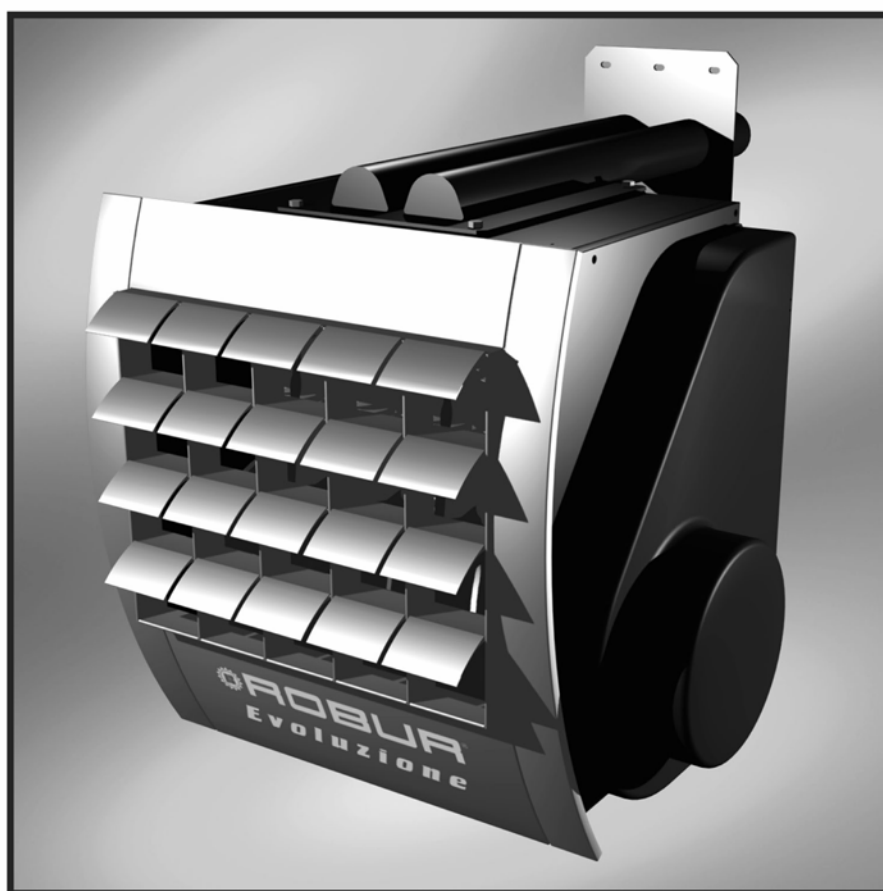

GAS FIRED UNIT HEATERS

Installation, Operation and Maintenance



SERIES ***Evoluzione***



 **ROBUR**[®]
COSCIENZA ECOLOGICA

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NOTE

Please read the warnings contained in this manual; they give important instructions regarding safe installation, operation and maintenance of the appliance. Keep this manual safe for all further consultation.

The manufacturer may not be held responsible for any damage arising from improper, incorrect or unreasonable use of the appliance.

1 GENERAL SECTION

1.1 GENERAL WARNINGS

This manual forms an integral and essential part of the product and must be delivered to the user as such.

This **appliance** must be used only for the purposes for which it has been expressly designed. All other uses are considered inappropriate and therefore dangerous.

The manufacturer does not accept any contractual or extracontractual liability for damage caused by errors in installation or use and in any case by failure to observe the instructions supplied by the manufacturer.

Do not obstruct the inlet vent of the fan or the outlet grille.

In the case of failure and/or poor operation of the appliance, deactivate it (disconnect the power supply and close the gas valve), and refrain from any attempt to repair or intervene directly upon the appliance.

Contact only **professionally qualified personnel**.

Professionally qualified personnel means personnel that have specific technical expertise in the sector of heating plant components for civil use. **In any case the user may obtain all necessary information by contacting ROBUR S.p.A.'s Customer Service Department (tel. 035/888111).**

Any product repairs must only be carried out by a Technical Assistance Centre authorised by the manufacturer, and using only genuine parts.

Failure to observe the instructions above may compromise the safety of the appliance.

To guarantee the efficiency and correct operation of the appliance it is essential to have annual maintenance carried out by **professionally qualified personnel**, observing the manufacturer's instructions.

If the appliance is sold or transferred to a different owner, ensure that this manual accompanies the appliance so that so that it may be consulted by the new owner and/or installation technician.

BEFORE STARTING THE APPLIANCE

Have **professionally qualified personnel** check that:

- the electricity and gas supply network data correspond to the data on the plate
- the exhaust air duct and combustion air intake are functioning correctly
- combustion air is supplied and exhaust fumes are discharged correctly, in accordance with current norms
- the fuel supply piping is correctly sealed internally and externally
- the rate of fuel supply is adjusted in accordance with the power demanded by the heater
- the appliance is supplied with the type of fuel for which it is designed
- the fuel supply pressure is within the ranges indicated on the data plate
- the fuel supply plant is sized for the flow required by the heater and that it is equipped with all the safety and control devices required by current norms

Do not use gas pipes to earth electrical appliances.

Do not leave the heater connected to the power supply unnecessarily when it is not used for a long period of time, and close the gas valve.

IF YOU SMELL GAS ...

- do not use electrical switches, telephones or any other object or device that can cause sparks
- open doors and windows in order to create an air current to ventilate the room
- close the gas valves
- contact **professionally qualified personnel** for assistance

1.2 OVERVIEW OF OPERATION OF THE APPLIANCE

The warm air heaters in the Evoluzione range are independent heating appliances of the sealed circuit and forced draught type.

They have been designed to be installed inside the room to be heated.

They may be set up to run on natural gas (G20) and L.P.G. (G30/G31) (the appliance belongs to category II_{2H3B/P} in accordance with the EN 1020 norm).

The combustion circuit is sealed off from the environment to be heated and complies with the requirements of norm EN 1020 for type C appliances: intake of combustion air and outlet of exhaust gases occur outside and are ensured by the operation of a blower which is located in the combustion circuit. The appliances are approved also as type B appliances for installations where combustion air intake is permitted directly from the room to be heated.

The operation of the heater is controlled by an ambient thermostat (not supplied as standard). When the thermostat is activated, the electronic control unit, after a pre-wash time of about 30 seconds, ignites the burner.

An electrode detects when ignition has occurred. If there is no flame, the electronic control unit halts operation of the appliance.

A green ON light located on the right-hand side of the appliance indicates that ignition of the burner has occurred (see item 5, Figure 2).

The combustion products pass through the heat exchangers internally. The heat exchangers receive the current of air produced by the helicoidal fan, thus introducing warm air into the room.

The direction of the airflow can be adjusted up or down and/or from side to side by applying on the inlet grille the (optional) adjustable fins (see "List of accessories" on page 27).

The helicoidal fan starts automatically only when it receives the command from the ventilation thermostat, that is, only when the exchangers are warm, in order to prevent cold air from being introduced into the room. Likewise, it stops when the exchangers are cold.

If the heat exchangers should overheat, because of abnormal operation, a limit thermostat is fitted which, if required, cuts off power to the gas valve, which in turn cuts off the flow of fuel and makes the burner switch off.

NOTE

Resetting the limit thermostat is an operation for **professionally qualified personnel only**, which restores operation of the appliance after having identified the cause of overheating.

Upstream from the burner, a blower ensures the correct air-gas mixture and the forced expulsion to the outside of the exhaust fumes deriving from combustion.

If the inlet or exhaust pipes are obstructed, or if the blower is operating inefficiently, the differential "air-gas valve" control system interrupts the flow of combustion air to the burner.

The diagram in Figure 1 summarises winter operation of the heater.

The heating output and ventilation of the Evoluzione warm air heater are modulating: they can be reduced by approximately 20% (see "TECHNICAL DATA" on page 5). Operation on reduced power and ventilation allow ambient temperature to be kept constant, reducing gas consumption and further lowering noise emissions into the environment. Operation with automatic or manual modulation depends on the type of control units chosen (for further information, see the paragraph "Other accessories" on page 29).

In the summer period, it is possible to operate the fan only, producing a pleasant movement of indoor air (for further information see Section "For the User", paragraph entitled "Summer").

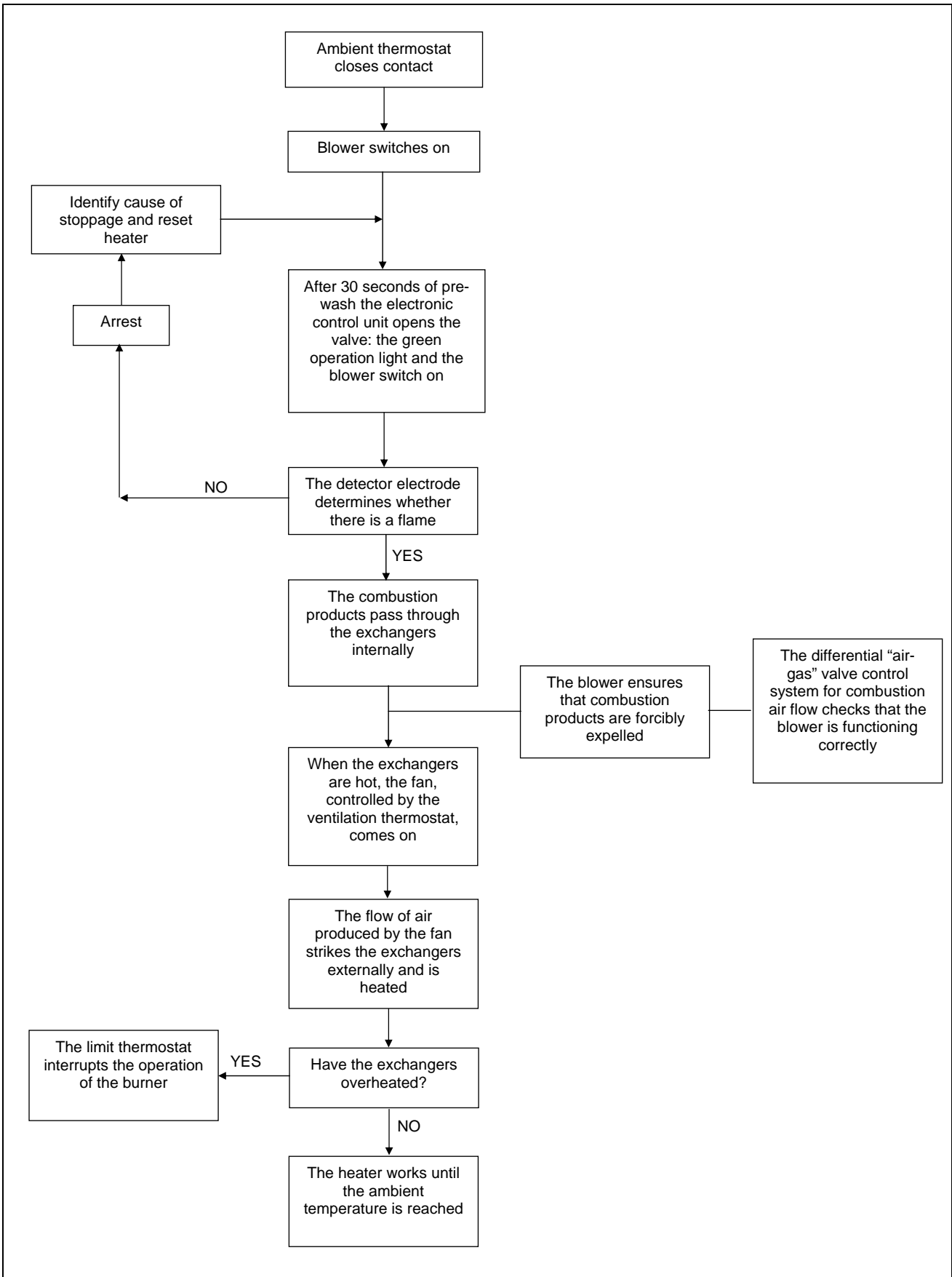


Figure 1 – DIAGRAM FOR WINTER OPERATION

1.3 TECHNICAL DATA

MODEL		U.M.	E 32	E 42	E 43	E 52	E 72
CATEGORY OF APPLIANCE			II _{2H3B/P}				
TYPE OF APPLIANCE			C ₁₃ - C ₃₃ - B ₂₃ - C ₅₃ - C ₆₃				
GAS TYPE			NATURAL GAS - L.P.G.				
NOMINAL HEAT INPUT (AT 1 st SPEED)		kW	26	34.75	37.15	48.35	69
		kcal/h	22360	29890	31950	41580	59340
NOMINAL HEAT OUTPUT (AT 1 st SPEED)		kW	24.2	32	34.2	44.5	62.8
		kcal/h	20790	27520	29410	38270	54010
REDUCED HEAT INPUT (AT 2 nd SPEED)		kW	20.8	27.8	29.8	38.7	55.2
		kcal/h	17900	23910	25630	33280	47470
REDUCED HEAT OUTPUT (AT 2 nd SPEED)		KW	19.35	25.6	27.4	35.6	50.25
		kcal/h	16640	22020	23560	30610	43210
NOMINAL EFFICIENCY		%	93	92	92	92	91
AIR FLOW RATE	AT 1 st SPEED	m ³ /h	2300	2900	3400	4200	6000
	AT 2 nd SPEED		1900	2500	2700	3400	5100
THERMAL HEAD	AT 1 st SPEED	K	31.2	32.5	29.4	31.0	31.0
	AT 2 nd SPEED		30.2	30.0	29.8	30.7	29.2
NOMINAL GAS CONSUMPTION (15°C - 1013 mbar)	NATURAL GAS	m ³ /h	2.75	3.68	3.93	5.11	7.30
	L.P.G. G30	kg/h	2.05	2.74	2.93	3.81	5.44
	L.P.G. G31		2.01	2.69	2.90	3.74	5.34
REDUCED GAS CONSUMPTION (15°C - 1013 mbar)	NATURAL GAS	m ³ /h	2.20	2.94	3.15	4.09	5.84
	L.P.G. G30	kg/h	1.64	2.19	2.34	3.05	4.35
	L.P.G. G31		1.61	2.15	2.30	2.99	4.28
FUEL SUPPLY PRESSURE	NATURAL GAS	mbar	20				
	L.P.G. G30		30				
	L.P.G. G31		30				
GAS INLET DIAMETER		"	3/4				
PIPE DIAMETER	INTAKE	mm	80				
	EXHAUST						
ELECTRICITY SUPPLY VOLTAGE			230V - 50Hz				
INSTALLED ELECTRICAL POWER		W	250	300	350	420	800
FUSE		A	4				
AIR THROW AT 1 st SPEED (RESIDUAL SPEED >1m/s)		m	14	18	20	22	26
SOUND PRESSURE AT 6 m (1 st SPEED) IN FREE-FIELD CONDITIONS		dB(A)	38	39	40	42	43
	IN TYPICAL INSTALLATION		48	51	52	56	57
SOUND PRESSURE AT 6 m (2 nd SPEED) IN TYPICAL INSTALLATION		dB(A)	45	46	47	51	54
WEIGHT		kg	60	66	66	74	86

