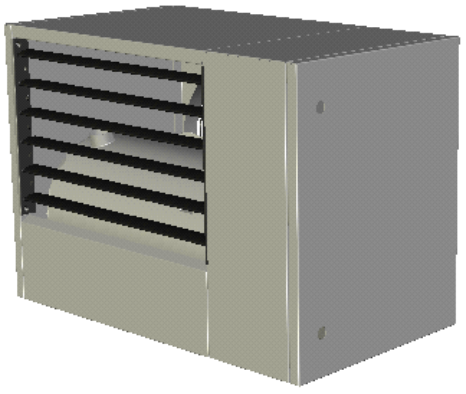
ROBUR
caring for the environment

Installation, user and maintenance manual

Series B15 Generators

Gas fired unit heaters
for heating medium areas

Methane gas powered



Revision: B
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INDEX OF CONTENTS

1 PREFACE

The present "Installation, user and maintenance manual" is intended for anyone who is to install or operate Robur series **B15** hot air generators.
In particular, the booklet is intended for the plumber who will install the generator, the electrician who will connect it to the mains power supply and the final user who will control it during everyday operation.
The booklet is also intended for technical service staff charged with the main service tasks.

Summary

The booklet has 5 sections:
SECTION 1 is a brief introduction to the use of the manual itself
SECTION 2 is intended for use by the **final user**, **hydraulic** and **electrical** installation technicians and the **service technician**; it gives general warnings, operating instructions and constructional specifications for the **B15** series.
SECTION 3 is intended for use by the **hydraulic** and **electrical** installation technicians; it provides the information required to install series **B15** generators correctly.
SECTION 4 is intended for use by the **final user**; it provides the information required to operate series **B15** generators correctly.
SECTION 5 is intended for use by **technical service technicians**; it provides the information required to adjust the gas flow and run gas type changeovers. It also includes service instructions.
The **icons** used in the manual have the following meanings:

 = DANGER

 = WARNING

 = NOTE

 = START OF OPERATING PROCEDURE

 = REFERENCE to another part of the manual or other document

2 OVERVIEW AND TECHNICAL FEATURES

This section contains general instructions regarding the installation and operation of series **B15** generators, and a brief section about the operation of generators, their construction and technical data.

2.1 WARNINGS

This manual constitutes an integral and essential part of the product and must be delivered to the user together with the appliance.
The appliance must only be used for the purposes for which it has been designed. Any other use must be considered inappropriate and therefore dangerous.

The appliance is not intended to be used by persons (including children) whose physical, sensory and mental capacities are impaired, or who lack the necessary experience and knowledge, unless they are supervised or instructed in its use by persons responsible for their safety. **Children must be supervised to ensure that they do not play with the appliance**.

The manufacturer is exempt from any contractual or extra-contractual responsibility for damage caused by errors of installation, use and in any case the non-observance of the instructions supplied by the manufacturer.
The appliance must be installed in accordance with established legislation.
Do not obstruct the fan intake or the outlet grilles.

In the event of failure of the appliance and/or breakage of any of its parts, deactivate it by disconnecting it from the electrical and gas supplies, and refrain from any attempt to repair and/or restore operation of the appliance through direct action.

Any repair may be carried out solely by a **ROBUR Technical Assistance Centre**, using only original replacement parts.
The non-observance of the foregoing warnings may compromise the safety of the device.
For correct operation, the appliance must be overhauled annually as per the manufacturer's instructions, by **professionally qualified service personnel**.
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"Professionally qualified personnel" is defined as those possessing specific technical competence in the residential heating equipment sector. Contact ROBUR S.p.A. Technical Assistance Centre (tel. +39.035.888.111) for any further information.

If the appliance is put out of service for a long time, refer to paragraph 4.1 SWITCHING ON AND SWITCHING OFF → 29.
If the appliance is to be sold or transferred to another owner, ensure that this booklet is handed over to the new owner and installation technician for their reference.
Before starting up the generator, have the following items checked by ***professionally qualified personnel*** :

- the electricity and gas mains specifications correspond to the specifications on the nameplate;
- the fumes exhaust tubes are operational;
- the combustion air and fumes exhaust are in accordance with established legislation;

- the gas supply seals, both internal and external;
- the gas flow rate setting as required by the generator's power rating;
- the gas supplied to the appliance is of the type for which it is designed;
- the gas supply pressure in relation to the admitted range specified on the nameplate;
- the gas supply system is correctly rated for the capacity required by the appliance, and that it is equipped with all safety and control devices prescribed by current regulations.

Do not use gas pipes to ground electrical appliances.

IF YOU SMELL GAS:

- Do not operate electrical switches, the phone or any other equipment which may generate sparks.
- Immediately open the doors and windows to allow fresh air to enter the area.
- Close the gas valve.
- Contact professionally qualified personnel for assistance.

2.2 NOTES ON OPERATION OF THE APPLIANCE

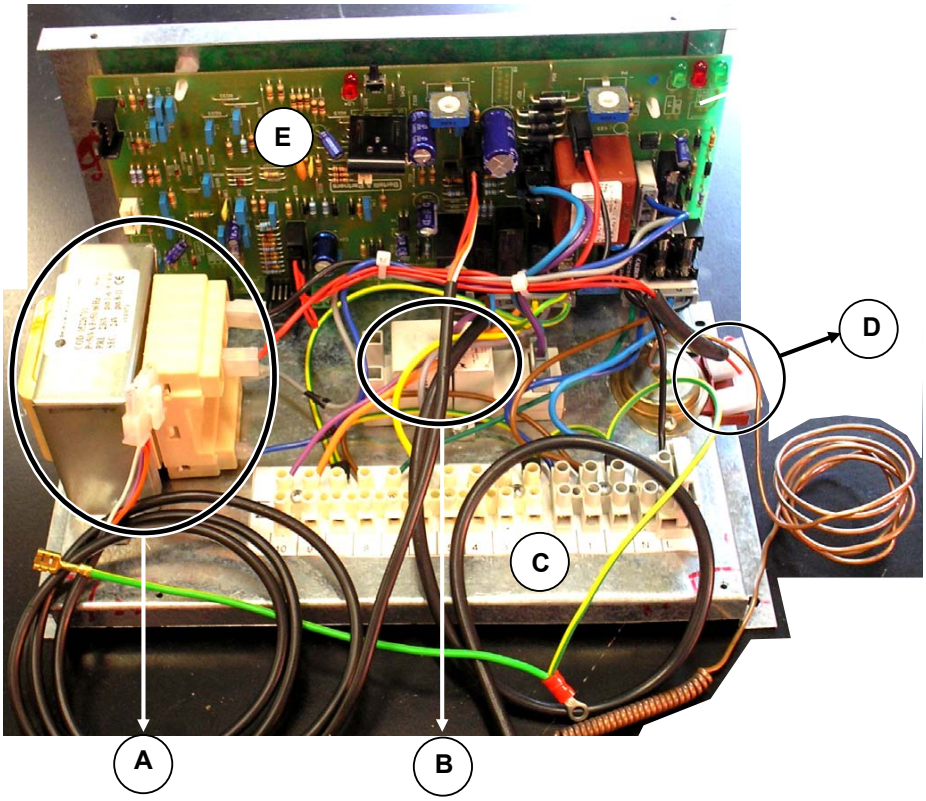
The series **B15** hot air generator is an independent heating appliance with sealed circuit and forced draw.
The appliance can be used with natural gas (G20).
It is designed for installation inside the room to be heated.
The combustion circuit is sealed in relation to the room and corresponds to the requirements of EN 1020 for type C appliances: the combustion air intake and fumes exhaust are outdoors and are driven by a blower in the combustion circuit.
The appliance is homologated as type B for installations in which the combustion air is drawn directly from the room itself.
The generator is controlled by a room thermostat (not supplied). When the thermostat trips, the controller waits for a pre-plunge delay of around 40 seconds, and then ignites the burner.
The detection electrode senses the flame. If it fails to detect a flame, the controller locks out the appliance.
Combustion products are sent through the heat exchangers which are subject to an external flow of air from the fan, thus delivering hot air to the room.
The flow of air can be adjusted vertically with the horizontal fins of the delivery grille. On request, a vertical fins kit is available to enable the direction of the flow of air to be adjusted horizontally.
If the heat exchangers overheat due to a malfunction, a limit thermostat trips and shuts off power to the gas valve, which in turn cuts off the supply of gas to the burner. The generator must be reset manually once the limit thermostat has tripped, using the remote control.
A blower upline of the burner mixes the air and gas and expels the combustion fumes.
The generator can run in HEATING mode (WINTER mode) and also provides a pleasant flow of fresh air during the summer in **FAN ONLY mode** (SUMMER mode). For further information see paragraph "4.1 SWITCHING ON AND SWITCHING OFF → 29".

