT	31
2.16 SETTING FIELD.....	32
2.17 END OF SEASON.....	33
section 3: PLUMBER INSTALLER.....	34
3.1 GENERAL RULES FOR INSTALLATION OF THE APPLIANCE	34
3.2 INSTALLATION SEQUENCE	34
3.3 SIZE AND INSTALLATION OF THE AIR INLET / EXHAUST FLUE	36
3.4 CONDENSATE DRAINAGE	45
section 4: ELECTRICAL INSTALLER.....	47
4.1 HOW TO CONNECT THE HEATER TO THE ELECTRICAL SYSTEM	47
4.2 HOW TO CONNECT THE CHRONOTHERMOSTAT TO THE HEATER	47
4.3 UNIT OPERATION WITH EXTERNAL CONSENT.....	48
4.4 REMOTE SIGNALLING OF THE ANOMALIES.....	49
4.5 INSTALLATION WIRING DIAGRAM	50
4.6 WIRING DIAGRAM FOR MULTIPLE HEATER WITH ONE PROGRAMMER	51
section 5: ASSISTANCE AND MAINTENANCE	52
5.1 START UP OF THE UNIT	52
5.2 HOW TO REGULATE THE GAS VALVE	52
5.3 CONVERSION TO ANOTHER TYPE OF GAS	54
5.4 MAINTENANCE	55

SECTION1: GENERAL INFORMATION AND TECHNICAL CHARACTERISTICS

In this section you can find the general warnings to follow for the installation and use of the Condensing Gas Fired Unit Heaters G Series, a short description of the heater operation, design characteristics and technical data.

1.1 GENERAL WARNINGS

This manual is an integral and essential part of the product and must be given to the final user.

This appliance must be exclusively used for the purpose it was intended. Any other use is to be considered improper and therefore dangerous.

The unit must not be used by persons (children included) with lack of physical or mental disease or not experienced. **Children must be supervised to be sure that they do not play with the unit.**

The Manufacturer will not be held responsible for damages resulting from installation errors or failure to comply with the Manufacturer's instructions.

The appliance must be installed in compliance with the rules and regulations in force.

Do not obstruct the fan intake opening or the air delivery grids.



In case of failure and/or malfunction of the appliance, isolate the unit (disconnect it from the power supply and close the main gas cock), do not attempt any repair or direct servicing.

The Manufacturer's **Authorised Service Centres** using only original spare parts must only carry out any repair to the products.

The non-observance of the above-mentioned provisions may compromise the safety of the unit.

To ensure unit efficiency and correct operation, it is essential that **qualified service engineers** carry out annual maintenance following the Manufacturer's instructions.



By the term *Qualified Service Engineers* it is meant the personnel having specific technical skills in the field of heating system components for civil use. In any case for more information please contact the Technical Assistance Office of ROBUR S.p.A. (tel. +39 035/888111).

Should the unit be sold or transferred to another owner, please ensure that the manual remains with the unit for use by the new owner and/or installer.

Before turning the heater on, a **qualified service engineer** must check:

- that electric and gas supply ratings are the same as those given in the data plate;
- that the exhaust duct operates correctly;
- the correct functioning of the condensate drainage;
- that combustion air feed and exhaust occur correctly according to the existing standards;

- the internal and external tightness of the fuel supply system;
- fuel flow control according to the heater power requirements;
- that the heater is supplied with the type of fuel for which it is pre-set.;
- that the gas supply pressure is within rating limits;
- that the gas supply system is suitable to the heater and all safety and check-over devices prescribed by existing standards are duly installed;



Do not use gas pipes to ground the appliance, or any other electrical appliances.



Avoid unnecessary supply when unit is not in use and always clock the main gas cock. If the appliance is turned off for a longer time period, close the main gas supply cock and cut off the power supply.



IF YOU SMELL GAS

- Do not operate electric switches, telephones and any other object or device which may cause sparks.
- Shut-off the gas supply.
- Open immediately doors and windows to create a cross-current of air to purify the room.
- Call for a qualified service engineer.

1.2 OPERATION OF THE UNIT

The G Series gas fired unit heater is an independent heater appliance with airtight combustion circuit and forced air draft.

It is designed for an indoor installation - inside the area to be heated.

It is adjustable for the use of Natural Gas (G20) and L.P.G. (G30/G31) (appliance belonging to the II_{2H3B/P} category according to the Standard EN 1020).

The combustion circuit is airtight with respect for the heated environment and conforms to the ordinances of regulations EN 1020 and EN 1196 for C type appliances: the air inlet of the combustion air and the flue exhaust are outdoors and are ensured through the operation of combustion blower.

A room thermostat, integrated in a chronothermostat, controls the heater operation.

When the thermostat is turned on the flame control box, after the pre-purge period (about 40 seconds), ignites the burner.

The flame sensor controls the ignition of the burner. If the flame does not appear the flame control unit locks out the heater.

The combustion products pass through the heat exchangers, the air flow given by the axial fan provides warm air to the room.

The airflow direction is regulated by means of adjustable horizontal louvres.

The fan control thermostat allows the axial-flow fan to start automatically only when the heat exchangers are hot (after about 60 sec. from the flame detection or when the temperature of 60°C is reached on the exchanger thermostat) and to turn off when they are cold. This prevents cool air from being blown into the room.

If heat exchangers overheat due to malfunction, the temperature limit thermostat cuts off the supply to the gas valve by setting the blower and the fan to the maximum speed; should the temperature increase further, the limit thermostat comes into operation causing the switching off of the heater. The limit thermostat reset is manual.



After removing the cause of overheating, **Qualified service engineers** should carry out resetting of the temperature.

Ahead of the burner the flue fan is installed which makes the air-gas mixture and forces draft of the exhaust flues.

In case of obstructions in the exhaust or intake duct or in case of blower malfunction, the flame control box intervenes immediately with the modulation of the heater. In case of obstructions or malfunction beyond the allowed limits, the differential pressure switch closes the gas valve and consequently stops the fuel flow to the burner.

For winter operation the heating unit can be used in either automatic or manual mode. For further information see paragraph “WINTER OPERATING (HEATING)” at page 26.

In the summer time it is possible to activate only the axial fan to provide pleasant and refreshing air movement in the room (for more information see Paragraph “SUMMER OPERATION (VENTILATION ONLY)” at page 30).

1.3 CONSTRUCTIVE CHARACTERISTICS

The G Series gas fired unit heaters are supplied with:

- **Premix burner made of stainless steel.**
- **High head blower**, with rotation speed control.
- Cylindrical **combustion chamber** made of stainless steel.
- **Heat exchangers**, patented by ROBUR, made of special light alloy, fining horizontally on the air side and vertically on the flue side with extremely high capacity of thermal exchange.
- **Steel casing** painted with epoxy powders.
- High air flow capacity **axial fan(s)**, with rotation speed control.

- **SAFETY AND CONTROL DEVICES**

- **Programming electronic board**, with microprocessor and filter: it allows the following functions: start up of the burner, check and modulation of the flame; set and control of the blower speed, set speed of fan(s); control of the temperature of the heat exchanger by a probe; control of the minimum temperature of the exhaust flue by a probe.
 - Supply voltage: 230 V - 50 Hz.
 - Safety time: 5 seconds.
 - Pre- purge time: 40 seconds.
 - Model: Bertelli & Partners DIMS03 with ignition transformer BRAHMA TC2LTCAF.
- **Limit thermostat** 100°C preventing the overheating of the heat exchanger.
- **Exhaust flue thermostat**: in case the exhaust/air intake pipe or the internal condensing discharge pipe would be obstructed the unit will stop.
- **Gas valve**: in the case that one of the safety devices is activated (limit thermostat, safety thermostat, etc.) the gas valve is electrically de-energised with contemporary cut-off of the burner gas supply.
 - Supply voltage: 230 V - 50 Hz.
 - Operating temperature: 0° C up to +60° C.
 - Model: SIT 822 Novamix.

1.4 TECHNICAL DATA

MODEL	U.M.	G 30	G 45	G 60	G 100
APPLIANCE CATEGORY		II ₂ H ₃ P			
APPLIANCE TYPE		C ₁₃ - C ₃₃ - B ₂₃ - C ₆₃ - C ₅₃			
GAS SUPPLY		Gas naturale - G.P.L.			
NOMINAL HEAT INPUT (Hi)	kW	30	45	58	93
NOMINAL HEAT OUTPUT	kW	29,2	43,3	56,2	90,2
MINIMUM HEAT INPUT (Hi)	kW	15,0	15,0	19,3	31,7
MINIMUM HEAT OUTPUT	kW	15,8	15,6	20,2	33,5
MAX CONDENSATE PRODUCED	l/h	4,6	6,9	8,9	14,4
NOMINAL GAS CONSUMPTION (Hi) NATURAL GAS (15° C – 1013 mbar) L.P.G.G31	m ³ /h kg/h	3,17 2,33	4,76 3,50	6,14 4,50	9,84 7,22
ECONOMY GAS CONSUMPTION (Hi) NATURAL GAS (15° C – 1013 mbar) L.P.G.G31	m ³ /h kg/h	1,58 1,16	1,58 1,16	2,14 1,50	3,35 2,46
EFFICIENCY AT MAXIMUM HEAT INPUT	%	97,3	96,5	97	97
EFFICIENCY AT THE MINIMUM HEAT INPUT	%	105,3	104,3	104,6	105,7
INLET GAS PRESSURE NATURAL GAS L.P.G.G31	mbar	20 37			
DIAMETER GAS INLET	"	3/4			
AIR INLET PIPE DIAMETER	mm	80			
EXHAUST FLUE DIAMETER	mm	80			
VOLTAGE		230V - 50Hz			
WATTAGE	W	350	450	750	1000
OPERATIONAL TEMPERATURE ⁽¹⁾ IN AMBIENT	°C	0 +35			
FUSE	A	6,3			
AIR FLOW ⁽²⁾ AT MAXIMUM SPEED AT MINIMUM SPEED	m ³ /h	2700 2300	4000 2340	5350 3310	8250 5200
TEMPERATURE RISE AT MAXIMUM SPEED AT MINIMUM SPEED	K	31,8 16,1	31,8 19,6	30,8 17,9	32,1 18,9
THROW AT THE MAX SPEED (RESIDUAL AIR SPEED >1m/s) ⁽³⁾	m	18	25	31	40
NOISE LEVEL AT 6 METERS (MAX SPEED) IN FREE FIELD IN TYPICAL INSTALLATION	dB(A) dB(A)	47 59	48 60	50 61,5	54 65,5
NOISE LEVEL AT 6 M DISTANCE (MAX SPEED) IN TYPICAL INSTALLATION	dB(A)	55	55	56	60,5
WEIGHT	kg	55	65	75	120

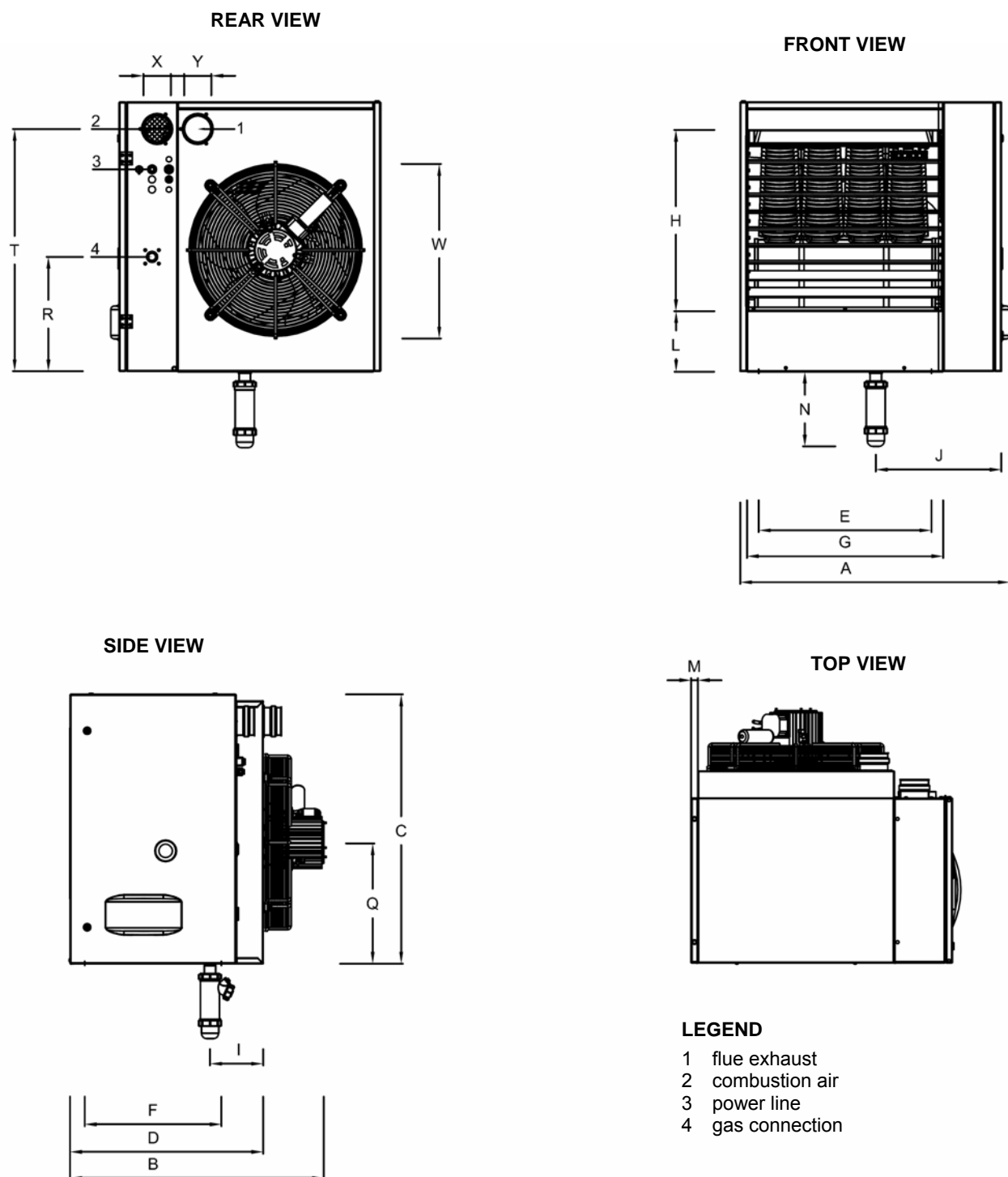
Table 2 – Technical data.

