ROBUR

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Installation, use and maintenance manual

Heaters Line K Series

Gas fired unit heaters
for commercial and industrial areas

Natural gas/LPG fired

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FOREWORD

This manual is for anyone who must install or use the Robur K series gas fired heating units.

This manual especially applies to the plumbers who must install the heating unit, to the electrician who must connect the heating unit to the electrical system and to the end user who must check that it functions properly.

This manual is also for the technicians regarding the principle maintenance operations.

Summary

This manual is composed of six sections:

Section 1 pertains to the **end user**, the **plumbing installer**, the **electrical installer** and to the **qualified service engineer**; it provides general warnings, technical data and the construction characteristics of the K series heating units.

Section 2 is for the **end user**; it provides all the information necessary for the correct use of the K series heating units.

Section 3 is for the **plumbing installer**; it provides the necessary indications to the plumber in order to perform the correct installation of the K series heating units.

Section 4 is for the **electrical installer**; it provides the necessary information to the electrician in order to perform the electrical connections of the K series heating units.

Section 5 is for the **qualified service engineer**; it provides the instructions to regulate the flow of gas and to perform the gas conversion. It also gives indications regarding maintenance.

Section 6 is for the **end user**, the **plumbing installer**, the **electrical-installer** and the **qualified service engineer**. It contains information concerning the accessories available for the K series.

For rapid access to the sections, refer to the relative graphical icons (see Table 2) contained in the right margin of the odd-numbered pages.

Icon definition

The icons present in the margins of the manual have the following meanings.

	Danger
	Warning
	Note
	Begin operational procedure
	Reference to another part of the manual or to a different manual

Table 1 – Descriptive Icons

	General information and technical characteristics
	End user section
	Plumbing installer section
	Electrical installer section
	Qualified service engineer section

Table 2 – Icons sections

TABLE OF CONTENTS

SECTION 1: GENERAL INFORMATION AND TECHNICAL CHARACTERISTICS

In this section you will find the general instructions to follow for the installation and use of the K series heating units, a brief mention of the operation of the unit, the constructive characteristics and the technical data.

1.1 GENERAL WARNINGS

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

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

This unit must be exclusively used for the purpose it was intended. Any other use is to be considered improper and therefore dangerous.
The manufacturer will not be held responsible for damages resulting from installation errors or failure to comply with the manufacturer's instructions.

The unit must be installed in accordance with current regulations.

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

☞ In case of failure and/or poor operation, isolate the unit (disconnect it from the power supply and close the main gas cock), do not attempt any repair or direct servicing. Call **qualified service engineers** only.
The manufacturer's authorised service centres using only original spare parts must only carry out any repair to the products.

Misapplication of the above might 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.

Qualified service engineers are those having specific technical experience in the field of heating installation unit for domestic and industrial use. In the case of any doubt, contact your local agent or Manufacturer.

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 the electric and gas supply ratings are the same as those on the data plate.
- That the exhaust duct functions properly.
- That the combustion air intake and exhaust occur in the correct manner according to the existing standards.
- The internal and external sealing of the gas supply system.
- The fuel flow control according to the heater's power requirements.
- That the heater is supplied with the type of fuel for which it is predisposed.
- That the gas supply pressure is within the rating limits reported on the data tag.

- That the gas supply system is suitable to the heater and it is equipped with all safety and checking devices required by current regulations.

Do not use gas tubes as a ground for electrical appliances.

Avoid unnecessary electrical supply when the unit is not in use and always close the main gas valve.

If the heater is turned off for prolonged periods of time, close the main gas supply valve and cut off the electrical supply.

IF YOU SMELL GAS

- Do not activate electrical switches, the telephone or any other object or device that may produce sparks.
- Close the gas supply valve.
- Immediately open door and windows in order to create a cross-current of air to purify the room.
- Call a qualified service engineer.

1.2 OPERATION OF THE UNIT

The K series gas fired air heater is an independent heating appliance with airtight combustion type circuit and forced air draft.

It is designed to be installed within the area to be heated.

It is adjustable for use with natural gas (G20) and LPG (G30/G31).

The combustion circuit is airtight with respect to the heated environment and conforms to the ordinances of regulation EN 1020 for type B and C appliances: the air inlet of the combustion air and exhaust flue are outdoors and their function via a blower connected to the combustion circuit.

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 blocks the appliance.

The combustion products pass within the heat exchangers and a flow of air is blown over them by a ventilator, providing a circulation of warm air to the room.

The air flow direction is regulated by means of adjustable horizontal louvers.
Vertical louvers can be supplied on request. These allow for left/or right adjustment of airflow from the front of the unit according to the site conditions and the customers requirements.

The fan will automatically turn on only when the heat exchangers are warm (after approx. 60 sec. from flame detection or when the sensor reaches a temperature of 60°C) and will shut off when they are cold. This prevents cool air from being blown into the room.

If the heat exchangers overheat due to malfunction, the temperature limit thermostat cuts electricity to the gas valve powering the blower and the maximum speed fan; if the temperature should further increase, the temperature limit thermostat will intervene and shut off the heating unit. Resetting of the temperature limit thermostat is done manually.

☞ After having determined the cause of the overheating, a ***qualified service engineer*** should perform the resetting of the temperature limit thermostat.

A flue fan is installed before the burner which makes the air-gas mixture and forces the expulsion of exhaust fumes.

In the case of obstructions in combustion air intake and exhaust outlet, or if the flue fan does not function properly, the electronics respond automatically, causing the modulation of the combustion air flow rate. In the case of obstructions or malfunctions that go beyond what is permitted, the differential pressure switch activates, shutting down the gas valve and turning off the unit.

For winter operation the heating unit can be used in either automatic or manual mode: for further information see the WINTER OPERATION (HEATING) paragraph on page 29.

In the summer time it's possible to activate only the axial fan, either automatically or manually, to provide pleasant and refreshing air movement in the room (for more information see the SUMMER OPERATION (VENTILATION) paragraph on page 34).

1.3 CONSTRUCTIVE CHARACTERISTICS

The K series gas fired heating units are supplied with:

- **a premix burner made of stainless steel**
- **a high head blower**, with rotation speed control
- **an electronic control circuit with microprocessor and anti-clutter filter**, which controls burner lighting, surveillance and regulation of the flame, blower speed, fan speed, and temperature of the heat exchanger by means of a sensor
- a cylindrical **combustion chamber** made of stainless steel
- **heat exchanger** patented by Robur made of special aluminium 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 powder
- high air flow capacity **axial fan(s)** with heat recovering post-ventilation and rotation speed control.

SAFETY AND CONTROL DEVICES

- **high temperature limit switch**: 100°C with manual reset prevents overheating of the heat exchangers.
- **pressure differential switch:** for the control of the correct flue fan operation; when fan not operates correctly or the flue/air inlet ducts are obstructed the pressure switch stops the gas supply by closing the gas valve.
- **Gas valve:** in the case that one of the safety devices is activated (limit thermostat, safety thermostat etc.) the gas valve is automatically de-energised with contemporary cut-off the burner's gas supply gas electro-valve.
  - Electrical supply: 230 V - 50 Hz
  - Operational temperature: 0°C to +60°C
  - Model: SIT 822 Novamix
- **Ignition and flame control box:** controls the ignition and flame of the premix burner; if the is flame not detected during the safety period the flame control box will stop the appliance; with manual reset.
  - Safety time: ignition 5 seconds
  - Purge time: 40 seconds
  - Power supply: 230 V - 50 Hz
  - Flame control box model: Bertelli & Partners DIMS03.
  - Ignition transformer: BRAHMA TC2LTCAF

1.4 TECHNICAL CHARACTERISTICS

MODEL		UNIT	K 32	K 45	K 60	K 80	K 100
APPLIANCE CATEGORY			$II_{2H3B/P}$				
APPLIANCE TYPE			$C_{13} – C_{33} – B_{23} – C_{63} – C_{53}$				
GAS SUPPLY			Natural gas – G.P.L.				
NOMINAL HEAT INPUT		kW	32	45	60	80	100
NOMINAL HEAT OUTPUT		kW	29,6	41,6	55,2	73,6	92
MINIMUM HEAT INPUT		kW	18,6	27	34,5	48	56
MINIMUM HEAT OUTPUT		kW	17,7	25,8	33	45,6	53,9
GAS CONSUMPTION	NATURAL GAS	m^3/h	3,39	4,76	6,35	8,47	10,58
(15° C – 1013 mbar)	LPG G30	kg/h	2,52	3,55	4,73	6,31	7,88
	LPG G31	kg/h	2,49	3,50	4,66	6,22	7,77
ECONOMY GAS CONSUMPTION	NATURAL GAS	m^3/h	1,97	2,86	3,65	4,87	5,93
(15° C – 1013 mbar)	LPG G30	kg/h	1,47	2,13	2,72	3,63	4,42
	LPG G31	kg/h	1,44	2,10	2,68	3,57	4,35
EFFICIENCY AT MAXIMUM HEAT INPUT		%	92,5	92,44	92	92	92
EFFICIENCY AT MINIMUM HEAT INPUT		%	95	95,5	95,6	96	96,2
INLET GAS PRESSURE	NATURAL GAS	mbar	20				
	LPG G30		30				
	LPG G31		37				
DIAMETER GAS INLET		”	¾				
AIR INLET PIPE DIAMETER		mm	80				
EXHAUST FLUE DIAMETER		mm	80				
VOLTAGE			230V - 50Hz				
WATTAGE		W	350	450	750	650	900
OPERATIONAL TEMPERATURE(1)		ºC	0 +35				
FUSE		A	6,3				
AIR FLOW(2)	AT MAXIMUM SPEED	m^3/h	2700	4000	5350	6300	8250
	AT MINIMUM SPEED		2300	2600	3670	4000	5775
TEMPERATURE RISE	AT MAXIMUM SPEED	K	32	30,8	30,6	34,6	33,0
	AT MINIMUM SPEED		23	29,4	26,7	32,8	27,7
THROW AT MAXIMUM SPEED (RESIDUAL AIR SPEED >1m/s)(3)		m	10	25	31	36	40
NOISE LEVEL AT 6 METERS							
(AT MAXIMUM SPEED)	IN FREE FIELD	dB(A)	47	48	50	52	54
	IN TYPICAL INSTALLATION	dB(A)	59	60	61,5	63	65,5
NOISE LEVEL AT 6 METERS							
(AT MINIMUM SPEED)	IN TYPICAL INSTALLATION	dB(A)	56	55	56	56	60,5
WEIGHT		kg	55	65	75	98	120

Table 3 – Technical data

1 *WARNING: THE **ROOM** OPERATING TEMPERATURE IS BETWEEN 0°C AND +35°C; THE OPERATING TEMPERATURE OF THE **COMPONENTS ON THE APPLIANCE** IS BETWEEN 0°C AND +60°C*

2 *AT 20 °C – 1013 mbar*

3 *THROWS FOR GUIDANCE ONLY. THROW DEPENDS ON HEIGHT OF THE BUILDING, MOUNTING HEIGHT OF THE HEATER, ROOM TEMPERATURE AND LOUVRE SETTING*

1.5 DIMENSIONS OF THE UNITS

	A	B	C	D	E	F	G	H	I	J	L	M
K 32	656	722	800	570	370	405	440	536	490	120	180	20
K 45	706	722	800	570	370	405	490	536	490	120	180	20
K 60	796	722	800	570	510	405	580	536	490	120	180	20
K 80	1097	722	800	570	810	405	880	536	490	120	180	20
K 100	1296	722	800	570	1010	405	1080	536	490	120	180	20