2.3 TECHNICAL MANUFACTURING CHARACTERISTICS

Series **B15** hot air generators are supplied complete with:

- **pre-mix burner** in stainless steel.
- **high head blower**.
- **cylindrical combustion chamber** in stainless steel.
- **heat exchangers** in corrugated stainless steel with a very large exchange surface.
- **external panelling** in steel with epoxy powder enamel finish.
- **high capacity axial fan**.
- **CONTROL AND SAFETY COMPONENTS:**
  - **controller board**, with CPU: controls burner ignition, flame detection; blower speed control, fan speed control.
    - Power voltage: 230 V - 50 Hz.
    - Safety time: 5 seconds.
    - Pre-plunge time: 5 seconds.
    - Model: Bertelli & Partners DIMS05 with ignition transformer.
  - **limit thermostat** set to 100°C, automatic reset, to prevent heat exchanger overheating.
  - **Gas solenoid valve**: if a safety device trips (limit thermostat) the gas valve is de-excited, thus cutting off gas supply to the burner.
    - Power voltage: 230 V - 50 Hz.
    - Operating temperature: 0° C to +60° C.
    - Model: SIT 830 Tandem / BM 762.

Figure 2.1



LEGEND

A	transformer 230/24 V AC
B	ignition transformer
C	terminal block with fuse
D	limit thermostat
E	controller

Electrical panel.

2.4 TECHNICAL DATA

Table 2.1 – Technical data.

TECHNICAL CHARACTERISTICS		unit of measurement	B15
appliance category			I_{2H}
appliance type			C13-C33-B23-C63-C53
gas	natural (methane)		G20
thermal capacity	nominal	kW	15
thermal power	nominal	kW	13,8
gas consumption (1)	natural (G20)	m3/h	1,59
efficiency	nominal	%	92
gas supply pressure	natural gas (G20)	mbar	20
gas fitting dia.		"G	3/4 F
fumes/combustion air fitting dia.	air intake	mm	80
	fumes outlet	mm	80
electrical power	voltage	V	230
	TYPE		single-phase
	frequency	50 Hz supply	50
electrical power absorption	nominal	w	160
fuse	-	A	3.15
operating temperature (2)	in *room*	°C	0 ÷35
air flow (3)	nominal	m3/h	1900
thermal differential	-	k	21,3
air throw (4)	residual speed > 1m/s	m	12
sound level at 6 m	open area	dB(A)	40
sound level at 6 m	typical installation	dB(A)	52
weight	-	kg	30

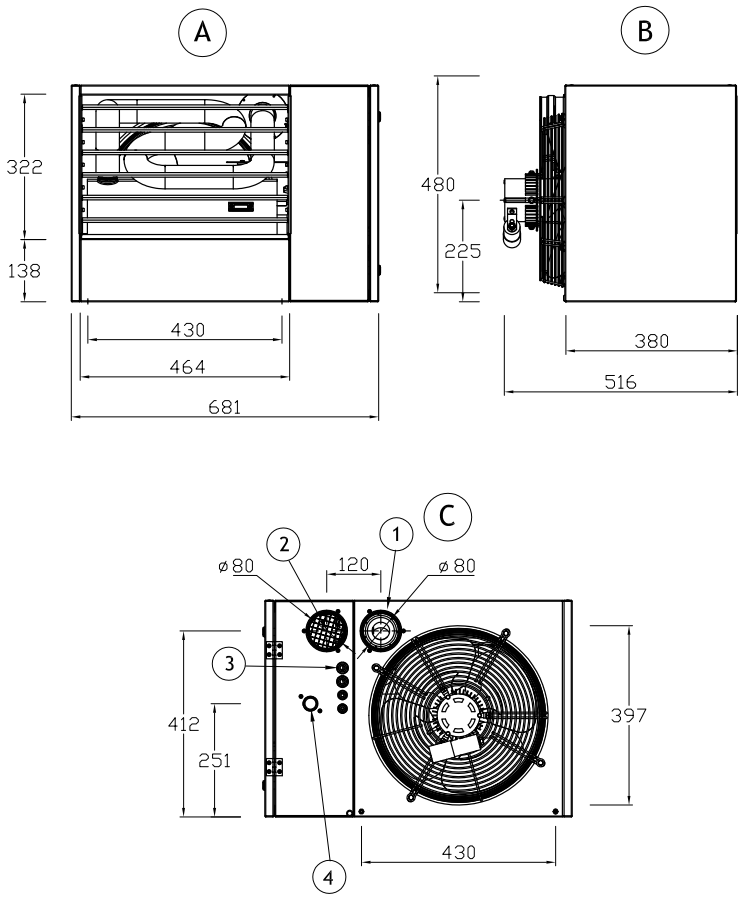
Technical data.

Notes:

1. At 15 °C - 1013 mbar.
2. WARNING: The operating temperature IN THE ROOM is 0 °C/+35 °C; The operating temperature OF THE APPLIANCE'S COMPONENTS is 0 °C/+60 °C;
3. At 20 °C - 1013 mbar.
4. Values measured in an open area; in a real installation, the thermal flow may reach GREATER distances than those given here (depending on the height of the ceiling and its thermal insulation).

2.5 DIMENSIONS

Figure 2.2



LEGEND

1	fumes outlet fitting
2	combustion air intake fitting
3	power cable inlet
4	gas fitting
A	front view
B	side view
C	rear view

Series B15 dimensions.

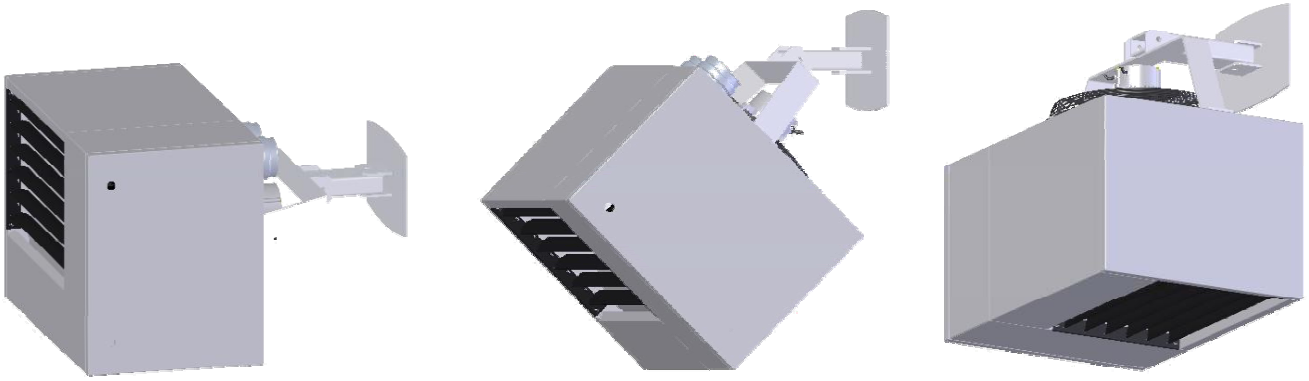
3 INSTALLATION

3.1 GENERAL INSTALLATION INSTRUCTIONS

- The installation must be done, as instructed by the manufacturer, by **professionally qualified personnel**.
- **Professionally qualified personnel** is defined as those possessing specific technical competence in the residential heating equipment sector. Contact ROBUR S.p.A. Presales (tel. +39.035.888.111) for any further information.
- Incorrect installation may cause damage to persons, animals or things, for which the manufacturer is not liable.
- The installation must be done in accordance with established local and national regulations, in particular:
  - Italian Ministerial Decree of 12 April 1996 containing fire prevention regulations regarding the design, construction and operation of heating systems supplied with gas fuel;
  - Italian Decree n. 412/93 governing the design, installation, operation and maintenance of heating systems;
  - Italian Decree n. 551/99 which introduces certain modifications to D.P.R. n. 412/93;
  - Italian Law n. 46/90 and its actuating regulation (D.P.R. 447/91) regarding the safety of heating systems;
  - UNI CIG 7129 governing the installation of appliances supplied with natural gas;
  - Italian Law n. 186 of 1 March 1968 regarding the installation of electrical systems.

On the basis of the installation design, set out the gas and electrical supply lines, as well as the appliance's supporting brackets. The appliance may be installed horizontally, at an angle or vertically (air flow downwards), using the optional mounting bracket (3.1 → 13).

Figure 3.1



Possible installation positions for series B15 generator.