Table 1 – TECHNICAL DATA, EVOLUZIONE SERIES

1.4 DIMENSIONS

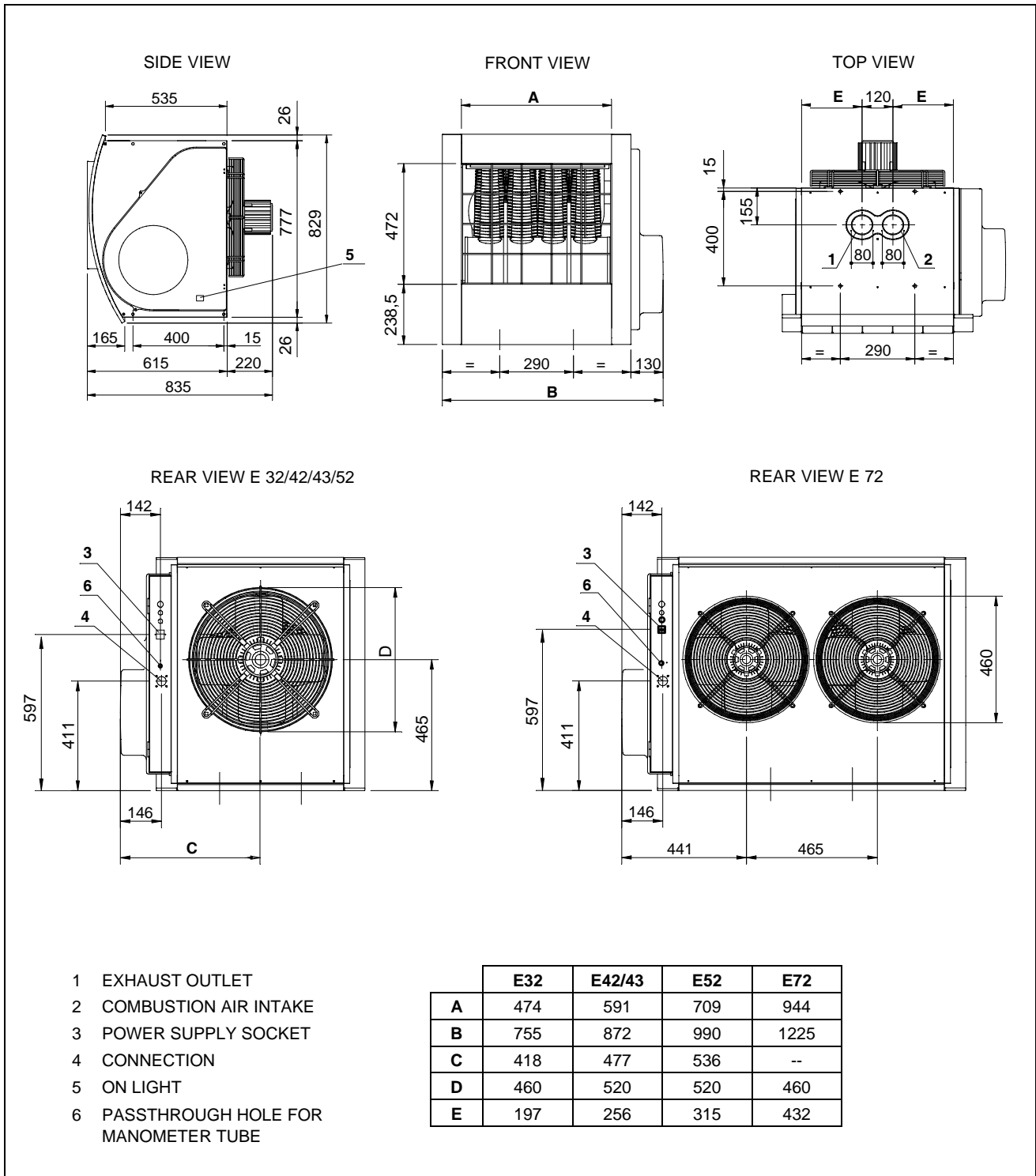


Figure 2 – DIMENSIONS

2 FOR THE USER

2.1 SWITCHING THE APPLIANCE ON AND OFF

WARNING

The first switching on of the appliance must be carried out by **professionally qualified personnel**.

Before starting the heater, have professionally qualified personnel check that:

- the data on the plate correspond to the data from the electricity and gas supply grids
- the calibration is compatible with the power of the heater
- the exhaust gas pipe is operating correctly
- the intake of combustion air and outlet of exhaust gases occur correctly in accordance with the specifications of current legislation

WINTER

1. Set the index of the ambient thermostat to maximum.
2. Check that the gas valve is open.
3. Supply current to the appliance by closing the omnipolar switch (provided by the electrical installation technician).
4. Set the summer/winter switch to the winter position (indicated by the snowflake symbol ❄).
5. After a pre-wash time of approximately 30 seconds, the gas electrovalve opens and the burner switches on.
6. When a flame is present, the central control unit keeps the gas valve open.
7. If no flame is present, the central control unit arrests operation of the appliance, and the arrest light illuminates on the reset button.
8. If point 7 applies, press the reset button.
9. If ignition is trouble-free, set the ambient thermostat index (not supplied as standard) to the value desired.

WARNING

If the appliance is switched on after a long period of disuse, or the first time the appliance is switched on, it may be necessary to repeat the operation several times, due to air being present in the gas pipes.

SWITCHING OFF

To switch off the appliance, set the ambient thermostat index to the minimum. The burner will switch off, while the fans will continue to operate until the appliance has fully cooled.

WARNING

If the appliance is not used for a protracted period, after the operation described above and after waiting for the fans to cease operating, close the gas valve and cut off electrical current to the appliance via the omnipolar switch located on the power supply line.

WARNING

In no circumstances must the appliance be switched off by removing the power supply from it directly. This can damage the appliance, as it causes the fans to stop immediately and the limit thermostat to be activated, which must be reset manually.

SUMMER

1. Close the gas valve and check that electrical current reaches the appliance.
2. Set the summer/winter switch to the summer position (indicated by the sun symbol ☀); set thus, only the fans will operate.

SEASONAL ARREST

1. Switch off the appliance and wait for the fans to stop.
2. Close the gas valve upstream of the appliance.
3. If the SUMMER function is not to be used, remove electrical power from the appliance by means of the omnipolar switch located on the power line.

RESET OF THE LIMIT THERMOSTAT

The limit thermostat stops the burner if the appliance becomes too hot. Reset is carried out by pressing the button on the rear of the appliance, after having removed the protective cap (see Figure 3). Replace the protective cap after resetting the thermostat.



Figure 3 – LIMIT THERMOSTAT RESET BUTTON POSITION

WARNING

Activation of the limit thermostat ALWAYS indicates an abnormal condition. For this reason, reset of the limit thermostat is a task for professionally qualified personnel, who will restore operation of the appliance ONLY after identifying the cause of overheating.

2.2 MAINTENANCE

Careful maintenance is always at the basis of economy and safety.

The maintenance of heating plants must be carried out on an annual basis, preferably at the beginning of the winter season, **by professionally qualified personnel**.

For prolonged, trouble-free operation, we recommend a general cleaning of the appliance (paying particular attention to the heat exchangers and the fan grilles) and carrying out combustion tests in accordance with specific regulations.

2.3 ASSISTANCE

WARNING

Always entrust **professionally qualified personnel** with all reinstallation, activation, maintenance, gas change, and other operations.

For this reason, ROBUR S.p.A. has a network of Technical Assistance Centres that can be contacted via the dealer, the area representative, or by calling ROBUR S.p.A.'s Customer Assistance directly on 035/888111.

Before calling Customer Assistance, make sure that you have the machine documentation to hand and, if possible:

- the registration number and model of the product, which may be found on the data plate and on the guarantee card
- a description - even if only brief - of the type of installation

3 FOR THE INSTALLATION TECHNICIAN

3.1 BUILD CHARACTERISTICS

- **premixed burner in stainless steel**
- **high head blower**
- cylindrical **combustion chamber** in stainless steel
- ROBUR-patented **heat exchanger**, manufactured in special light alloy, with horizontal fins on the air side and vertical fins on the exhaust gas side, with extremely high heat exchange capacity
- **external panelling** manufactured in painted steel and anodised aluminium
- two-speed **axial fan**

The Evoluzione heater is manufactured in compliance with the norms currently in force as applied to gas appliances and electromagnetic emissions.

3.2 CONTROL AND SAFETY COMPONENTS

- manually resettable 100°C **limit thermostat**, providing protection against overheating of the heat exchangers.
- **differential “air-gas valve” control system for combustion airflow**. If the air intake or exhaust outlet pipes are obstructed, this safety system is activated, bringing about the arrest of the appliance.
- **Gas electrovalve**: if a safety device is activated (limit thermostat, central control unit, etc.) the gas valve is de-energised electrically, with the consequent interruption of gas flow to the burner.
 - Power supply: 230 V - 50 Hz
 - Operating temperature range: 0°C to +60°C
- **central ignition and flame control unit** which takes care of the operation of igniting the premixed burner and detecting the flame; if a flame is not detected within the safety time, the electronic control unit arrests the machine, which must be restarted manually.
 - Safety time: 5 seconds
 - Pre-wash time: 30 seconds
 - Power supply: 230 V - 50 Hz

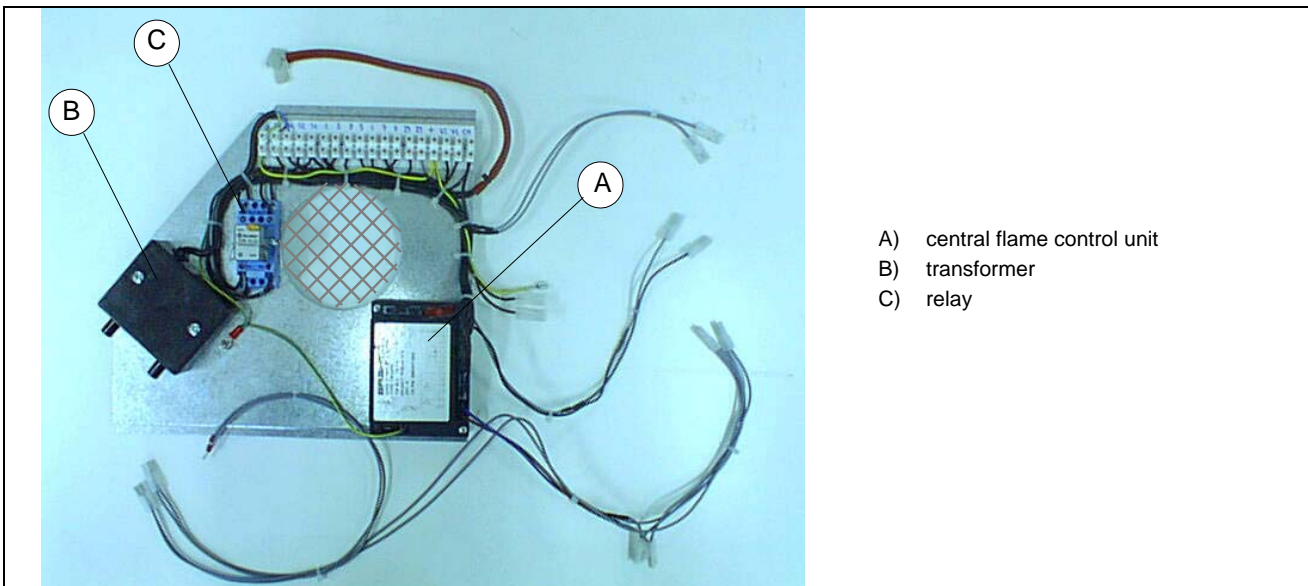


Figure 4

3.3 INSTALLATION

3.3.1 GENERAL NORMS FOR INSTALLATION OF THE APPLIANCE

WARNINGS

- Installation must be carried out by professionally qualified personnel, following the manufacturer's instructions.
- Professionally qualified personnel means personnel that have specific technical expertise in the sector of components of heating plants. In any case you may obtain any information that you may require by calling ROBUR S.p.A.'s Pre-sales Office on 035/888111.
- Erroneous installation may cause damage to persons, animals or things. The manufacturer may not be held responsible for such damage.
- Installation must be carried out in compliance with current national and local norms.