	N	P	Q	R	S	T	U	V	W	X	Y	Z
K 32	121	417	360	340	600	720	136	440	400	80	80	196
K 45	121	441	360	340	600	720	136	490	450	80	80	196
K 60	121	486	360	340	600	720	136	580	520	80	80	196
K 80	121	637	401	340	600	720	136	880	635	80	80	196
K 100	121	466	360	340	600	720	136	1080	520	80	80	196

Table 4 – Dimensions of the K series heating units

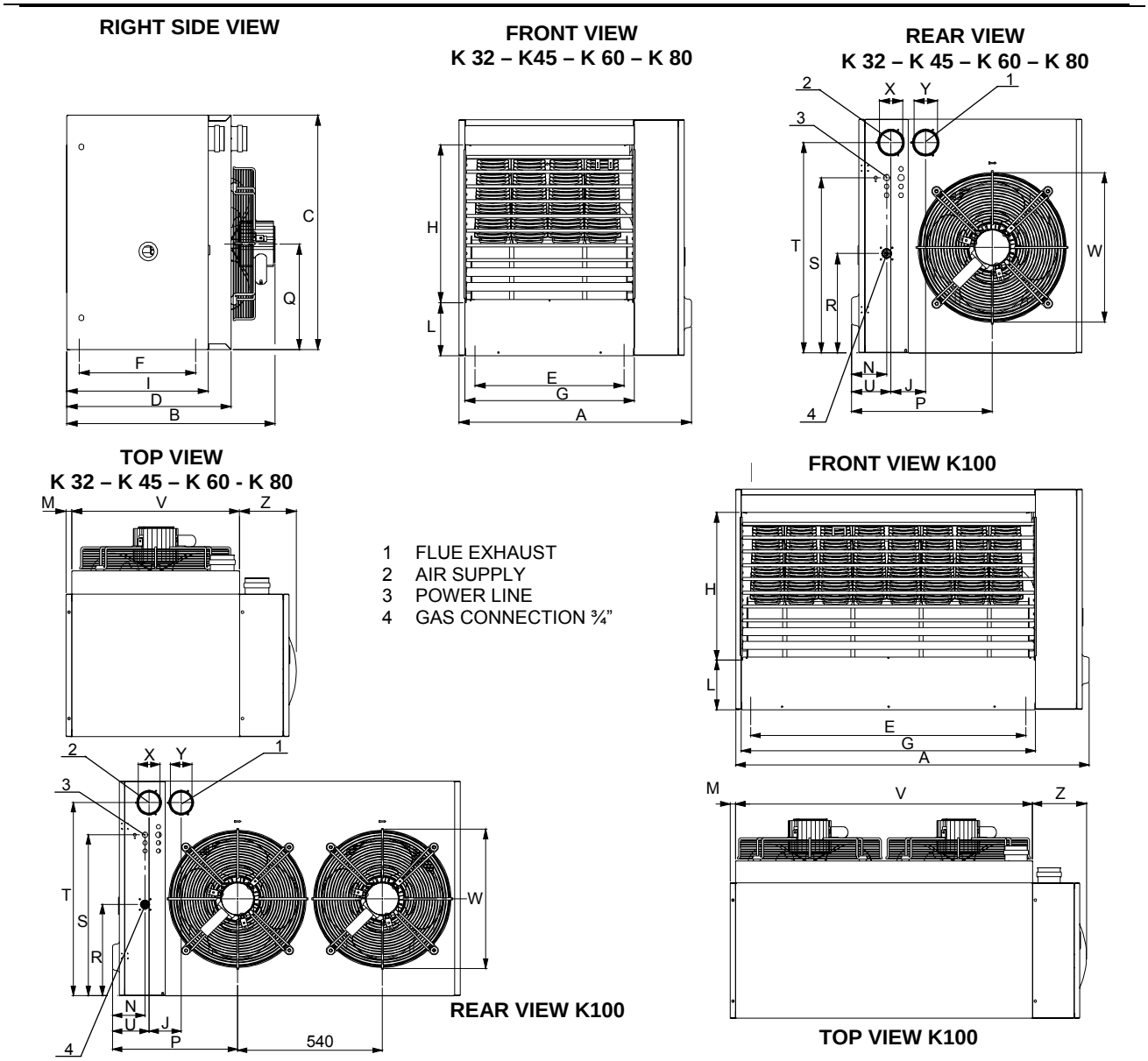


Figure 1 – Dimensions of the K series heating units

SECTION 2: END USER

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

The functioning of the K series heating unit is controlled by a digital chronothermostat (see Figure 2) that is supplied as standard with the heater.

The chronothermostat performs the duel 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.

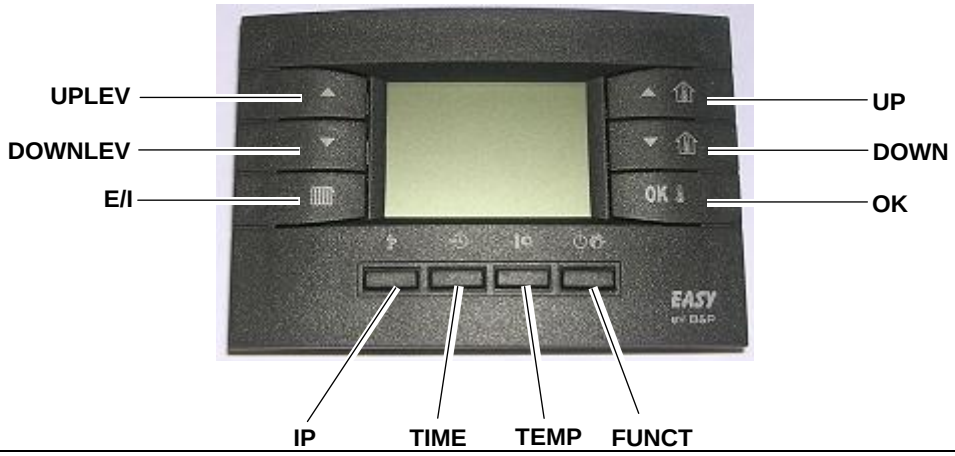


Figure 2 – Digital chronothermostat

2.1 SETTING OF 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 P 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 P button to exit the programming mode, *RUN* will then appear on the display for a few seconds.

2.2 SETTING THE COMFORT, ECONOMY AND ANTI-FROST 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.

To set the Comfort, Economy and Anti-Frost temperatures, proceed as follows:

1. Enter into the programming mode by briefly pressing the P 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 3).
   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.

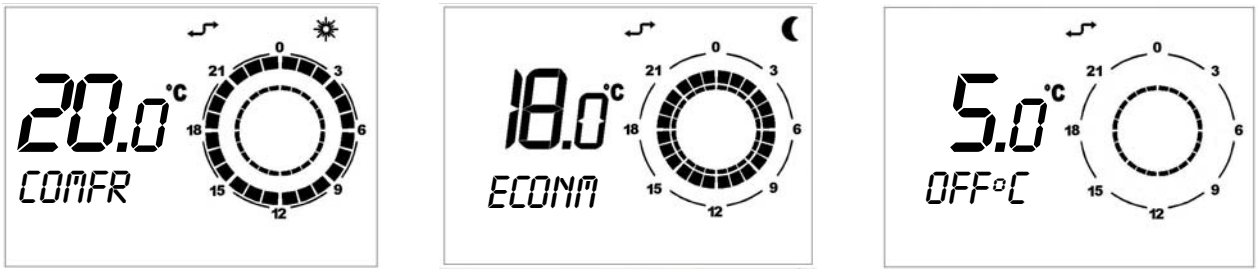


Figure 3 – Comfort, economy and anti-frost temperatures

☞ If the set comfort temperature is lower than 15ºC, follow the directions provided in the paragraph "HOW TO USE THE UNIT WITH A LOW ROOM TEMPERATURE" on page 36.

2.3 PROGRAMMING OF THE DAILY SET POINTS 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 ⏻ 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 (Figure 4).

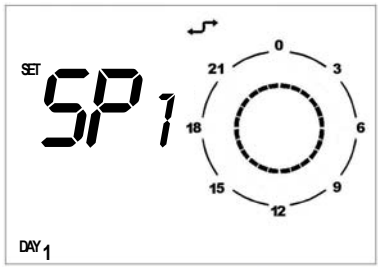


Figure 4 – Daily set points

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 🕒 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 5).
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 in Figure 5 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 5 – Daily set points

☞ When programming the daily set points, it is important to ALWAYS program all 24 hours, as in the example in Figure 5. 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 2.3 on page 15 and then select that same day in the programming mode of the daily set point (using the DAY 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 P button to exit the programming mode.

HOW TO CHECK THE DAILY SET POINTS SETTINGS

1. Enter the programming mode by briefly pressing the P 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 P button to exit.

2.4 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 P button:
2. Repeatedly press the (⏻) button:
3. *DAY* will appear on the lower left side of the display.
4. Press the · button and choose the desired day of the week.

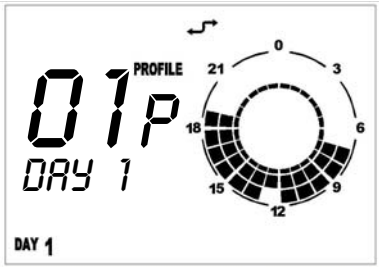


Figure 6 – Daily profile

5. In the upper right-hand corner of the display, the word ***PROFILE*** and the selected profile number will appear and be flashing (Figure 6).
6. Pressing the ▲ and buttons, one of 16 possible daily profiles can be selected (see Table 5 on page 18).
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 P button to exit the programming mode.

2.5 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 the programming mode (P button)**.**
2. Press the ⏻ button repeatedly.
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.

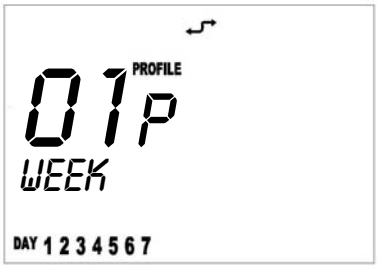


Figure 7 – Weekly profile

Each weekly profile is a collection of 7 preset daily profiles.

5. Pressing the ▲ and buttons, one of 16 possible weekly profiles can be selected (see Table 6).
   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 2.4 SELECTING A PRESET DAILY PROFILE ON THE CHRONOTHERMOSTAT on page 17) or proceed with freely programming the daily set points (see paragraph 2.3 PROGRAMMING OF THE DAILY SET POINTS ON THE CHRONOTHERMOSTAT on page 15).

DAILY PROFILE	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 5 – Daily profiles

A: ANTIFREEZE TEMPERATURE;
R. ECONOMY 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 6 – Weekly profiles

2.6 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 8).
- **TIMED OFF (VACATION PROGRAM)** function: noted by the presence of both the hourglass and airplane icons (see Figure 9).
- **TIMED MANUAL (PARTY)** operation: noted by the presence of both the hourglass and manual icons (see Figure 10).

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 20ºC). Both the automatic and manual icons (see Figure 9) will appear on the display.

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 8 – Forced automatic mode

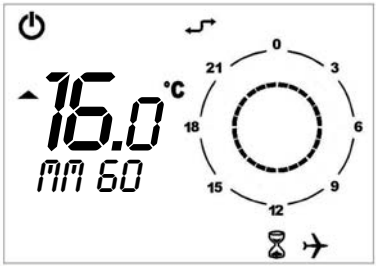


Figure 9 – Timed shut down mode

Figure 10 – 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 disenabled whereas the antifreeze function remains active; (if it has not been deactivated from the *INFO* menu – see Table 7 on page 22).