1 OPERATIONAL TEMPERATURE OF THE **COMPONENTS ON THE APPLIANCE** is between 0 °C / +60 °C.

2 AT 20 °C – 1013 mbar.

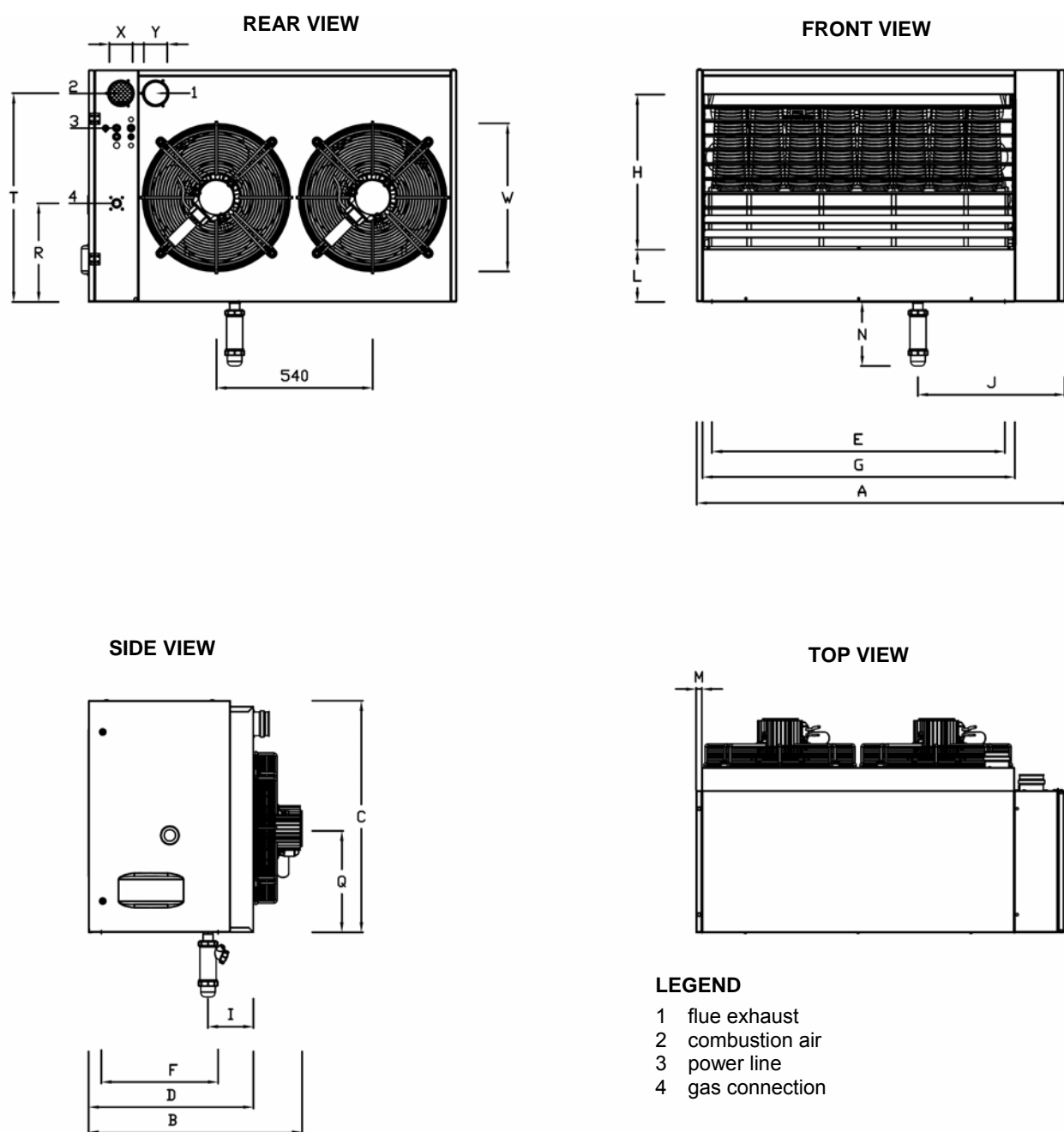
3 VALUES MEASURED IN FREE FIELD; IN TYPICAL INSTALLATION THE HEAT FLOW COULD REACH BIGGER DISTANCES THAN THE VALUE INDICATED (DEPENDING ON THE HEIGHT OF THE BUILDING AND THERMAL INSULATION OF THE ROOF).

1.5 DIMENSIONS OF G SERIES GAS FIRED UNIT HEATER



	A	B	C	D	E	F	G	H	I	J	L	M	N	Q	R	T	W	X	Y
G 30	656	735	800	570	370	405	440	536	157,2	307	180	20	223	360	340	720	400	80	80
G 45	706	735	800	570	370	405	490	536	157,2	327	180	20	223	360	340	720	520	80	80
G 60	796	760	800	570	510	405	580	536	157,2	371	180	20	223	360	340	720	520	80	80

Figure 1 – Dimensions of gas fired unit heater model G 30 – G 45 – G 60.



	A	B	C	D	E	F	G	H	I	J	L	M	N	Q	R	T	W	X	Y
G 100	1296	740	800	570	1010	405	1080	536	157,20	507	180	20	223	360	340	720	520	80	80

Figure 2 – Dimensions of gas fired unit heater model G 100.

SECTION 2: END USER

In this section you will find all the information necessary for the correct use of the G series heating units.

The functioning of the K series heating unit is controlled by a digital chronothermostat that is supplied as standard with the heater (see Figure 3).

The chronothermostat performs the dual functions of a room thermostat and programming clock besides diagnosing any operational errors.

All the necessary instructions for the correct use of the chronothermostat are reported below.










Figure 3 – Digital chronothermostat

2.1 FUNCTIONS OF CHRONOTHERMOSTAT

The buttons of the chronothermostat have the following functions:

- **UPLEV** (▲) and **DOWNLEV** (▼) buttons: they allow to modify the level of heating output/air flow from level 0 to level 3 (level 1 minimum heat input, level 2 medium heat input, level 3 maximum heat input; selecting level 0 during winter operating mode the heating input would modulate in automatic mode, selecting level 0 during summer operating mode it would obtain the switch off of the fan(s)).
- Button **E/I** (🔥) permits to select the winter operating mode (on the display it will appear the radiator icon) or summer operating mode (the burner is off, ONLY the fan(s) will work).
- Buttons **UP** (▲ 🏠) and **DOWN** (▼ 🏠): permit to modify the temperature of ambient set point; the increasing would be a tenth of degree. Maintaining pressed one of the two buttons it would obtain a quicker and continuous variation.
- Button **OK** (🌡️): permits to visualise the actual ambient temperature, the ambient temperature desired, confirm the set data
- Button **IP** (🕒): in order to enter in programming mode to access to menu INFO as specified here below:

- Programming mode *PROG*: press briefly the button , on the display will appear for few seconds *PROG*; in order to exit from programming mode press again briefly the button , on the display will appear for few seconds *RUN*.
- menu *INFO*: press for at least 3 seconds the button , on the display will appear for a few seconds *INFO*; to exit from menu *INFO* press again briefly the button , on the display will appear for few seconds *RUN*.
- Button **TIME** (): it permits to set timing functions (for more information see paragraph 2.7 – TIMED FUNCTIONS OF THE CHRONOTHERMOSTAT at page 15).
- Button **TEMP** (): it permits to select the temperature of comfort or the reduced one.
- Button **FUNCT** () to set the automatic, manual or off functioning.
When the functioning **off** is selected the gas unit heater is in stand-by: it will remain active ONLY the anti-freezing functioning (in case it would not be disabled in the menu info – for more information see paragraph 2.9 – INFORMATION SCREEN OF THE CHRONOTHERMOSTAT at page 18).









The functions of the buttons here above described would refer to the standard functioning. The buttons change their function depending on the window visualised.

2.2 SETTING THE TIME AND DAY ON THE CHRONOTHERMOSTAT



Requirements: The chronothermostat must be connected to the heater's electrical board and the heater must be connected to the electrical system.



To set the current time and date, proceed as follows:

1. Enter into the programming mode by briefly pressing the  button: *PROGR* will appear on the display for a few seconds and then the time and day of the week will appear with the *DAY* icon being shown.
2. With the  and  buttons the selected value can be changed (which is blinking). To move from one value to another, press either the **OK**  or the  button.
3. After having set the correct time and date, press the  button to exit the programming mode, *RUN* will then appear on the display for a few seconds.

2.3 SETTING THE COMFORT, ECONOMY AND ANTI- FREEZING TEMPERATURES ON THE CHRONOTHERMOSTAT



Requirements: The chronothermostat must be connected to the heater's electrical board and the heater must be connected to the electrical system.

1. Enter into the programming mode by briefly pressing the  button.
2. Repeatedly press the  button to arrive at the temperature that you would like to set.

3. In the lower left-hand corner of the display, **COMFR** will appear for the programming of the comfort temperature, **ECONM** will appear for the programming of the economy temperature, and **OFF°C** will appear for programming of the freeze protection temperature (see Figure 4).

The desired temperature can be set using the ▲ and ▼ buttons.

The comfort temperature must be between 5.0 and 30.0°C (with 0.1°C increments);

The economy temperature must be between 5.0 and 25.0°C (with 0.1°C increments);

The anti-frost temperature must be between 2.0 and 10.0°C (with 0.1°C increments);

4. To confirm the set value press the **OK** button. In this manner you will go to the successive set.
5. After having set the desired temperature, press the **P** button to exit the programming mode.

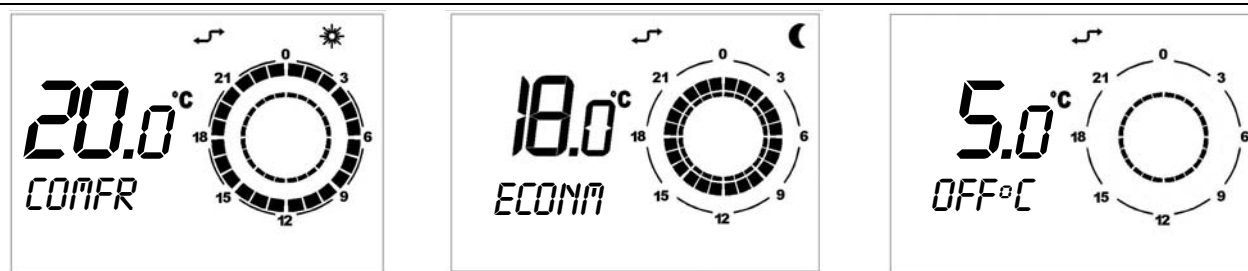


Figure 4 – Comfort, economy and anti-freezing temperatures

2.4 PROGRAMMING OF THE DAILY SET POINT ON THE CHRONOTHERMOSTAT



Requirements: The chronothermostat must be connected to the heater's electrical board and the heater must be connected to the electrical system.

1. Enter into the programming mode by briefly pressing the **P** button.
2. Press the **ON/OFF** button repeatedly.
3. In the lower left-hand corner of the display, SP n will appear where n is the number of daily set points (See figure 6).



Figure 5 – Daily set point.



The daily set point refers to the time at which the operation setting, that is, the desired temperature level, changes. The set temperature value remains valid until the next set point.

4. Set the desired day of the week using the **W** button.
5. Select the set point to set using the ▲ and ▼ buttons.

6. Adjust the time using the ▲ ⏸ and ▼ ⏸ buttons (minimum 10 minute intervals).
7. Set the desired temperature level using the 🌡️ button: in the upper right of the display, the sun will appear for the Comfort setting, the moon for economy setting, and no icon for the anti-frost setting.
8. The set time and temperature level will be graphically shown on the clock of the display (see Figure 6).
9. To move to the programming of the next set point, press the ▲ or ▼ button and set the time and temperature level as before: up to 8 set points can be set for each daily profile.
10. In the example of Figure 6 for a Monday, 7 set points were made as specified below:

- Set point 1 at 00:00 anti-frost temperature
- Set point 2 at 7:00 econm temperature
- Set point 3 at 8:00 comfr temperature
- Set point 4 at 11:00 econm temperature
- Set point 5 at 14:00 comfr temperature
- Set point 6 at 18:00 econm temperature
- Set point 7 at 19:00 anti-frost temperature

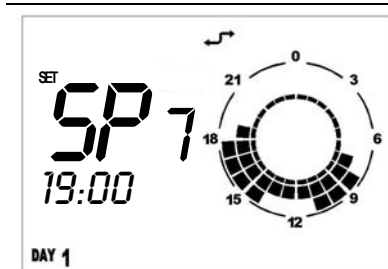


Figure 6 – Daily set point.

👉 When programming the daily set points, it is important to ALWAYS program all 24 hours, as in the example in Figure 6. If times are left unprogrammed, the chronothermostat will automatically apply the set data from the previous day for that same time frame (even if it is not shown on the display).

👉 In order to simplify the programming of the daily set points, a preset day profile can be associated to a specific day (see paragraph 2.5 - SELECTING A PRESET DAILY PROFILE ON THE CHRONOTHERMOSTAT - on page 13 and then select that same day in the programming mode of the daily set point (using the 🌞 button); proceed in changing the daily profile by scrolling the set points with the ▲ and ▼ buttons and changing the time using the ▲ ⏸ ▼ ⏸ buttons and the temperature level using the 🌡️ button.

11. Once the day profile and the relative temperature set points have been programmed, press the **OK** 🌡️ button to confirm.

👉 Confirming with the **OK** 🌡️ button will replace the previously set day profile with the newly confirmed profile. If confirmation is not provided, all entered settings will be lost.

12. Press the 🏠 button to exit the programming mode.

HOW TO CHECK DAILY SET POINTS SETTINGS

1. Enter the programming mode by briefly pressing the **IP** button.
2. Press the **⏻** button repeatedly.
3. On the lower left side of the display, SP n will appear where n indicates the number of the daily set point.
4. Use the **DAY** button to select the day of the week desired.
5. Use the **▲** and **▼** buttons to scroll the set points that are set.
6. Press the **IP** button to exit.

2.5 SELECTING A PRESET DAILY PROFILE ON THE CHRONOTHERMOSTAT



Requirements: The chronothermostat must be connected to the heater's electrical board and the heater must be connected to the electrical system.

1. Enter into the programming mode by briefly pressing the **IP** button:
2. Repeatedly press the **⏻** button:
3. **DAY** will appear on the lower left side of the display.
4. Press the **DAY** button and choose the desired day of the week.

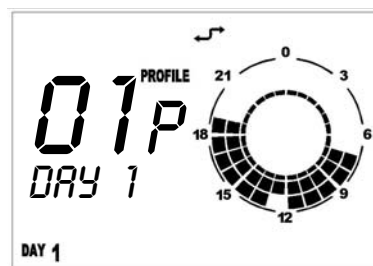


Figure 7 – Daily profile

5. In the upper right-hand corner of the display, the word **PROFILE** and the selected profile number will appear and be flashing (Figure 7).
6. Pressing the **▲** **⏻** and **▼** **⏻** buttons, one of 16 possible daily profiles can be selected (see Table 3 at page 14).
7. Press the **OK** **⏻** button to confirm.





Confirming with the **OK** **⏻** button will replace the previously set daily profile with the newly confirmed profile.

8. Press the **IP** button to exit the programming mode.

2.6 SELECTING A PRESET WEEKLY PROFILE ON THE CHRONOTHERMOSTAT



Requirements: The chronothermostat must be connected to the heater's electrical board and the heater must be connected to the electrical system.

1. Enter into the programming mode by briefly pressing the  button:
2. Repeatedly press the () button:
3. The word *WEEK* will appear in the lower left-hand corner of the display.
4. On the upper right side of the display, *PROFILE* will appear and the number of the selected profile will flash.

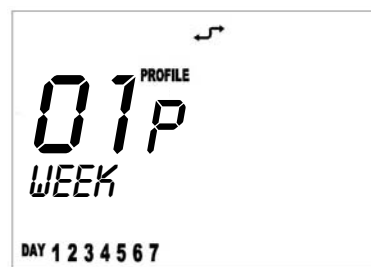






Figure 8 – Weekly profile

5. Pressing the  and  buttons, one of 16 possible weekly profiles can be selected (see Table 4).
Each weekly profile is a collection of 7 preset daily profiles.
6. Press the **OK**  button to confirm the selected weekly profile.



Confirming with the **OK**  button will cancel any previously set weekly profile or daily profile.



We recommend selecting the weekly profile that is closest to your needs and then, for the days in which you do not want the daily profile set in the weekly profile, set the desired preset daily profile as described in the corresponding paragraph, (see paragraph 2.5 - SELECTING A PRESET DAILY PROFILE ON THE CHRONOTHERMOSTAT at page 13) or proceed with freely programming the daily set points (see paragraph 2.4 - PROGRAMMING OF THE DAILY SET POINT ON THE CHRONOTHERMOSTAT at page 11).

DAILY PROFILES	TIMETABLE AND TEMPERATURE LEVEL ASSOCIATED WITH THE DAILY SET POINTS							
	1	2	3	4	5	6	7	8
01	00:00 A	05:30 C	21:30 A	---	---	---	---	---
02	00:00 R	05:30 C	21:30 R	---	---	---	---	---
03	00:00 A	07:00 C	12:00 R	13:00 C	19:30 A	---	---	---
04	00:00 R	07:00 C	12:00 R	13:00 C	19:30 R	---	---	---
05	00:00 R	05:30 C	15:00 R	---	---	---	---	---
06	00:00 A	06:30 C	19:00 A	---	---	---	---	---
07	00:00 A	05:00 R	06:30 C	19:00 R	21:00 A	---	---	---
08	00:00 A	08:00 C	12:00 R	13:00 C	18:00 A	---	---	---
09	00:00 A	04:00 R	07:00 C	18:00 R	21:30 A	---	---	---
10	00:00 A	04:00 R	07:00 C	14:00 R	21:30 A	---	---	---
11	00:00 A	07:00 C	14:30 A	---	---	---	---	---
12	00:00 R	06:00 C	12:00 R	14:00 C	20:00 R	---	---	---
13	00:00 A	05:00 C	12:00 R	13:00 C	21:00 A	---	---	---
14	00:00 C	---	---	---	---	---	---	---
15	00:00 R	---	---	---	---	---	---	---
16	00:00 A	---	---	---	---	---	---	---

Table 3 – Daily profile.