For installation purposes, the following regulations should be respected:

- The minimum distance of the appliance from the wall behind it should be enough to allow adequate air renewal (at least 350 mm). The minimum distance from the side walls is indicated in Figure 5.
- The optimum height recommended from the ground to the base of the heater is 2.5 – 3.5 m (see Figure 5). The heater must NOT be installed at heights of less than 1.8 m from the ground (for models E 32 and E 42), or 2.5 m (for models E 43, E 52 and E 72).
- To obtain maximum comfort and performance from the plant, we recommend that the following rules are observed:
 - make sure that the flow of air from the appliance does not strike workers directly
 - take into account the presence of obstacles (pillars and suchlike).
 - for better heat distribution, if several machines are installed, create alternating flows of warm air (see Figure 6).
 - in such cases it may also be a good idea to position the appliances near main doors so that they perform the additional function of creating an "air barrier" at the moment these doors are opened.
- Do not install Evoluzione series heaters in greenhouses or environments with a high degree of humidity or other such climatic conditions, as they have not been designed for this type of use.

On the basis of the installation plan, set up the gas and electricity supply lines, as well as the holes for exhaust gas outlet and combustion air intake (together with the mounting brackets, ROBUR supplies an "installation template" on which the layout of the holes has been reproduced).

- A) Unpack the appliance, taking care to check that it has not been damaged during transport; each appliance is tested in the factory before being dispatched. Therefore, if damage has occurred, tell the transporter immediately.
- B) Fit the mounting brackets, chosen from the three available types (for further information see the paragraph entitled "Wall installation" on page 18), following the instructions supplied with the accessory.
- C) Fix the heater to the bracket, using the screws supplied with the bracket.
- D) On the gas supply pipe, provide a gas shut-off valve and a three-piece joint.
- E) Check that an adequate gas distribution network exists. In particular, if the appliance is fuelled by:

Natural gas

Make sure that the gas supply pressure from the distribution network, when the appliance is in operation, is set to the value of 20 mbar (204 mm H₂O) (with a tolerance from 17 mbar to 25 mbar).

L.P.G. (Propane-Butane mix)

It is essential to fit a first-stage pressure reducer in proximity to the liquid gas tank to reduce pressure to 1.5 bar, and a second-stage pressure reducer for a further reduction from 1.5 bar to 30 mbar (306 mm H₂O) in proximity to the heater (with a tolerance from 20 mbar to 35 mbar).

L.P.G. (pure Propane)

It is essential to fit a first-stage pressure reducer in proximity to the liquid gas tank to reduce pressure to 1.5 bar, and a second-stage pressure reducer for a further reduction from 1.5 bar to 30 mbar (306 mm H₂O) in proximity to the heater (with a tolerance from 25 mbar to 35 mbar).

NOTE

If you are not sure what composition of L.P.G. is used, assume that it is a Propane-Butane mix and act accordingly.

3.3.2 ELECTRICAL CONNECTIONS

- A) Connect the appliance electrically using the socket supplied as standard and a **type H05 VVF 3x1.5 mm² cable, with a maximum external diameter of 8.4 mm.** For this operation, ensure that:
- power grid data corresponds to the data on the machine data plate (230 V/50 Hz single phase).
 - when the connection is made, the ground wire is kept longer than the live wire, so that it will be the last cable to be pulled out if the power supply cable is accidentally pulled out, thus ensuring that it remains grounded.

NOTE

Electrical safety of the appliance is achieved only when it is correctly connected to an efficiently grounding system, created in accordance with current safety legislation. Do not use gas pipes to ground electrical equipment.

- B) Provide a bipolar switch on the power supply line with minimum contact clearance of 3 mm. *“Bipolar” means that it may be opened on both phase and neutral.* This means that when it is opened, both contacts are open.
- C) The installation of an ambient thermostat **is obligatory**, whenever the control used does not provide it. The thermostat must be connected to the appliance as shown in the electrical assembly diagram (see Figure 22 on page 23). We recommend that the thermostat (or its sensor) is positioned approximately 1.5 m from the floor, away from draughts or direct sunlight and other direct heating sources (lights, warm flows of air from the appliance itself, etc.) and, if possible, **NOT on outside-facing walls**, so as not to give false temperature readings and therefore compromise operation of the plant. **IN THIS WAY, UNDESIRE SWITCHING ON AND OFF OF THE PLANT WILL BE AVOIDED AND OPTIMAL COMFORT WILL BE ENSURED IN THE ROOM.**
- In addition to the ambient thermostat it is necessary to install one of the control units that ROBUR supplies as optional accessories (for further information, see the paragraph entitled “List of accessories” on page 27.)

NOTE

Control cables (in particular those connected to the control units and temperature sensors) **must be protected from interference created by power cables.** Such protection may be obtained, for example, either by shielding the cables or by laying them in separate channels from the power cables.

- D) If it is not intended to use one of these accessories, it is nonetheless necessary to install, as well as the thermostat:
- 1 switch to control summer/winter operation of the heater, to connect to poles 1, 2 and 3 of the terminal board (see electrical assembly diagram on page 23)
 - 1 switch to control operation at maximum and reduced power, to connect to poles 8 and 3 of the terminal board (see electrical assembly diagram on page 23)
 - 1 illuminated switch to signal arrest of the heater, to connect to poles 5, 6 & 7 of the terminal board (see electrical assembly diagram on page 23)

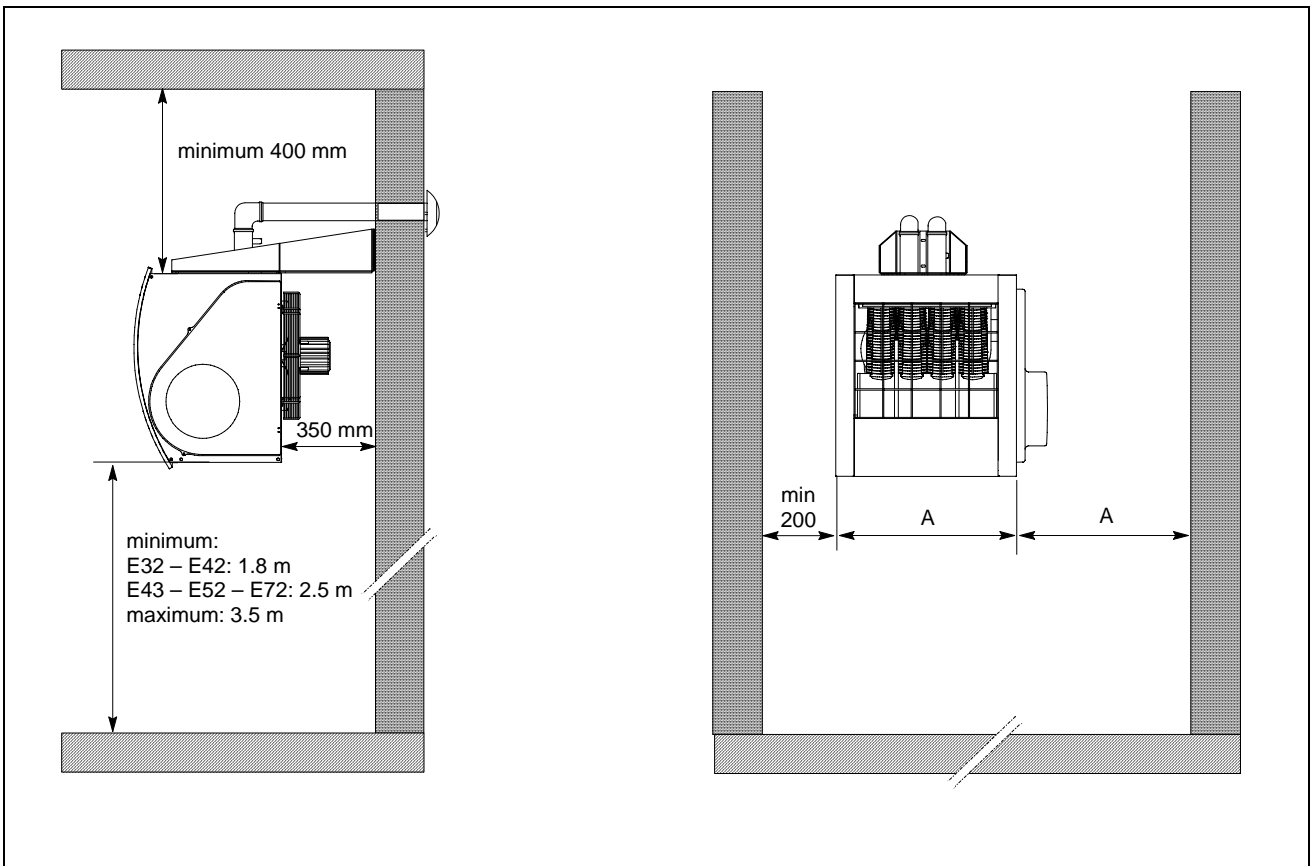


Figure 5 – CLEARANCES

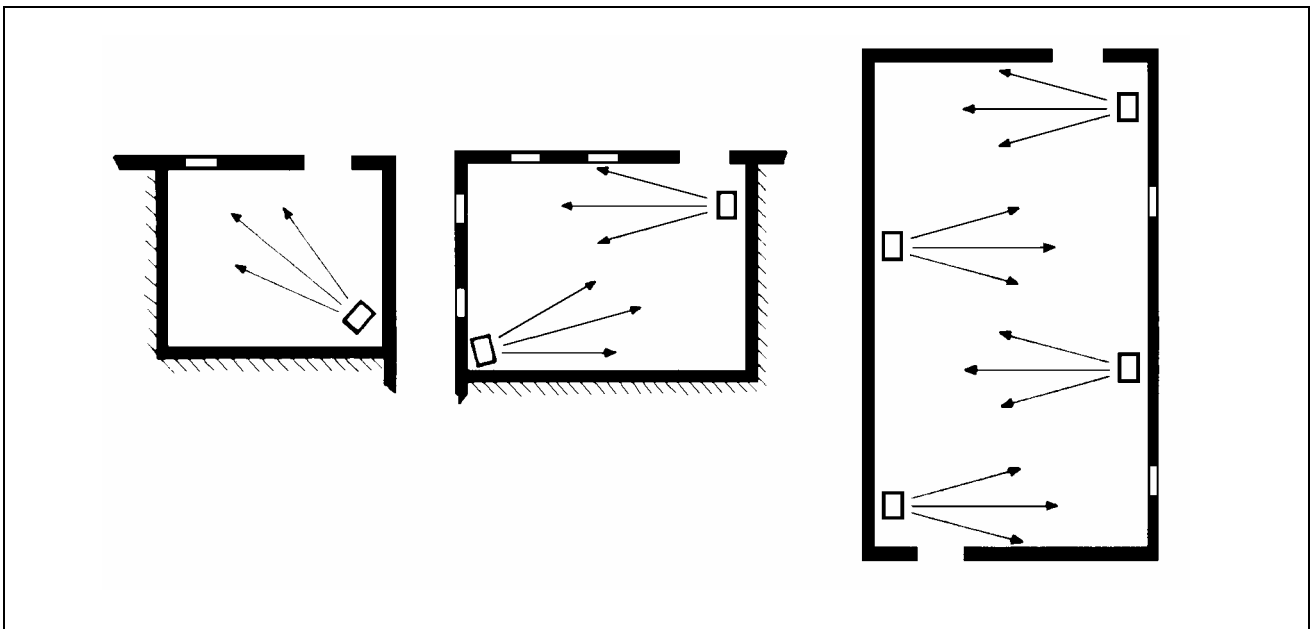


Figure 6 – EXAMPLES OF INSTALLATION

3.3.3 SIZING AND INSTALLATION OF COMBUSTION AIR AND EXHAUST GAS PIPES

The Evoluzione series of warm air heaters may be installed in one of the following ways:

- type **B₂₃** installation: in this type, combustion air intake occurs inside the room, while exhaust gas outlet takes place outside, via a special pipe, that may be either horizontal or vertical. In this type of installation, the appliance is not sealed off from the room (see Figure 7 and Figure 8)
- type **C₁₃** and **C₃₃** installation: the outlet of exhaust gases and intake of combustion air occur outside, through coaxial or separate pipes, on a wall (for **C₁₃** see Figure 9 or Figure 10) or on the roof (for **C₃₃** see Figure 11). In this way the appliance is sealed from the room in which it is installed.
- type **C₅₃** installation: the outlet of combustion products and combustion air intake occur through separate pipes that exit on the outside of the building, on different walls. This type allows wall-based air intake and exhaust gas outlet far from the appliance, or via the roof (see Figure 12).
- type **C₆₃** installation: with this type, exhaust outlet/air intake systems can be created using commercially available tubes, bends and terminals, on condition that they are approved for this type of appliance. In addition, pipes with a diameter of more than 80 mm can be used: for example when it is necessary to create air/exhaust systems of considerable length. With this type, for the calculation of the air/exhaust system, reference should be made to the data supplied by the pipe manufacturer, as well as to the composition, flow rate and temperature of the exhaust gases (see Table 2).

In any case, use approved pipes according to the type of installation that is to be carried out. ROBUR S.p.A. can supply to order rigid pipes, coaxial pipes and approved terminals.

In order to size the pipe system, it is necessary to calculate the total pressure drop generated by the system itself.

The maximum and minimum admissible total pressure drop depend on the model of appliance (see Table 2).

Table 3 gives the pressure drops, for Ø 80 and Ø 100, for the air pipes and coaxial pipes supplied by ROBUR.

The pressure drops of the external terminals, being extremely small, can be disregarded.

In the design stage, it is necessary to verify that the sum of the pressure drops of the pipe system is higher than the minimum admissible pressure drop and that it is lower than the maximum admissible pressure drop of the appliance (see Table 2). The following pages give an example of how to calculate pressure drops.

The maximum lengths of the air pipe and the exhaust gas pipe, in relation to the type of installation carried out, are given in Table 4. The lengths should be taken as APPROXIMATE, and in the case of standard installations in which the air pipe and the exhaust gas pipe are routed in a linear fashion as shown in Figure 7, Figure 8, Figure 9, Figure 10, Figure 11 and Figure 12.