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 9 on page 20).
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 10 on page 20).
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.

2.7 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.

2.8 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 **i** 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 7 can be viewed.

STRING	DESCRIPTION	CHANGEABLE PARAMETER
NΓ C1	Visualization of the output air temperature.	NO
NΓ C2	Parameter not managed by the circuit board.	----
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; a value of 10 if the area is large. As default this parameter is set at 5.	YES using the UP and DOWN buttons can be modified from 1 to 10
NO FRX	Activates or deactivates the anti-freeze function[2]. To activate it, the value of 1 must be set using the UP button and pressing OK to confirm (the intervention point of the freeze protection function is +5ºC and shuts off at +6ºC). To deactivate it, set the value to 0 using the DOWN button and then pressing OK to confirm.	YES using the UP and DOWN buttons 1 = freeze protection activated 0 = freeze protection deactivated

Table 7 – Information screen

1 TO BETTER UNDERSTAND THE THERMAL POWER OR MODULATION PERCENTAGE, REFER TO TABLE 12 ON PAGE 33 AND THE CORRESPONDING NOTE

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 INFORMATION SEE THE PARAGRAPH 2.2 SETTING THE COMFORT, ECONOMY AND ANTI-FROST TEMPERATURES ON THE CHRONOTHERMOSTAT ON PAGE 14). IF THE VALUE SET FOR THE ANTIFREEZE TEMPERATURE IS HIGHER THAN THE SET POINT TEMPERATURE, THIS SHALL CONTROL THE TURNING ON OF THE UNIT.

2.9 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 8 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 – increased air flow rate. 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	Lower modulation depth limit in the increased air flow rate mode. Indicates the lower modulation value of the unit's thermal power (0 % corresponds to the minimum supplied power): ex : by setting 76%, the unit will adjust from 100% (maximum supplier power) to 76 % of the modulation range[1].	From 0 to 100 %	Default : 76%

PARAMETER	DESCRIPTION	FUNCTIONALITY	DEFAULT VALUE
PM 05	Upper modulation depth limit in the increased air flow rate mode. Indicates the upper modulation value of theunit'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 8 – Operating parameters

1 TO BETTER UNDERSTAND THE THERMAL POWER OR MODULATION PERCENTAGE, REFER TO TABLE 12 ON PAGE 33 AND THE CORRESPONDING NOTE

2.10 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	REASONS	INTERVENTION
01 E	Unit locks out during the first ignition phase	• 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 • No gas supply	• Modify the position or replace the ignition electrode • Modify the position or replace the flame sensor • Check electrical connections and/or replace the dialog board • Check electrical connections and/or replace the gas valve • Improve grounding • Remove the air from gas supply • Open the gas supply or turn to the gas supplier **After having identified and resolved the cause of the error, press the OK button on the chronothermostat**. **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).
02 E	The temperature limit thermostat stops the burner. The heat exchanger have overheated	• Accumulation of dirt on the air inlet • Obstruction of ventilation and supply grill • Failure in the axial fan • Electricity black-out during operation	• Clean the heat exchanger • Clean ventilation and supply grill • Check axial flow fan or replace it • Check electricity and verify involuntary cut out of electricity by workers **After having identified and resolved the cause of the error, press the OK button on the chronothermostat**. **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)..

ERROR CODE	DESCRIPTION	REASONS	INTERVENTION
03 E	Temperature probe	• 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	Air pressure switch	• The air pressure switch is damaged or jammed. • Intake and/or exhaust ducts are obstructed or too long • The electrical or pneumatic connections of the pressure switch are faulty	• Replace the pressure switch • Clean the intake or/and exhaust ducts or modify them • Replace or adjust it The error message turns off automatically once the anomaly that caused it has been eliminated.
07 E 08 E 09 E	Blower	• Electrical connections faulty • Failure in the blower motor • Lack of performance	• Modify electrical connections • Replace the blower motor • Replace the blower motor The error message turns off automatically once the anomaly that caused it has been eliminated.

Table 9 – 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	• Position of chronothermostat could be influenced by external heat sources • Bad performance of chronothermostat or electrical connections • Check the chronothermostat setting	• Check the position of the chronothermostat • Replace the chronothermostat • New setting
NO error code	The chronothermostat is ON and the heater no run	• No electrical supply • Failure of remote unit interface • Contact on main control circuit is open	• Check • Replace the remote unit interface • Close the contact

Table 10 – Failures that are NOT show on display of chronothermostat

2.11 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 9).
	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 11 – Icon meanings on chronothermostat display

2.12 FUNCTION OF THE CHRONOTHERMOSTAT BUTTONS

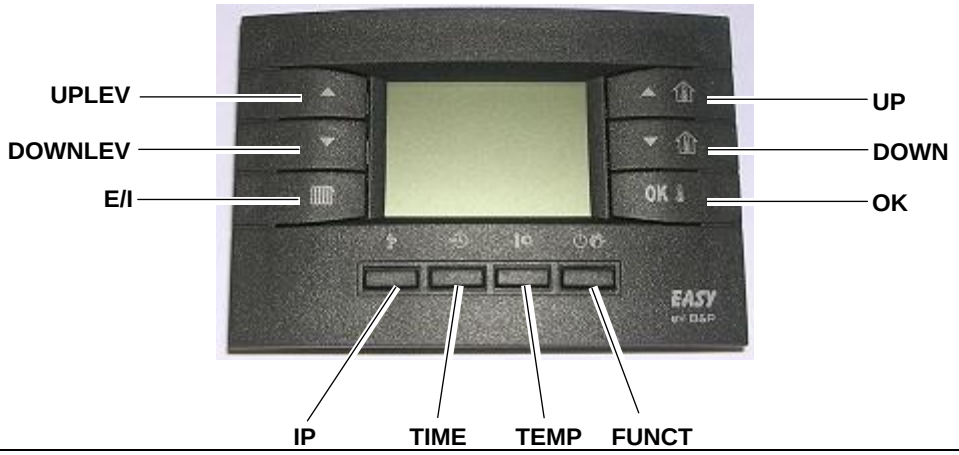


Figure 11 – Digital chronothermostat

The buttons on the chronothermostat have the following functions:

- The **UPLEV** (▲) and **DOWNLEV** (▼) buttons: allows the air/heat flow level to be changed form level 0 to 3 (level 1 minimum flow, level 2 medium flow, level 3 maximum flow; selecting level 0 during winter operation the flow will be automatically adjusted, but selecting level 0 during summer operation will shut the fan(s) off.
- The **E/I** ( ) button lets you select between winter operation (the radiator symbol will appear on the display) or summer operation (the burner is off and ONLY the fan(s) will operate).
- The **UP** ( ) and **DOWN** ( ) buttons: allow the setpoint room temperature to be modified; the increment is one tenth of a degree. Keeping either of the buttons pressed will cause a more rapid and continuous variation.
- The **OK** button: allows you to view the current room temperature, the requested room temperature and to confirm the settings.
- The button: used to enter into the programming mode and to access the INFO menu as described below:
  - programming mode *PROG*: briefly press the button, *PROG* will appear for a few seconds on the display; to exit the programming mode, briefly press the button, *RUN* will appear for a few seconds on the display.
  - *INFO* menu: press the button for at least 3 seconds, *INFO* will appear for a few seconds on the display; to exit the *INFO* menu, briefly press the button, *RUN* will appear for a few seconds on the display.
- The **TIME** ( ) button: allows timed operations to be set (for more information see paragraph 2.6 - TIMED FUNCTIONS OF THE CHRONOTHERMOSTAT on page 19).
- The **TEMP** ( ) button: lets you select either the comfort or economy temperature.
- The **FUNCT** ( ) button is used to select automatic or manual operation or to turn off the unit.
  When set to the off position, the heater is in stand-by: ONLY the freeze protection remains active (if it was not deactivated in the info menu - for more information see

paragraph 2.8 - INFORMATION SCREEN OF THE CHRONOTHERMOSTAT on page 22).

The functions of the above mentioned buttons refer to normal operation. The buttons change functions with the different screens that are displayed.

2.13 HOW TO TURN ON AND SHUT OFF THE HEATING UNIT

☞ The initial ignition of the heating unit must be done by a ***qualified service engineer***. Before starting the heating unit, have a qualified service engineer verify:

- that the electric and gas supply ratings are the same as those on the data plate;
- that the calibration is compatible with the power of the heater;
- that the exhaust duct functions properly;
- that the combustion air feed and exhaust occur in the correct manner according to the current regulations.

WINTER OPERATION (HEATING)

Winter operation may be (also see Figure 12):

- modulating standard operation
  - automatic (unit operation automatically managed by the chronothermostat according to the time settings)
  - manual (unit operation controlled manually by the end user)
- fixed standard operation
  - automatic (unit operation automatically managed by the chronothermostat according to the time settings)
  - manual (unit operation controlled manually by the end user)
- operation with increased ventilation
  - automatic (unit operation automatically managed by the chronothermostat according to the time settings)
  - manual (unit operation controlled manually by the end user)

By default, the unit leaves the factory configured for the modulating standard operation mode. To set the operation mode with increased ventilation refer to paragraph 2.9 “SELECTION MENU WINDOW” on page 23.

- **AUTOMATIC MODULATING STANDARD OPERATION**

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

1. Open the gas supply valve.
2. Supply the unit with electrical power by closing the omnipolar switch.
3. Press the button on the chronothermostat (see Figure 2 on page 13); the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
4. Program the date, time, temperatures, as well as the weekly and daily profiles on the chronothermostat as described in the relative paragraphs.
5. Using the button on the chronothermostat (see Figure 2 on page 13), select the function type: automatic ( ) (in this mode, the unit's operation is regulated by the end user defined profiles).
6. 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.

- **MANUAL MODULATING STANDARD OPERATION**

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

1. Open the gas supply valve.
2. Supply the unit with electrical power by closing the omnipolar switch.
3. Press the button on the chronothermostat (see Figure 2 on page 13); the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
4. Using the button on the chronothermostat (see Figure 2 on page 13), select the function type: **manual** ( ), (in this mode, the unit's operation is controlled manually by the end user).
5. 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 2.2"SETTING THE COMFORT, ECONOMY AND ANTI-FROST TEMPERATURES ON THE CHRONOTHERMOSTAT" on page 14), use the button to select the desired setting.
6. 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.

- **AUTOMATIC FIXED STANDARD OPERATION**

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

1. Open the gas supply valve.
2. Supply the unit with electrical power by closing the omnipolar switch.
3. Press the button on the chronothermostat (see Figure 2 on page 13); the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
4. Program the date, time, temperatures, as well as the weekly and daily profiles on the chronothermostat as described in the relative paragraphs.
5. Using the button on the chronothermostat (see Figure 2 on page 13), select the function type: automatic ( ) (in this mode, the unit's operation is regulated by the end user defined profiles).
6. 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.

- **MANUAL FIXED STANDARD OPERATION**

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

1. Open the gas supply valve.
2. Supply the unit with electrical power by closing the omnipolar switch.
3. Press the button on the chronothermostat (see Figure 2 on page 13); the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
4. Using the button on the chronothermostat (see Figure 2 on page 13), select the function type: **manual** ( ), (in this mode, the unit's operation is controlled manually by the end user).
5. 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 2.2"SETTING THE COMFORT, ECONOMY AND ANTI-FROST

TEMPERATURES ON THE CHRONOTHERMOSTAT" on page 14), use the button to select the desired setting.

6. 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.