- A: ANTI FREEZING TEMPERATURE; - R: REDUCED TEMPERATURE; - C: COMFORT TEMPERATURE.

WEEKLY PROFILES	DAILY PROFILES ASSOCIATED TO EACH DAY OF THE WEEK						
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
01	01	01	01	01	01	16	16
02	01	01	01	01	01	01	16
03	06	01	01	01	01	16	16
04	06	01	01	01	01	01	16
05	02	02	02	02	02	16	16
06	02	02	02	02	02	02	16
07	06	02	02	02	02	16	16
08	06	02	02	02	02	02	16
09	01	01	01	01	01	01	01
10	14	14	14	14	14	14	14
11	02	02	02	02	02	02	02
12	06	06	06	06	06	06	06
13	07	07	07	07	07	07	07
14	08	08	08	08	08	08	08
15	09	09	09	09	09	09	09
16	10	10	10	10	10	10	10

Table 4 – Weekly profiles



2.7 TIMED FUNCTIONS OF THE CHRONOTHERMOSTAT

There are 3 types of timed functions:

- **FORCED AUTOMATIC** operation: noted by the presence of both the automatic and manual icons (see Figure 9).
- **TIMED OFF (VACATION PROGRAM)** function: noted by the presence of both the hourglass and airplane icons (see Figure 10).
- **TIMED MANUAL (PARTY)** operation: noted by the presence of both the hourglass and manual icons (see Figure 11).

FORCED AUTOMATIC OPERATION

The forced automatic function allows you to set a temperature different from the programmed temperature (for example, the program is set so that the heating unit will operate from the hours of 8:00 to 12:00 at the programmed temperature of 18°C but the day is particularly cold and you would like to heater to operate until a temperature of 20°C is reached).

To activate the forced automatic function, just press the ▲  and ▼  buttons and set the desired temperature (in the example 20°C). Both the automatic and manual icons will appear on the display (see Figure 9).

The forced automatic operation will continue until the next programmed set point (in the example, up to 12:00), and will then return to the automatic mode using the programmed temperatures.




The **FORCED AUTOMATIC** function can ONLY be activated while in the **AUTOMATIC** mode ( button).



Figure 9 – Forced automatic mode

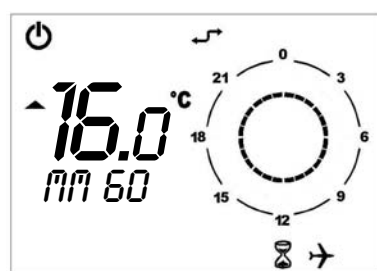


Figure 10 – Timed shut down mode



Figure 11 – Timed manual mode.

TIMED SHUT DOWN MODE (VACATION PROGRAM)

This turns off the unit for a certain period of time; in this period of time, any automatic programs that were set are disabled whereas the antifreeze function remains active; ((if it has not been deactivated from the *INFO* menu – see Table 5 at page 18).

The timed shutdown function is particularly useful when on vacation.

To activate the timed shut down function, proceed as follows:

1. Select the **AUTOMATIC** function using the button.
2. Press the button (the hourglass and airplane icons will appear and the word OFF will continually cross the display).
3. Using the and buttons, set the time the unit is to be shut down. The time can be expressed in:
 - minutes from 10 to 90 (reading MM:nn) (can be increased or decreased in 10 minute increments)
 - hours from 2 to 47 (reading HH:nn) (can be increased or decreased in 1 hour increments)
 - days from 2 to 45 (reading DD:nn) (can be increased or decreased in increments of 1 day)

The passage from minutes to hours and from hours to days is done through progressive increments of the parameter shown on the video.

4. During the entire period, the time remaining for the timed function will be displayed (see Figure 10 at page 16).
5. After the timed shut down period has finished, the chronothermostat will begin the automatic program.






The timed function can be interrupted at any moment by selecting the **SHUT DOWN**, **AUTOMATIC** or **MANUAL** function (using the button) or by repressing the button.

TIMED MANUAL OPERATION (PARTY)

Lets you set a desired temperature for a certain period of time, after which it switches to AUTOMATIC operation.





To activate the timed manual mode, proceed as follows:

1. Select the **MANUAL** function using the button.

2. With the ▲  and ▼  buttons, set the desired temperature.
3. Press the  button (the hourglass and hand icons will appear on the display).
4. Using the ▲  and ▼  buttons, set the duration for manual operation. The time can be expressed in:
 - minutes from 10 to 90 (reading MM:nn) (can be increased or decreased in 10 minute increments)
 - hours from 2 to 47 (reading HH:nn) (can be increased or decreased in 1 hour increments)
 - days from 2 to 45 (reading DD:nn) (can be increased or decreased in increments of 1 day)






The passage from minutes to hours and from hours to days is done through progressive increments of the parameter shown on the video.

5. During the entire period, the time remaining for the timed function will be displayed (see Figure 11 at page 16).
6. After the period of timed manual operation has finished, the chronothermostat will begin the automatic program.

 The timed function can be interrupted at any moment by selecting the **SHUT DOWN**, **AUTOMATIC** or **MANUAL** function (using the   button) or by repressing the  button.






2.8 KEYBOARD BLOCK

The chronothermostat can be protected from tampering or involuntary settings by activating the keyboard block function (KEY) as follows:

1. Enter the *INFO* menu by pressing the  button for more than 3 seconds. *INFO* will appear on the display
2. Press the **OK**  button until the string *KEY* appears.
3. Activate the keyboard block by setting value 1 using the ▲  and ▼  buttons.
4. Press the  button to exit from the *INFO* menu
5. 10 minutes after the last time any key is pressed, the keyboard block function will be activated.





The activation of the keyboard block is shown on the display by the “asterisk” symbol that appears next to the time.

6. To reactivate keyboard use, press the buttons in the following sequence  , ,  and .
7. To deactivate the keyboard block function, repeat the instructions indicated in sections 1, 2 and 3, setting the value to 0.

2.9 INFORMATION SCREEN OF THE CHRONOTHERMOSTAT

The information menu (*INFO*) contains 8 parameters that provide information about the unit's operating mode; some of these parameters can be changed and are used to personalise the operating mode of the installed unit.

1. Enter the INFORMATION mode by pressing and holding the  button for at least 3 seconds: the word *INFO* will appear on the display.
2. By pressing the **OK**  button the information windows seen in Table 5 can be viewed.

STRING	DESCRIPTION	CHANGEABLE PARAMETER
NF C1	Visualization of the output air temperature.	NO
NF C2	Visualization of flue temperature	NO
SP %	This value, which is calculated directly by the circuit board, indicates the instantaneous percentage of the modulation range of the power ¹ effectively supplied by the unit.	NO
SP MX %	This parameter changes the unit's modulation ¹ range to change the maximum limit (maximum power supplied by the unit). By setting a value equal to 50%, the UNIT will run from the value of 0 up to 50% of the modulation range contained between the foreseen maximum (100%) and minimum (0%). As default, this parameter is set at 100%. It can be particularly useful to set a percentage lower than 100 when the system is too large for its intended use.	YES using the UP and DOWN buttons can be changed from 100% to 0%
RPM	Displays the instantaneous revolutions of the blower.	NO
KEY	Enables or disenables the chronothermostat's keyboard block	YES using the UP and DOWN buttons 0 = block deactivated 1 = block activated
BUILD	Building dimension parameter. Can be set from 1 to 10: a value of 1 is recommended if the area to heat is of reduced dimensions; value 10 if the area to be heated is large. Default parameter is 5.	YES using the UP and DOWN buttons can be modified from 1 to 10
NO FRX	Enables or disenables anti-freezing function ² . To activate it, it is necessary to set value 1 by using the button UP and press OK to confirm. To disenable it is necessary to set value 0 by using the button DOWN and press OK to confirm.	SI attraverso i tasti UP e DOWN 1 = antigelo attivo 0 = antigelo disattivo

Table 5 – Information screen.











- ¹ TO BETTER UNDERSTAND THE THERMAL POWER OR MODULATION PERCENTAGE, REFER TO THE SPECIFIC NOTE AT PAGE 19.
- ² THE ANTIFREEZE FUNCTION IS THE FUNCTION THAT ACTIVATES THE UNIT IF THE TEMPERATURE OF THE ROOM IN WHICH THE UNIT IS INSTALLED DECREASES BELOW THE SET ANTIFREEZE TEMPERATURE (FOR MORE DETAILS SEE PARAGRAPH 2.3 SETTING THE COMFORT, ECONOMY AND ANTI- FREEZING TEMPERATURES ON THE CHRONOTHERMOSTAT AT PAGE10).IF THE VALUE SET FOR THE ANTI-FREEZING TEMPERATURE IS HIGHER THAN THE SET POINT TEMPERATURE, THIS SHALL CONTROL THE TURNING ON OF THE UNIT.



Percentage of heating output means the *percentage of the modulation field included between the nominal and the minimum heating output* (see Table 2).
For example, setting the parameter "SP MX %" (limit maximum of the heating output) the value "50", the range of modulation of the heater will be from "0%" to "50%".
 To know at which heating output the heater will work it is necessary to do the following operation (referred to the example here above and thinking about the heater would be a G100):
Modulation field maximum $[(100-0)\%] = (90,2 \text{ kW} - 33,5 \text{ kW}) = 56,70 \text{ kW}$
Modulation heating output $= (56,70 \text{ kW} \times 50 \%) = 28,35 \text{ kW}$
Functioning heating output $= (33,5 \text{ kW} + 28,35 \text{ kW}) = 61,85 \text{ kW}$.

2.10 SELECTION MENU WINDOW

The selection menu contains 6 parameters that are used to personalise the operating mode of the installed unit.

1. Access the SELECTION MENU by pressing the  button for 3 seconds and then, after accessing the *INFO* menu, by pressing the  and  buttons at the same time.
 2. Scroll the menu parameters using the  and  buttons.
 3. Once the parameter to change has been selected, make the change using the **UP** () and **DOWN** () buttons. Once changed, the parameter value will start to flash. The parameter has been accepted when the flashing stops.
-  If a value not permitted for the selected parameter has been set, the default value shown in Table 6 will be restored.
4. Press **OK**  to return to the INFO menu.
 5. Press  to exit the info menu and return to the main screen.

PARAMETER	DESCRIPTION	FUNCTIONALITY	DEFAULT VALUE
PM 01	Operating mode	01 – standard 02 – function not applicable 03 – ventilation priority (only without a chronothermostat)	Default : 01
PM 02	Ventilation speed in ventilation priority mode (only without a chronothermostat)	1 – low speed 2 – medium-low speed 3 – medium-high speed 4 – high speed	Default : 4
PM 03	Lower modulation depth limit in standard mode. Indicates the lower modulation value of the unit's thermal power (0% corresponds to the minimum supplied power): ex : by setting 10%, the unit will adjust from 100% (maximum supplier power) to 10 % of the modulation range ¹	From 0 to 100 %	Default : 0%
PM 04	Upper modulation depth limit in the increased air flow rate mode. PARAMETER NOT APPLICABLE	From 0 to 100 %	Default : 76%
PM 05	Upper modulation depth in standard mode. It indicates the upper modulation value of the unit's thermal power (100% corresponds to the maximum supplied power) .	From 0 to 100 %	Default : 100%
PM 06	Chronothermostat installed	1: chronothermostat installed 0: chronothermostat not installed	Default : 1

Table 6 – Operating parameters.

¹ TO BETTER UNDERSTAND THE THERMAL POWER OR MODULATION PERCENTAGE REFERS TO THE SPECIFIC NOTE ABOVE AT PAGE 19, AT THE BOTTOM OF PARAGRAPH 2.9).

2.11 MALFUNCTION WARNINGS

Any malfunctions that may be determined during normal operation of the heater are identified with the appropriate “error code” on the chronothermostat display.

The table below shows any anomalies visualized on the chronothermostat display, the failure that occur and the operation to be carried out.

ERROR CODE	DESCRIPTION	RESONS	INTERVENTION
01 E	Unit locks out during the first ignition phase	<ul style="list-style-type: none"> The ignition electrode is broken or badly positioned The flame sensor is broken or incorrectly positioned or touches the unit ground. Failure of dialog board or failure of its electric connection Failure in the gas valve or in its electrical connections Bad grounding Air inside the gas pipes 	<ul style="list-style-type: none"> Modify the position or replace the ignition electrode Modify the position or replace the flame sensor replace the dialog board replace the gas valve Improve grounding Remove the air from the gas supply <p>After having identified and resolved the cause of the error, press the OK button on the chronothermostat</p> <p>WARNING: after four resets 01E and / or 02 E within 1 hour, the error can not be reset manually. In order to reset the error, you must wait one hour or do a power reset (cut OFF the electrical supply and than switch it ON)</p>
02 E	The temperature limit thermostat stops the burner. The heat exchanger have overheated	<ul style="list-style-type: none"> Accumulation of dirt in the air inlet Obstruction of ventilation and supply grill Failure in the axial fan Electricity black-out during operation 	<p>After having identified and resolved the cause of the error reset the limit thermostat pressing the button OK of the chronothermostat in order to reset the error</p> <p>WARNING: after four resets 01E and / or 02 E within 1 hour, the error can not be reset manually. In order to reset the error, you must wait one hour or do a power reset (cut OFF the electrical supply and than switch it ON)</p>
03 E	Temperature probe	<ul style="list-style-type: none"> The probe that measures the temperature of the output air is broken. 	The error message turns off automatically once the anomaly that caused it has been eliminated.
06 E	Cable flue exhaust probe cut off on the board	<ul style="list-style-type: none"> False contact on flue exhaust probe 	Replace the contact
07 E 08 E 09 E	Problems on the blower	<ul style="list-style-type: none"> Electrical connections faulty Failure in the blower motor Lack of performance 	The error message turns off automatically once the anomaly that caused it has been eliminated.
10 E	Problems on flue exhaust probe	<ul style="list-style-type: none"> Exhaust flue temperature probe failed 	Replace the probe.

ERROR CODE	DESCRIPTION	RESONS	INTERVENTION
11 E	Lock out caused by minimum temperature of the flue exhaust	<ul style="list-style-type: none"> Combustion flue temperature too low 	<p>Verify that combustion air or flue pipes are not obstructed or too long.</p> <p>Verify that the pipe of condensate drainage or the condensing siphon are not obstructed or with a wrong diameter.</p> <p>Verify that flue exhaust probe is correctly positioned in the flue collector.</p>

Table 7 – Error codes

The table below shows the failures that are NOT show on display of chronothermostat.

ERROR CODE	DESCRIPTION	REASONS	INTERVENTION
NO error code	The burner goes out and does not re-ignite even if room temperature requires it	<ul style="list-style-type: none"> Position of chronothermostat could be influenced by external heat sources. Check the chronothermostat setting 	<ul style="list-style-type: none"> Check the position of the chronothermostat New setting
NO error code	The chronothermostat is ON and the heater doesn't work	<ul style="list-style-type: none"> No electrical supply Failure of remote unit interface Contact on main control circuit is open 	<ul style="list-style-type: none"> Check electrical supply Replace the remote unit interface Close the contact

Table 8 – Failures that are NOT show on display of chronothermostat.

2.12 TABLE OF ICON MEANINGS ON CHRONOTHERMOSTAT DISPLAY













ICON	MEANING
	The heater is in stand-by mode.
	Winter operation enabled.
	Error or request for maintenance (see TABLE 7).
	Communication between chronothermostat and heater active.
	Comfort temperature in use.
	Economy temperature in use.
	Automatic operation in use.
	Manual operation in use.
	Forced automatic operation in use.
	Timed shut down function in use.
	Timed manual operation.
	Flame/power level used.

Table 9 – Icon meanings on chronothermostat display.

2.13 HOW TO USE THE UNIT HEATER

The Gas Fired Unit Heater has the following use options
(please refer to the diagrams of Figure 12 and Figure 13, from page 25):

FUNCTIONING WITH CHRONOTHERMOSTAT

(ref. to Paragraph 2.14, page 26)

- **Winter operating (Heating)**
- with only chronothermostat, it means with chronothermostat and external devices.
- **Summer operating (Ventilation only)**
- with only chronothermostat, it means with chronothermostat and external devices.