During the installation, observe the following precautions:

- Unpack the appliance, and check it for damage suffered during shipping; each appliance is factory tested before shipping; if it is damaged, notify the shipping agent immediately.
- Allow a clearance of at least 300 mm between the back of the appliance and the wall for an adequate air supply (see Figure 3.2 → 15).
- The optimal recommended height from the ground of the generator's base is 2.5 m (see Figure 3.2 → 15). Do not install the appliance at less than 2.20 m above the ground.

- A cut-off valve and three-piece coupling must be fitted on the gas supply.
- Check that there is an adequate mains gas supply. In particular: make sure that the gas mains pressure, with the appliance operating, is set to 20 mbar (204 mm H_2O) with an admissible range of 17 mbar to 25 mbar (G20 natural gas supply).
- Hook the appliance up as shown in the installation wiring diagram (see Figure 3.11 → 24), and make sure the power supply is rated at 230 V 1N - 50Hz. Make sure that:
  - the electricity mains specifications correspond to the specifications on the nameplate;
  - the cable is of the type H05 VVF 3x1.5 mm^2 with a maximum external diameter of 8.4mm;
  - ensure that the ground cable is longer than the live cables. In this way it will be the last wire to be pulled away if the mains cable should accidentally be pulled, and will thus guarantee the ground connection.

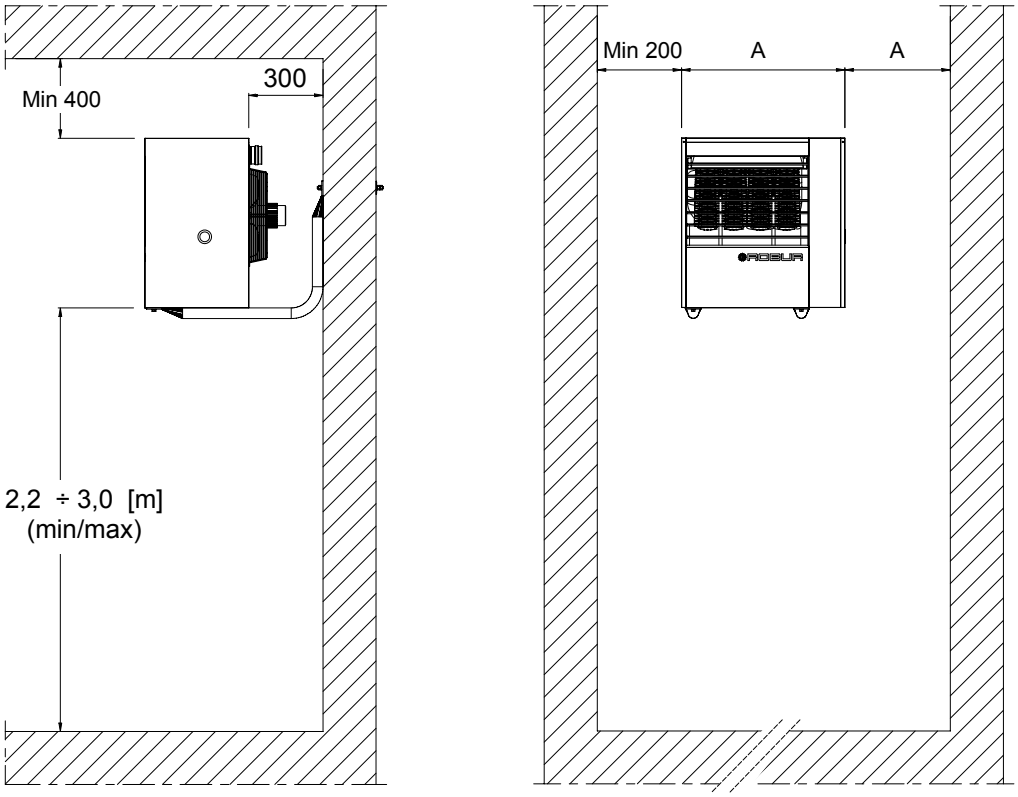
The electrical safety of the appliance is guaranteed only when it is correctly connected to an efficient grounding system, executed in accordance with current safety regulations. **Do not use gas pipes to ground electrical appliances**.

- The appliance must be connected to the mains cable via a two-pole switch with minimum air gap 3 mm. *A two-pole switch is one which opens both the phase and the neutral contacts*. Thus both contacts will be open when the switch is opened.
- **It is obligatory** to equip the installation with a room thermostat connected to the appliance as shown in the installation wiring diagram (see Figure 3.11 → 24). Locate the thermostat (or its sensor) around 1.5 m off the floor, shielded from draughts, direct sunlight, direct heat sources (lamps, the appliance's hot air output, etc.) and preferably **NOT on an external wall**, as this will compromise its temperature reading and hence the operation of the installation. **THIS PREVENTS UNDESIRABLE OPERATING CYCLES AND ENSURES OPTIMAL HEATING COMFORT IN THE ROOM.**
- As an alternative to the room thermostat, use one of the accessory adjustment and programming units.

The control cables (especially those connected to the wall panel and temperature sensors) must be protected from interference generated by power cables. This can be achieved, for example, by shielding the cables or routing them through ducts separate from power cables.

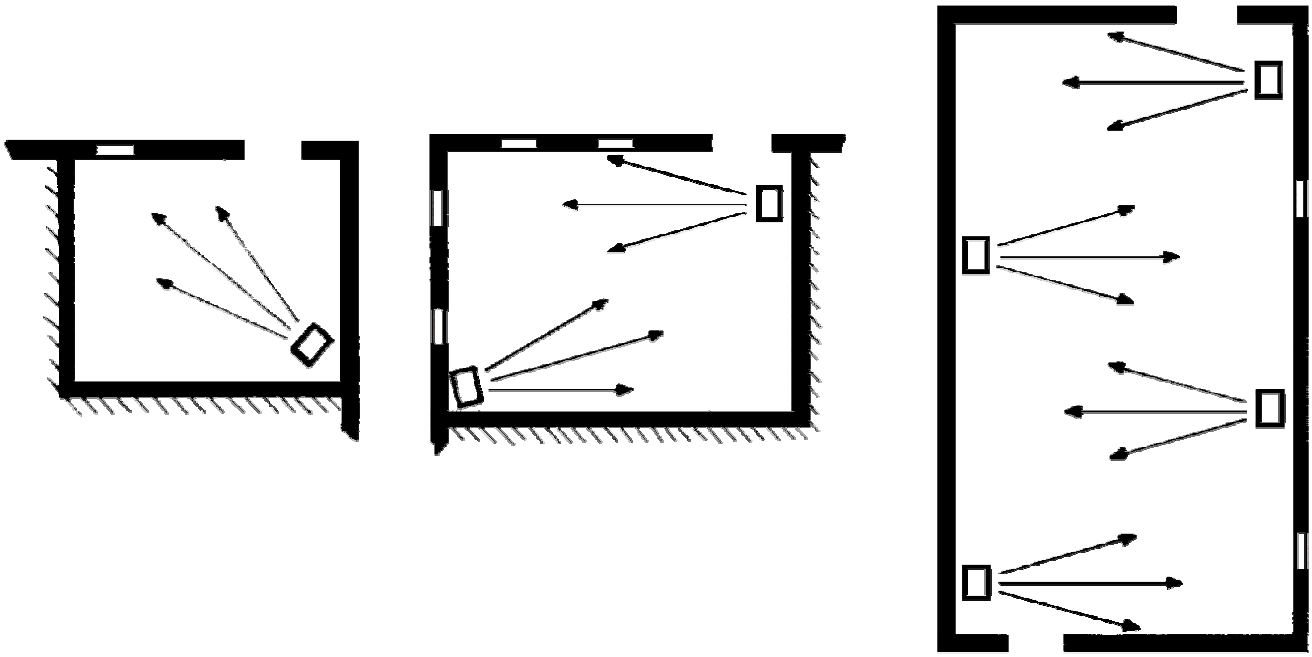
- For best results, comfort and efficiency, observe the following rules:
  - make sure that the air flow is not directed towards persons (adjust its direction with the grille fins)
  - take any obstacles into account (columns, etc.).
  - fro better heat distribution, in multiple appliance installations, provide alternating hot air flows (see Figure 3.3 → 15).

Figure 3.2



Clearances: minimum clearance required for installation.

Figure 3.3



Example of generator positioning.

3.2 SIZING AND INSTALLING THE COMBUSTION AIR/FUMES EXHAUST TUBES

Series **B15** hot air generators can be installed in one of the following ways.