- **AUTOMATIC OPERATION WITH INCREASED VENTILATION**

In this mode, the unit's operation can be set with a greater air/power ratio in comparison to the standard operation mode described in the previous paragraph. With a fixed power level, this mode guarantees a greater air exchange/recirculation within the room to heat. It reduces the thermal gradient and increases overall comfort.

To set this mode, proceed as described below.

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

1. Open the gas supply valve.
2. Supply the unit with electrical power by closing the omnipolar switch.
3. Press the button on the chronothermostat (see Figure 2 on page 13); the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display
4. Program the date, time, temperatures, as well as the weekly and daily profiles on the chronothermostat as described in the relative paragraphs.
5. Using the button on the chronothermostat (see Figure 2 on page 13), select the function type: automatic ( ) (in this mode, theunit's operation is regulated by the end user defined profiles).
6. Press the IP button for 3 seconds and then, once the INFO menu has been accessed, the TIME ( ) and FUNCT ( ) buttons at the same time: set the PM01 parameter "operation mode" to 2 – increased air flow rate (see Table 8).
7. By setting the air flow level to **0,** (▲ and ▼ buttons) the thermal power **modulates from 100% to 76%** (default value) whereas the air flow rate is fixed to the maximum permitted setting. Depending on the PM04 parameter setting (see Table 8 on page 24 to modify the default value of the lower modulation limit) the software will therefore modulate the air flow rate according to the standard operating mode.
8. By selecting the air flow level at **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) (see Table 12).The unit will run without modulation until it reaches the requested temperature.

Table 12 summarises the difference between the standard operating mode and increased ventilation operating mode, referring to the percentage of power and the flow rate level associated with each fixed operating level.

	FLOW RATE LEVEL	3	2	1
STANDARD MODE	THERMAL POWER	100%	42%	0%
	AIR FLOW RATE	MAXIMUM	MEDIUM-LOW	LOW
INCREASED VENTILATION MODE	THERMAL POWER	76%	51%	26%
	AIR FLOW RATE	MAXIMUM	MEDIUM-HIGH	MEDIUM-LOW

Table 12 – Ventilation power association in the operating mode levels

Taking the operating level 3 as an example, at the same ventilation speed, the power associated with the increased ventilation mode is lower in comparison to that associated with the standard mode. The air/power ratio is therefore greater in the latter case, obtaining a lower temperature delta of the air flow.

The thermal power percentage indicated in Table 12 refers to the modulation range percentage included between the nominal and minimum thermal power (see Table 3). Setting for example the air flow rate level to 1, in the increased ventilation mode, to know which thermal power at which the unit will operate see below:
K100 Unit
Maximum modulation heat output range (100-0%)= (92 kW – 53.9 kW) = 38.1 kW
Modulation heat output = (38.1 kW x 0,26) = 9.9 kW
Heat output = (53.9 kW + 9.9 kW) = **63.8** kW

- **MANUAL OPERATION WITH INCREASED VENTILATION**

In this mode, the unit's operation can be set with a greater air/power ratio in comparison to the standard operation mode described in the previous paragraph. With a fixed power level, this mode guarantees a greater air exchange/recirculation within the room to heat. It reduces the thermal gradient and increases overall comfort.

To set this mode, proceed as described below.

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

1. Open the gas supply valve.
2. Supply the unit with electrical power by closing the omnipolar switch.
3. Press the button on the chronothermostat (see Figure 2 on page 13); the winter operation is confirmed by the appearance of the radiator symbol in the upper left corner of the display.
4. Using the button on the chronothermostat (see Figure 2 on page 13), select the function type: **manual** ( ).
5. Press the IP button for 3 seconds and then, once the *INFO* menu has been accessed, the **TIME** ( ) and **FUNCT** ( ) buttons at the same time: set the PM01 parameter "operation mode" to 2 (see Table 8).

6. Use the **UP** (▲) and **DOWN** (▼) buttons to select the desired room temperature. If you want to use the reset temperature, Economy or Comfort, (see paragraph 2.2 “SETTING THE COMFORT, ECONOMY AND ANTI-FROST TEMPERATURES ON THE CHRONOTHERMOSTAT” on page 14), use the * button to select the desired setting.
7. By setting the air flow level to **0** (▲ and ▼ buttons) the thermal power **modulates from 100% to 76%** (default value) whereas the air flow rate is fixed to the maximum permitted setting. Depending on the PM04 parameter setting (see Table 8 on page 24 to modify the default value of the lower modulation limit) the software will therefore modulate the air flow rate according to the standard operating mode.
8. 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) (see Table 12)).The unit will run without modulation until it reaches the requested temperature (room thermostat on).

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 ( ) will appear on the display.
   In this mode, the unit is in stand-by: only the antifreeze function remains active unless deactivated from the *INFO* menu (see “NO FRX” in Table 7).

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)

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 (also see **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*).

OPERATION WITH VENTILATION PRIORITY

This function is particularly useful if the room air must be constantly exchanged.

In this operation mode, the fan(s) always run whereas the burner only turns on when heat is requested (closure of the room thermostat contact).

☞ The operation with ventilation priority is only possible without a chronothermostat.

To set this operation mode follow the instructions provided 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 “Operation mode” to 03 (ventilation priority) (see Table 8)).
3. Set the PM06 parameter “Chronothermostat presence” to 0 (without a chronothermostat) (see Table 8)).
4. Press **OK** to return to the *INFO* menu.
5. Press 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.
7. To make the unit run in winter, simply close the contact marked with the “fan” symbol located on the LC23 board and also close the contact marked with the “radiator” symbol also 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).
8. To make the unit run in summer (only fans) only close the contact marked with the “fan” symbol located on the LC23 board. In this way, the fan will run at maximum ventilation.
9. Concerning the remote signalling of the anomalies, refer to paragraph 4.4 “REMOTE SIGNALLING OF THE ANOMALIES” on page 55.

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

END OF THE 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 function, remove electrical power to the appliance by means of the omnipolar 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.

2.14 HOW TO USE THE UNIT WITHOUT A CHRONOTHERMOSTAT

The unit may also be used without the chronothermostat supplied as standard by following the instructions provided 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 PM06 parameter “Chromothermostat presence” to 0 (without a chronothermostat) (see Table 8)).
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” on page 55.

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

2.15 HOW TO USE THE UNIT WITH A LOW ROOM TEMPERATURE

If the unit is used to maintain a particularly low room temperature, considering the high operating efficiency the unit has at low power ratings, temporary steam condensation could be generated inside the equipment, especially when it remains at the minimum modulation setting for long periods.

To avoid this, theunit's modulation range must be limited in function of the room temperature set on the remote control, as shown below.

UNIT MOD.	DEFINED SET POINT TEMPERATURE	LOWER MODULATION RANGE LIMIT
K 32 - 45	> 15°C	No limit (range 0- 100 %)
K 32 - 45	Between 7 and 15°C	40 % (range 40 -100%)
K 32 - 45	< 7°C	100 % (no modulation)
K 60- 80 - 100	> 13°C	No limit (range 0- 100 %)
K 60- 80 - 100	< 13°C	40 % (range 40 -100%)

Table 13

The modulation range can be regulated by changing the PM 03 or PM 04 parameter, according to the set operating mode with the PM01 parameter, inserted within the selection menu. For more details see paragraph "SELECTION MENU WINDOW" on page 23.

With this regulation, the unit will continue to operate regularly, but the automatic modulation of air flow rate and thermal power will have a more limited operating range.