FUNCTIONING WITHOUT CHRONOTHERMOSTAT

(ref. to the Paragraph 2.15, page 31)

- **Winter operating (Heating)**
- **Summer operating (Ventilation only)**
- **Renewable air functioning (with priority of ventilation)**



The unit is delivered from the factory with standard mode functioning, equipped with chronothermostat.

In order to set a different functioning mode (for example renewable air) please refer to paragraph 2.10 SELECTION MENU WINDOW at page 19.

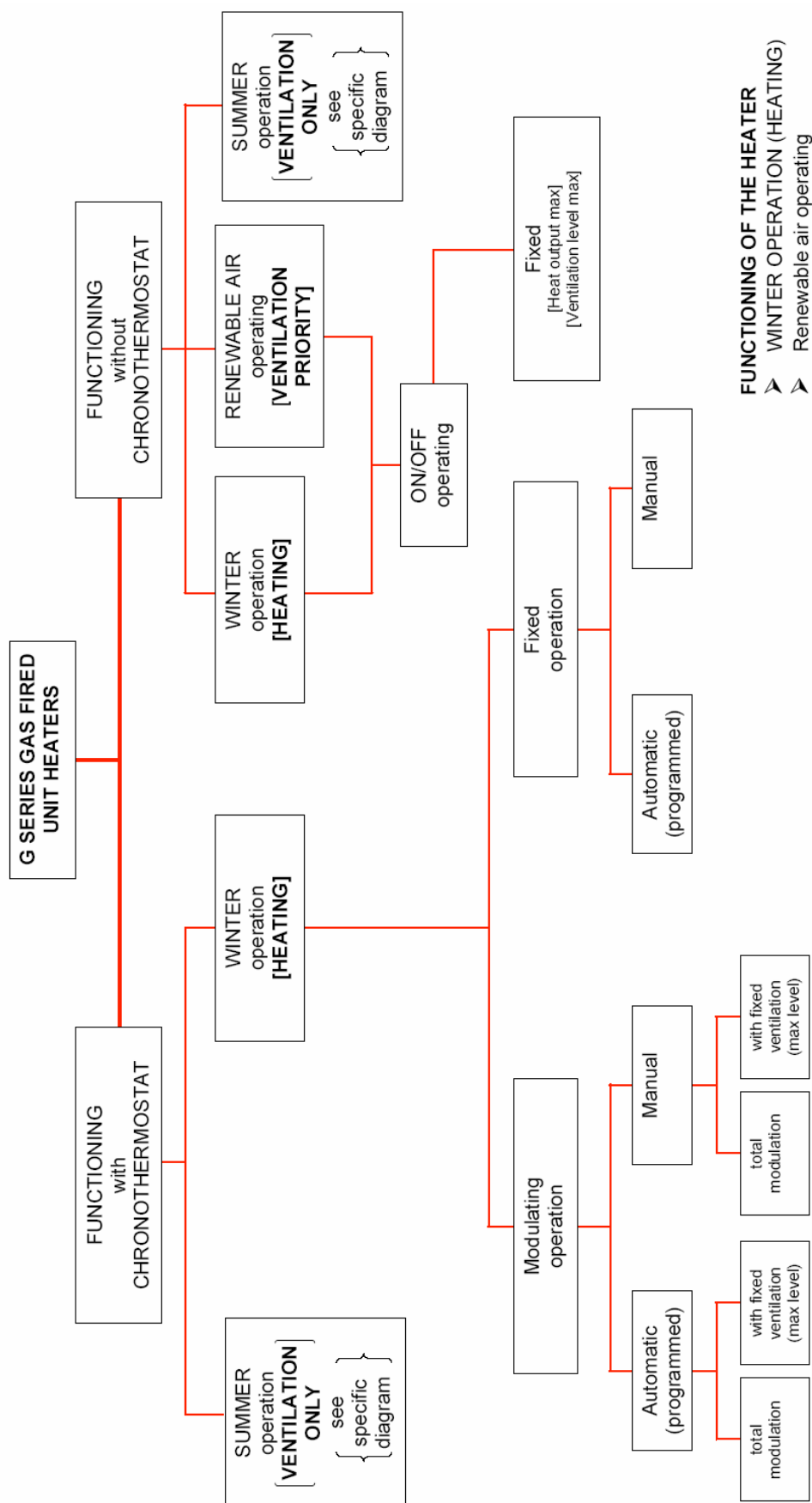


Figure 12 – Winter operation and renewable air functioning.

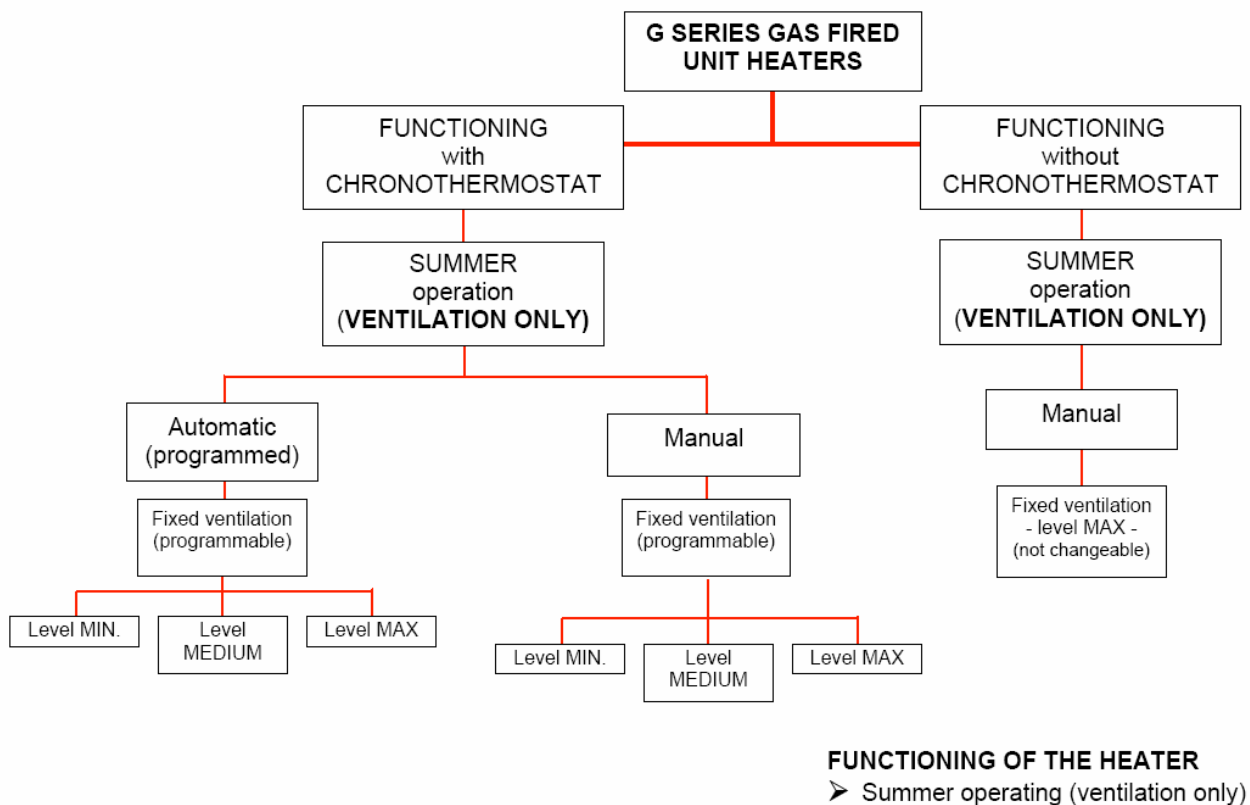


Figure 13 – Summer operation.

2.14 HOW TO USE THE UNIT WITH THE CHRONOTHERMOSTAT

Options of use with the chronothermostat are:
 winter operating (heating) and summer operating (ventilation).

WINTER OPERATING (HEATING)

The functioning in heating mode could be *modulating* or *fix* (see Figure 12):

A) Automatic modulating functioning

functioning with modulation of the heating output of the unit, controlled automatically by the chronothermostat following the hourly program set

- **Total modulation** (with modulating ventilation);
- **With fix ventilation** (with constant ventilation at the maximum speed).

B) Manual modulating functioning

functioning with modulation of the heat output of the unit, controlled manually by the end user

- **Total modulation** (with modulating ventilation);
- **With fix ventilation** (with constant ventilation at the maximum speed).

C) Automatic fix functioning

functioning with fix heat output controlled automatically by the chronothermostat following the hourly program set.

D) Manual fix functioning






functioning with fix heat output of the unit controlled manually by the end user.

A Automatic modulating functioning standard operation

➤ Total modulation (with modulating ventilation)



Requirements: The heater must be connected to the electrical and gas networks.

1. Press the  button on the chronothermostat (see Figure 3 at page 9) the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
2. Program the date, time, temperatures, as well as the weekly and daily profiles on the chronothermostat as described in the relative paragraphs.
3. Using the  button on the chronothermostat (see Figure 3 at page 9) select the function type: **automatic** () (in this mode, the unit's operation is regulated by the end user defined profiles).
4. By setting the flow rate level to **0** ( and  buttons), **the thermal power and the air flow rate are adjusted** continuously based on an internal algorithm and on the temperature difference between the room set point (requested temperature) and the detected temperature.








If ignition is done after a long period of inactivity, or at the time of the initial ignition of the unit, the operation may need to be performed numerous times due to air in the piping.

➤ With fix ventilation (with constant ventilation at the maximum speed)



Requirements: The heater must be connected to the electrical and gas networks.

1. Press the  button on the chronothermostat (see Figure 3 at page 9) the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
2. Program the date, time, temperatures, as well as the weekly and daily profiles on the chronothermostat as described in the relative paragraphs.
3. Using the  button on the chronothermostat (see Figure 3 at page 9) select the function type: **automatic** () (in this mode, the unit's operation is regulated by the end user defined profiles).
4. By setting flow rate at **value 4** ( and  buttons), **the air flow will remain constant at the maximum speed and the heat output will module** continuously based on an internal algorithm and on the temperature difference between the room set point (requested temperature) and the detected temperature.











If ignition is done after a long period of inactivity, or at the time of the initial ignition of the unit, the operation may need to be performed numerous times due to air in the piping.

B Automatic modulating functioning standard operation

- Total modulation (with modulating ventilation)



Requirements: The heater must be connected to the electrical and gas networks.

1. Press the  button on the chronothermostat (see Figure 3 at page 9) the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
2. Using the  button on the chronothermostat (see Figure 3 at page 9) select the function type: **manual** () , (in this mode, the unit's operation is controlled manually by the end user).
3. Use the **UP** () and **DOWN** () buttons to select the desired room temperature. If you want to use the set temperature, Economy or Comfort, (see paragraph SETTING THE COMFORT, ECONOMY AND ANTI- FREEZING TEMPERATURES ON THE CHRONOTHERMOSTAT at page 10), use the  button to select the desired setting.
4. By setting flow rate level to **0** ( and  buttons), **the thermal power and the air flow rate are adjusted** continuously based on an internal algorithm and on the temperature difference between the room set point (requested temperature) and the detected temperature.









If ignition is done after a long period of inactivity, or at the time of the initial ignition of the unit, the operation may need to be performed numerous times due to air in the piping.



- With fix ventilation (with constant ventilation at the maximum speed)



Requirements: The heater must be connected to the electrical and gas networks.

1. Press the  button on the chronothermostat (see Figure 3 at page 9) the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
2. Using the  button on the chronothermostat (see Figure 3 at page 9) select the function type: **manual** () , (in this mode, the unit's operation is controlled manually by the end user).
3. Use the **UP** () and **DOWN** () buttons to select the desired room temperature. If you want to use the set temperature, Economy or Comfort, (see

paragraph SETTING THE COMFORT, ECONOMY AND ANTI- FREEZING TEMPERATURES ON THE CHRONOTHERMOSTAT at page 10), use the  button to select the desired setting.

4. By setting flow rate at **value 4** ( and  buttons), **the air flow will remain constant at the maximum speed and the heat output will module** continuously based on an internal algorithm and on the temperature difference between the room set point (requested temperature) and the detected temperature.









If ignition is done after a long period of inactivity, or at the time of the initial ignition of the unit, the operation may need to be performed numerous times due to air in the piping.

C Automatic fix functioning standard operation



Requirements: The heater must be connected to the electrical and gas networks.

1. Press the  button on the chronothermostat (see Figure 3 at page 9) the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
2. Program the date, time, temperatures, as well as the weekly and daily profiles on the chronothermostat as described in the relative paragraphs.
3. Using the   button on the chronothermostat (see Figure 3 at page 9) select the function type: **automatic** () (in this mode, the unit's operation is regulated by the end user defined profiles).
4. By setting the air flow level to **1, 2 or 3** ( and  buttons) the unit's operation will be **fixed** at the power/flow rate level that is set (1 = low, 2=medium, 3= maximum). The unit will run without modulation until it reaches the requested temperature.












If ignition is done after a long period of inactivity, or at the time of the initial ignition of the unit, the operation may need to be performed numerous times due to air in the piping.



D Manual fixed standard operation



Requirements: The heater must be connected to the electrical and gas networks.

1. Press the  button on the chronothermostat (see Figure 3 at page 9) the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
2. Using the   button on the chronothermostat (see Figure 3 at page 9) select the function type: **manual** () (in this mode, the unit's operation is controlled manually by the end user).
3. Use the **UP** ( ) and **DOWN** ( ) buttons to select the desired room temperature. If you want to use the set temperature, Economy or Comfort, (see

paragraph 2.3 - SETTING THE COMFORT, ECONOMY AND ANTI- FREEZING TEMPERATURES ON THE CHRONOTHERMOSTAT at page 10), use the  button to select the desired setting.

4. By setting the air flow level to **1, 2 or 3** ( and  buttons) the unit's operation will be **fixed** at the power/flow rate level that is set (1 = low, 2=medium, 3= maximum). The unit will run without modulation until it reaches the requested temperature (room thermostat on).





If ignition is done after a long period of inactivity, or at the time of the initial ignition of the unit, the operation may need to be performed numerous times due to air in the piping.

SHUTDOWN



Requirements: The heater must be connected to the electrical and gas networks.

1. To turn off the heater, select the off mode using the  button: the icon (). In this mode, the unit is in stand-by: only the antifreeze function remains active unless deactivated from the *INFO* menu (see "NO FRX" of Table 5).






To avoid damage to the appliance, never turn it off by removing electrical power; doing this will cause the immediate arrest of the fans and the intervention of the temperature limit thermostat, which must be reset manually.


SUMMER OPERATION (VENTILATION ONLY)



Functioning with ventilation only could be with manual ventilation or with automatic ventilation (see Figure 13).



Requirements: The heater must be connected to the electrical and gas networks.

1. Close the gas valve and check that the appliance has electrical power.
2. Press the  button on the chronothermostat. The icon representing the radiator symbol will disappear.
3. Use the  and  buttons to select the ventilation level (level 1 minimum ventilation, level 2 medium ventilation, level 3 maximum ventilation). By setting level 0, there is no ventilation (the fans turn off).
4. During SUMMER operation, the burner is off and only the fan(s) operates to circulate the air.







During summer operation, the following ventilation modes can also be selected using the FUNCT () button (see also Figure 13):

- manual ventilation (MAN ): continuous ventilation without time limits at the selected ventilation level;
- automatic ventilation (AUTO ) the programmed time intervals are used to start the ventilation at the selected level (*COMFR*), or to turn off the ventilation (*ECONM*).

2.15 HOW TO USE THE UNIT WITHOUT A CHRONOTHERMOSTAT

Options of use, without the chronothermostat, are:
winter operating, summer operating and renewable air operating.