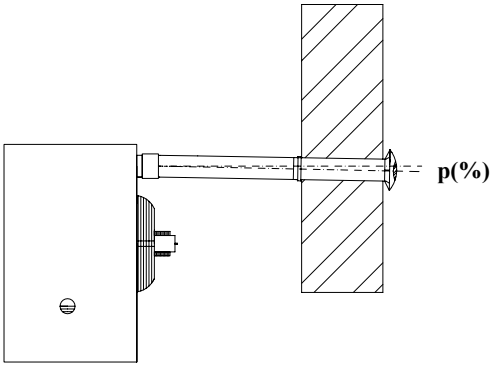
- Type **B_{23}** installation: this type has the combustion air intake inside the room and the fumes exhaust outdoors via a dedicated tube, which may be either horizontal or vertical. In this case, the appliance is not sealed off from the room (see Figure 3.5 → 17).
- Type **C_{13}** installation: The fumes exhaust and the air intake are routed in coaxial or separate horizontal tubes (or wall-mounted, see Figure 3.6 → 19). In this case, the appliance is sealed off from the room.
- Type **C_{33}** installation: the fumes exhaust and the air intake are routed in coaxial or separate vertical tubes (or roof-mounted, see example C33 in Figure 3.7 → 19). In this case, the appliance is sealed off from the room.
- Type **C_{53}** installation: the fumes exhaust and the air intake are routed in separate tubes which exit outside the building and at a distance from each other. This type of installation enables implementation of air intake, for example, with horizontal tubes (or wall-mounted) behind the appliance, and the fumes exhaust distant from the appliance with a horizontal or vertical tube (or roof-mounted, see example C53 in Figure 3.7 → 19). In this case, the appliance is sealed off from the room.
- Type **C_{63}** installation: this type enables the implementation of fume/air installations using commercially available tubes, bends and terminals (homologated). Furthermore, it enables the use of tubes of diameter greater than 80 mm: fro example when very long air/fumes systems are required. In this type of system, the calculation of the sir/fumes system requires the data provided by the tubes manufacturer, as well as the composition, flow rate and temperature of the fumes themselves (see Table 3.1 → 17).

In any case, always use tubes which are homologated for the type of installation in question. **ROBUR S.p.A. can provide homologated rigid tubes, coaxial tubes and terminals**.

In order to dimension the system of tubes, you must calculate the total pressure drop of the system.
The *total admitted pressure drop* is given in Table 3.1 → 17. The *pressure drops of the fumes, air and coaxial tubes* supplied by ROBUR, are given in Table 3.2 → 17 (for dia. 80 and 100).
The *pressure drops of external terminals* need not be considered as they are negligible.
When designing the system, check that the sum of pressure drops of the system of tubes is less than the maximum pressure drop permitted for the appliance (see Table 3.1 → 17).
The following pages give an example calculation of the pressure drop.
For the maximum admitted lengths (APPROXIMATE) for the air and fumes tubes, depending on the type of installation in question, refer to Table 3.3 → 18 and the note following it.

If the horizontal fumes tubes are longer than 1 metre, to prevent condensation returning to the appliance, the tube must be installed at a downwards slope of 2 or 3 cm per metre of length (see Figure 3.4 → 17). Furthermore, for a correct installation of the external fumes exhaust and air intake terminals, observe the instructions given in Figure 3.8 → 20.

Figure 3.4



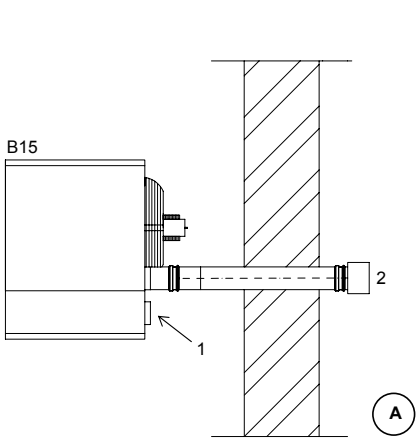
LEGEND
p(%) tube slope *

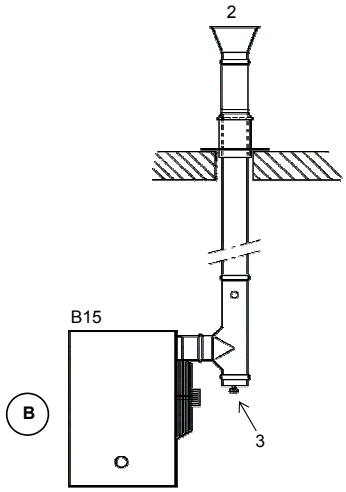
* slope to be provided: -2% or -3% (downwards).
example:
slope (downwards) of 2 cm per metre or 3 cm per metre

horizontal tube slope.

If the fumes tubes are vertical, to prevent condensation from returning to the appliance, equip the base of the vertical tube with a "T" junction to collect the condensate (see example "B" in Figure 3.5 → 17).

Figure 3.5





LEGEND

A	type B23 installation with horizontal exhaust (or wall-mounted) [B15 generator: seen from above]
B	type B23 installation with vertical exhaust (or roof-mounted) [B15 generator: side view]
1	combustion air intake
2	fumes exhaust
3	condensation outlet

B23 type installations: with wall-mounted exhaust and roof-mounted exhaust.

Table 3.1

DATA FOR CALCULATING THE AIR/FUMES SYSTEM WITH COMMERCIALLY AVAILABLE TUBES			
Fumes outlet temperature [°C]	Fumes mass flow rate [kg/h]	CO_2 content of fumes [%] (with G20 gas)	Admitted pressure drop [Pa]
175	25,9	9,2 ÷ 9,4	60

Data for calculating the air/fumes system with commercially available tubes.

Table 3.2

PRESSURE DROP OF DIA. 80 COMPONENTS						**PRESSURE DROP OF DIA. 100 COMPONENTS**				
tube [Pa/m]		**90° bend** [Pa]		**coaxial** [Pa]		**tube** [Pa/m]		**90° bend** [Pa]		**coaxial** [Pa]
fumes	**air**	**fumes**	**air**	**wall** O-SCR007	**roof** O-SCR008	**fumes**	**air**	**fumes**	**air**	**roof** O-SCR009
0,7	0,4	1,0	0,9	1,6	2,0	0,2	0,2	0.35	0,25	1,0

Dati per il calcolo del sistema aria/fumi con condotti Ø 80 o Ø 100 forniti da Robur Spa.

Each "T" junction increases the effective length of the tube to which it is mounted by 3 metres. For example, if the junction is fitted to a 2 metre fumes tube, when calculating the pressure drop you must deem the total length of the tube to be 5 metres. Each 5° bend increases the effective length of the tube to which it is mounted by 1.2 metres. For example, if the bend is fitted to a 2 metre air tube, when calculating the pressure drop you must deem the total length of the tube to be 3.2 metres.

Table 3.3

APPROXIMATE ADMITTED MAXIMUM LENGTHS [m] - by TYPE of installation								
B23		C13			C33			C53
fumes tube		separate tubes	coaxial wall-mounted		coaxial roof-mounted			separate tubes
dia. 80		dia. 80	dia. 125 O-SCR007	dia. 180 O-KTC004	dia. 125 O-SCR008	dia. 150 O-SCR009	dia. 210 O-KTC001	dia. 80
Horizontal	Vertical	-	dia. 80 tubes	dia. 130 tubes	dia. 80 tubes	dia. 100 tubes	dia. 130 tubes	-
fumes	fumes	air/fumes	air/fumes	air/fumes	air/fumes	air/fumes	air/fumes	air/fumes
30	30	25+25	20+20	N/A	25+25	30+30	N/A	1+25

Approximate maximum lengths.

The above maximum admitted lengths are to be considered **APPROXIMATE** and apply to installations in which the tubes (air and fumes) are routed linearly as shown in Figure 3.5 → 17; Figure 3.6 → 19 and Figure 3.7 → 19. If this condition does not apply, you must calculate the pressure drop (see "EXAMPLE CALCULATION" below): **the installation is permitted only if the total pressure drop is less than the admitted pressure drop** (see 3.1 → 17).

EXAMPLE CALCULATION

We are to install a B15 with separate tubes, dia. 80, as follows:

- 7 metres of fumes tube dia. 80;
- 2 90° bends dia. 80 on the fumes tube;
- 6 metres of air tube dia. 80.

We can now calculate the pressure drop (see Table 3.4 → 18), bearing in mind that the total admitted pressure drop is 60 Pa.

Table 3.4

COMPONENT	Quantity [m]		Pressure drop [Pa/m]		Pressure drops [Pa]
Dia. 80 fumes tube	7	x	0,7	=	4,9
90° bends	2	x	1,0	=	2,0
Dia. 80 air tubes	6	x	0,4	=	2,4
TOTAL PRESSURE DROP				=	**9,3**

Example numerical calculation.