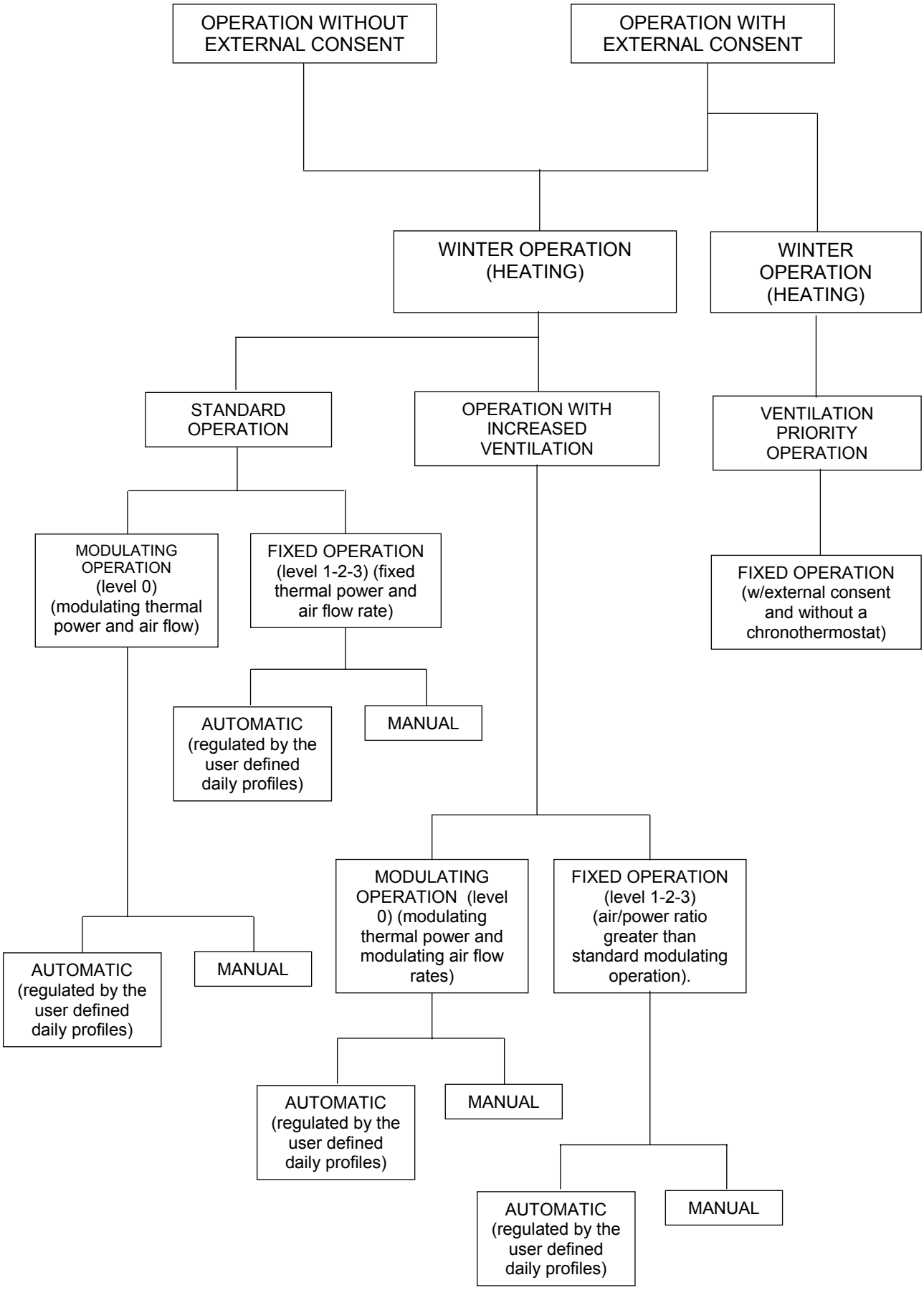


Figure 12 – Winter operation

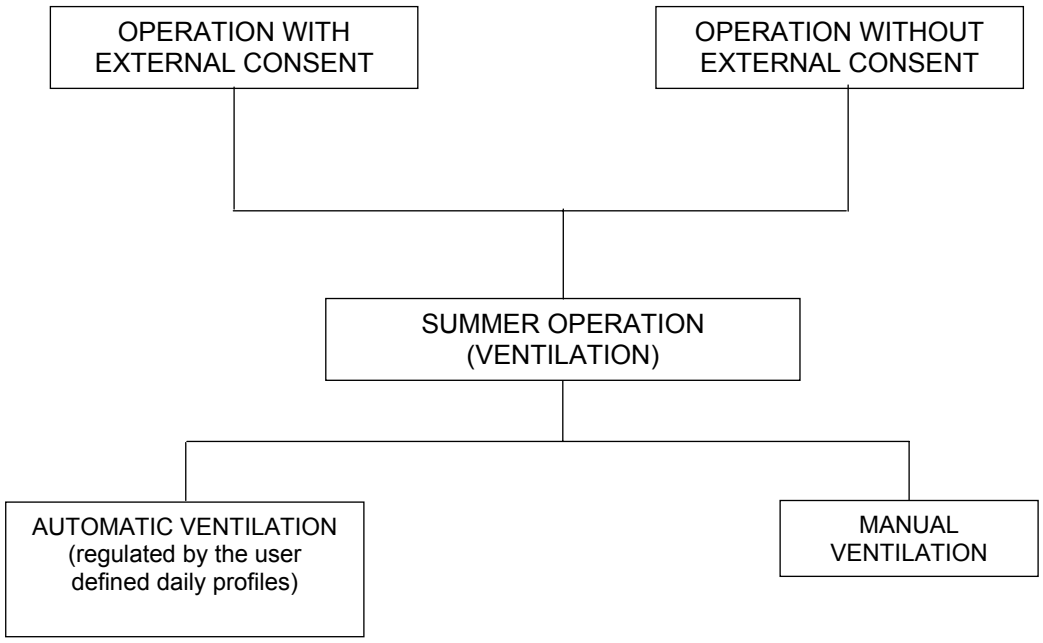


Figure 13 – Summer operation

SECTION 3: PLUMBING INSTALLER

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

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 15 on page 43.
- 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 15 on page 43).
- 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 16 on page 43).
    - 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 K 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. Should you wish not to use these accessories, please refer to the diagram below. Fasten the unit to the support brackets using four M10 bolts.

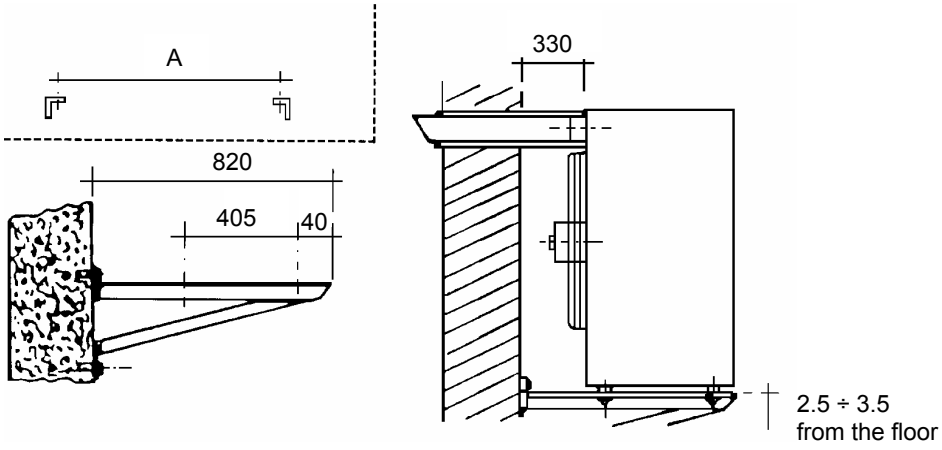


Figure 14 – Support bracket

Model	K 32	K 45	K 60	K80	K100
A (mm)	370	370	510	810	1010

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 (0.29 psig, 8.03 in.WG.) allowed tolerance between 17 and 25 mbar (0.25 to 0.36 psig; 6.9 to 10.0 in.WG.).

   LPG. (Propane – Butane mix) - G30

   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 (22 psig). A pressure governor for a second pressure drop should be placed near the heater to reduce the pressure to 30 mbar (0.43 psig; 12.0 in.WG.) allowed tolerance between 20 and 35 mbar (0.29 to 0.50 psig; 8.1 to 14 in.WG.).

   LPG (Pure Propane) - G31

   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 (22 psig). A low pressure governor for a second pressure drop should be placed near the heater to reduce the pressure to 37 mbar (0.43 psig; 12.0 in.WG.) allowed tolerance between 25 and 45 mbar (0.29 to 0.50 psig; 8.1 to 14 in.WG.)

☞ 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

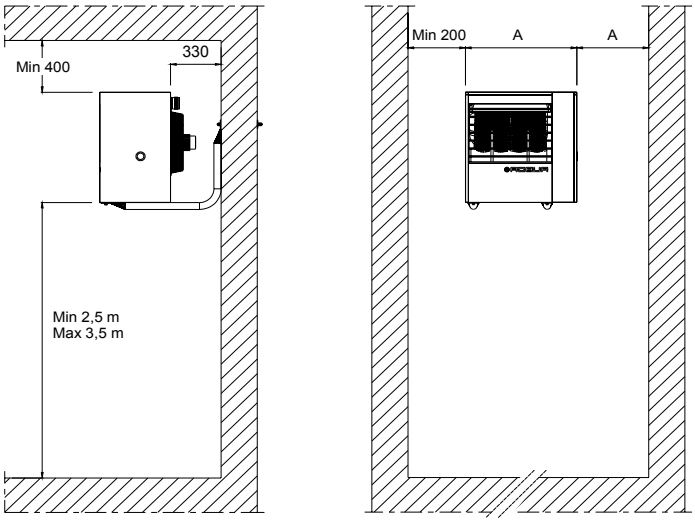


Figure 15 – Clearances to be respected

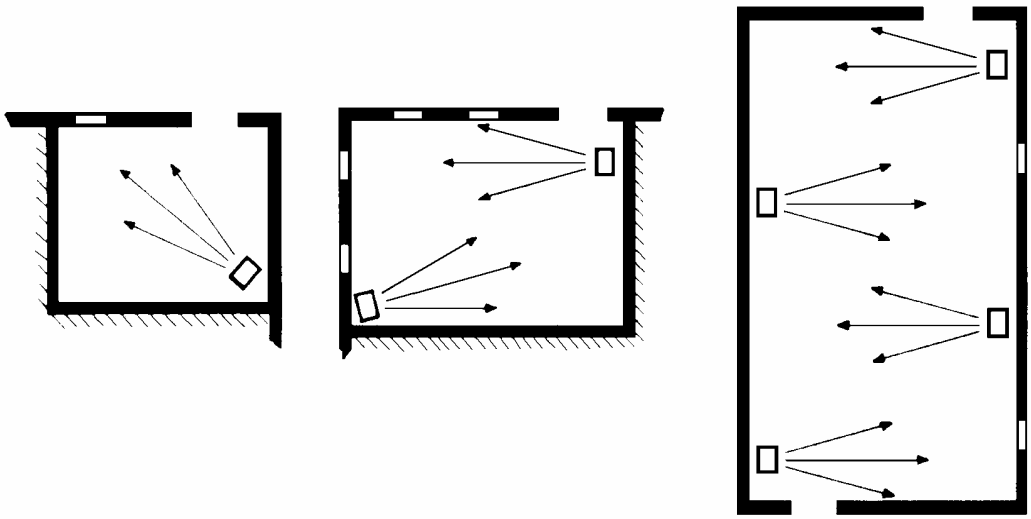


Figure 16 – Sample positioning of the units

3.3 SIZE AND INSTALLATION OF THE AIR INLET / EXHAUST FLUE

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

- **C_{13} e C_{33}** type installation; room sealed combustion circuit. Appliance with inlet air supply and outlet of exhaust gases with, either, concentric or separate ducts - horizontal (for **C_{13}** see Figure 19, Figure 20, Figure 21 and Figure 22 on page 47 and 48) or vertical ones (for **C_{33}** see Figure 23 and Figure 24 on pages 48 and 49).
- **C_{53}** type installation: room sealed combustion circuit; appliance with inlet air supply and outlet of exhaust gases by using separated ducts and terminals n different walls, for example, the air inlet duct from the wall behind the appliance and the flue exhaust duct on the roof (see Figure 25 and Figure 26 on pages 49 and 50).

- **C_{63}** 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 14 on page 45).

- **B_{23}** 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 Figure 27 to Figure 30 starting on page 50).

Use only approved ducts for the installation of the units. Upon request, manufacturer can supply approved rigid pipes, coaxial pipes and terminals.

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 (see Table 14 on page 45).

Table 15 and Table 16 show the maximum allowed pressure drop for each unit; they show the losses of the exhaust and air intake flues regarding the coaxial ducts supplied by manufacturer.

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 14. 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 (see Table 14)

The maximum lengths of the air inlet and exhaust tubes, in relation to the type of installation being done, are reported in Figure 19 and Figure 26. 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).

☞ When horizontal pipes with lengths above 1 metre are installed, the flue pipe must be mounted with a slope of 2 to 3 cm each 1 metre length (see Figure 17), to prevent entering the condense drops into the unit. In addition, to install correctly the flue exhaust and the air intake terminals, follow the details given in Figure 18.

☞ When vertical pipes are installed, to prevent that condense drops enter the unit, on base of the vertically mounted flue pipe a T-shaped piece MUST be fitted, in order to collect the condense (Figure 24).

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**	
K 32	180	58	9.2 – 9.4	10.7	50
K45	140	76			60
K 60	190	100			160
K 80	170	140			150
K 100	195	175			160

Table 14 – Technical data for air/exhaust system

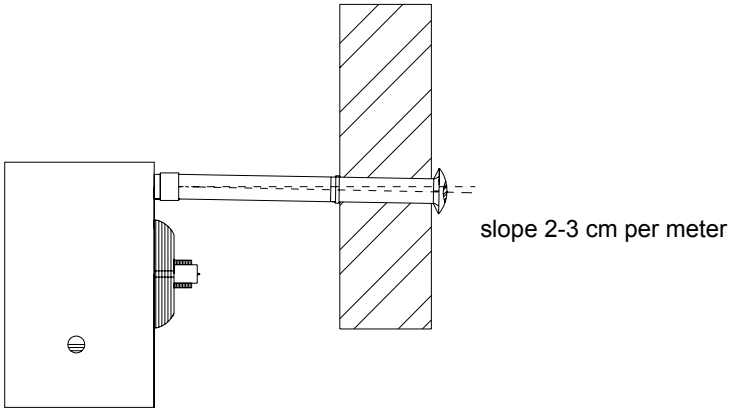


Figure 17 – Slope of horizontal ducts

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**	**roof (O-SCR009)**
K 32	4	2,5	8	4	17	1.4	0.9	4	2	15
K 45	6	4	11	5	20	1.8	1.3	5	3.8	18
K 60	10	7	19	12	N.P.	5	2.6	8	5	N.P.
K 56	20	15	26	20	N.P.	7	3.2	14	8	N.P.
K 100	24	18	38	26	N.P.	9	4	18	11	N.P.

Table 15 – 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)		90º elbow (Pa)		duct (Pa/m)		90° elbow (Pa)		Coaxial (Pa)	
	flue	air	flue	air	flue	air	flue	air	wall (O-SCR011)	roof (O-KTC001)
K 32	1.1	0.6	3	1.6	0.7	0.2	1.8	0.5	7	9
K 45	1.4	0.8	4	2	0.9	0.3	2	0.8	9	12
K 60	2.5	1.8	6.6	4.1	1.8	1	4	1.8	15	22
K 80	6	2.4	10	6	2.7	1.2	7	2	30	32
K 100	7	3	15	8	3	1.5	10	3	32	35

Table 16 – 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 K 100 for this example. The air/flue system is made using the following separate Ø 80 ducts:

- 4 meters of Ø 80 flue pipe
- 1 elbows 90° of Ø 80 on the flue pipe
- 2 meters of Ø 80 air pipe

The calculation can therefore be done keeping in mind that the maximum allowed pressure loss is 160 Pa (see Table 14).