NOTE

It is ALWAYS necessary to install a condensate separator (see detail D in Figure 8), available as an accessory (Code O-SCN000).

NOTE

In the case of installations with horizontal pipes of more than 1 metre in length, in order to prevent drops of condensate reaching the appliance, it is necessary to install the exhaust gas pipe with a counterslope of 1 or 2 cm for each metre of length.

In addition, for the correct installation of external terminals for outlet of combustion products and intake of combustion air, follow the indications given in Figure 13.

NOTE

If the integrated upper mounting bracket is not used, to make connection of the heater and the air/exhaust gas pipes easier, ROBUR supplies as an accessory an "air/exhaust gas pipe connector kit" (Code O-SCR010) that includes 2 adaptors Ø 80 with element for drawing exhaust gases/air (see detail C of Figure 8) and gasket.

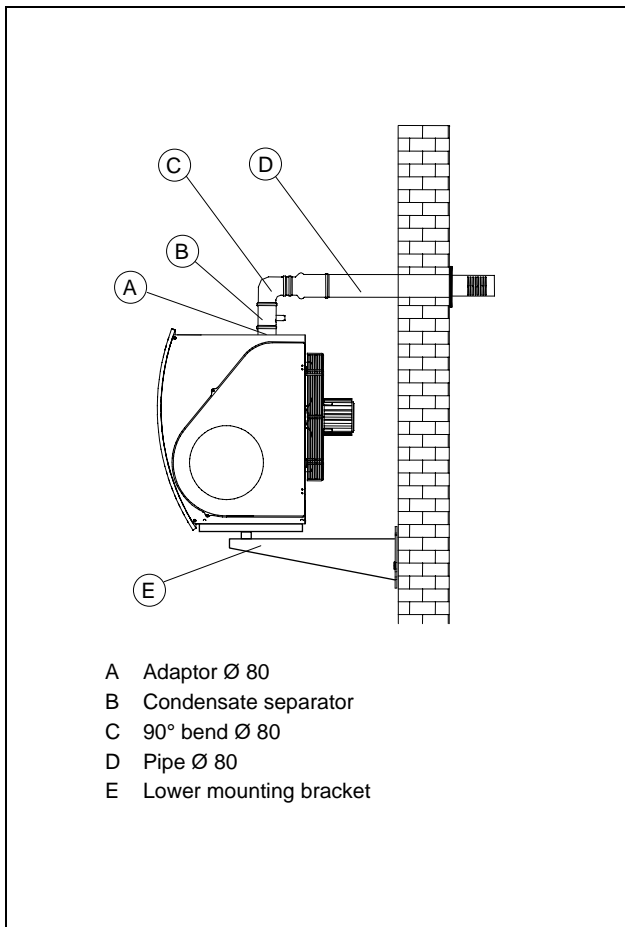


Figure 7 – TYPE B23 INSTALLATION WITH WALL-BASED EXHAUST OUTLET

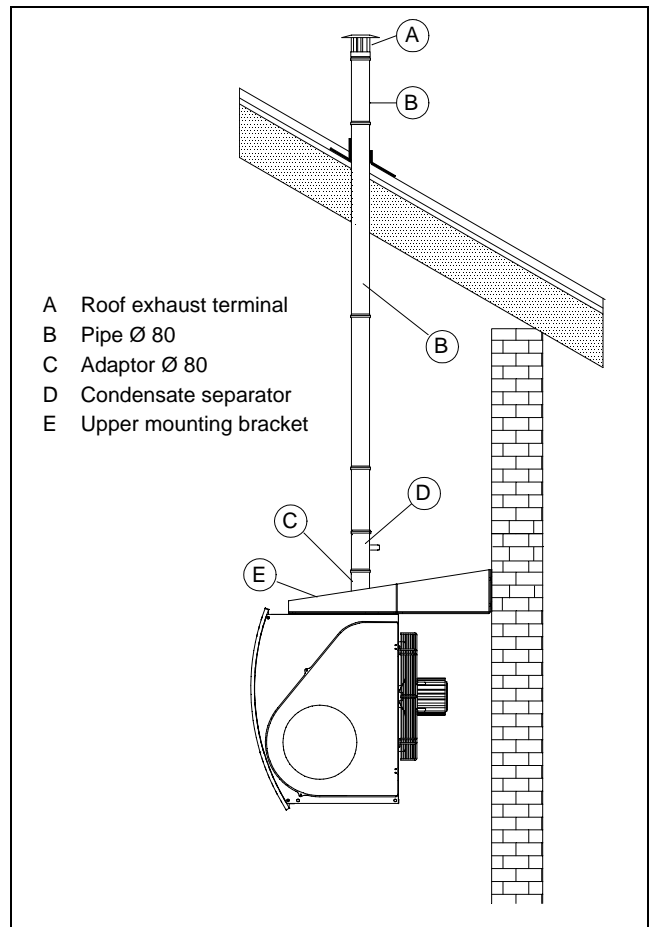


Figure 8 - TYPE B23 INSTALLATION WITH ROOF-BASED EXHAUST OUTLET

DATA FOR CALCULATION OF AIR/EXHAUST GAS SYSTEM WITH COMMERCIALY AVAILABLE PIPES						
MOD.	TEMPERATURE EXHAUST GASES °C	FLOW RATE OF EXHAUST GASES IN MASS kg/h	CO ₂ CONTENT IN EXHAUST GASES %		ADMISSIBLE PRESSURE DROP	
			NATURAL GAS	LPG	MIN (Pa)	MAX (Pa)
E 32	150	43.3	9.0	9.5	5	30
E 42	170	57.5			7	40
E 43	170	62.5			8	40
E 52	170	79.1			10	50
E 72	175	116.2			10	80

Table 2

DATA FOR CALCULATION OF AIR/EXHAUST GAS SYSTEM WITH PIPES Ø 80 OR Ø 100 SUPPLIED BY ROBUR ON REQUEST												
MOD.	PRESSURE DROP FOR COMPONENTS Ø 80						PRESSURE DROP FOR COMPONENTS Ø 100					
	PIPE (Pa/m)		90°BEND (Pa)		COAXIAL (Pa)		PIPE (Pa/m)		90°BEND (Pa)		COAXIAL ROOF (Pa)	
	EXH.	AIR	EXH.	AIR	WALL	ROOF	EXH.	AIR	EXH.	AIR		
E 32	0.70	0.36	1.05	0.54	2.5	4.4	0.26	0.10	0.39	0.15	3.1	
E 42	1.20	0.60	1.80	0.90	4.2	12.3	0.40	0.20	0.60	0.30	7.9	
E 43	1.39	0.74	2.08	1.11	4.9	14.6	0.45	0.27	0.67	0.40	10.1	
E 52	2.26	1.16	3.39	1.74	9.7	25.6	0.76	0.40	1.14	0.60	16.9	
E 72	4.95	2.54	7.42	3.81	13.5	48.7	1.66	0.86	2.50	1.30	31.9	

Table 3

NOTE

For each "T"-shaped element, consider an increase in length of 2 metres.
For each 45° bend, calculate an increase in length of 0.75 metres.

APPROXIMATE MAXIMUM LENGTHS ALLOWED FOR EACH TYPE OF INSTALLATION

MOD.	TYPE OF INSTALLATION							
	B 23		C 13		C 33			C 53
	PIPE Ø 80		SEPARATE PIPES Ø 80	COAXIAL WALL Ø 80	COAXIAL ROOF			
	HORIZONTAL	VERTICAL			Ø 80	Ø 100		
	EXHAUST GAS	EXHAUST GAS	PIPES Ø 80	PIPES Ø 80	PIPES Ø 80	PIPES Ø 100	PIPES Ø 100	SEPARATE PIPES Ø 80
		AIR/EXH.	AIR/EXH.	AIR/EXH.	AIR/EXH.	AIR/EXH.	AIR/EXH.	
E 32	20	20	16+16	14+14	13+13	15+15	20+20	1+15
E 42	20	20	14+14	13+13	12+12	14+14	20+20	1+15
E 43	20	20	13+13	12+12	10+10	12+12	20+20	1+15
E 52	20	20	10+10	8+8	7+7	9+9	15+15	1+15
E 72	15	15	7+7	7+7	4+4	6+6	15+15	1+10

Table 4

NOTE

If your installation does not correspond with the figures given in Table 4 above (e.g. type C13 installation of an E 52 with air pipe diameter Ø 80 length 10 m and exhaust gas pipe diameter Ø 80 length 16 m), it is necessary to calculate the pressure drop of the pipe system and verify that the sum is not greater than the admissible pressure drop, or alternatively to contact ROBUR's Pre-sales service on 035/888111.

CALCULATION – AN EXAMPLE

Let us hypothesise that we are installing an E 43 heater. The air/exhaust gas system will be created from separate pipes, Ø 80, in the following way:

- 20 metres of exhaust gas pipe Ø 80
- Four 90° bends, Ø 80, on the exhaust gas pipe
- 8 metres of air pipes, Ø 80

It is now possible to proceed with a test calculation, remembering that the minimum admissible pressure drop is 8 Pa while the maximum admissible pressure drop is 40 Pa (see Table 2).

	Quantity		Pressure drop			
Exhaust gas pipe Ø 80	20 m	x	1.39 Pa	=	27.8 Pa	+
90° bends on exhaust gas pipe	4	x	2.08 Pa	=	8.32 Pa	+
Air pipe Ø 80	8 m	x	0.74 Pa	=	5.92 Pa	=
Total pressure drop					42.04 Pa	

The total pressure drop of the pipe system is higher than the maximum admissible pressure drop (42.04 Pa, HIGHER than 40 Pa). Therefore, the installation IS NOT PERMITTED.

Installation will be possible if one of the following measures is adopted:

- reducing the length of the air/exhaust gas pipes;
- reducing the number of bends in the exhaust gas pipe;
- increasing the diameter of the pipes to 100mm