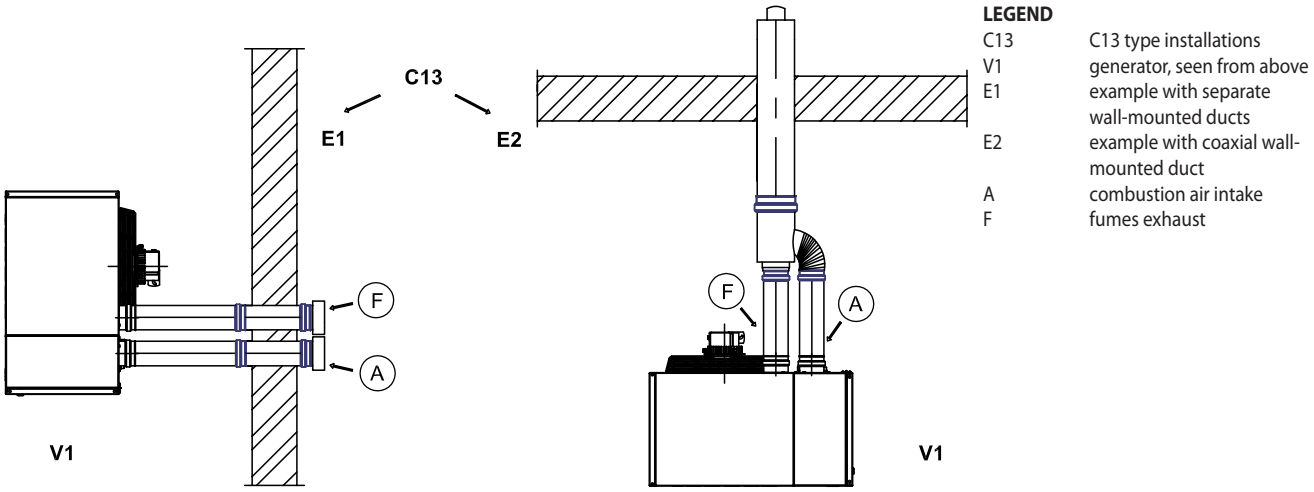
The total pressure drop is less than the admitted pressure drop (9.3 Pa less than the maximum admitted figure of 60 Pa) and hence the installation is PERMITTED.

If the installation had turned out to be not permitted due to excessive pressure drop, we could have adopted one of the following measures:

- reduce the length of the air/fumes tubes;
- increase the diameter of the tubes to dia. 100.

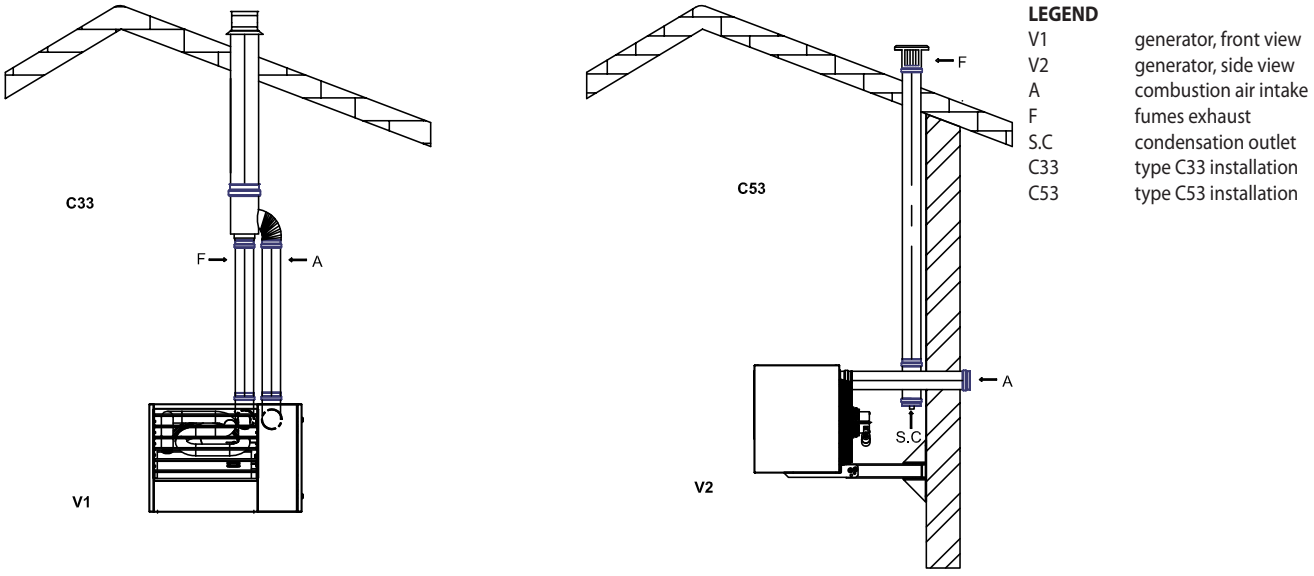
For special installations, phone ROBUR Presales at +39.035.888.111.

Figure 3.6



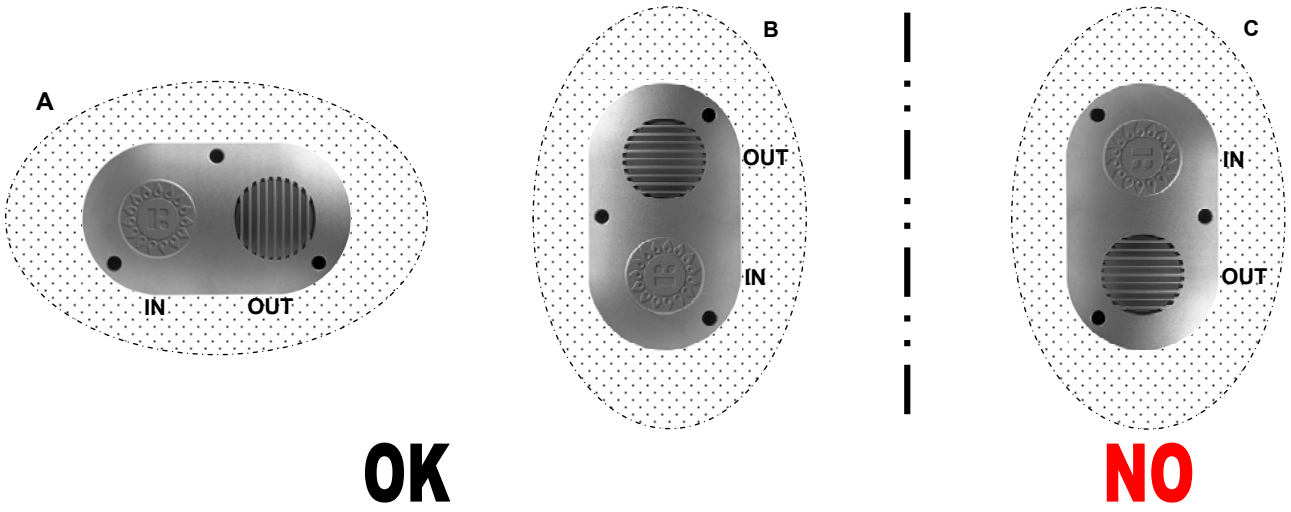
C13 type installations.

Figure 3.7



C33 and C53 type installations.

Figure 3.8



LEGEND

IN	combustion air intake
OUT	fumes exhaust
A	recommended position (OK)
B	admitted position (OK)
C	NOT admitted position (NO)

Wall terminal position.

3.3 BRACKET INSTALLATION

USING ROBUR SUPPORTING BRACKETS

ROBUR S.p.A. provides easy to install mounting brackets as accessory equipment for the series B15 generator [accessory code: O-STF019].
To install the appliance using the Robur (O-STF019) mounting bracket:

1. install the bracket to the appliance as explained in the instructions supplied with the O-STF019 mounting bracket itself;
2. follow the instructions given in Paragraph 3.1 GENERAL INSTALLATION INSTRUCTIONS → 13 and Figure 3.2 → 15;
3. drill n. 4 holes into the wall (through its entire thickness) in line with the 4 holes in the wall plate supplied with the Robur bracket;
4. secure the generator's mounting bracket to the wall using the counterplate supplied with the Robur bracket: secure the counterplate (located on the outside of the wall) to the wall plate (on the inside of the wall) with 4 M10 bolts.