	Quantity		Pressure loss					
Flue pipe Ø 80	4 m	x	24	Pa	=	96.0	Pa	+
90º elbow	1	x	38	Pa	=	38.0	Pa	+
Air pipe Ø 80	2 m	x	18	Pa	=	36.0	Pa	=
Total pressure loss						170.0	Pa	

The total pressure loss of the system is greater than the max. allowed pressure loss (170 Pa GREATER than 160 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.

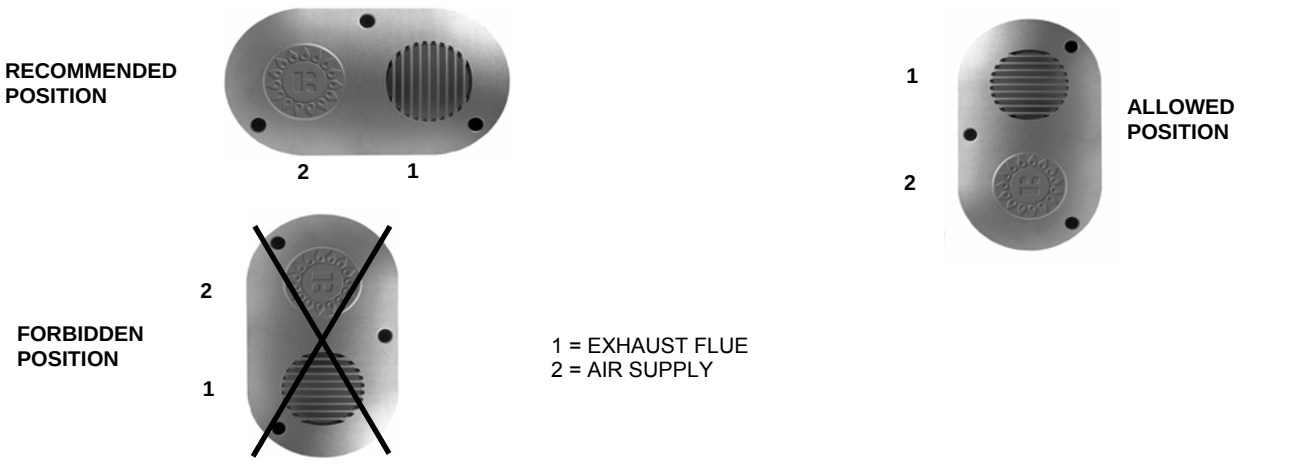
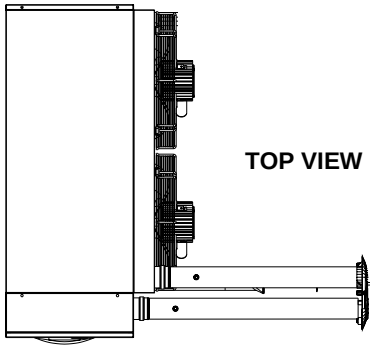


Figure 18 – Wall terminal positioning

C13 INSTALLATION W/ SEPARATE Ø 80 DUCTS

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
K 32	7	7
K 45	6	6
K 60	9	19
K 80	4	4
K 100	3	3

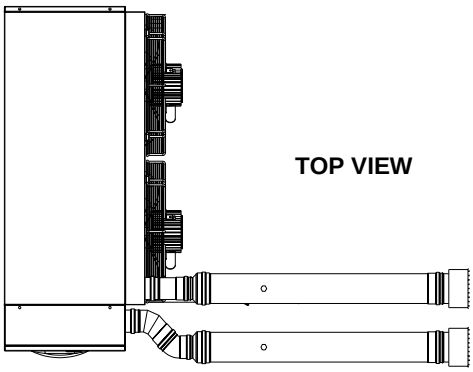


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 19 – C13 type installation with separate Ø 80 ducts

C13 INSTALLATION W/ SEPARATE Ø 110 DUCTS

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
K 32	25	25
K 45	20	20
K 60		
K 80	15	15
K 100	12	12

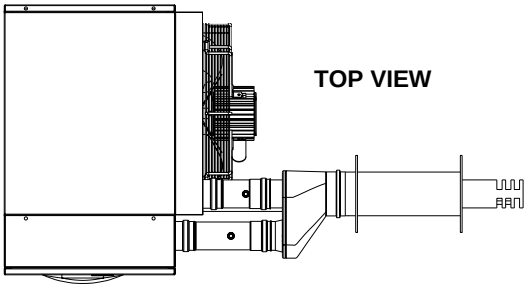


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 20 – C13 type installation with separate Ø 110 ducts

C13 COAXIAL WALL INSTALLATION WITH Ø 80 DUCTS

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
K 32	5	5
K 45	4	4
K 60	INSTALLATION NOT POSSIBLE	
K 80		
K 100		

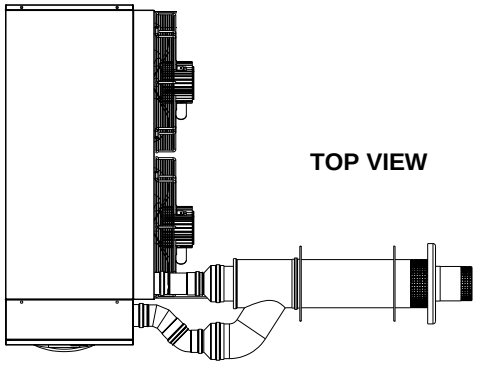


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 21 – 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
K 32	25	25
K 45	20	20
K 60		
K 80		
K 100	16	16

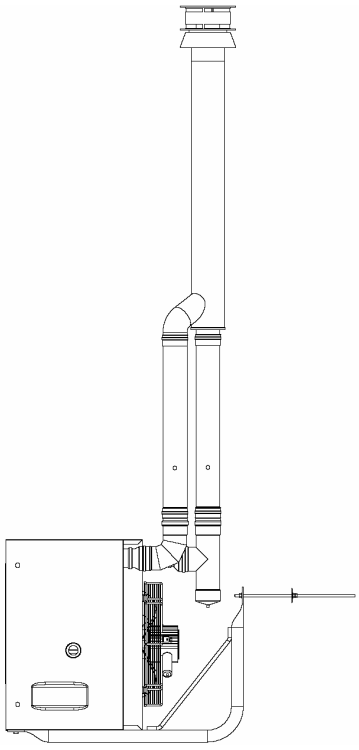


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 22 – 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
K 32	10	10
K 45		
K 60	INSTALLATION NOT POSSIBLE	
K 80		
K 100		

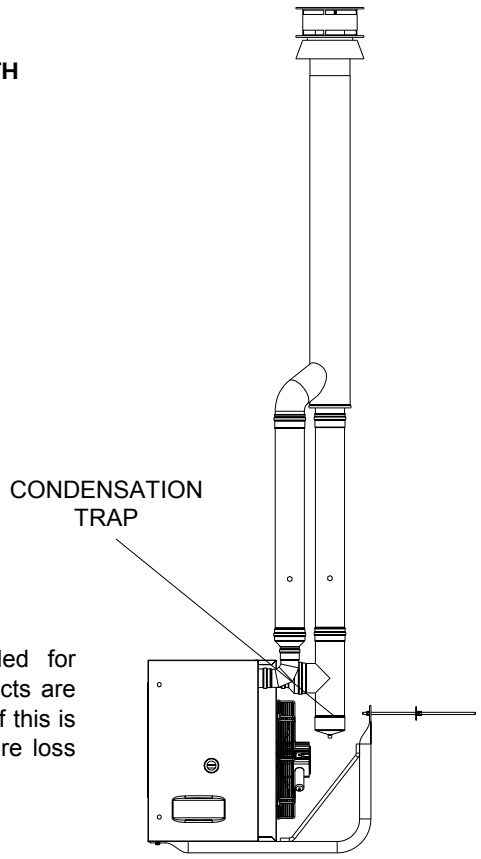


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 23 – 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
K 32	25	25
K 45	20	20
K 60		
K 80	15	15
K 100		

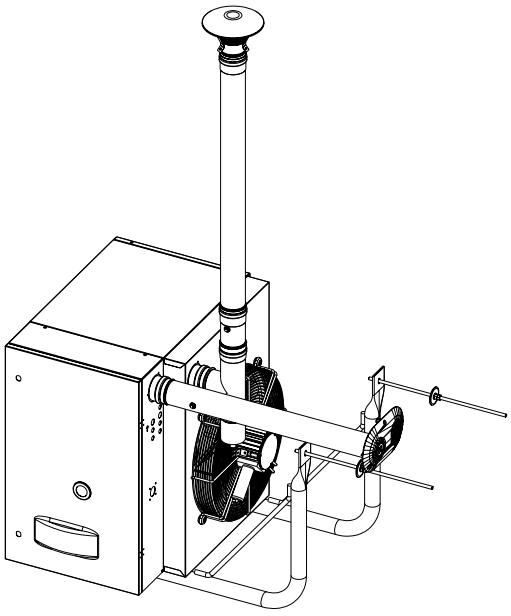


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 24 – C33 coaxial roof type installation with Ø 130 ducts

C53 INSTALLATION WITH Ø 80 PIPES

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
K 32	1	8
K 45	1	6
K 60	1	10
K 80	INSTALLATION NOT POSSIBLE	
K 100		

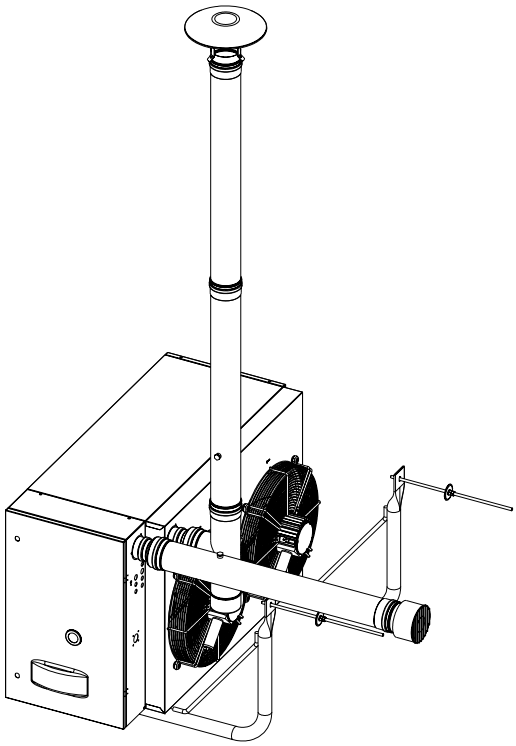


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 25 – C53 type installation with Ø 80 pipes

C53 INSTALLATION WITH Ø 110 PIPES

MAXIMUM ALLOWED LENGTHS (m)		
	AIR PIPE	FLUE PIPE
K 32	1	25
K 45	1	20
K 60		
K 80	1	18
K 100	1	15

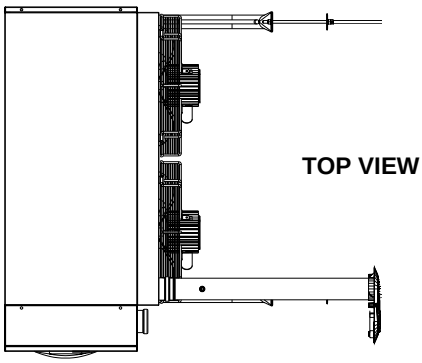


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 26 – C53 type installation with Ø 110 pipes