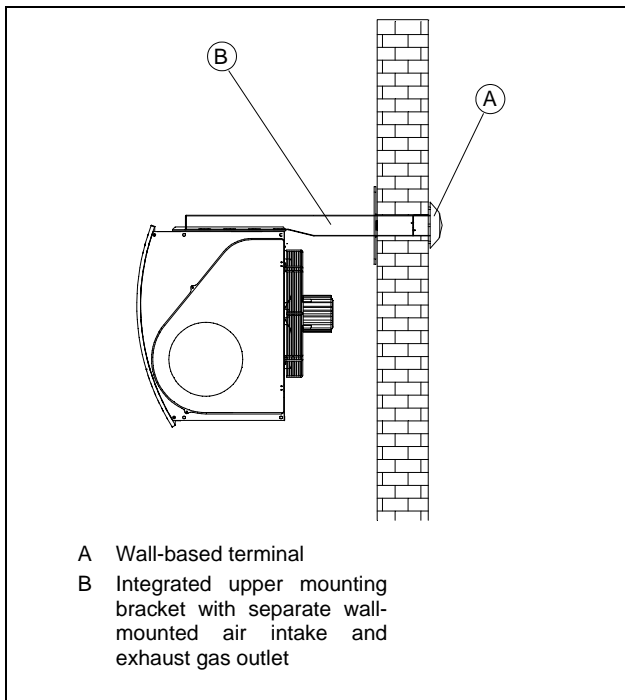


Figure 9 – TYPE C13 INSTALLATION WITH SEPARATE WALL-MOUNTED PIPES

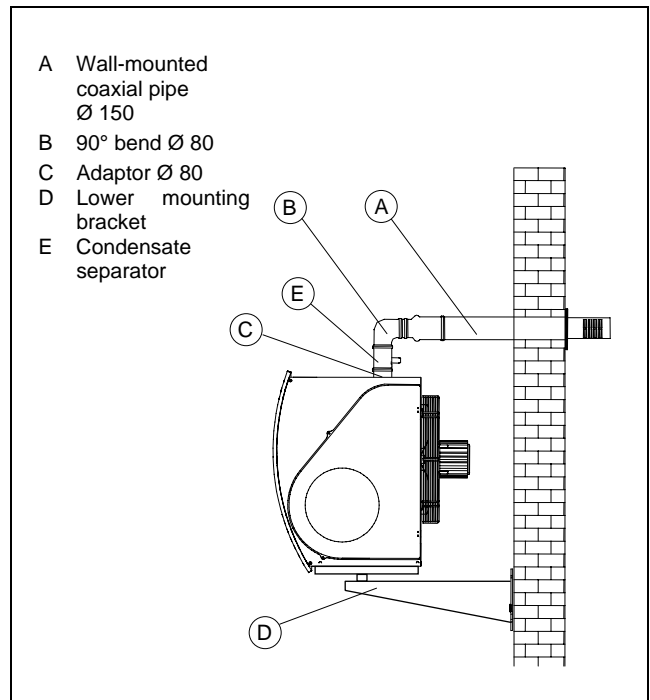


Figure 10 – TYPE C13 INSTALLATION WITH WALL-MOUNTED COAXIAL PIPES

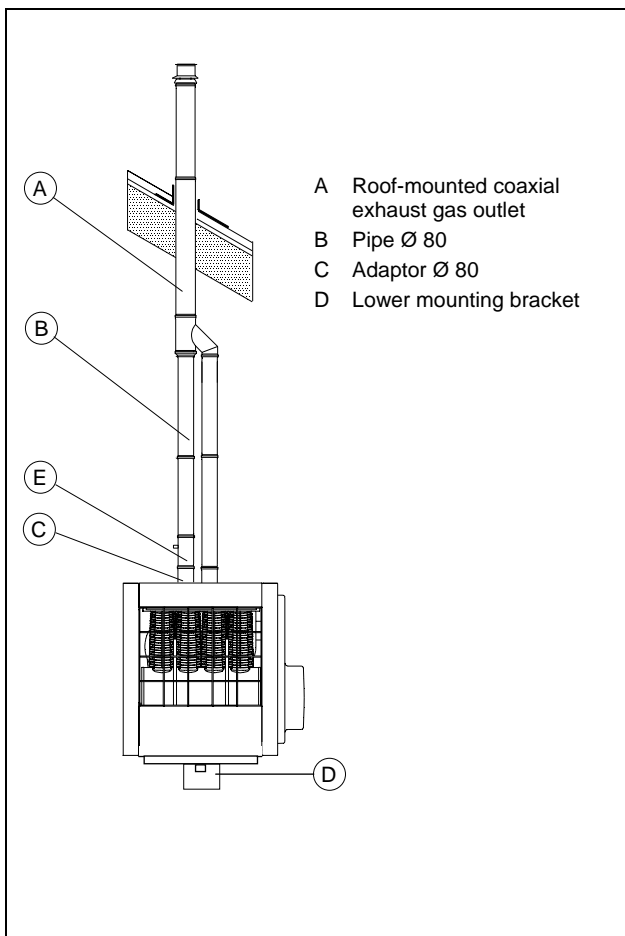


Figure 11 – TYPE C53 INSTALLATION WITH ROOF-MOUNTED COAXIAL PIPE

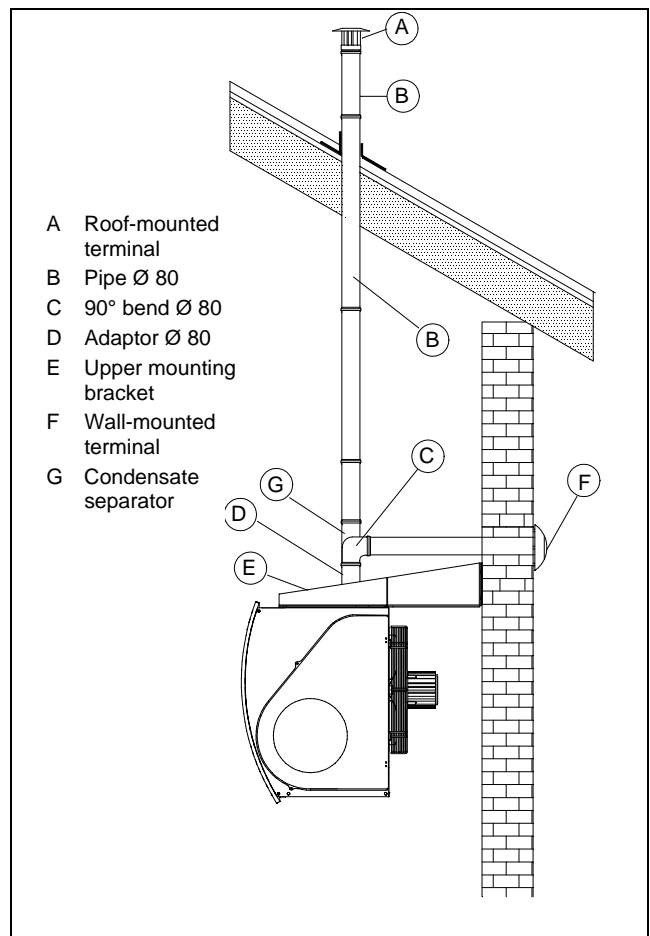


Figure 12 – TYPE C53 INSTALLATION WITH ROOF-MOUNTED EXHAUST GAS OUTLET AND WALL-MOUNTED AIR INTAKE

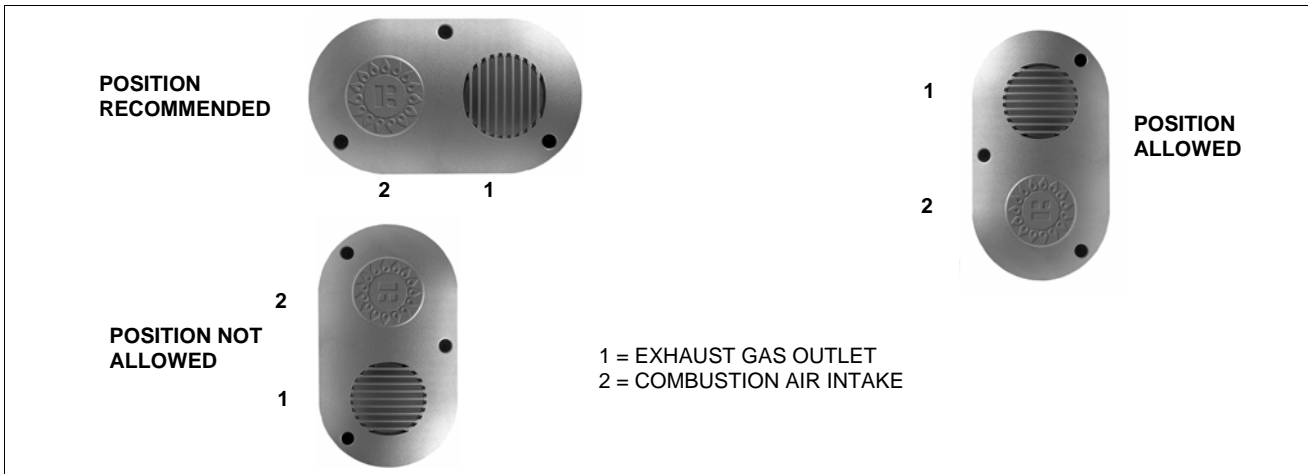


Figure 13 – POSITIONS OF WALL-MOUNTED TERMINAL

3.3.4 WALL INSTALLATION

For the installation of its Evoluzione heaters, ROBUR S.p.A. supplies various types of mounting brackets (as optional extras) from which to choose according to the type of exhaust outlet to be created. In particular:

- upper mounting bracket. This supports the heater from above, and is supplied complete with condensate drain and air/exhaust gas pipe connection kit with elements for drawing air/exhaust gas (see Figure 31).
- upper mounting bracket with integrated wall-mounted outlets (see Figure 32). This bracket performs two functions: supporting the heater from above, and intake and outlet of combustion products. It is supplied complete with an external dual wind-protected terminal.
- Adjustable lower mounting bracket. This supports the heater from below and allows it to adjusted by $\pm 30^\circ$ in relation to the wall used for installation; it is supplied complete with condensate drain and air/exhaust gas pipe connection kit with elements for drawing air/exhaust gas (see Figure 33).
- tubular support bracket. This supports the heater from below, and is supplied complete condensate drain and air/exhaust gas pipe connection kit with elements for drawing air/exhaust gas (see Figure 34).

If it is not intended to use these accessories, refer to the diagram below. As regards fixing the appliance to the support shelf, fix the latter with 4 M10 bolts.

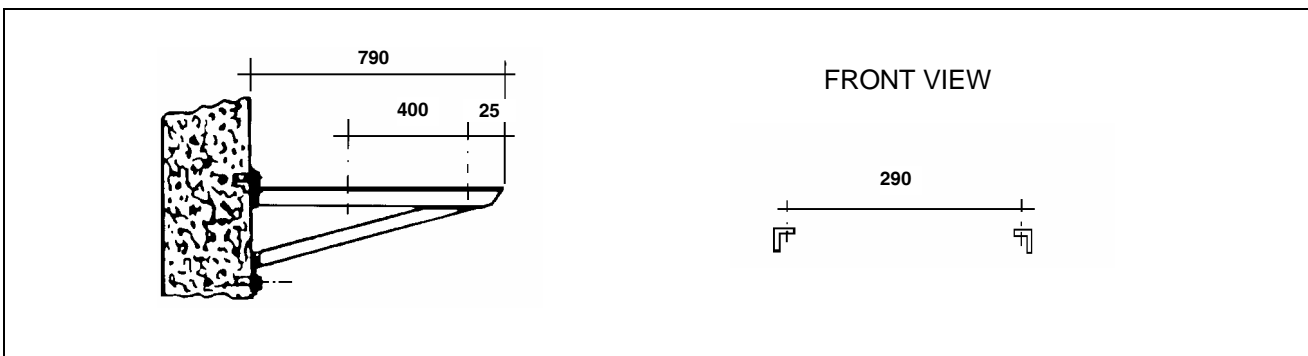


Figure 14

3.3.5 PROCEDURE FOR CHECKING & ADJUSTING CALIBRATION OF THE NOVAMIX VALVE SIT 822

WARNING

These operations must be carried out by **qualified personnel**. Wrong or careless assembly or fitting of the gas circuit can cause dangerous gas leaks and in particular in areas that are tampered with. Use, too, adequate sealants on all connections.

Each heater is tested and approved in the factory for operation with G20 natural gas.

The calibration of the valve must be carried out **ONLY** if the gas valve is replaced.

After calibration is completed, the valve's adjusting screws, A and B, must be sealed. After calibration, check the sealing of the screws of the pressure intakes with soapy water or other suitable means.

- A) Completely unscrew the air/gas ratio adjustment screw A (Figure 15), turning it anticlockwise.
- B) Tighten screw B (Figure 15) until flush, turning it clockwise.
- C) Connect a differential manometer, with a resolution of at least 5 Pascal, in the following way:
 - the positive connector (+) to the blower gas pressure intake D (Figure 15) on the gas valve;
 - The negative connector (-) in parallel to the silicon tube that connects the blower (connector "G", Figure 18) to the open valve signal input F (this operation is made possible by inserting a "T" connector between the silicon tube and the input (connector "F") to the valve as indicated in Figure 17.
- D) Start the heater and select minimum operating power.
- E) Check that the difference in pressure read on the differential manometer corresponds to the OFFSET value (pressure at the burner – pressure at the blower) indicated in Table 5.
- F) If the OFFSET value detected is more than +/- 0,1 mbar off of the valued indicated in Table 5, adjust the valve by turning OFFSET adjustment screw C.

WARNING

If the readout of the differential manometer is not sufficiently stable to carry out a correct calibration of the offset, we suggest inserting a damping nozzle (ROBUR optional accessory Code B-GLL103) in the silicone tube connected to the positive connector (pressure at the burner).

- G) Switch operation of the heater to maximum power and check that the offset value does not change from that indicated at minimum power (tolerance +/- 0.1 mbar).
- H) Visually check that the burner does not show signs of reddening at either minimum or maximum power.
- I) Switch the heater off and on, and check the offset calibration again at minimum and maximum power.
- J) Switch off the heater, disconnect the differential manometer from the valve's gas pressure intake "F" and the burner's "G", restore the connection of the silicone tube to the gas valve's connector "F" and tighten until flush screw "D" (Figure 15) of the gas pressure intake.