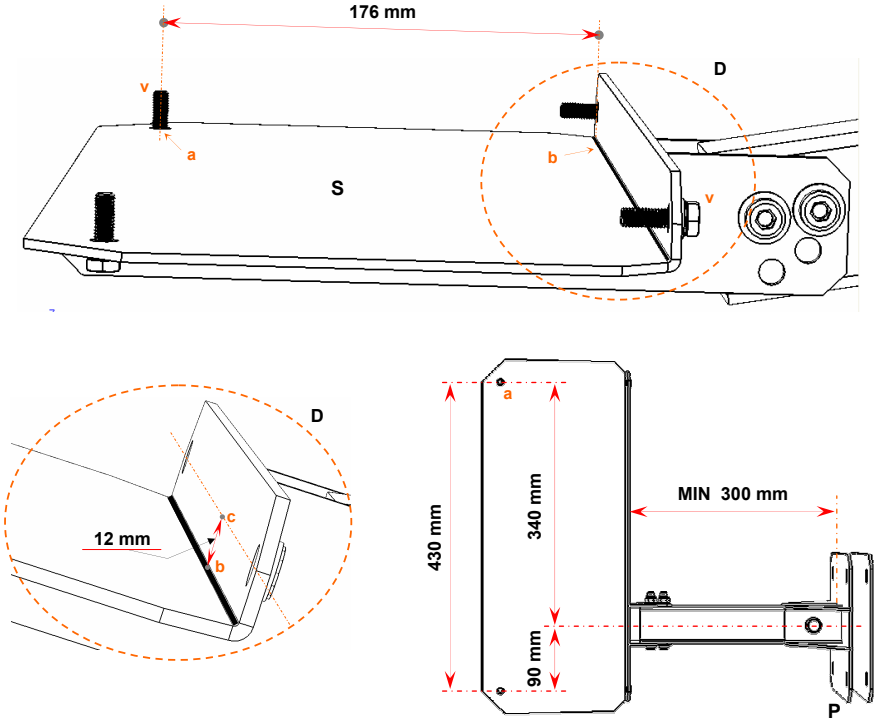
Observe the warnings given in the Robur O-STF019 bracket's assembly instructions.

USING SHELVES (not supplied by Robur)

If he opts not to use Robur mounting accessories, the installer must not only observe the instructions given in Paragraph 3.1 GENERAL INSTALLATION INSTRUCTIONS → 13 and Figure 3.2 → 15, but must also employ a shelf which satisfies the specifications of Figure 3.9 → 21.

The shelf must be sufficiently robust for its intended use and able to support the weight of the appliance (see Table 2.1 Technical data. → 10) plus its own.

Figure 3.9



LEGEND

S	supporting plate
P	wall-mounted plate (and counterplate)
a	generator base mounting hole spacing
c	generator rear mounting hole spacing
b	generator base/rear support plane line of intersection
v	generator mounting bolts (*)
D	detail of "b-c"

* use (n. 4):
spring washer 6.4x12.5 UNI 6592-69-R4O galvanised
washer D.6 UNI 8842 A6 galvanised
bolts UNI EN 24017-M6x20-8.8 galvanised

Installation with supporting bracket provided by installer.

3.4 INSTALLING THE WALL PANEL

Series B15 appliances are supplied with a wall panel with: summer/winter button and reset button with lockout led (Figure 4.1 → 29). The panel should be installed on the wall in an appropriate position. It connects to the appliance as shown in Figure 3.11 → 24.

This must be done **by a qualified technician**, as instructed in Paragraph 3.1 GENERAL INSTALLATION INSTRUCTIONS → 13 . Make sure that the cables are not live when making the connection. Each wire must have at least a 1 mm cross section.

To install the wall panel, proceed as follows:

1. after having found a suitable location (at most 100 metres away from the generator itself), install it with the expansion bolts;
2. then route the cable (FROH 8x1 mm^2) of a suitable length (maximum 100 metres);
3. shut off power to the appliance;
4. open the hatch on the appliance and connect the cable to the terminal block, as shown in the installation wiring diagram, Figure 3.11 → 24 (see connection details "E/I" and "Reset");

Terminals "Z9-Z9" on the appliance's terminal block are intended for hooking up a room thermostat (see connection detail "T.A" - in the Figure 3.11 → 24). Terminals "Z9-Z9" enable you to control multiple generators with a single external enable signal (e.g.: analogue thermostatic programmer, clock, etc.) as shown in the connection examples in Figure 3.12 → 25, Figure 3.13 → 26 and Figure 3.14 → 27.

5. restore the appliance.

Now check the operation of the appliance to ensure the connections have been made correctly. With reference to the procedures given in Paragraph 4.1 SWITCHING ON AND SWITCHING OFF → 29:

6. activate FAN ONLY mode;
7. activate HEATING mode;
8. in HEATING mode, close the gas supply line and check that the lockout led on the reset button "B" lights up after a few seconds (detail "3" - Figure 4.1 → 29);
9. now check that when you open teh gas cock and press reset button "B", the lockout led goes out and the generator starts up again;

If the appliance behaves in any other way than specified in the procedures in Paragraph 4.1 SWITCHING ON AND SWITCHING OFF → 29 or exhibits any anomalous behaviour, this indicates a possible wiring error. Check the connections and if the anomaly persists, contact your local TAC or Robur Spa Service (tel. +39.035.888.111).

CONTROLLING MULTIPLE APPLIANCES WITH A SINGLE EXTERNAL ENABLE SIGNAL

Terminals "Z9-Z9" enable you to control multiple generators with a single external enable signal (e.g.: analogue thermostatic programmer, clock, etc.).
There are three possible control options as shown in Figures 3.12 → 25, 3.13 → 26 and 3.14 → 27:

- control of multiple appliances with a single programmer and multiple room thermostats;
- control of multiple appliances with a single programmer and a single room thermostats (with multiple relays);
- control of multiple appliances with a single programmer and a single room thermostats (with a single relay).

3.5 SETTING THE GAS VALVE

For correct operation of series B15 generators, the gas valve must be set to the values given in Table 3.5 → 23. The appliance is shipped with the gas valve already set.
If further adjustment should be necessary, proceed as explained below (see Figure 3.10 → 23).

The adjustment must be done by **professionally qualified personnel**. ROBUR S.p.A. has a network of Assistance Centres which can be contacted via your reseller, area agent, or by phoning ROBUR S.p.A. Customer Assistance tel. +39.035.888.111.

You will need: the appliance connected to the power/gas supply. Necessary equipment and materials.

1. Connect a pressure gauge to pressure fitting "B", after having slackened off the seal screw.

   If using a differential gauge, connect gas valve fitting "B" to the gauge's + (positive) terminal.

2. Turn on the appliance and wait for the flame to reach a steady state (around 2 minutes).
3. Operation with hatch open: remove its cap with a screwdriver and adjust offset adjuster screw "A" (you will need a 4 mm allen key) to the nominal value given in 3.5 → 23.

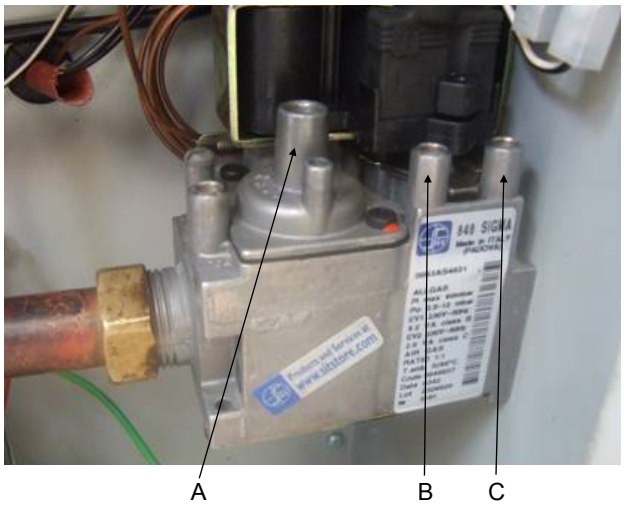
Table 3.5

OFFSETS		
OFFSET	[mbar]	[Pa]
nominal	0,1	10

Offsets.

1. Check that the CO_2 percentage is as given in 3.1 → 17. If it is not, adjust the offset again until the CO_2 percentage is as given in 3.1 → 17.
2. Turn the appliance off and back on again two or three times to check that the new setting is stable.
3. Disconnect the pressure gauge and screw pressure fitting "B" seal screw back in again.
4. Restore the appliance, making sure to fit the cap onto screw "A".