WINTER OPERATING (HEATING) AND SUMMER OPERATING (VENTILATION ONLY)

1. Access the SELECTION MENU by pressing the  button for 3 seconds and then, after accessing the *INFO* menu, by pressing the    buttons at the same time.
2. Set the PM06 parameter “Chronothermostat presence” to 0 (without a chronothermostat) (see Table 6).
3. Press **OK**  to return to the *INFO* menu.
4. Press  to exit the *INFO* menu and return to the main screen.
5. Disconnect the remote control and remove the dialogue board located in the control circuit in position x13.
6. To make the unit run in winter simply close the contact marked with the “radiator” symbol located on the LC23 board. In this way, the unit will not run in the modulating mode but in an ON-OFF mode with fixed thermal power and ventilation (maximum settings).
7. To make the unit run in summer (only fans) close the contact marked with the “fan” symbol located on the LC23 board. In this way, the fan will run at maximum ventilation.
8. Concerning the remote signalling of the anomalies, refer to paragraph 4.4 REMOTE SIGNALLING OF THE ANOMALIES at page 49.



For more information regarding unit operation and use in this mode, directly contact Robur's Pre-Sales service on +39 035/888.111

TOTAL FRESH AIR (ventilation priorità)








Total fresh air operating is possible ONLY without chronothermostat.

This option allows an on/off functioning with continuous ventilation and with burner on only when heating is needed (ambient thermostat contact closed).
Air flow and heat output are fixed (maximum values).

This function is particularly useful if a CONSTANT RENEWABLE AIR OF THE AMBIENT is needed.

In order to set this functioning mode follow the instructions here below.

1. Access the SELECTION MENU by pressing the  button for 3 seconds and then, after accessing the *INFO* menu, by pressing the    buttons at the same time.
2. Set the PM01 parameter “Functioning mode” to 03 (priority ventilation) (see Table 6).

3. Set the PM06 parameter "Chronothermostat presence" to 0 (without a chronothermostat) (see Table 6).
4. Press **OK**  to return to the *INFO* menu.
5. Press **IP** to exit the *INFO* menu and return to the main screen.
6. Disconnect the remote control and remove the dialogue board located in the control circuit in position x13.



The settings here above permit to use the heater with two options: "ventilation only" mode (for renewable air) so "ventilation and heating contemporary" (to renew the air and to heat the ambient). **This option, then, does not allow the mode "heating only", granting the priority to the ventilation.**

7. To activate the mode "ventilation only" (functioning of the fans only, for the renewable air) it is necessary to close only the contact with the symbol "fan" on the LC23 board.
Option, for example, for summertime.
8. To activate the mode "ventilation with heating" (contemporary functioning of fans and burner, for renewable air and heating mode) it is necessary to close, not only the contact with "fan" symbol but also the contact with the symbol "radiator", both positioned on the LC23 board.
To disable the heating mode (turn off of the burner only) re- open the contact with the symbol "radiator".
Option, for example, for wintertime.
9. To remote the signalling anomalies refer to paragraph 4.4 REMOTE SIGNALLING OF THE ANOMALIES at page 49.



For more information regarding unit operation and use in this mode, directly contact Robur's Pre-Sales service on +39 035/888.111

2.16 SETTING FIELD

By the use of the chronothermostat it is possible to set the heat input of the unit, fixing a value (in percentage) different than the nominal one.

This option modifies the maximum heat output of the unit and it can be selected anytime you want the heater has a heat input lower than the nominal one.



The setting of the heat input can be done only by an Authorised and Qualified Technical Service.



In case of Service, the parameter to be modified is "PM 05": see Table 6, page 20.
For the eventual setting, please follow the instructions in the Paragraph 2.10 of Page 19.

In the Table 10 are listed, depending on the model, the values (in percentage) that could be set and the appropriate heat input **(to be reported on the data plate)**.

Example:

For a heater "model G100", setting a heat input of 86,9 kW, it is needed to set (in the parameter "PM 05") the value: "90".

NOTE: the value "100" (%) (= value of default) correspond to the Heat Nominal Input of the heater; the value "0" (%) corresponds to the Minimum heat input of the heater.

"PM 05" (higher limit of modulation)	G 30		G 45		G 60		G 100	
Value to be set [%]	Blower speed	Heat Input	Blower speed	Heat Input	Blower speed	Heat input	Blower speed	Heat input
	[rpm]	[kW]	[rpm]	[kW]	[rpm]	[kW]	[rpm]	[kW]
100 %	3500	30,0	4850	45,0	5650	58,0	6000	93,0
95 %	3420	29,3	4693	43,5	5468	56,1	5803	89,9
90 %	3340	28,6	4535	42,1	5285	54,3	5605	86,9
85 %	3260	27,9	4378	40,6	5103	52,4	5408	83,8
80 %	3180	27,3	4220	39,2	4920	50,5	5210	80,8
75 %	3100	26,6	4063	37,7	4738	48,6	5013	77,7
70%	3020	25,9	3905	36,2	4555	46,8	4815	74,6

Table 10



Once the heat input of the heater has been set, it is obligatory to update the data plate by printing the new set value, as for the law UNI EN 1020.



On the data plate of the unit there is space for the installer to mark up with indelible characters the nominal setting heat input, just before the start up of the unit (UNI EN 1020 law, paragraph 7.1.2).

2.17 END OF SEASON

1. Turn off the appliance (as described in the SHUTDOWN paragraph) and wait for the fans to stop.
2. Close the gas supply valve on the appliance.
3. If you will not be using the SUMMER OPERATION (VENTILATION ONLY) function, remove electrical power to the appliance by means of the omni polar switch located on the power line.



The chronothermostat has a 12 hour battery buffer. If the heater does not have electrical power, after 12 hours the time and date settings will be lost (however the temperature and profile settings will remain in memory). To avoid this, do not remove electrical power from the heater, even during the seasonal shutdown.

SECTION 3: PLUMBER INSTALLER

In this section you will find all the necessary indications for installation from a plumbing point of view for series **G**.

3.1 GENERAL RULES FOR INSTALLATION OF THE APPLIANCE

Installation must be carried out, according to the manufacturer's instructions, by a **qualified service engineer**;



A **qualified service engineer** is defined as someone having specific technical competence in the heating unit components sector.

The units must be installed according to the national and international norms regarding this type of appliances and applications.

Installation procedures should be as follows:

- The minimum distance from the wall behind the unit must be enough for air circulation. The minimum distance from the lateral walls is given by Figure 14 at page 35.
- The distance from the lower part of the heater to any object or structure below it must be not inferior than 50 cm in order to permit the installation and the service of the condensing siphon.
- The recommended height from the floor to the heater base is 2.5 to 3.5 m. It is not recommended to install the appliance under the 2.5 m height (see Figure 14 at page 35).
- To obtain the maximum system efficiency it is advisable to comply with the following rules:
 - install units as close as possible to the work area, taking care that the air flow does not come directly into the contact with people
 - take obstacles into consideration (columns, etc.).
 - for better heat distribution in the case of multiple unit installation, create alternate flows of hot air (see Figure 15);
 - in some cases it may be suitable to place the units close to the main doors, so they can operate as an air barrier when doors are opened.
- Do not install the series G heating units in greenhouses or in environments with a high degree of humidity or similar atmospheric conditions because they were not designed for this type of use.

3.2 INSTALLATION SEQUENCE

Install the gas supply lines, the electric power lines and a suitable support bracket for the unit according the approved installation project.

1. Unpack the unit, carefully checking that it has not been damaged. Every unit is factory tested before shipment, therefore, if there are damages, report them immediately to the carrier.

2. Install the support bracket. Robur S.p.A. supplies an optional, easy-to-install bracket specifically designed for each heater.
3. Fasten the heater to the bracket using the screws provided.
4. Make sure that an adequate gas supply from the gas network is provided, particularly if the unit is supplied with:

Natural gas

Be sure that the pressure of the gas network, with the unit in operation, is set at 20 mbar (204 mm H₂O) (allowed tolerance between 17 and 25 mbar).

L.P.G. (Propane – Butane mix)

For the first pressure drop required in the supply, it is advisable to install a pressure governor near the liquid gas tank so as to reduce the pressure to 1.5 bar. A pressure governor for a second pressure drop should be placed near the heater to reduce the pressure to 37 mbar (allowed tolerance between 20 and 45 mbar).

L.P.G. (Pure Propane)

For the first pressure drop required in the supply, it is advisable to install a pressure governor near the liquid gas tank so as to reduce the pressure to 1.5 mbar. A low pressure governor for a second pressure drop should be placed near the heater to reduce the pressure from 1,5 bar to 37 mbar (allowed tolerance between 20 mbar and 45 mbar).

☞ In the case of doubt, adjust the appliance as for the propane- butane mix.

5. A gas cock and a pipe union must be provided for gas supply

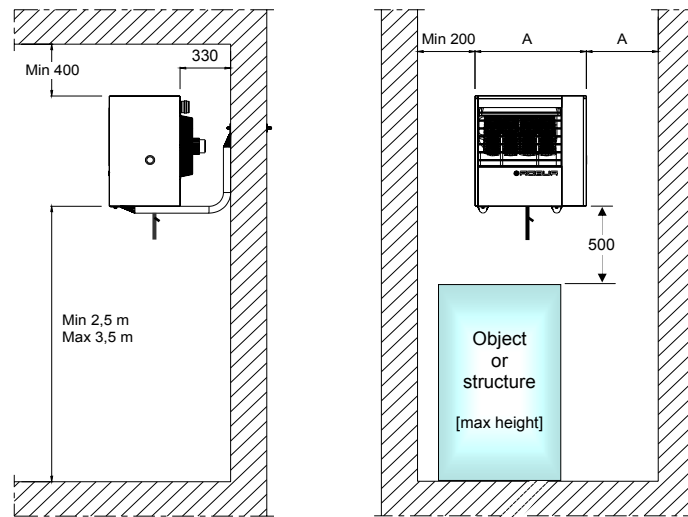


Figure 14 – Clearances to be respected

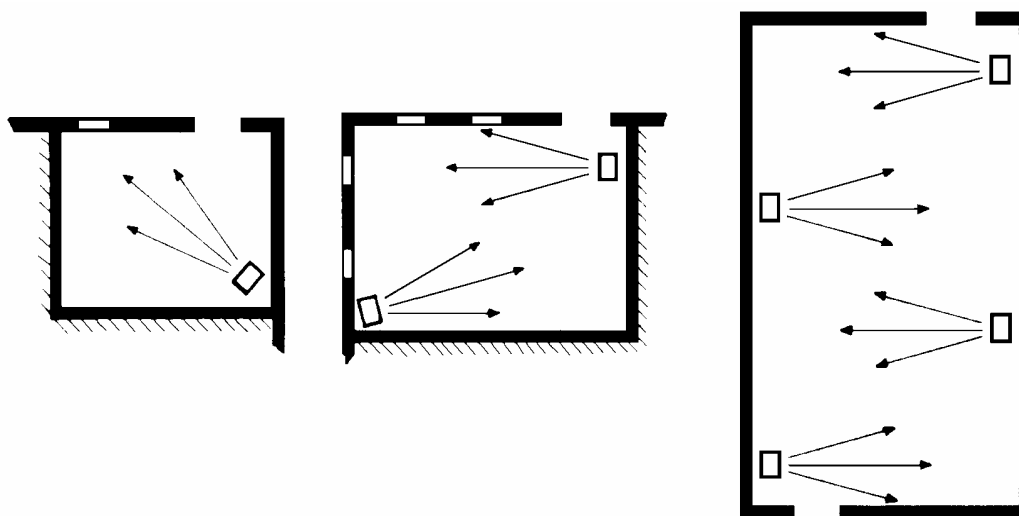


Figure 15 – Sample positioning of the units

3.3 SIZE AND INSTALLATION OF THE AIR INLET / EXHAUST FLUE

The G series gas fired heating units can be installed in one of the following ways:

- **C₁₃** type installation: room sealed combustion circuit. Appliance with inlet air supply and outlet of exhaust gases with or separate ducts (see Figure 18 and Figure 19 at page 40) or concentric (see Figure 20 and Figure 21 at page 40 and 41).
- **C₃₃** type installation: type installation; room sealed combustion circuit. Appliance with inlet air supply and outlet of exhaust gases with, either, concentric or separate ducts (see Figure 22 and Figure 23 at page 41 and 42).
- **B₂₃** type installation: combustion air taken directly from the room and flue exhaust gases to the outside. This exhaust flue duct can be either horizontal or vertical. This type of installation is not sealed regarding the heated room (see from Figure 24 to Figure 27 starting from page 42).
- **C₅₃** type installation: room sealed combustion circuit; appliance with inlet air supply and outlet of exhaust gases by using separated ducts and terminals on different walls, for example, the air inlet duct from the wall behind the appliance and the flue exhaust duct on the roof (see Figure 28 and Figure 29 at page 44 and 45).
- **C₆₃** type installation: allows installing the certified air inlet/flue exhaust ducts, elbows and terminals purchased on the market. Moreover, it permits to use the pipe diameters bigger than 80mm: for example when the installation requires using the pipe of the larger diameter, caused by the longer ducts. With this typology, for the calculus of the flue/air inlet duct refer to the duct manufacturers data and furthermore to the flue composition, flue flow and its temperature (see Table 11 at page 37).

In any case use flue pipes according to the approved type of installation you have to do. The material used for the exhaust fumes must be class W1 UNI EN 1443 and then adapted to resist the action of the condensate of combustion products from gaseous fuels.

In case you should use different pipes from the ones furnished by the producer, please assure yourself that these are appropriate for the kind of heater on which they are installed. You should especially check that the class of temperature of these pipes must

be appropriate with the working features of the heater and to the chemical-physical stability of the system itself.



The combustion products contain a high concentration of water vapour. Ensure that the fumes are not sucked in by the combustion air intake because it may cause the unit to malfunction.

To determine a correct size of the flue system its total pressure drop has to be calculated. The allowed pressure drop in the pipe system depends on the model of the unit (Table 11 at page 37).

The maximum allowed pressure drop for each unit, the losses of the exhaust and air intake flues regarding the coaxial ducts supplied by manufacturer are shown in Table 12 at page 38 (for Ø 80 and Ø 100) and in Table 13 at page 38 (for Ø 110 and Ø 130).

External terminals pressure losses are negligible since it is very low.

Check the total inlet/outlet pipes pressure losses regarding maximum values given by Table 11. On the following pages there is an the example of pressure loss calculation and respective duct project. It must be checked that the total amount of the flue system pressure losses are within the minimum and the maximum losses allowed for the unit

The maximum lengths of the air inlet and exhaust tubes, in relation to the type of installation being done, are reported from Figure 18 to Figure 29. These lengths are intended to be APPROXIMATE values for standard installations in which the air supply pipe and exhaust pipe follow linear paths as seen in the respective figures. If this is not the case, you must proceed to the calculation to verify the pressure loss (see SAMPLE CALCULATION).



In the case of horizontal flue pipe installations must meet the following guidelines:

Flue length ≤ 1 m: Install the flue pipe with a counter slope of 2 to 3 cm towards the heater (see Figure 16).

Flue length > 1 m: the condensate produced from the exhaust pipe must be adequately drained by a special collection and disposal system in accordance with the local norms.

For proper installation of the wall external terminals of the exhaust products of combustion and combustion air intake see Figure 17.

TECHNICAL DATA FOR THE AIR/EXHAUST SYSTEM					
Mod.	Flue temperature °C	Flue flow rate in weight kg/h	CO ₂ in exhaust %		Max. Allowed Pressure Loss (Pa)
			Natural gas	LPG	
G 30	82	52	9,2-9,4	10,7	65
G 45	90	76			100
G 60	85	98			120
G 100	85	158			200

Table 11 – Technical data for air/exhaust system.

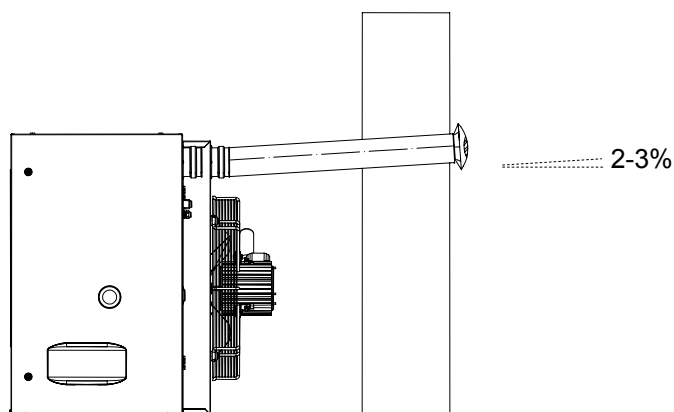


Figure 16 – Counterslope horizontal pipes

TECHNICAL DATA FOR THE CALCULATION OF THE AIR/EXHAUST SYSTEM USING Ø 80 OR Ø 100 DUCTS SUPPLIED BY ROBUR UPON REQUEST										
Mod.	Pressure loss Ø 80 components					Pressure loss Ø 100 components				
	duct (Pa/m)		90° elbow (Pa)		coaxial (Pa)	duct (Pa/m)		90° elbow (Pa)		coaxial (Pa)
	flue	air	flue	air	wall (O-SCR012)	flue	air	flue	air	wall (O-SCR009)
G 30	3,8	2,4	7,6	3,6	15	1,2	0,8	3,5	2	13
G 45	6	4	11	5	20	1,8	1,2	4,8	3,7	18
G 60	8	6,5	17	10	N.P.	5	2,6	8	5	N.P.
G 100	22	17	36	24	N.P.	9	4	18	11	N.P.