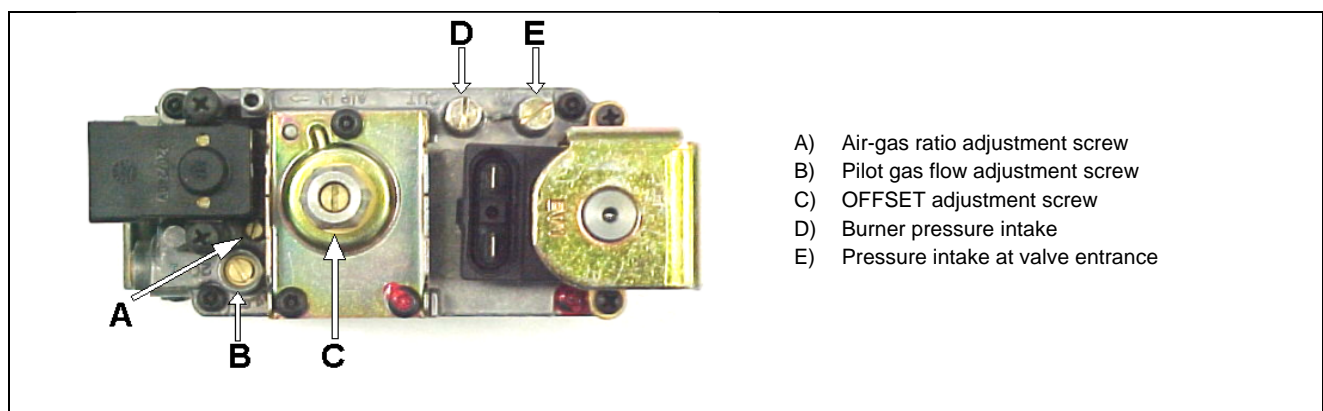


Figure 15 – Novamix SIT 822 gas valve

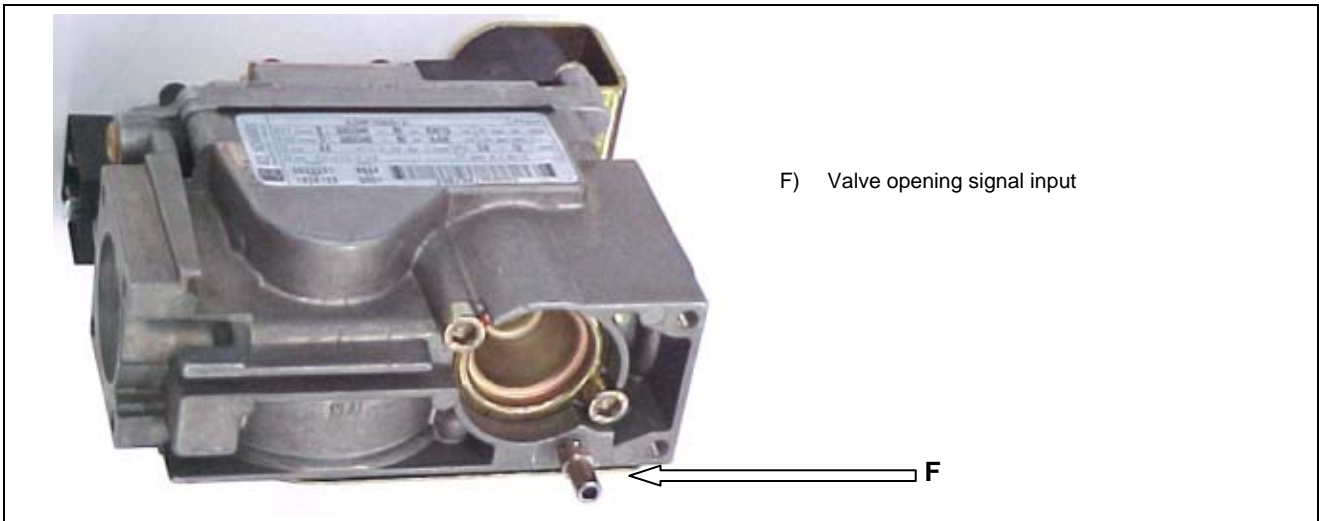


Figure 16 – Novamix SIT 822 gas valve

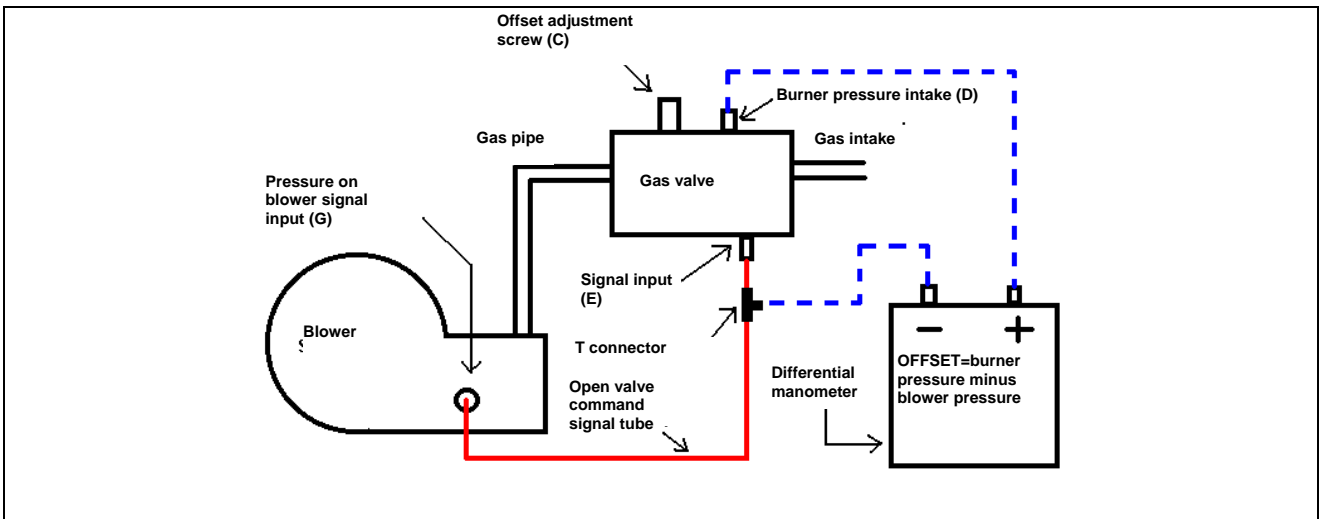


Figure 17

OFFSET VALUES					
MODEL	E 32	E 42	E 43	E 52	E 72
OFFSET [mbar]	0	0	-0,3	0	0

Table 5 – OFFSET VALUES

3.3.6 GAS CHANGE

WARNING

These operations must be carried out by **professionally qualified personnel**. Wrong or careless fitting and installation of the gas circuit may cause dangerous gas leaks in the whole circuit and in particular in areas that are tampered with. In addition, adequate sealants must be used on all connections.

If the type of gas indicated on the label does not correspond to that which is to be used, the appliance must be converted and adapted to the type of gas that is going to be used.

To carry out this operation, proceed as follows:

- A) Remove both the gas and electricity supply.
- B) Unscrew the hexagonal nut that connects the gas pipe to the connector of the nozzle base (Figure 18). **Take care not to lose or damage the round internal seal.**

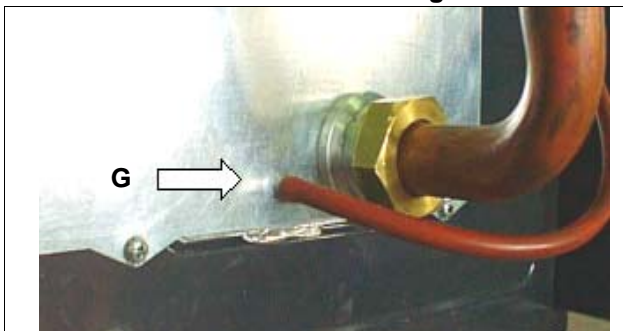


Figure 18 – EXIT OF PRESSURE SIGNAL GENERATED BY BLOWER

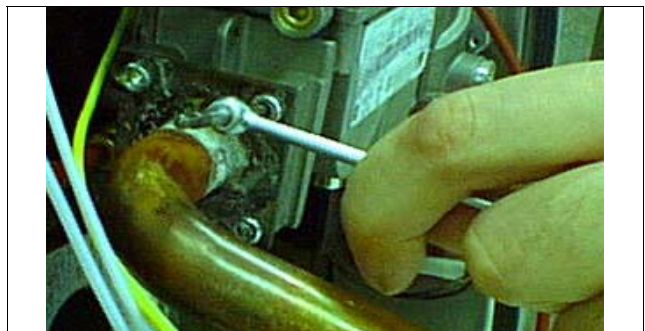


Figure 19

- C) Loosen, without removing, the 4 screws that fix the gas supply pipe to the valve (Figure 19).
- D) Move the gas pipe and extract the nozzle, with the help of a screwdriver for leverage if necessary (see Figure 20).
- E) Remove the o-ring seal from the nozzle and fit it to the new nozzle.
For the type of nozzle suitable for the model of heater refer to Table 6.
- F) Insert the new nozzle in its seating.

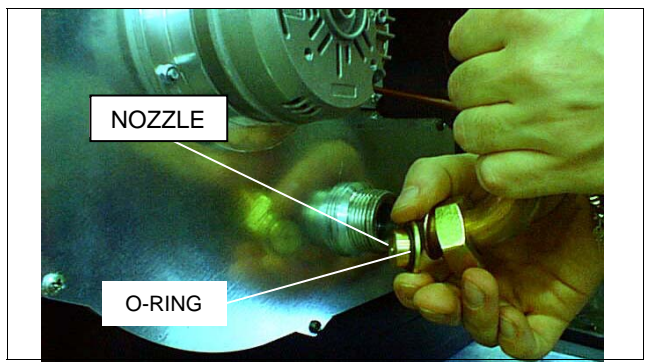


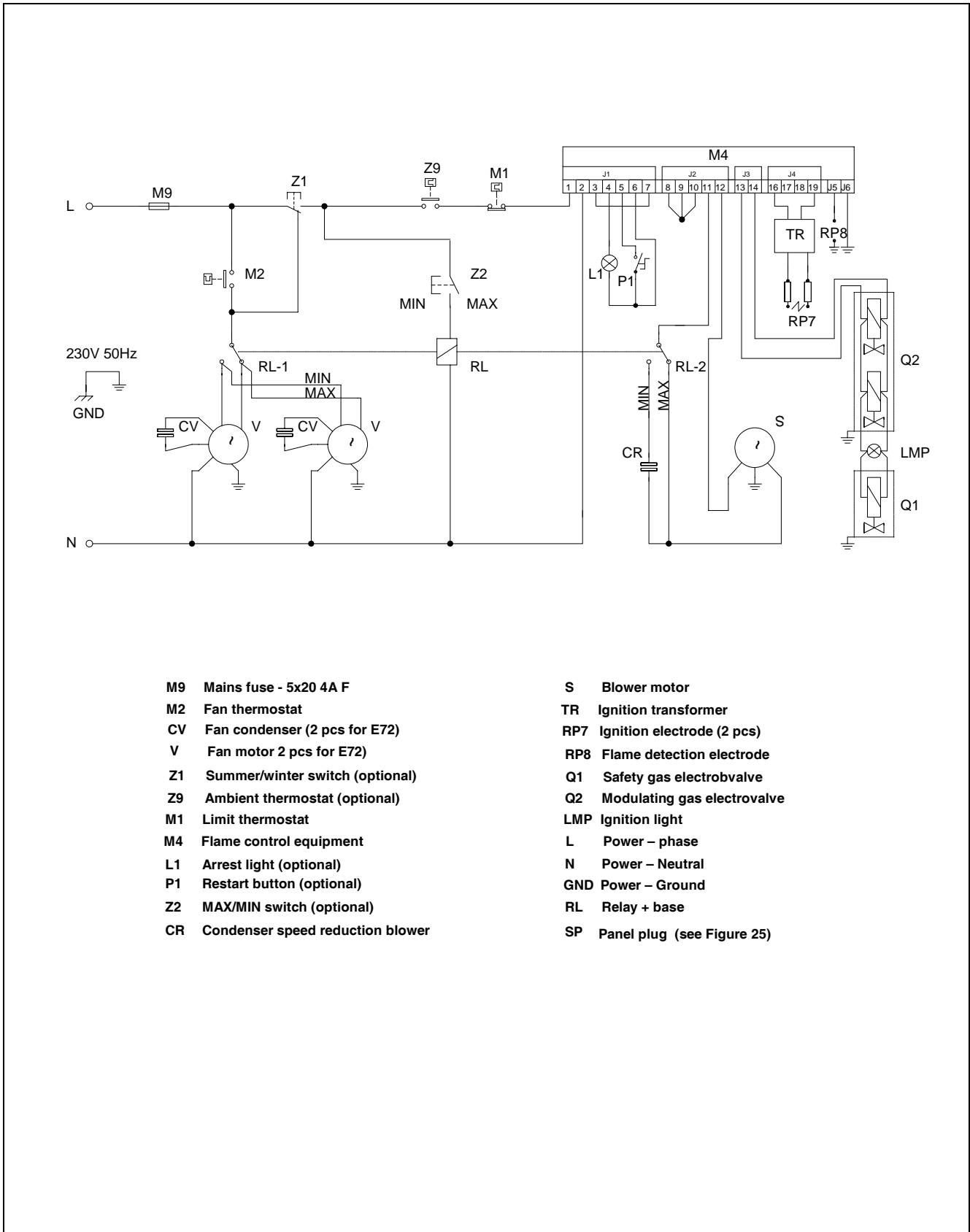
Figure 20

- G) Refit the gas pipe, checking that the round seal in the metal nut and the square seal on the valve exit are firmly in place. Tighten the nut to a locking torque of 62 ± 2 Nm; tighten the valve screws and carry out calibration checks.
- H) Calibrate the appliance for the new gas type; adjusting the pressure to the burner as described in the previous paragraph "Checking and adjusting operating gas pressure".
- I) While the appliance is in operation, check the sealing of all gas connections with soapy water or by another suitable means, including those that have not been handled during the operation.
- J) Replace the sticker indicating the type of gas applied on the appliance with one indicating the new type of gas.

NATURAL GAS AND L.P.G. NOZZLES		E 32	E 42	E 43	E 52	E 72
Natural gas (G20)	diameter (mm)	4.60	5.50	5.90	7.20	10.3
	stamped code	108	119	074	120	121
LPG	diameter (mm)	3.50	4.25	4.50	5.40	7.50
	stamped code	117	122	123	073	124

Table 6

3.3.7 FUNCTIONAL WIRING DIAGRAM



- | | |
|--|---------------------------------------|
| M9 Mains fuse - 5x20 4A F | S Blower motor |
| M2 Fan thermostat | TR Ignition transformer |
| CV Fan condenser (2 pcs for E72) | RP7 Ignition electrode (2 pcs) |
| V Fan motor 2 pcs for E72) | RP8 Flame detection electrode |
| Z1 Summer/winter switch (optional) | Q1 Safety gas electrovalve |
| Z9 Ambient thermostat (optional) | Q2 Modulating gas electrovalve |
| M1 Limit thermostat | LMP Ignition light |
| M4 Flame control equipment | L Power – phase |
| L1 Arrest light (optional) | N Power – Neutral |
| P1 Restart button (optional) | GND Power – Ground |
| Z2 MAX/MIN switch (optional) | RL Relay + base |
| CR Condenser speed reduction blower | SP Panel plug (see Figure 25) |