Figure 3.10



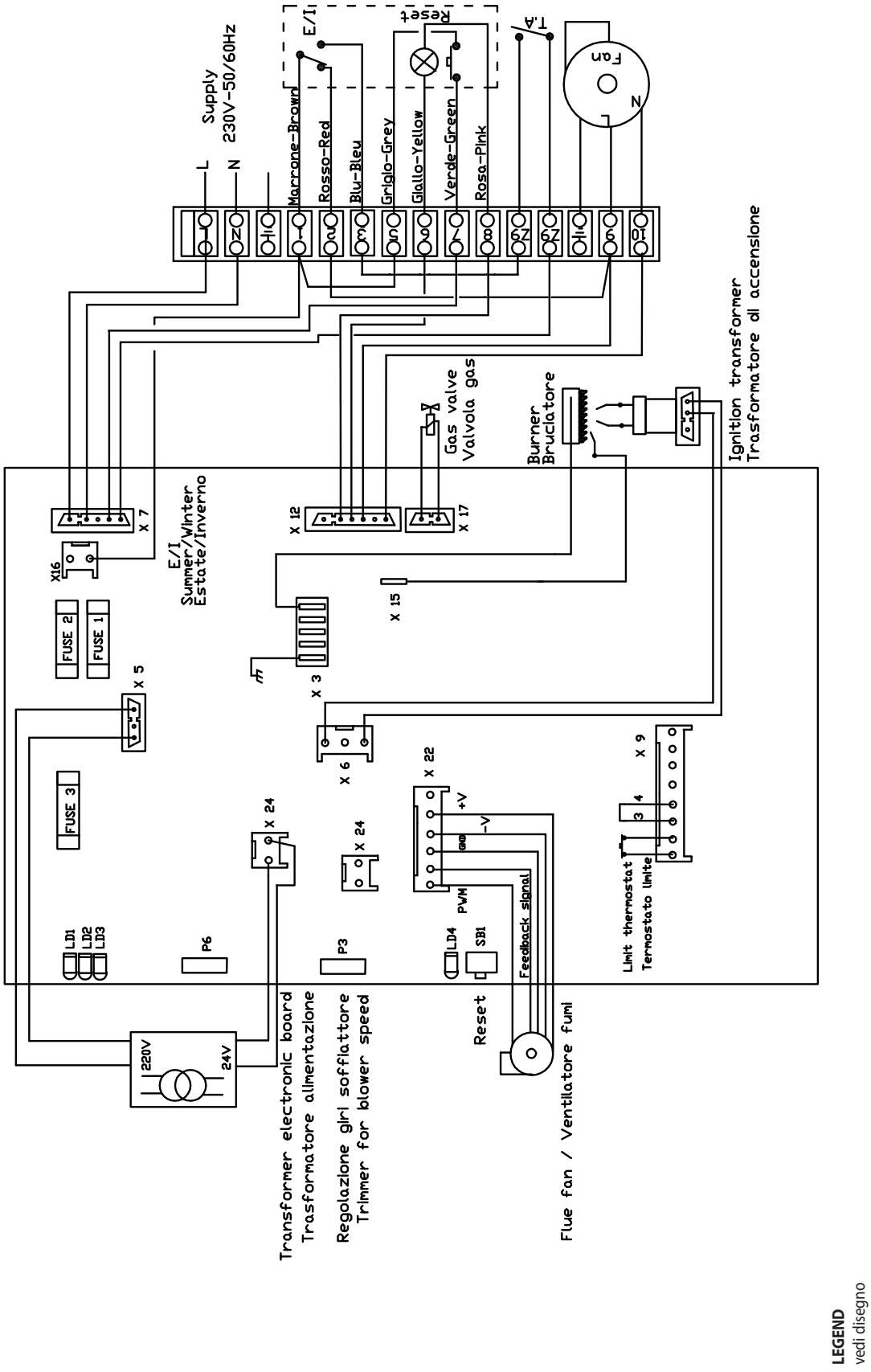
LEGEND

A	offset adjuster screw
B	outlet gas pressure fitting
C	inlet gas pressure fitting

Gas Valve.

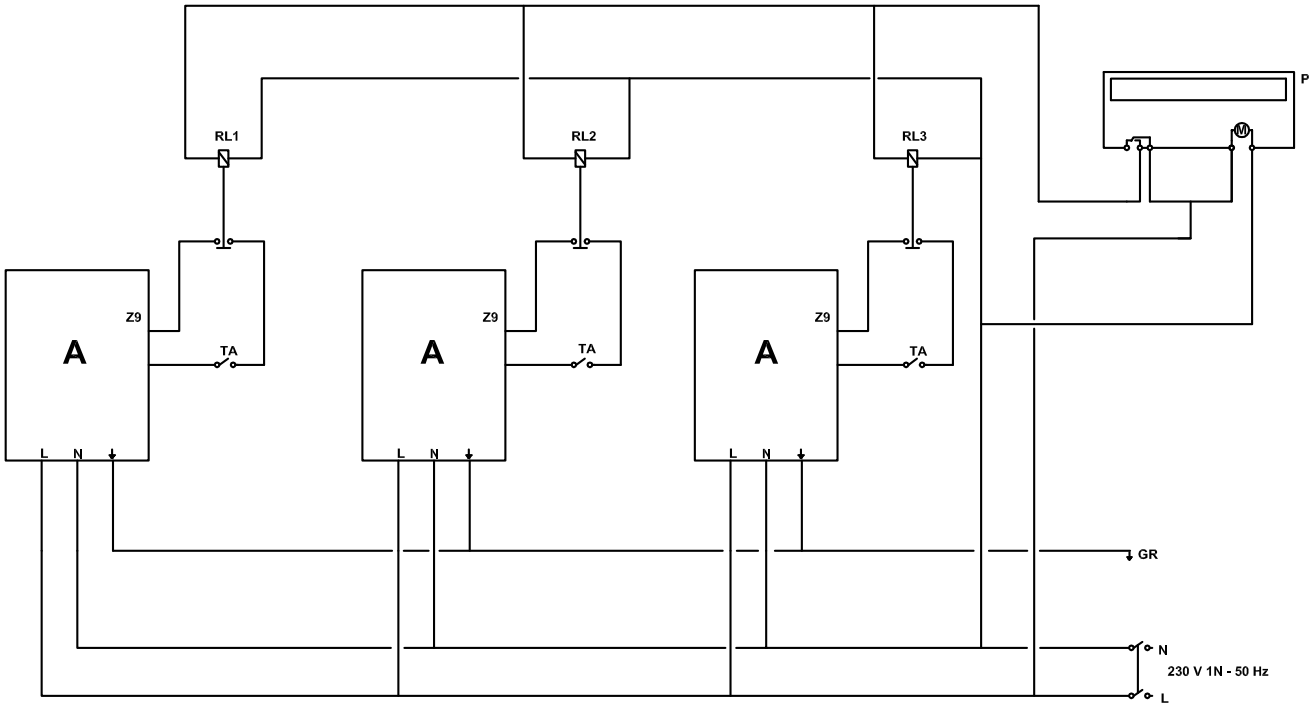
3.6 WIRING DIAGRAMS

Figure 3.11



Installation diagram.

Figure 3.12

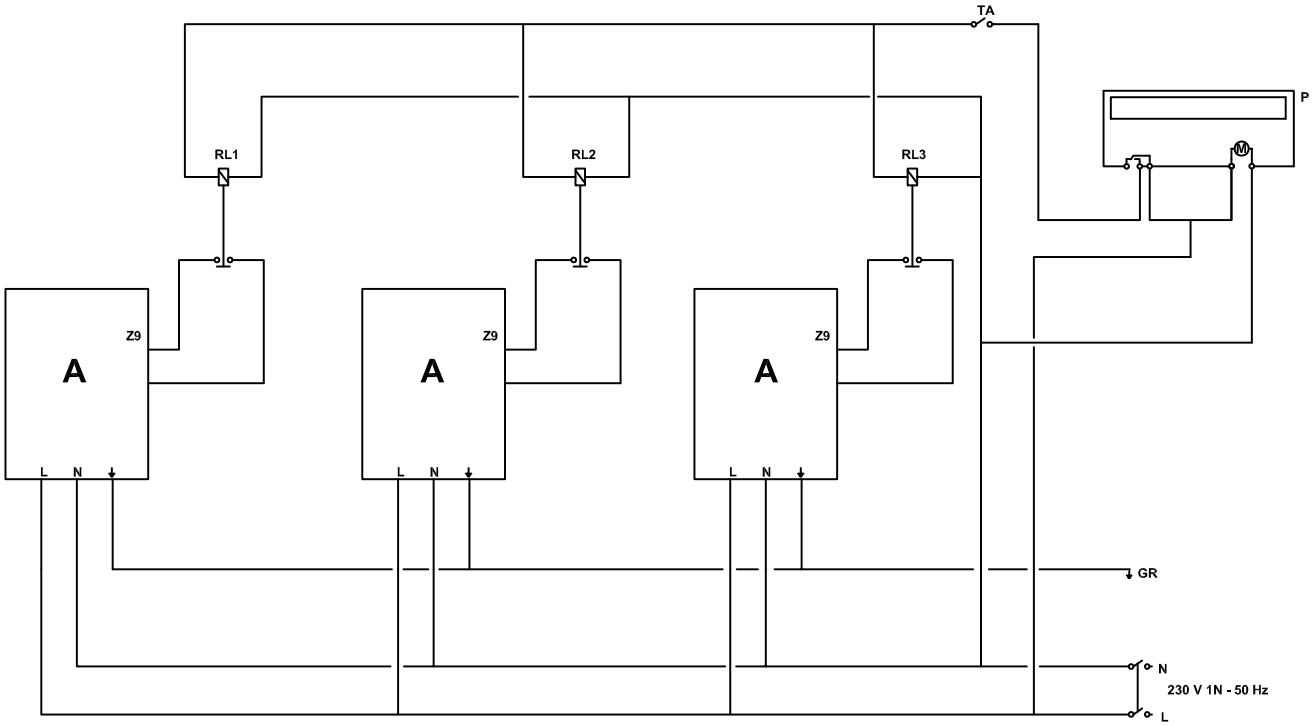


LEGEND

P	programmer
TA	room thermostat
RL1-2-3	programmed control relay
GR	ground
L-N	single-phase line (230 V - 50 Hz)
A	wall-mounted generator
Z9	generator internal terminals