B23 INSTALLATION WITH Ø 80 FLUE PIPE

MAXIMUM ALLOWED LENGTHS (m)	
	FLUE PIPE
K 32	12
K 45	10
K 60	12
K 80	7
K 100	6

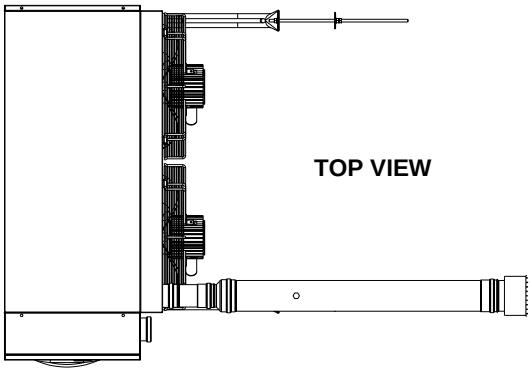


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 27 – B23 type installation with Ø 80 flue pipe

B23 INSTALLATION WITH Ø 110 FLUE PIPE

MAXIMUM ALLOWED LENGTHS (m)	
	FLUE PIPE
K 32	30
K 45	20
K 60	
K 80	20
K 100	18

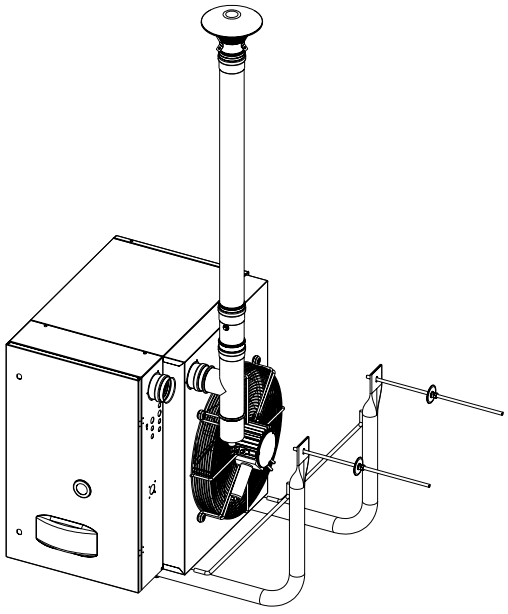


ATTENTION: The above mentioned lengths are intended for installations in which the air and exhaust ducts are on linear paths as represented in the figure. If this is not the case, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 28 – B23 type installation with Ø 110 flue pipe

B23 INSTALLATION WITH Ø 80 ROOF FLUE PIPE

MAXIMUM ALLOWED LENGTHS (m)	
	FLUE PIPE
K 32	9
K 45	8
K 60	10
K 80	INSTALLATION NOT POSSIBLE
K 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, you must calculate the pressure loss (see SAMPLE CALCULATION).

Figure 29 – B23 type installation with Ø 80 roof flue pipe

B23 INSTALLATION WITH Ø110 ROOF FLUE PIPE

MAXIMUM ALLOWED LENGTHS (m)	
	FLUE PIPE
K 32	25
K 45	20
K 60	
K 80	20
K 100	16

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, you must calculate the pressure loss (see SAMPLE CALCULATION).

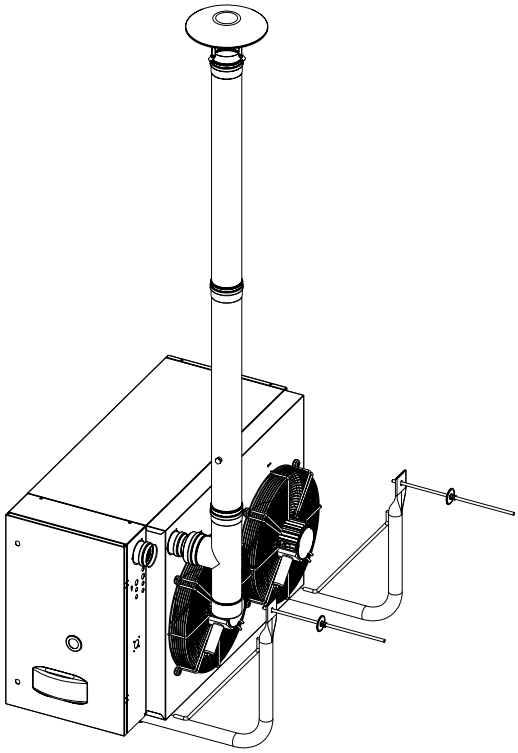


Figure 30 – B23 type installation with Ø 110 roof flue pipe

SECTION 4: ELECTRICAL INSTALLER

In this section you will find all the information necessary for the electrical connections of the K 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 32 on page 56); wire type is H05 VVF 3x1 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'', i.e. a switch capable of disconnecting both on phase and neutral. 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.
5. For lengths greater than 5 meters use an unshielded bipolar 0,75 mm^2 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.

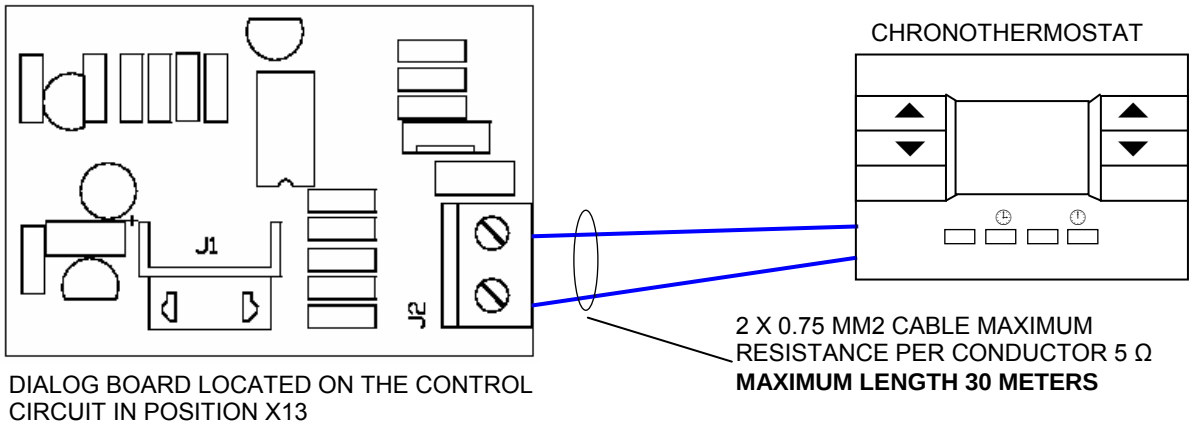


Figure 31 – Connection of chronothermostat and dialog board

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 33 on page 57).
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 33 on page 57)
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’s 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 9

The operating anomalies can also be signalled remotely by connecting a led to terminal J9 on the LC23 board (output 230V – 50Hz, see diagram in Figure 31).

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

If a led turns on, as described in Table 17, 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 31.

Closing the contact resets the anomaly.

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

If the overheat thermostat intervenes, after having identified and resolved the cause of the error, press the OK button on the chronothermostat.