Figure 21 – FUNCTIONAL WIRING DIAGRAM

3.3.8 ASSEMBLY WIRING DIAGRAM

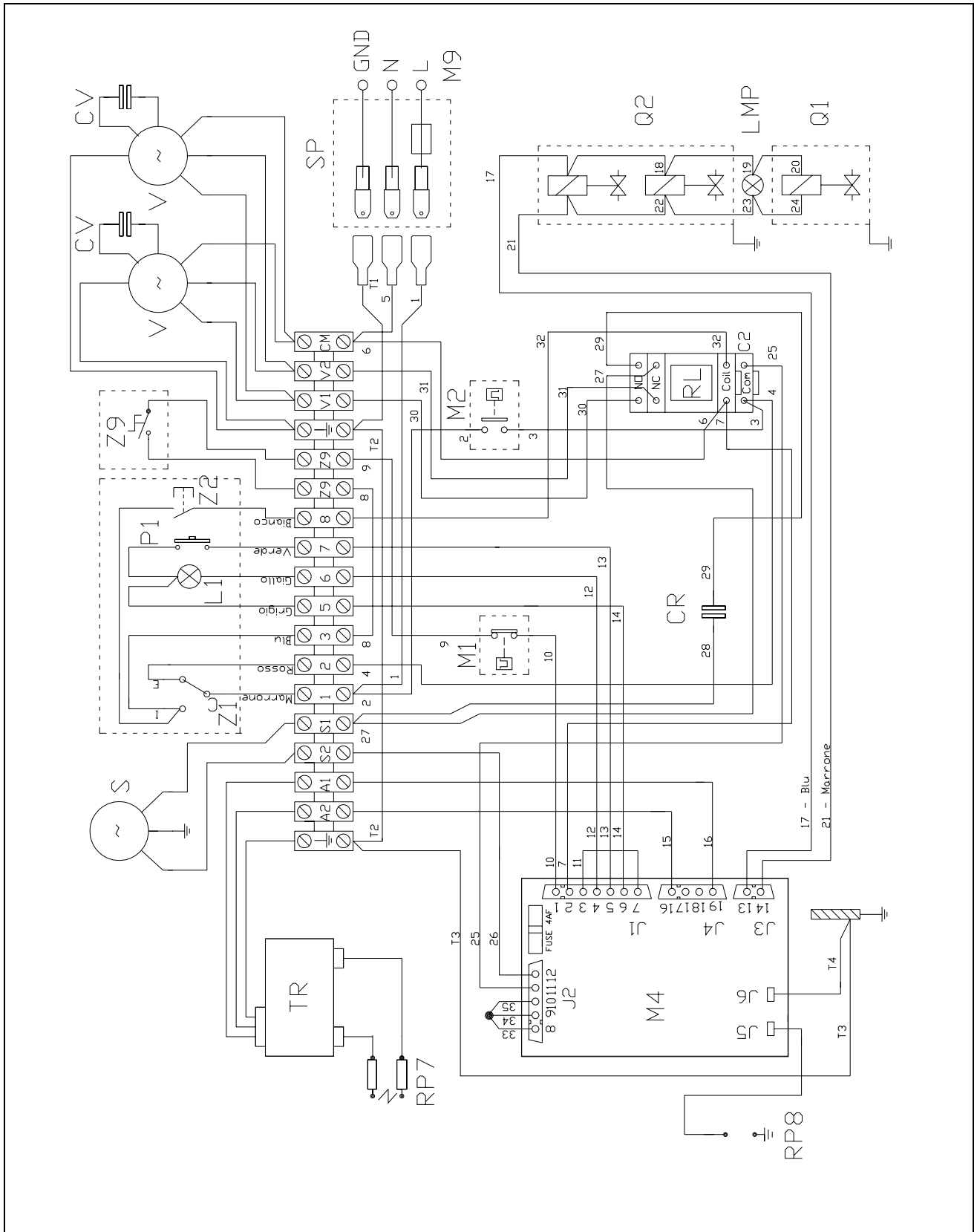


Figure 22 – ASSEMBLY WIRING DIAGRAM (SEE KEY TO Figure 21)

3.3.9 WIRING DIAGRAMS FOR THE INSTALLATION OF SEVERAL HEATERS

ROBUR has control units for the control and management of several heaters (see “List of accessories” on page 27). If these controls are not used, follow the diagrams below.

NOTE

In these conditions, power and ventilation modulation will not occur.

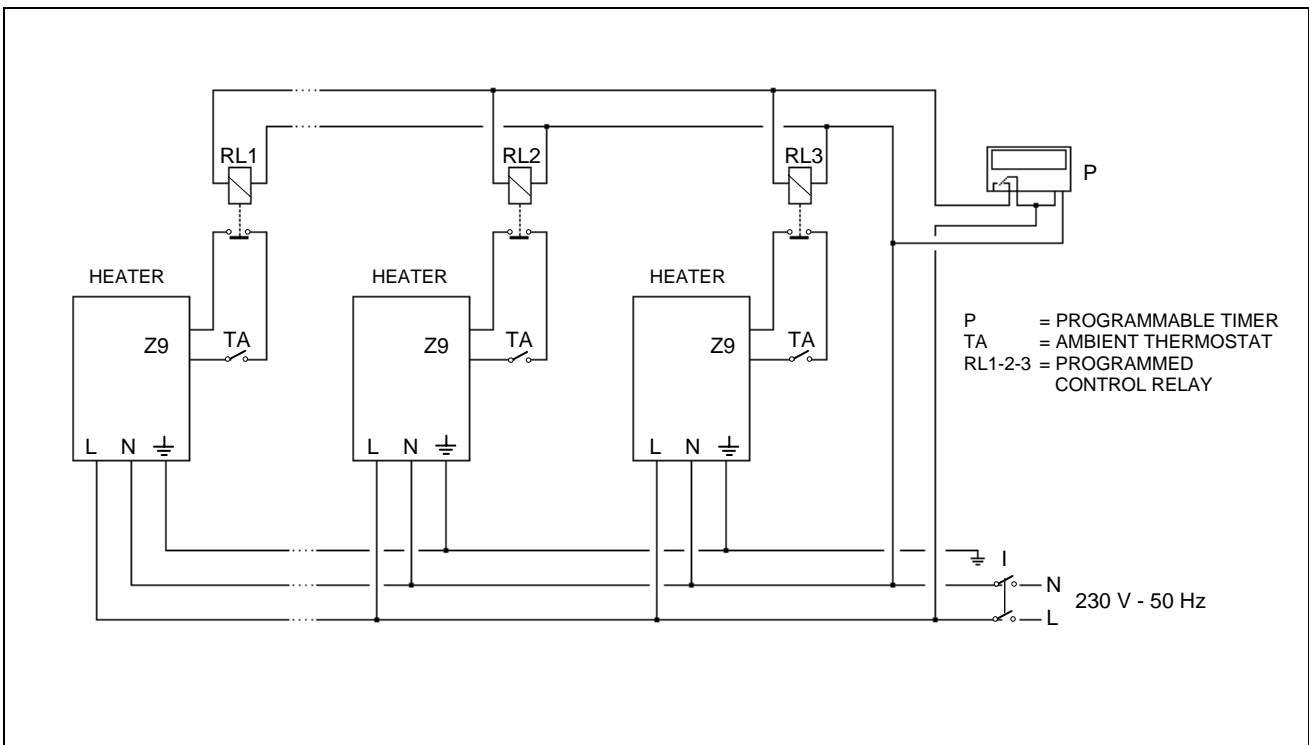


Figure 23 – WIRING DIAGRAM FOR OPERATION OF SEVERAL HEATERS WITH A SINGLE TIMER AND SEVERAL THERMOSTATS

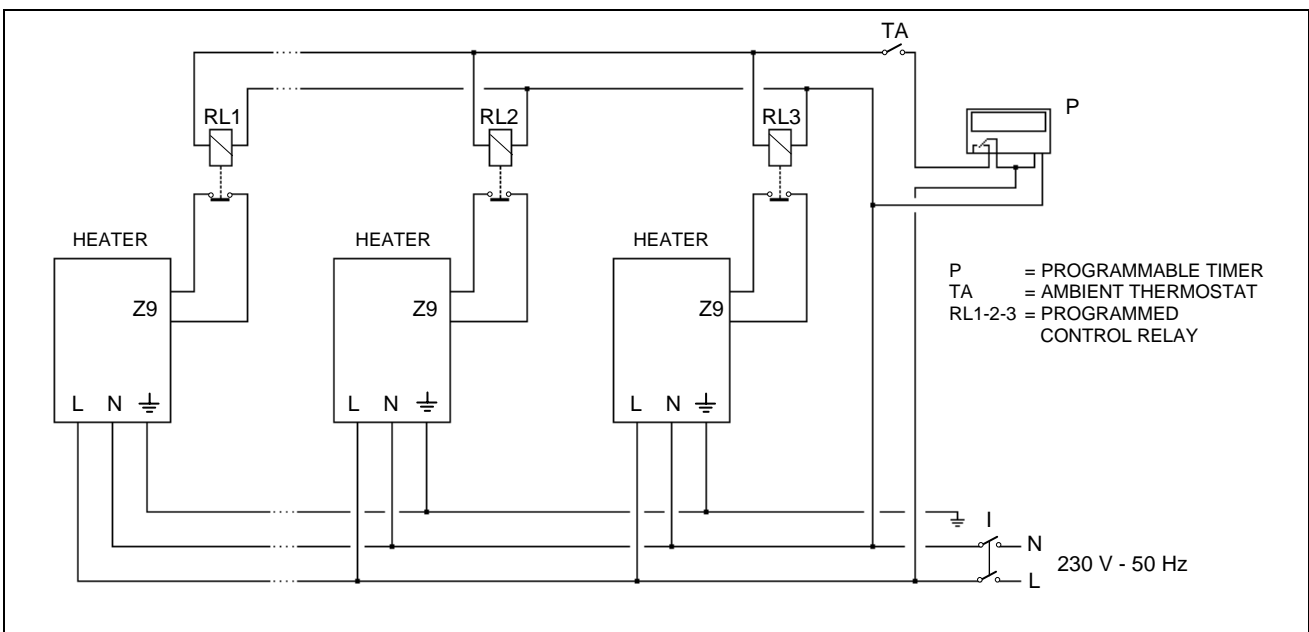


Figure 24 – WIRING DIAGRAM FOR OPERATION OF SEVERAL HEATERS WITH A SINGLE TIMER AND A SINGLE AMBIENT THERMOSTAT (solution with several relays)

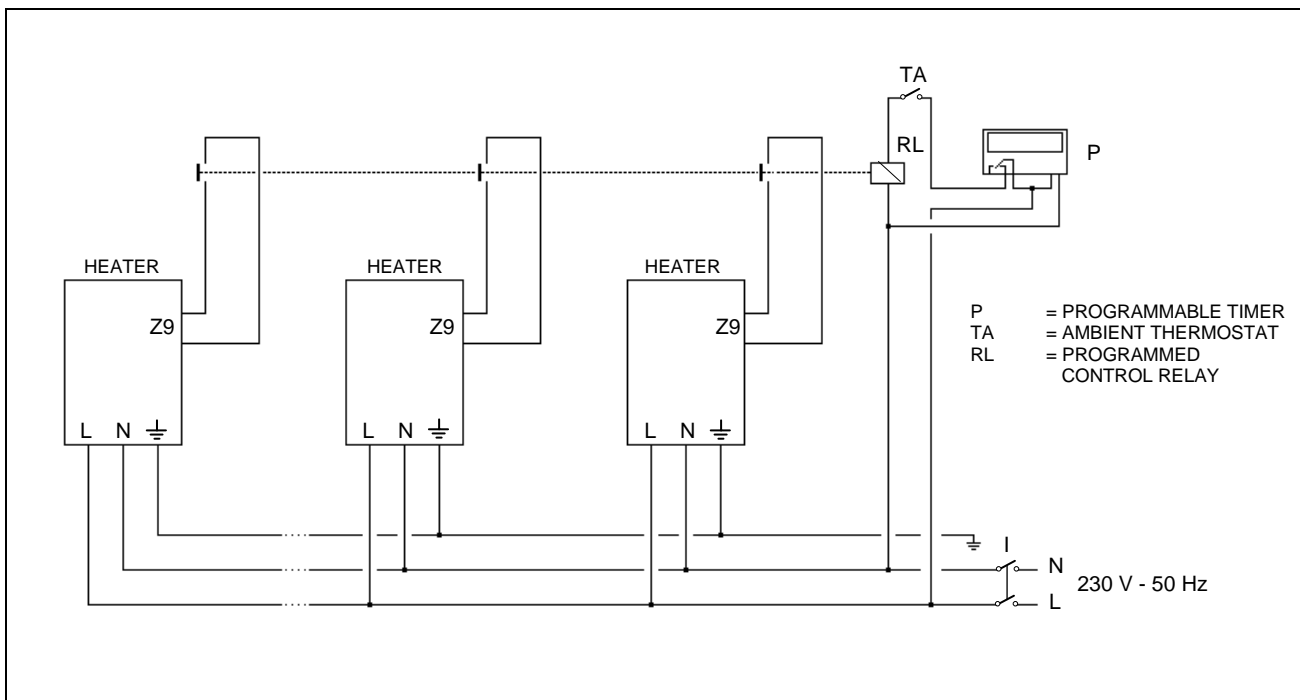


Figure 25 – WIRING DIAGRAM FOR OPERATION OF SEVERAL HEATERS WITH A SINGLE PROGRAMMABLE TIMER AND A SINGLE AMBIENT THERMOSTAT (solution with single relay)

3.4 SERVICE

NOTE

All maintenance and service operations must be carried out by an **Authorised Service Centre**.

3.4.1 POSSIBLE OPERATING ANOMALIES

Before performing specific checks, make sure that:

- A) The appliance is powered (230 V ± 10% 50 Hz) and that it has an adequate grounding system.
- B) There is a supply of gas.
- C) Pressures and flows fall within the limits specified by the manufacturer. A lower pressure reading than that indicated by the manufacturer corresponds to insufficient gas supply. The causes may be:

If the appliance runs on natural gas:

- Inadequate meter
- excessive length and/or number of bends in the gas piping for the diameter used

If the appliance runs on L.P.G.:

- it may happen that after initial switch-off of the burner, upon switching on again, the appliance fails to start. In this case it is possible that the reducer has insufficient flow capacity
- if the indicated pressure is not reached it is possible that the pressure reducer on the tank does not have sufficient flow capacity, or that the length and/or number of bends in the gas piping are excessive in relation to the diameter used

Only at this point should you proceed with checking for the specific failure.

NOTE

Before opening the door on the side of the appliance to gain access to the electrical panel, **REMOVE ELECTRICAL POWER** from the appliance using the omnipolar switch located upstream of the appliance or by disconnecting the power plug.

3.4.2 TYPES OF FAILURE AND POSSIBLE COURSES OF ACTION

In case of failure contact your local **Authorised Service Centre**.