Table 12 – Data for the calculation of the air/flue system with Ø 80 or Ø 100 ducts

N.P.= INSTALLATION NOT POSSIBLE



For each T-shaped piece, consider an increment of length equal to 3.0 metres of the pipe on which it was assembled (ex. if the T-shaped piece was assembled on a 2 metre long flue pipe, when calculating the pressure loss the entire 5 metres of the flue pipe must be considered).

For each 45° elbow, consider an increment of length equal to 1.2 metres of the pipe on which it was assembled (ex. if 45° elbow was assembled on a 2 metre long air pipe, when calculating the pressure loss the entire 3.2 metres of the air pipe must be considered).

TECHNICAL DATA FOR THE CALCULATION OF THE AIR/FLUE SYSTEM USING Ø 110 OR Ø 130 DUCTS SUPPLIED BY ROBUR UPON REQUEST										
Mod.	Pressure loss Ø 110 components				Pressure loss Ø 130 components					
	duct (Pa/m)		90° elbow (Pa)		duct (Pa/m)		90° elbow (Pa)		Coaxial (Pa)	
	flue	air	flue	air	flue	air	flue	air	wall (O-SCR011)	roof (O-KTC001)
G 30	1,0	0,55	2,9	1,5	0,6	0,2	1,6	0,5	6	8
G 45	1,4	0,8	4	2	0,9	0,3	2	0,8	9	12
G 60	2,5	1,7	6,6	4,1	1,8	1	4	1,8	15	22
G 100	7	3	15	8	3,5	1,5	10	3	32	35

Table 13 – Data for the calculation of the air/flue system with Ø 110 or Ø 130 ducts

SAMPLE CALCULATION

Let's use the installation of a G 100 for this example. The air/flue system is made using the following separate Ø 80 ducts:

- 7 meters Ø 80 flue pipe
- 1 elbow 90° of Ø 80 on the flue pipe
- 3 meters of Ø 80 air pipe

The calculation can therefore be done keeping in mind that the maximum allowed pressure loss is 200 Pa (see Table 11).

	Quantity		Pressure loss				
Flue pipe Ø 80	6 m	x	22 Pa	=	132,0 Pa	+	
Elbow 90°	1 m	x	36 Pa	=	36,0 Pa	+	
Air pipe Ø 80	3 m	x	17 Pa	=	51,0 Pa	=	
Total pressure loss					219,0 Pa		

The total pressure loss of the system is greater than the max. allowed pressure loss (219 Pa GREATER than 200 Pa) therefore the installation is NOT POSSIBLE.

The installation can be done if one of the following actions is taken:

- reduce the air/flue duct length;
- increase the duct diameter using Ø100 ducting.

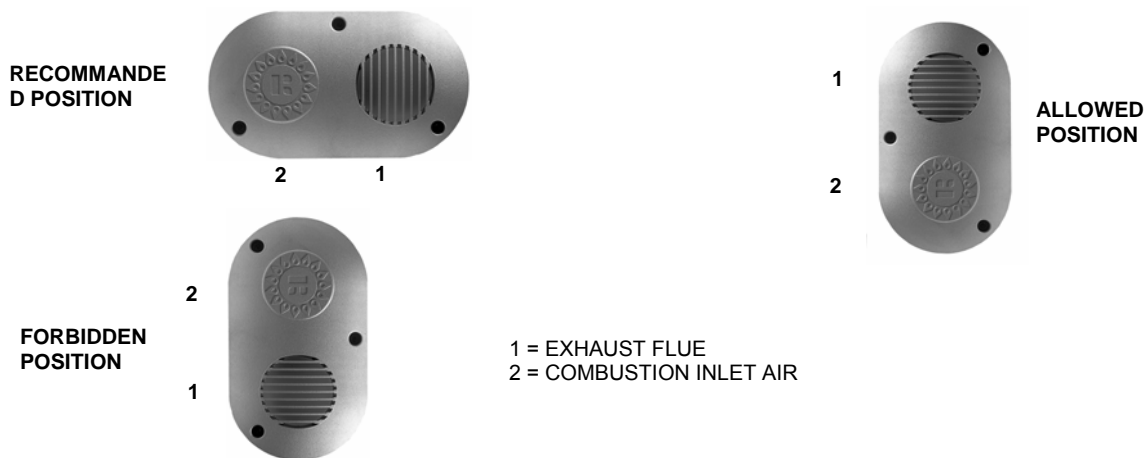
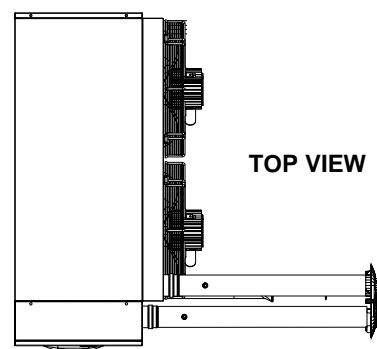


Figure 17 – Wall terminal positioning

C13 INSTALLATION W/ SEPARATE Ø 80 DUCTS

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
G 30	10	10
G 45	10	10
G 60	8	8
G 100	5	5

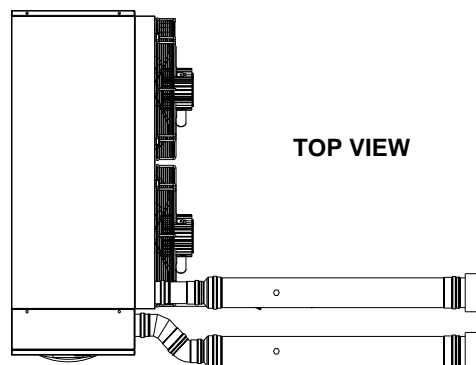


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

Figure 18 – C13 installation type with separate pipes Ø 80.

INSTALLATION C13 C/SEPARATE PIPES Ø 110

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
G 30	20	20
G 45		
G 60		
G 100	14	14

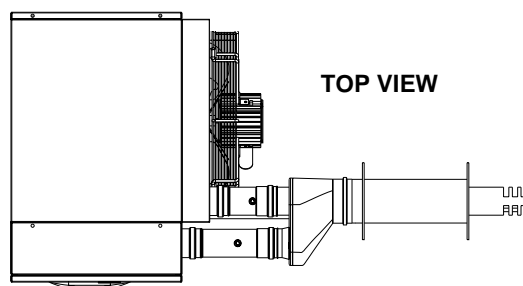


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

Figure 19 – C13 installation pipe with separate pipes Ø 110.

C13 COAXIAL WALL INSTALLATION WITH Ø 80 DUCTS

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
G 30	8	8
G 45	8	8
G 60	INSTALLATION NOT POSSIBLE	
G 100		

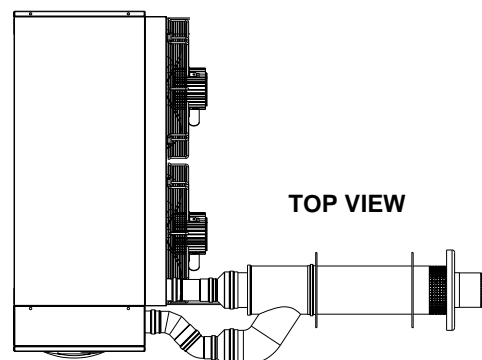


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

Figure 20 – C13 coaxial wall type installation with Ø 80 ducts.

**C13 COAXIAL WALL INSTALLATION WITH
Ø 130 DUCTS**

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
G 30	30	30
G 45	20	20
G 60		
G 100	18	18



ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

Figure 21 – C13 coaxial wall type installation with Ø 130 ducts

**C33 COAXIAL ROOF INSTALLATION (cod. O-SCR009) WITH
Ø 100 DUCTS**

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
G 30	20	20
G 45	18	18
G 60	INSTALLATION NOT POSSIBLE	
G 100		

ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

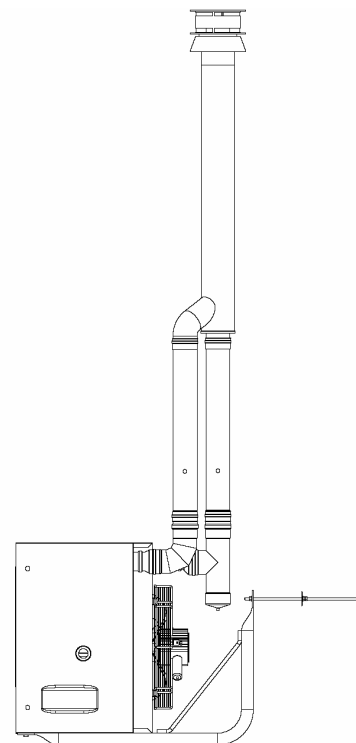


Figure 22 – C33 coaxial roof type installation with Ø 100 ducts

**C33 COAXIAL ROOF INSTALLATION (Cod. O-KTC001) WITH
Ø 130 DUCTS**

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
G 30	30	30
G 45	20	20
G 60		
G 100		

ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

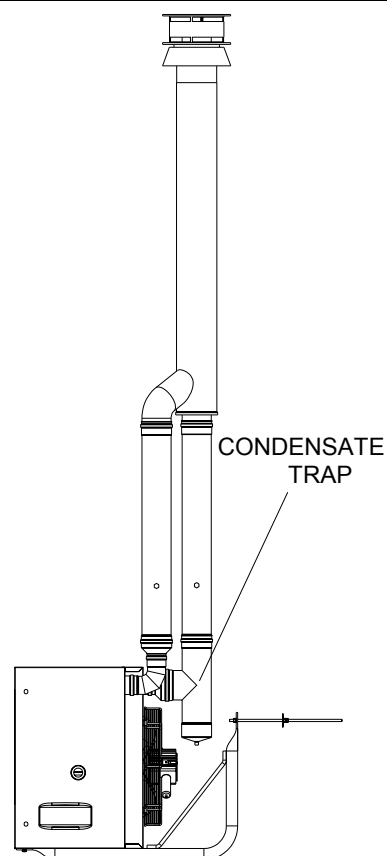
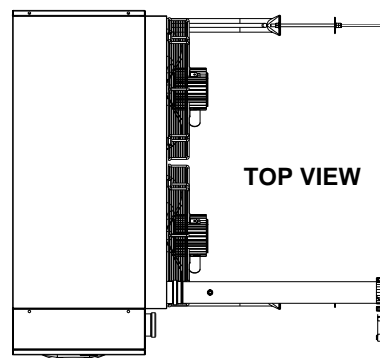


Figure 23 – C33 coaxial roof type installation with Ø 130 ducts

B23 INSTALLATION WITH Ø 80 FLUE PIPE

MAXIMUM ALLOWED LENGTHS (m)	
	FLUE PIPE
G 30	17
G 45	15
G 60	14
G 100	8

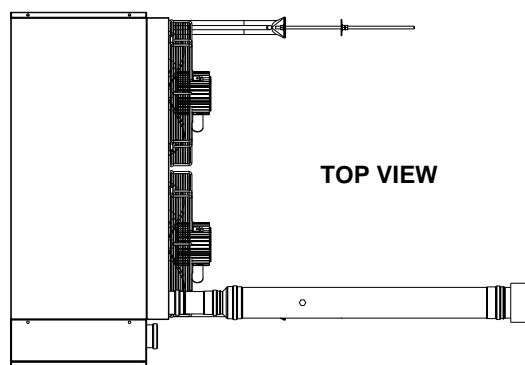


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

Figure 24 – B23 type installation with Ø 80 flue pipe

B23 INSTALLATION WITH Ø 110 FLUE PIPE

MAXIMUM ALLOWED LENGTHS (m)	
	FLUE PIPE
G 30	30
G 45	25
G 60	
G 100	20

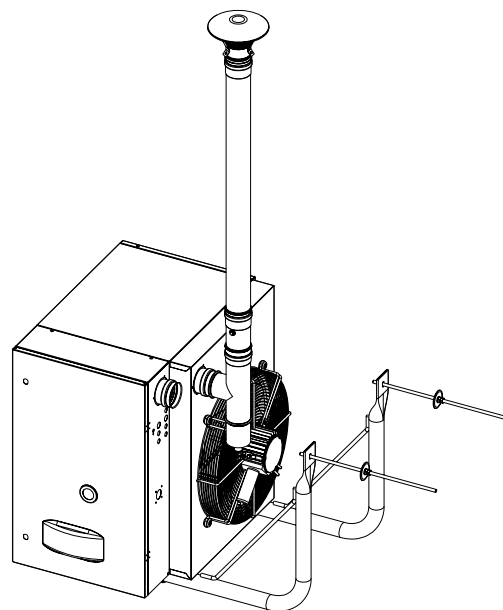


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

Figure 25 – B23 type installation with Ø 110 flue pipe

B23 INSTALLATION WITH Ø 80 ROOF FLUE PIPE

MAXIMUM ALLOWED LENGTHS (m)	
	FLUE PIPE
G 30	14
G 45	13
G 60	11
G 100	INSTALLATION NOT POSSIBLE



ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

Figure 26 – B23 type installation with Ø 80 roof flue pipe.

B23 INSTALLATION WITH Ø110 ROOF FLUE PIPE

MAXIMUM ALLOWED LENGTHS (m)	
	FLUE PIPE
G 30	30
G 45	25
G 60	
G 100	20

ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

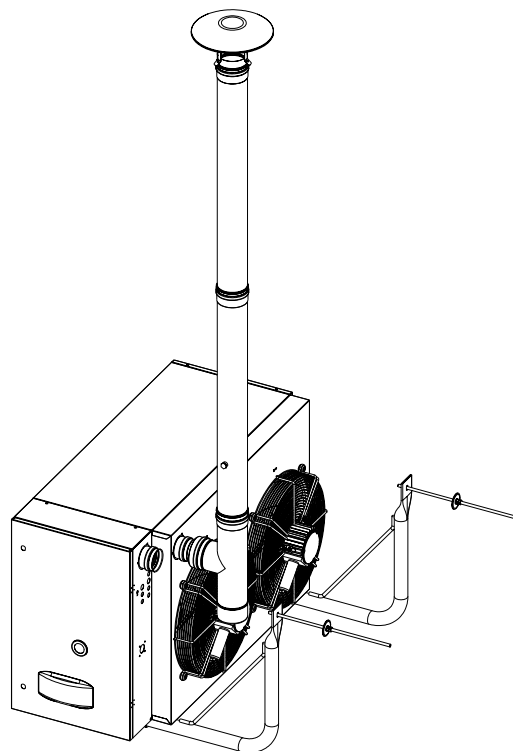


Figure 27 – B23 type installation with Ø 110 roof flue pipe

C53 INSTALLATION WITH Ø 80 PIPES

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
G 30	1	13
G 45	1	12
G 60	1	10
G 100	INSTALLATION NOT POSSIBLE	

ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

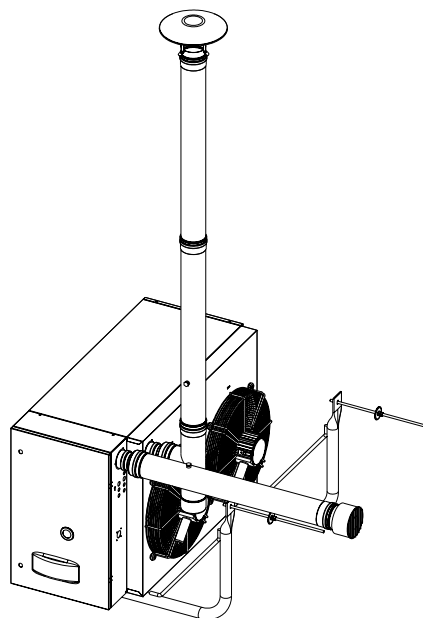


Figure 28 – C53 type installation with Ø 80 pipes

C53 INSTALLATION WITH Ø 110 PIPES

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
G 30	1	30
G 45	1	25
G 60		
G 100	1	18

ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case it is necessary to proceed and verify the pressure losses (see SAMPLE CALCULATION).