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

Table 17

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

4.5 INSTALLATION WIRING DIAGRAM

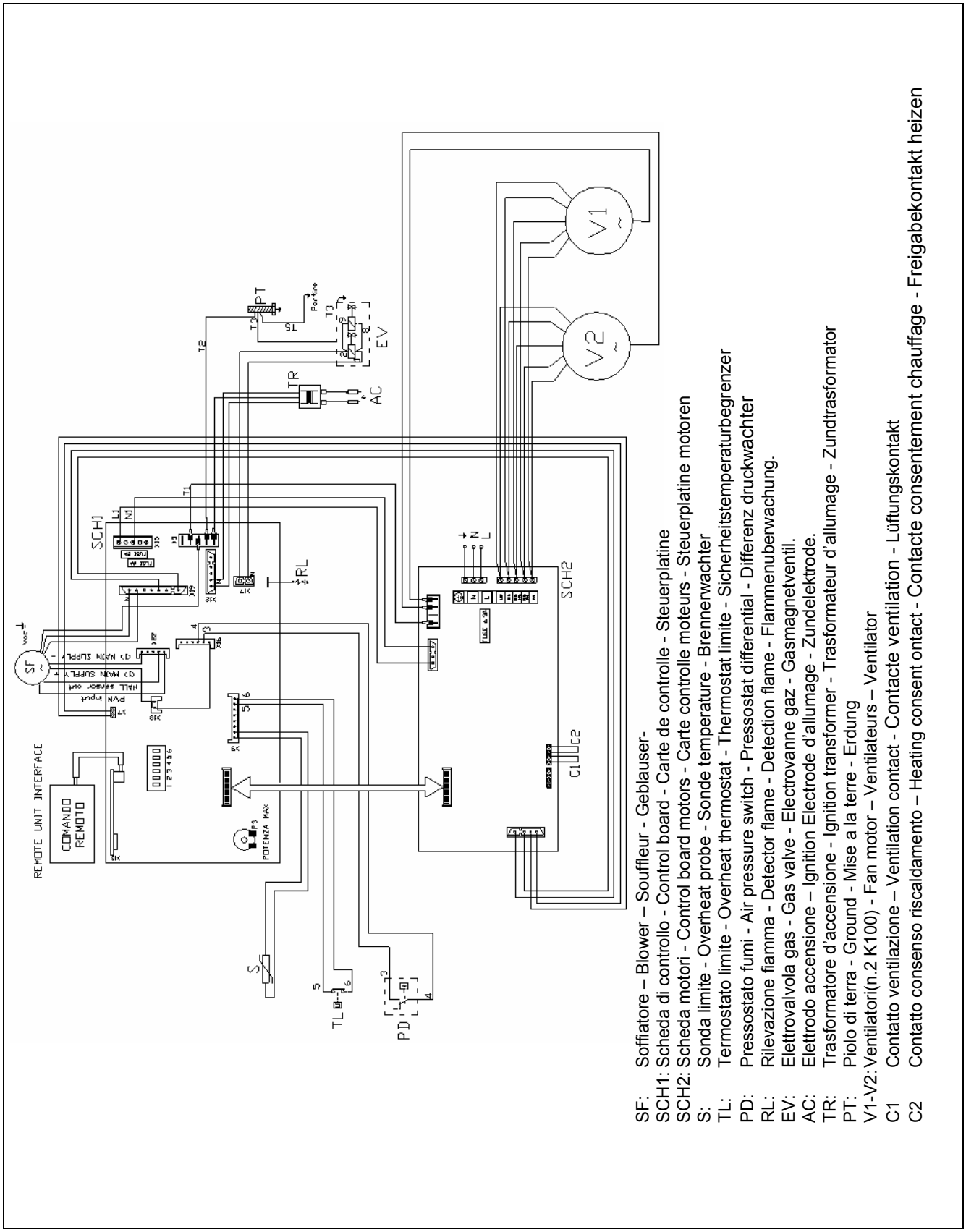


Figure 32 – Installation wiring diagram of K series heaters

4.6 WIRING DIAGRAM FOR MULTIPLE HEATER WITH ONE PROGRAMMER

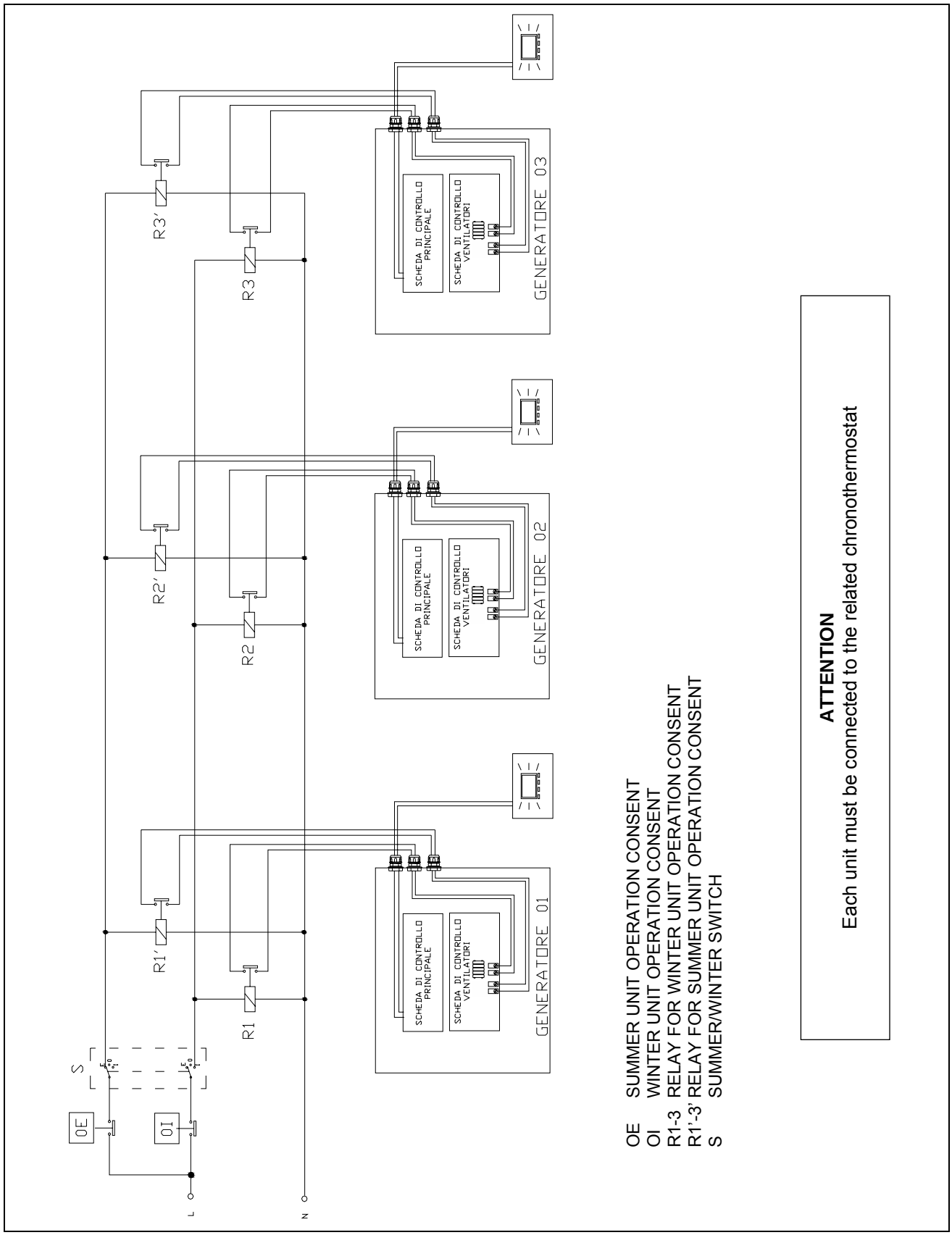


Figure 33 –Wiring diagram for controlling multiple units with external consent

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 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 18. The gas valve of the heating unit is precalibrated 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**.

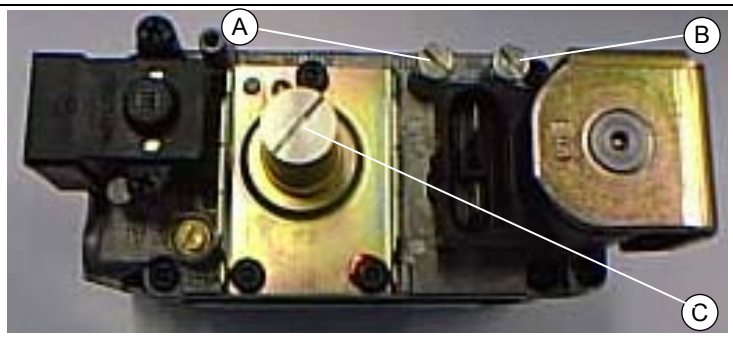
1. After having removed the relative holding screws, connect a pressure gauge to pressure jack A (see Figure 34 on page 60).

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 wait the necessary time for the flame to stabilize (about 2 minutes).
3. Set the chronothermostat to minimum power/output (level 1) using the ▼ button.
4. With the door open, turn the off-set regulation screw C (see Figure 34 on page 60) until the correct nominal value is obtained (see Table 18).
5. Check CO_2 in flue value (%). For correct operation, the CO_2 in flue value must be as given in Table 14 on page 45.
   If not an ulterior correction must be done setting again the nominal off-set value that has never to be higher than -0,04 mabar (e.i.-0,01 mbar) and lower than -0,2 mbar (e.i. 0,3 mbar) till the CO_2 flue value is the same as given in Table 14 page 45.
6. Turn the unit on and off two or three times in order to verify that the calibration is stable.
7. Disconnect the pressure gauge and replace the seal screw of pressure jack A.

NOMINAL OFF-SET VALUES						
		K 32	K 45	K 60	K 80	K 100
OFF-SET	**(mbar)** **(mmH_2O)**	-0,1 -1	-0,1 -1	-0,1 -1	-0,1 -1	-0,1 -1

Table 18 – Nominal off-set values



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

Figure 34 – Sit 822 Novamix valve

5.2 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 35).
3. Remove the gas pipe/flange assembly (see Figure 36).
4. Remove the sealing gasket, being careful not to damage or lose it (see Figure 37).
5. Replace the nozzle (see Table 19) 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 (see Figure 39).
8. Check that the OFF-SET value corresponds to that indicated in Table 18. If the value does not correspond, proceed with the calibration as indicated in paragraph 5.1 - HOW TO REGULATE THE GAS VALVE.
9. When appliance is on, check for gas leakage with soapy solution or other suitable method. Check all fittings - even those which were not handled during the operation.
10. 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. NOZZLES						
		K 32	**K 45**	**K 60**	**K 80**	**K 100**
Natural gas (G20)	**diameter (mm)** **Code**	6,60 155	7,40 137	7,30 154	10,30 168	10,60 169
LPG (G30-G31)	**diameter (mm)** **Code**	4,80 159	5,40 149	5,40 149	7,90 152	8,20 140

Table 19 – K series nozzle data (diameters and codes)

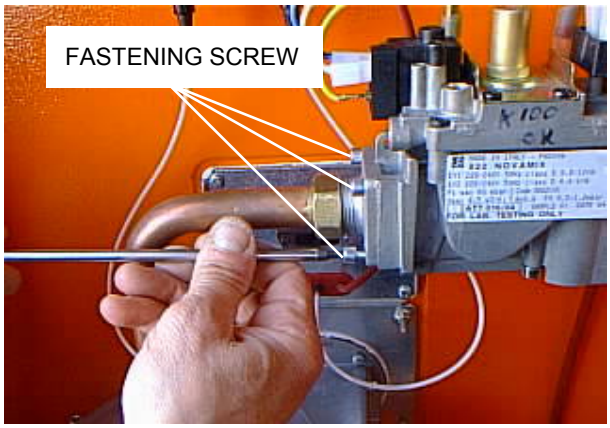


Figure 35 – Gas flange fastening screws

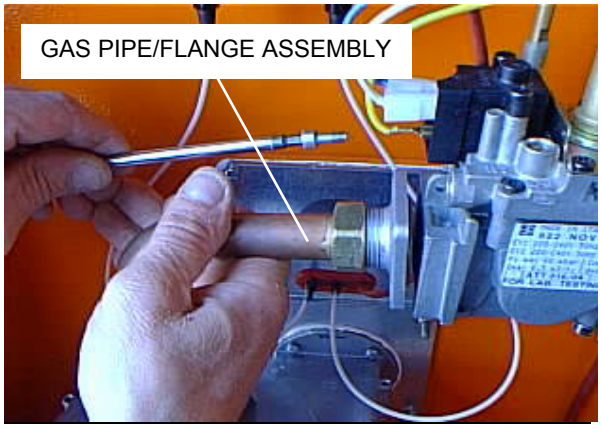


Figure 36 – Gas pipe/flange assembly

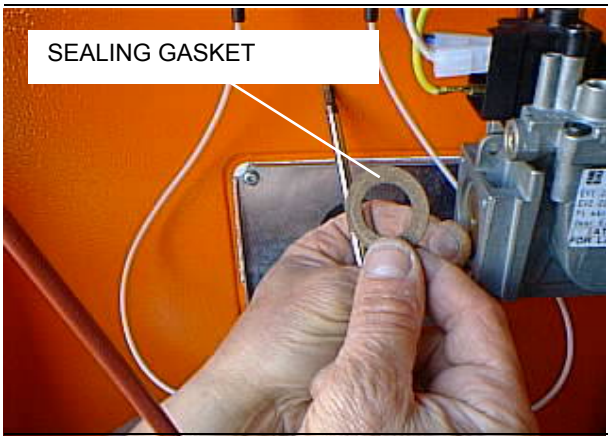


Figure 37 – Sealing gasket

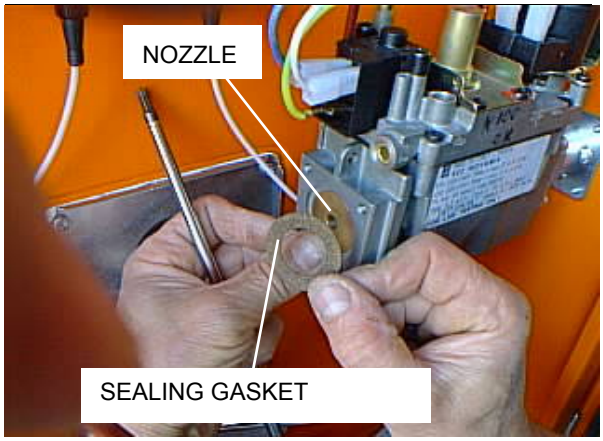
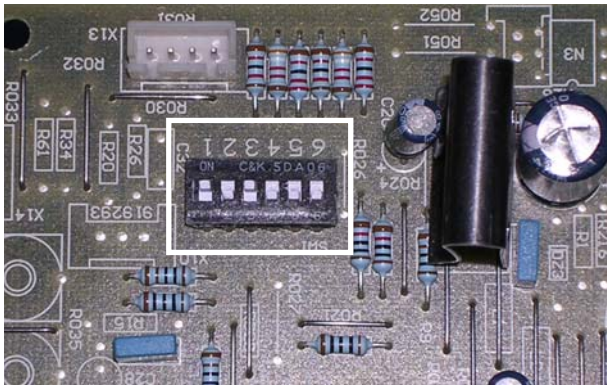
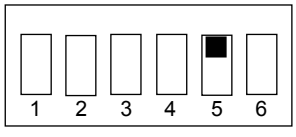


Figure 38 – Nozzle replacement





ON: LPG units
OFF: natural gas units

Figure 39 – Minidip position on main control circuit

5.3 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.

With the goal of improving the quality of its products, Robur S.p.A. reserves the right to change the data and contents of this booklet without previous notice.

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