Case 1: The appliance fails to start during ignition phase

- A) The correct phase connection has not been respected.
- B) The ignition electrodes are broken or incorrectly positioned.
- C) The flame detector electrode is broken, incorrectly positioned, or is touching the earth of the equipment.
- D) Damage to the ignition transformer or to its electrical connections.
- E) Damage to the gas valve or to its electrical connections.
- F) Inefficient grounding system.
- G) Air present in the gas piping.
- H) Incorrect calibration of gas pressure to burner.

Case 2: Arrest of the appliance during operation

- A) Gas not supplied due to damage to gas plant; the central control unit repeats the ignition cycle, after which it closes the gas valve, thereby arresting the appliance (accidental interruption to gas supply).
- B) Electrical power not received due to damage to the external electricity supply system; if electrical power is absent for a prolonged period, the limit thermostat (M1) is activated, arresting the machine and preventing it from being switched on again. When power returns, it must be reset by pressing the button located on the thermostat itself on the outside of the appliance under the black screw-cap (see Figure 3).
- C) The flame detector electrode touching the earth of the equipment or is interrupted.
- D) The gas valve closes because it or its electrical or pneumatic connections are damaged.

Case 3: The limit thermostat (M1) arrests the burner

- A) The heat exchangers have overheated: check operation of the fan, the gas pressure and the nozzles.
- B) The heat exchangers overheat because of a build-up of dirt or obstruction of the air inlet vent. Clean the exchangers or free the air inlet vent (clean the ventilation grille).
- C) Check that electrical power is always present during operation.

To reset the thermostat, press the button located on the thermostat underneath the black screw cap (see Figure 3 on page 8).

Case 4: The burner switches off and fails to restart, even if the ambient temperature requires it

- A) Check the operation of the ambient thermostat, and the relative electrical connections.
- B) Re-examine the position of the ambient thermostat (check that it is not influenced by external sources of heat).
- C) Check the signal from the blower that reaches the valve.

Case 5: The combustion air blower does not start

- A) Check that the device's protective fuse is intact.
- B) Check that the ambient thermostat requires heat and is correctly connected.
- C) Check the fuse on the power plug.
- D) Check that the limit thermostat has not activated.
- E) Check the power supply to the central control unit.
- F) Check that the central control unit's fuse is intact.
- G) Check the electrical connections of the blower.

Case 6: The combustion air blower starts but the appliance does not switch on

- A) The central ignition control unit does not begin the cycle: replace the internal fuse of the central control unit or the unit itself.
- B) Check the voltage supplied to the ignition transformer and to the gas valve.

3.5 LIST OF ACCESSORIES

NOTE

The accessories listed below are specifically for Evoluzione series heaters.

3.5.1 CONTROL UNITS

- **BASIC CONTROL UNIT** (Code O-CTR001): summer/winter selection, selection of maximum/reduced power operation, illuminated arrest warning/manual reset button (see Figure 26).
- **THERMOSTATED CONTROL UNIT** (Code O-CTR009): control of ambient temperature via remote sensor, automatic operation with modulation of maximum or reduced power according to temperature set, selection of reduced power operation, antifreeze function, summer/winter selection, arrest warning light, reset button, sound signal in the case of incorrect operation and/or wrong connections to the remote sensor (see Figure 27).



Figure 26 – BASIC CONTROL UNIT

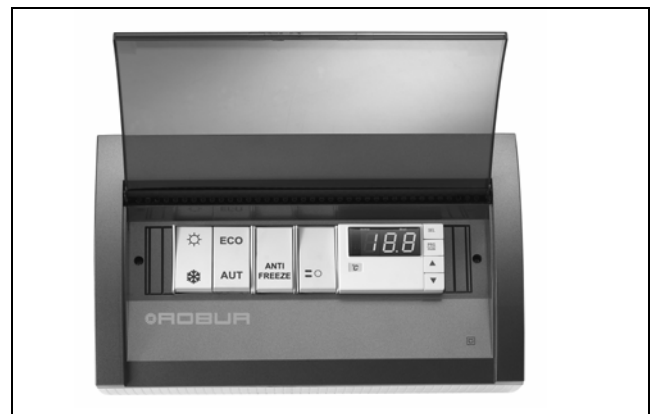


Figure 27 – THERMOSTATED CONTROL UNIT

- **INTEGRATED CONTROL UNIT** (Code O-CTR010): daily and/or weekly timer programming, control of ambient temperature via remote sensor, automatic operation with modulation of maximum or reduced power according to temperature set, selection of reduced power operation, antifreeze function, summer/winter selection, arrest warning light, reset button, sound signal in the case of incorrect operation an/or wrong connections to the remote sensor (see Figure 28).
- **STAGNO IP 55 INTEGRATED CONTROL UNIT** (Code O-CTR012): daily and/or weekly timer programming, control of ambient temperature via remote sensor, automatic operation with modulation of maximum or reduced power according to temperature set, selection of reduced power operation, antifreeze function, summer/winter selection, arrest warning light, reset button, sound signal in the case of incorrect operation an/or wrong connections to the remote sensor, lockable front cover (see Figure 29).

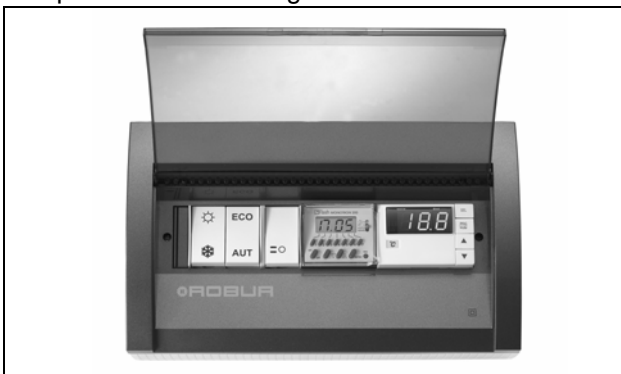


Figure 28 – INTEGRATED CONTROL UNIT



Figure 29 – STAGNO IP55 INTEGRATED CONTROL UNIT

- **EXPANSION MODULE** (Code O-CTR007): in conjunction with the use of a thermostated or integrated control, it allows up to a maximum of three heaters to be controlled simultaneously (see Figure 30)

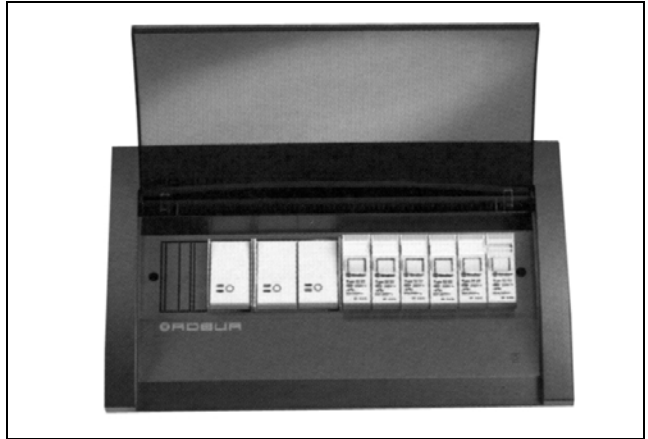


Figure 30 – EXPANSION MODULE

3.5.2 MOUNTING BRACKETS

- **UPPER MOUNTING BRACKET** (Code O-STF003): supplied complete with condensate drain and air/exhaust gas pipe connection kit with elements for drawing air/exhaust gases (see Figure 31).
- **UPPER MOUNTING BRACKET WITH INTEGRATED WALL-MOUNTED OUTLETS** (Code O-STF000): supplied complete with double external terminal (Figure 32).
- **ADJUSTABLE LOWER MOUNTING BRACKET** (Code O-STF006): supplied complete with condensation drain and air/exhaust gas pipe connection kit with elements for drawing air/exhaust gases (Figure 33).
- **TUBULAR MOUNTING BRACKET**: complete with condensation drain and air/exhaust gas pipes kit with elements for drawing air/exhaust gases (Code O-STF007 for models E32/E42/E43; Code O-STF008 for models E52/E72) (Figure 34).

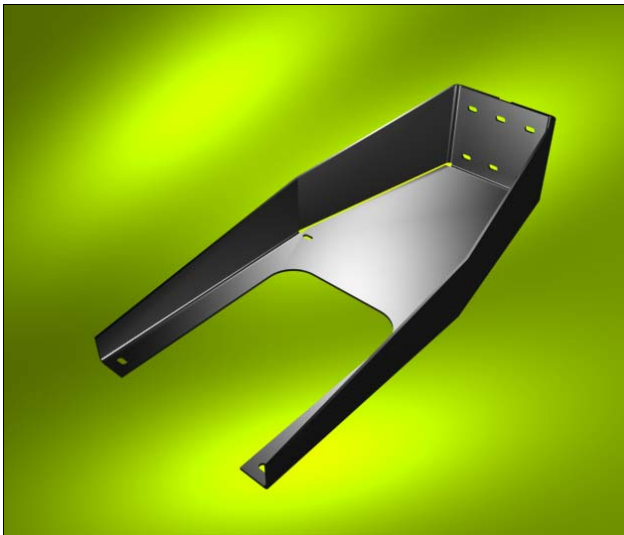


Figure 31 – UPPER MOUNTING BRACKET

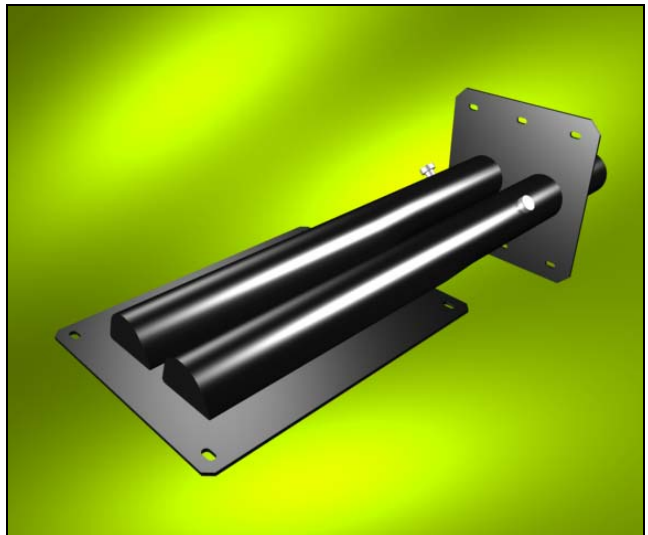


Figure 32 – UPPER MOUNTING BRACKET WITH INTEGRATED OUTLETS

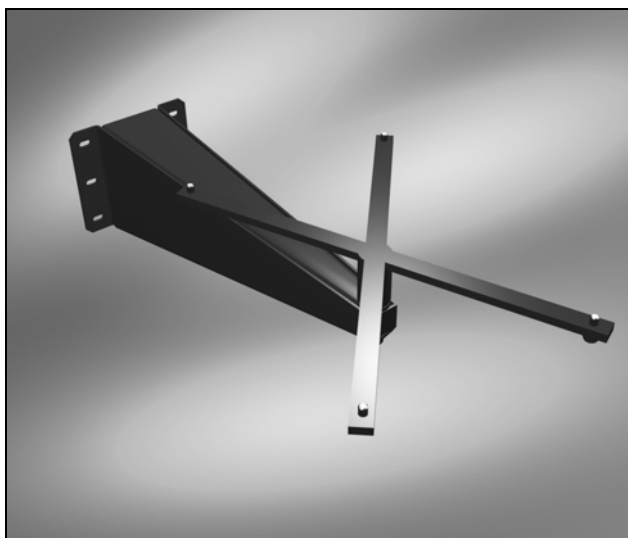


Figure 33 – ADJUSTABLE LOWER MOUNTING BRACKET



Figure 34 – TUBULAR MOUNTING BRACKET

3.5.3 OTHER ACCESSORIES

- ADJUSTABLE ALUMINIUM FINS: these allow the direction of warm air flow to be adjusted horizontally and/or vertically. Each kit (Code O-LTT000) consists of 20 fins (see Figure 35).
- CONDENSATE SEPARATOR (Code O-SCN000): this element allows any condensate that forms on the exhaust gas pipe to be collected and drained. It must be used when there is a vertical length of exhaust gas piping of 1 metre or longer and when ROBUR mounting brackets are not used (see Figure 36).

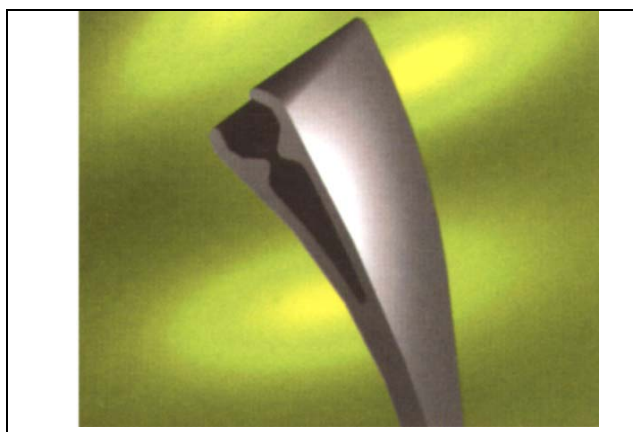


Figure 35 – ADJUSTABLE ALUMINIUM FIN

- AIR/EXHAUST PIPE CONNECTION WITH INTAKE ELEMENT (Code O-SCR010): consisting of 2 vertical connectors (see Figure 37) that allow the connection of the exhaust gas pipe and the air pipe to the heater. It is necessary when ROBUR mounting brackets are not used.



Figure 36 – CONDENSATE SEPARATOR



Figure 37 – AIR/EXHAUST GAS PIPE CONNECTOR

With the aim of continuously improving the quality of its products, ROBUR S.p.A. reserves the right to modify the data and contents of this manual without prior notice.

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ROBUR

M I S S I O N

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

Codice: D-LBR345 05 MED SPV 042 28/07/2005

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