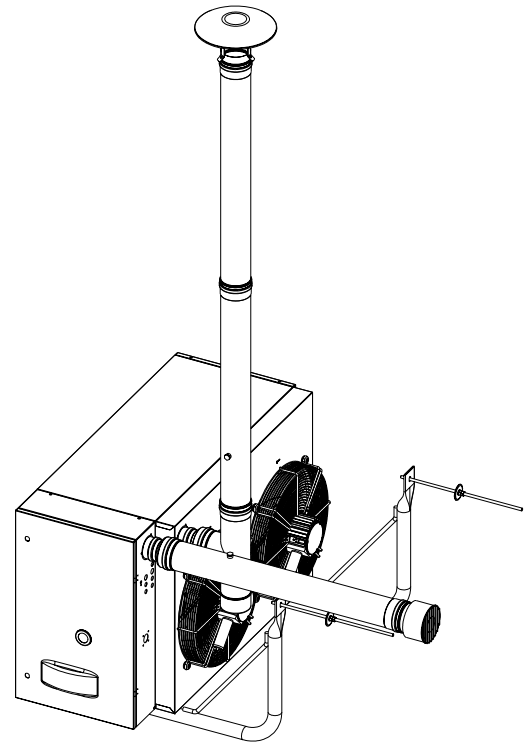


Figure 29 – C53 type installation with Ø 110 pipes

3.4 CONDENSATE DRAINAGE

G series Gas Fired Unit Heaters are equipped with a condensing drainage kit to be connected (by the installer) to the suitable outlet situated in the lower part of the heater. Connect the two parts of the kit (see inside the bag): unscrew upper ring of the "siphon condensing discharge", insert the "neck ring of condensing discharge connection" in aluminium (with the connection in external position) and screw the ring.

At this point, screw the assembled from the "neck ring connection" side in aluminium at the outlet of the heater (Figure 30).



The outlet situated in the lower part of the unit has been designed in the way to remain usable even in case of installation of support bracket (as accessory).

Regulate the siphon leaving the discharge connection facing the route of the exhaust pipe (Figure 31). The connection of the discharge to the collecting system must be at atmospheric pressure, it means as dripping in a siphoned tray connected to the collecting system, installing a suitable neutraliser of the condensate, in accordance with the installation rules.

Regarding the tray pipes of the condensate, they must be utilised suitable materials long term resistant to mechanical, thermal and chemical stresses of the condensate, as stainless steel pipes or in PP plastic material. Do not utilise iron or copper pipes, materials easily consumable by the acidity of the condensate.

In case of absence of specific technical norms, please refer to local legislations.

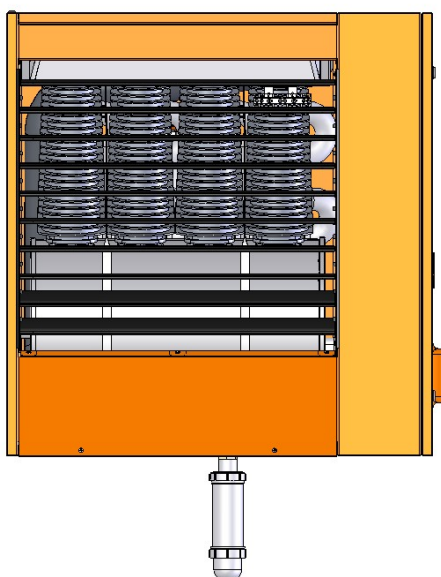


Figure 30 – Positioning of siphon condensate discharge.

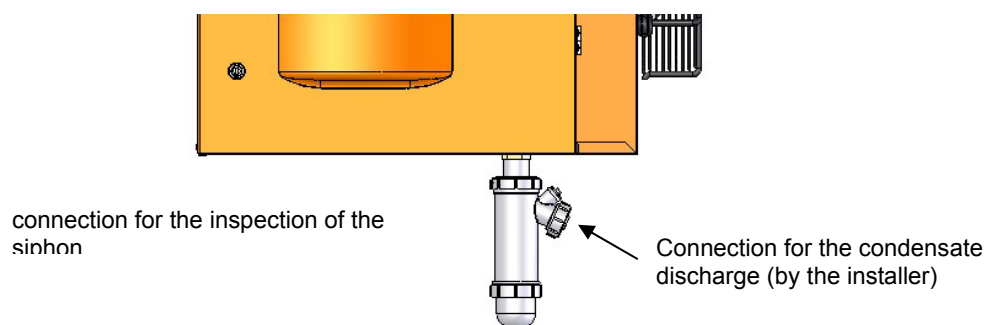


Figure 31 – Detail of the installation of the condensate siphon discharge.

SECTION 4: ELECTRICAL INSTALLER

In this section you will find all the information necessary for the electrical connections of the G series heating units.

4.1 HOW TO CONNECT THE HEATER TO THE ELECTRICAL SYSTEM



Requirements: The heater must be installed.



The electrical connections must be done by a **qualified service engineer**. Before beginning this operation, cut off the electrical supply.

1. Checking that the voltage supply is 230/50Hz single-phase.
2. Carry out the electrical connections according to the installation wiring diagram (see Figure 33 at page 50) wire type is H05 VVF 3x1,5 mm² with a maximum external diameter of 8.4 mm.
3. When connecting, ensure that the earth wire is longer than the live wires, so that it will be the last wire to break if the supply cable is stretched, thus ensuring a good earth continuity.



The electrical safety of the unit is attained only when the unit itself is correctly connected and efficiently grounded according to the existing safety standards. Do not use gas tubes to earth electrical apparatus.

4. The unit should be connected to the electric supply line by means of an omnipolar switch with a minimum contact opening of 3 mm. An omnipolar switch is a "Double pole isolating switch". This means that when the switch is opened, both contacts are disconnected.



The control wires (especially those connected to the chronothermostat) **must be protected from interference created by power wires**. This can be achieved, for example, using wire protectors or by using conduits that are separate from those containing the power cables.

4.2 HOW TO CONNECT THE CHRONOTHERMOSTAT TO THE HEATER



The electrical connections must be done by a **qualified service engineer**. Before beginning this operation, shut off the electrical supply.

For the installation of the chronothermostat, proceed as follows:

1. It is recommended to place the sensor at about 1.5 m from the floor, protected against air draughts, direct exposure to sun rays and direct heat sources (lamps, hot air flows from the unit itself, etc.). If possible, **DO NOT place the chronothermostat on walls bordering the outside**, to avoid false temperature readings and therefore system operation. **IF THE ROOM CHRONOTHERMOSTAT IS PROPERLY INSTALLED, UNWANTED STARTING AND STOPPING OF THE SYSTEM WILL**

BE AVOIDED AND ADEQUATE ROOM COMFORT WILL BE ENSURED. If this is not possible, shield the chronothermostat by placing a sheet of insulating material (cork, polystyrene, etc.) between it and the wall.

2. Drill holes in the wall corresponding to the fastening points of the chronothermostat.
3. Fasten the chronothermostat with 2 expansion screws.
4. Chronothermostat is supplied wired to the dialog board with 5 meters cables and must be installed at suitable position. For lengths greater than 5 meters use an unshielded bipolar 0,75 mm² section cable with maximum resistance for 5 Ω conductor (use a shielded cable if the installation has strong electrical disturbances). **In any case, the cable must not be longer than 30 meters.**

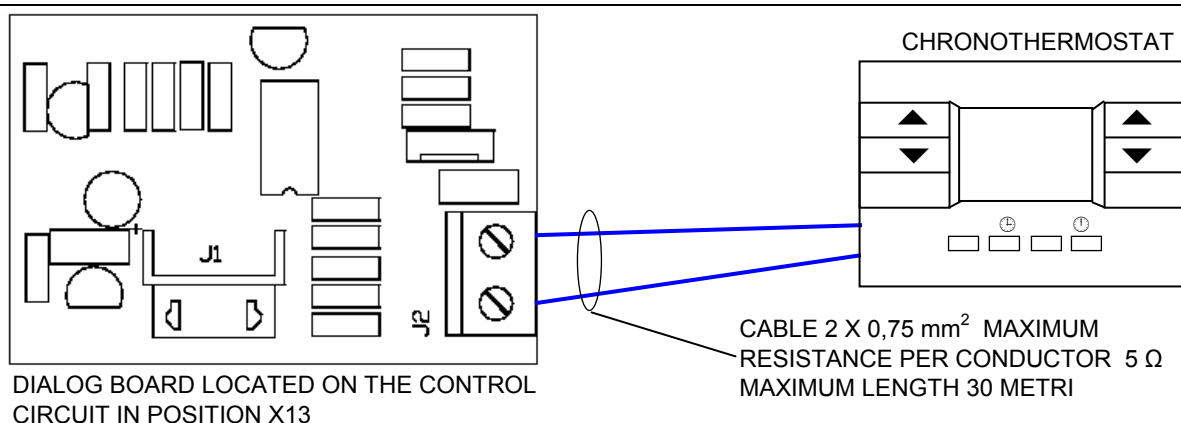


Figure 32 – Connection of chronothermostat and dialog board

4.3 UNIT OPERATION WITH EXTERNAL CONSENT

In winter, multiple units can be controlled with a single external consent (ex. programmer clock) by removing the electric jumper on the terminals marked by the symbol “radiator” and connecting the external consent to the terminals themselves (see Figure 34 at page 51).

In summer, multiple units can be controlled with a single external consent (ex. programmer clock) by removing the electric jumper on the terminals marked by the symbol “fan” and connecting the external consent to the terminals themselves (see Figure 34 at page 51).

In any case, each unit must be connected to the related chronothermostat, from which the operating consent must also be provided (AND logic).

Opening the external consent contact will deactivate the unit, regardless of what is foreseen by the chronothermostat.



For more information regarding unit operation and use in this mode, directly contact Robur Pre-Sales service on +39 035/888.111.

4.4 REMOTE SIGNALLING OF THE ANOMALIES



Electric connections must be made by **professionally qualified personnel**. In any case, before making any electric connection, cut off the electrical supply.

The possible anomalies that could arise during normal unit operation can be identified through their “error code” that appears on the chronothermostat display (for more information see Table 7).

The operating anomalies can also be signalled remotely by connecting a led to terminal J9 on the LC23 board (output 230V – 50Hz, see diagram of Figure 33 at page 50).

The maximum length of the remote signal cable is 200 metres.

If a led turns on, as described in Table 14, this means there is an anomaly.

Release may also be done remotely. To do this, a button must be connected to the J11 terminals on the LC23 board (output 230V – 50Hz, see diagram in Figure 33 at page 50).

Closing the contact resets the anomaly.

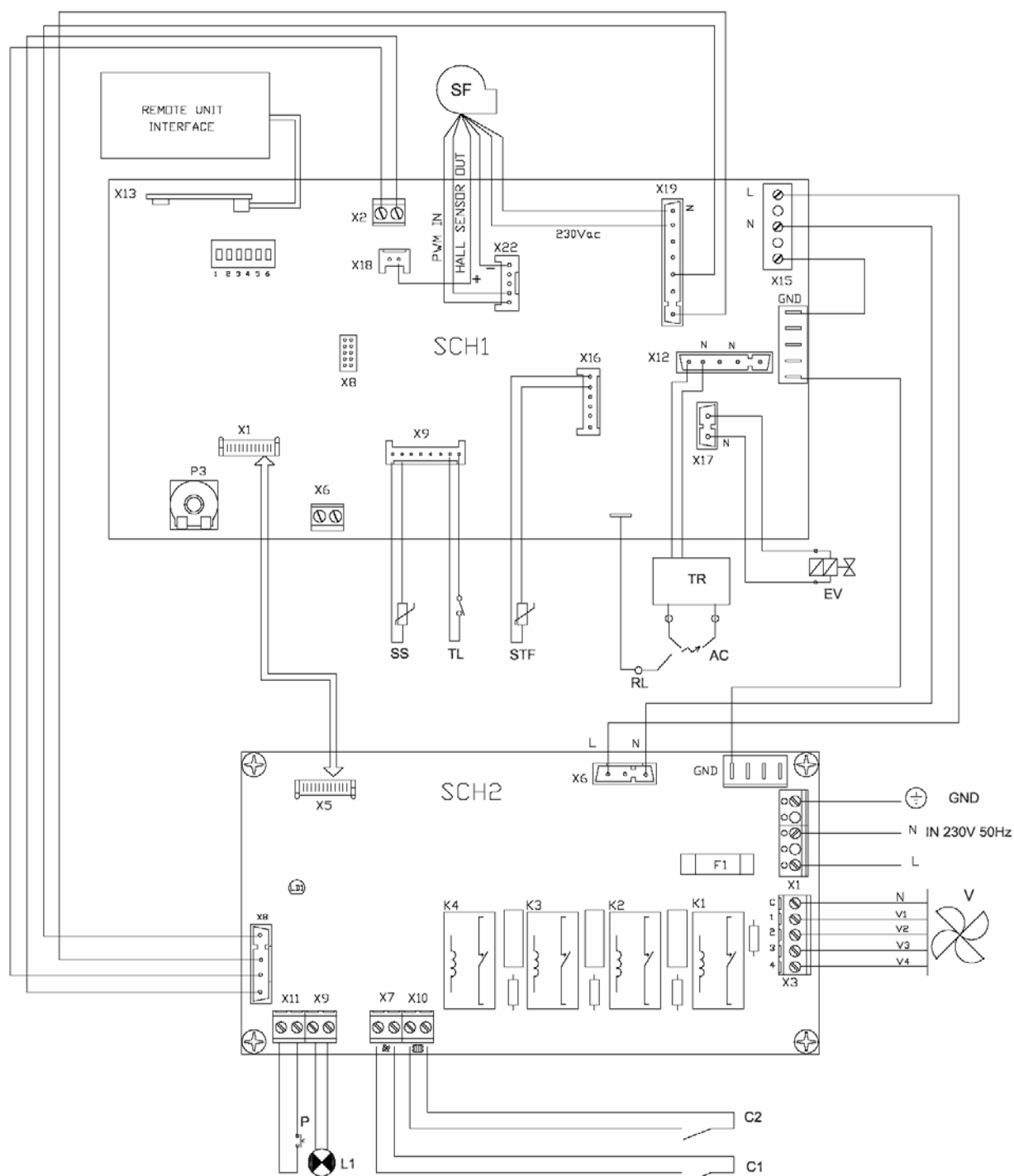
The maximum length of the remote signal cable is 200 metres.

ANOMALY	ACCENSIONE LED
UNIT LOCK OUT	FIXED
LIMIT THERMOSTAT	FLASHING (ON = 4 SECONDS, OFF = 1 SECOND) ⁽¹⁾
OTHER TYPE OF ANOMALY	FLASHING (ON = 1 SECOND, OFF = 4 SECONDS) ⁽¹⁾

Table 14

1 AFTER 72 CONTINUOUS HOURS OF FLASHING, THE STATUS BECOMES FIXED

4.5 INSTALLATION WIRING DIAGRAM



SF SOFFIATORE - BLOWER
 SCH1 SCHEDA DI CONTROLLO - CONTROL BOARD
 SS SONDA SCAMBIATORE - HEAT EXCHANGE PROBE
 SA SONDA AMBIENTE (non utilizzata) - EXTERNAL AIR PROBE (not to be used)
 RL RILEVAZIONE FIAMMA - DETECTOR FLAME
 EV ELETTROVALVOLA GAS - GAS VALVE
 TR TRASFORMATORE D'ACCENSIONE - IGNITION TRANSFORMER
 V VENTILATORI (n.2 per K100) - FAN MOTOR
 GND GROUND

SCH2 SCHEDA DI CONTROLLO VENTILATORI LC23 - FAN CONTROL BOARD
 STF SONDA TEMPERATURA FUMI - FLUE TEMPERATURE PROBE
 TL TERMOSTATO LIMITE o di sicurezza - OVERHEAT THERMOSTAT
 AC ELETTRODO DI ACCENSIONE - IGNITION ELECTRODE
 C1 CONTATTO VENTILAZIONE - VENTILATION CONTACT
 C2 CONTATTO CONSENSO RISCALDAMENTO - HEATING CONSENT CONTACT
 P PULSANTE DI SBLOCCO - RESET BUTTON
 L1 SEGNALE DI BLOCCO - LOCKOUT WARNING LAMP

Figure 33 – Installation wiring diagram of G series heaters

4.6 WIRING DIAGRAM FOR MULTIPLE HEATER WITH ONE PROGRAMMER

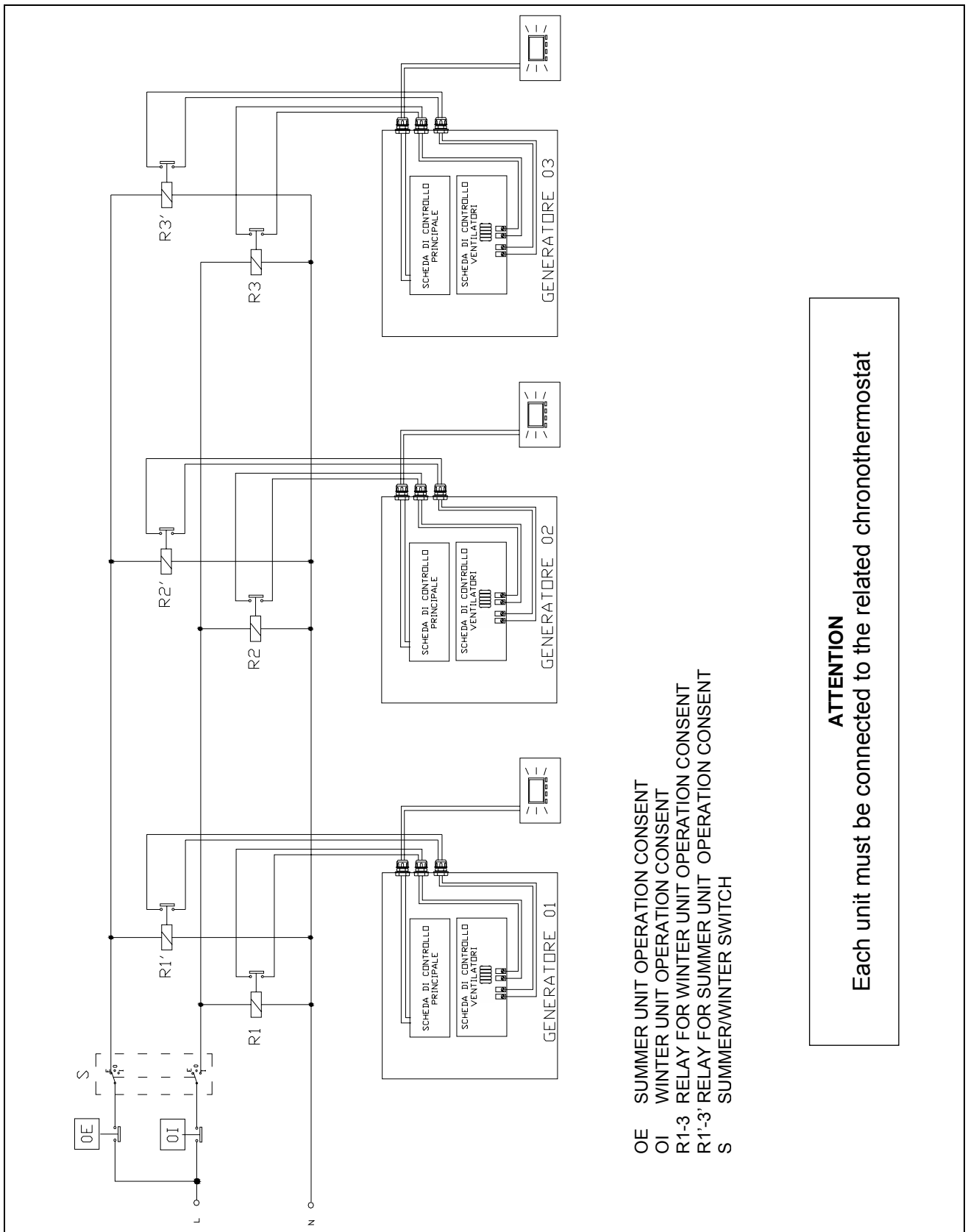



Figure 34 – Wiring diagram for controlling multiple units with external consent

SECTION 5: ASSISTANCE AND MAINTENANCE

In this section you will find the indications necessary for the technicians to regulate the gas valve, gas conversion as well as other instructions regarding maintenance.


5.1 START UP OF THE UNIT

 The start up of the unit has to be done by a **qualified service engineer** following the instructions here below:

- Data plate are the same as the ones of power and gas network;
- The set of pressure is compatible with the power of the heater.

Once it has been checked the correct installation and the correct installation data, the Authorised Technical Service could proceed with the start up of the unit and verify the correct functioning of it. In particular it must check:

- That static and dynamic pressure of the gas network will be in the demanded range;
- That set values of gas valve will be the same as the ones in Table 16, at page 53.
- That the connection of combustion air and flue exhaust will be correctly made as per local laws.
- That the functioning of the flue exhaust will be correct .

 If set values of gas valve will not be the same as the ones indicated in Table 16 of page 53, it is necessary to set the combustion parameters as reported in the paragraph 5.2.

The heater is delivered natural gas (G20) fired as standard. In case of installations with a different type of gas, it is necessary to do the conversion of gas (paragraph 5.3) and the setting of parameters (paragraph 5.2).

5.2 HOW TO REGULATE THE GAS VALVE

For the correct functioning of the K series heating units, the calibration values of the gas valve must be like that indicated in Table 16. The gas valve of the heating unit is pre-calibrated by the manufacturer. If adjustment is necessary, proceed as described below.



Requirements: The installed heater must be connected to the electrical and gas networks.



Regulation of the gas valve must be done by a **qualified service engineer**.

1. After having removed the relative holding screws, connect a pressure gauge to pressure jack A (see Figure 35 at page 53).



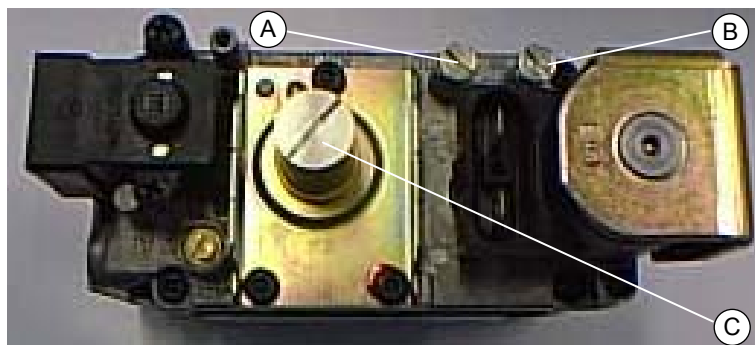
If a pressure switch is used, connect the gas valve's pressure jack A to the + (positive) inlet of the pressure gauge.

2. Turn on the heater and set chronothermostat on level 3 (maximum power) and wait the necessary time for the flame to stabilize (about 5 minutes).
3. Set the chronothermostat to minimum power/output (level 1) using the ▼ button.
4. Enter the information mode by pressing and holding the IP button for at least 3 seconds. The word INFO will appear on the display. Pressing the OK button selecting RPM string it displays the blower speed that must be checked at level 1 (minimum power/output). the value have to be as indicated Table 15.

	BLOWER SPEED AT LEVEL 1 MINIMUM POWER	BLOWER SPEED AT LEVEL 3 MAXIMUM POWER
G30	1900	3500 ± 150
G45	1700	4850 ± 150
G60	2000	5650 ± 150
G100	2050	6000 ± 150

Table 15

5. With the door open, turn the off-set regulation screw C (see Figure 35 at page 53) until the correct nominal value is obtained as reported in Table 16.



- A PRESSURE OFF-SET
REGULATION SET
B GAS REGULATION SCREW
C OFF-SET REGULATION

Figure 35 – Valve Sit 822 Novamix.

NOMINAL OFF-SET VALUES					
		G 30	G 45	G 60	G 100
OFF-SET	(mbar)	-0,15	-0,15	-0,15	-0,15
	(Pa)	-15	-15	-15	-15

Table 16 – Nominal off-set values.



Nominal setting value has never to be higher than -0,05 mbar and lower than -0,2 mbar.



Check the burner. It must not have reddened areas.

6. Disconnect the pressure gauge and replace the seal screw of pressure jack A.
7. Turn the unit on and off two or three times in order to verify that the calibration is stable.
8. Close the door of the instrument panel, set up by chronothermostat Level 3 (maximum power), check CO₂ flue value that have to be as indicated on Table 11 pag.37.

9. Check that the values of static and dynamic gas pressure, with the heaters operating at level 3, correspond to the paragraph 3.2 INSTALLATION SEQUENCE on page 34 (with lower gas pressure value CO₂ flue value will also be the minimum values).

5.3 CONVERSION TO ANOTHER TYPE OF GAS



Requirements: The installed heater must be connected to the electrical and gas networks.



Qualified engineers must carry out this operation. Wrong and careless assembly of the gas circuit may cause dangerous gas leakage. Use adequate seals for all connections.

If the type of gas on the identification label does not correspond to the one that will be used, the unit must be converted and adapted to the type of gas you wish to use.

For this operation proceed as follows:

1. Cut off the power and gas supply.
2. Loosen the four fastening screws from the gas flange (see Figure 36).
3. Remove the gas pipe/flange assembly (see Figure 37).
4. Remove the sealing gasket, being careful not to damage or lose it (see Figure 38).
5. Replace the nozzle (see Table 17) and reposition the sealing gasket.
6. Re-assembly the gas pipe/flange using the four fastening screws.
7. Modify the position of minidip n. 5, located on the main control circuit: ON position if LPG units, OFF position if natural gas units (Figure 40).
8. Check that the OFF-SET value corresponds to that indicated in Table 16 at page 53. If the value does not correspond, proceed with the calibration as indicated in paragraph 5.2 "HOW TO REGULATE THE GAS VALVE".
9. Replace the adhesive label indicating the type of gas for which the unit is set with a new label indicating the type of gas actually used.

NATURAL GAS and L.P.G nozzles					
		G 30	G 45	G 60	G 100
Natural gas (G20)	diameter (mm)	7,20	7,20	7,20	10,60
	codice	164	164	164	169
LPG (G31)	diameter (mm)	5,40	5,80	5,60	8,20
	codice	149	191	157	140

Table 17 – G series nozzle data (diameters and codes).

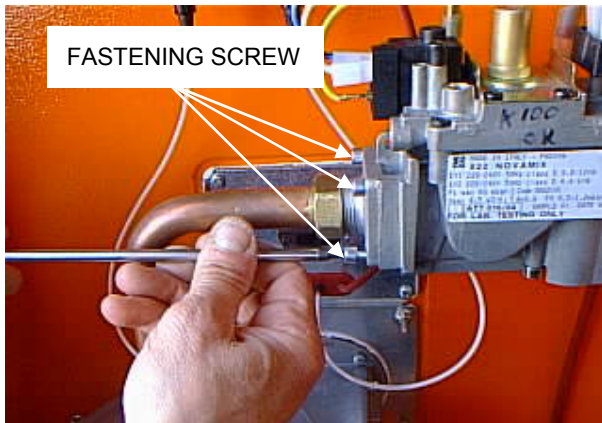


Figure 36 – Gas flange fastening screws.

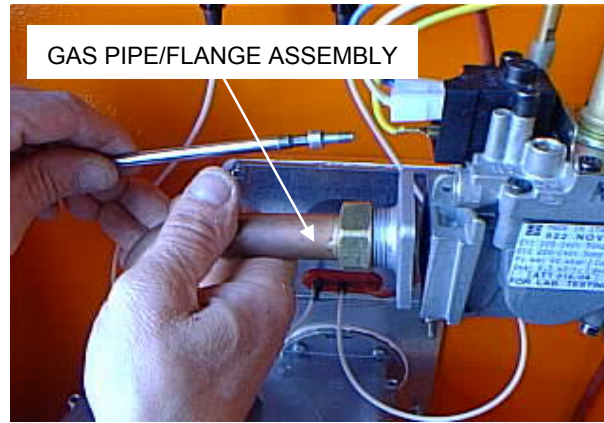


Figure 37 – Gas pipe/flange assembly.

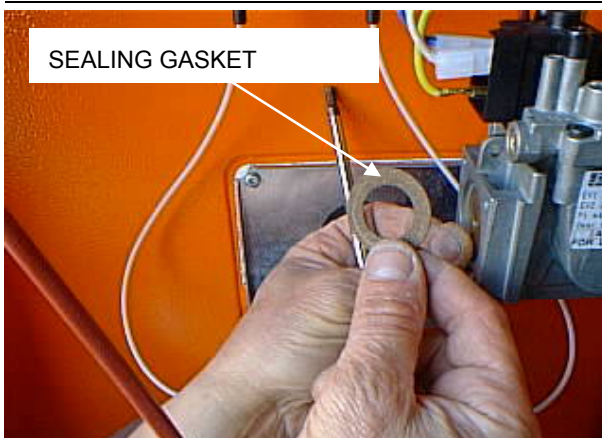


Figure 38 – Sealing gasket.

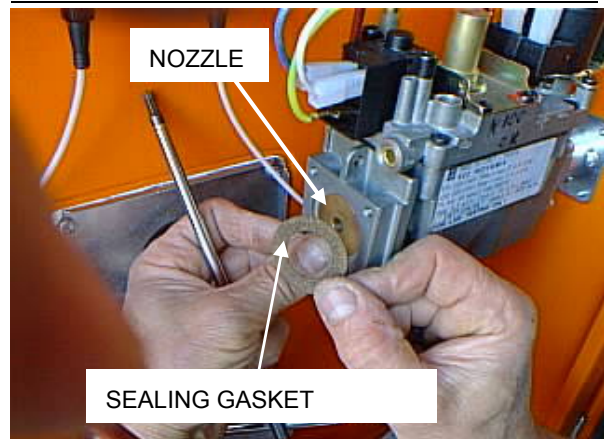


Figure 39 – Nozzle replacement.

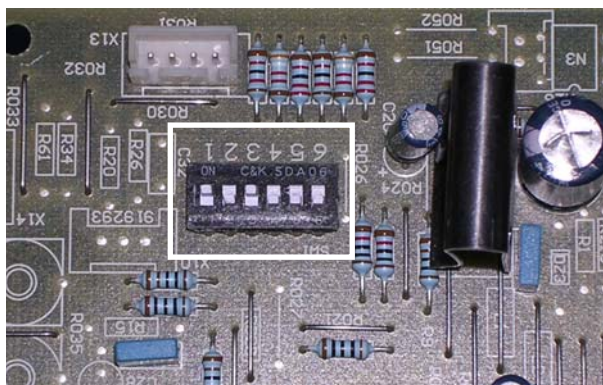
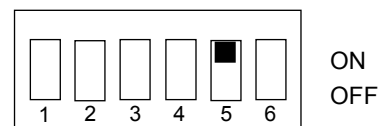


Figure 40 – Minidip position on main control circuit



ON: LPG units
OFF: NATURAL GAS units

5.4 MAINTENANCE

Regular maintenance is always a source of savings and safety.

Maintenance for heating units must be done, preferably at the beginning of winter, **by qualified service engineers**.

For a correct and extended operation, an general cleaning of the appliance is recommended at least once a year (with special attention given to the heat exchangers and ventilation grills) and combustion tests according to that foreseen by the specific regulations.



The intervention of the temperature limit thermostat is ALWAYS an indication of an irregular condition. Before resetting it is therefore a good idea to investigate the reasons why the unit overheated. In there are frequent shutdowns, contact ROBUR Customer Assistance.

Robur is dedicated to dynamic progression
in research, development and promotion
of safe, environmentally-friendly, energy-efficiency products,
through the commitment and caring
of its employees and partners.

Robur Mission



Robur Spa
advanced heating
and cooling technologies
Via Parigi 4/6
24040 Verdellino/Zingonia (Bg) Italy
T +39 035 888111 F +39 035 4821334
www.robur.com export@robur.it