Installation of multiple appliances with a single programmer and multiple room thermostats.

Figure 3.13

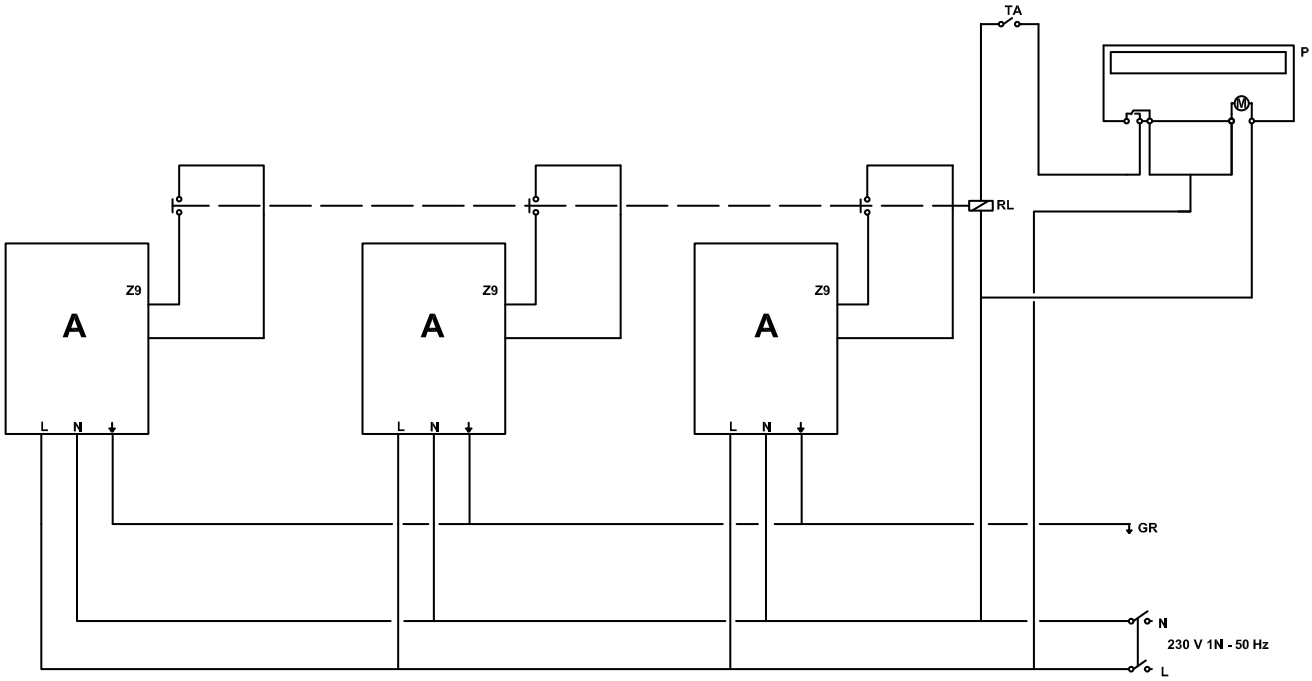


LEGEND

P	programmer
TA	room thermostat
RL1-2-3	programmed control relay
GR	ground
L-N	single-phase line (230 V - 50 Hz)
A	wall-mounted generator
Z9	generator internal terminals

Installation of multiple appliances with a single programmer and a single room thermostat (solution with multiple relays).

Figure 3.14



LEGEND

P	programmer
TA	room thermostat
RL	programmed control relay
GR	ground
L-N	single-phase line (230 V - 50 Hz)
A	wall-mounted generator
Z9	generator internal terminals

Installation of multiple appliances with a single programmer and a single room thermostat (solution with a single relay).

4 USE AND OPERATION

4.1 SWITCHING ON AND SWITCHING OFF

The first start up must be done by **professionally qualified personnel**.

Before starting up the generator, have it checked by professionally qualified personnel:

- the electricity and gas mains specifications must correspond to the specifications on the nameplate;
- the calibration must be compatible with the generator's power rating;
- the fumes exhaust tubes are operational;
- the combustion air and fumes exhaust must be in accordance with established legislation.

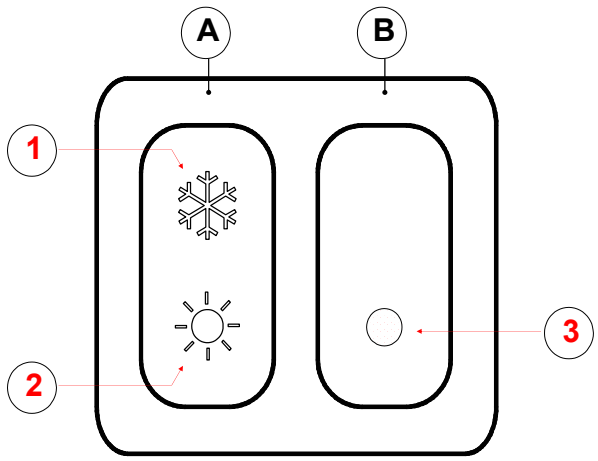
WINTER MODE

To activate HEATING mode, proceed as follows:

You will need: the appliance connected to the power/gas supply.

1. Set the room thermostat to its maximum.
2. Check that the gas valve is open.
3. Power up the appliance with the master power switch.
4. Set button "A" (summer/winter button) to *Winter* ("snowflake" ICON; detail "1" - Figure 4.1 → 29).
5. After the pre-plunge time (around 40 seconds), the gas solenoid valve opens and the burner ignites.
6. The appliance's controller keeps the valve open so long as it detects the flame.
7. If it does not, the controller locks out the appliance and turns on the lockout led on the reset button "B" (detail "3" - Figure 4.1 → 29): if this occurs, press the reset button "B".
8. Once he burner has ignited, set the room thermostat to the desired value.

Figure 4.1



LEGEND

A	summer/winter button
B	reset button
1	"snowflake" icon (winter position) [for heating operation]
2	"sun" icon (summer position) [for ventilation operation only]
3	lock-out led

Wall panel.

SWITCHING OFF

To switch off the appliance, proceed as follows:

You will need: the appliance operating (switched on).

- Set the room thermostat to its minimum.

The burner will go out, whereas the fan will continue running so long as the appliance is still warm.

Do not switch off the appliance by shutting off its power supply as this can severely damage it by stopping the fan and tripping the limit thermostat (automatic reset).

The limit thermostat ONLY trips during malfunctions. Before resetting it, troubleshoot the problem (in this case, overheating). If it trips frequently, contact ROBUR TAC.

SUMMER MODE

To activate FAN ONLY mode, proceed as follows:

You will need: the appliance connected to the power/gas supply.

1. Close the gas valve and check that the appliance is powered up.
2. Set button "A" (summer/winter button) to *Summer* ("sun" ICON; detail "2" - Figure 4.1 → 29): this runs only the fan, to refresh the air in the room.

PROLONGED PERIODS OF DISUSE

If the appliance is put out of service for a LONG TIME (i.e., seasonal disuse), proceed as follows:

- Switch the appliance off and wait for the fan to stop running.
- Close the gas cock upline of the appliance.
- If you have no intention of using SUMMER mode, switch off the power supply to the appliance with the master power switch on the power cable.

SWITCHING THE APPLIANCE BACK ON: after a long period of disuse, it may be necessary to start up the appliance several times, due to air in the tubes.

5 SERVICE AND ASSISTANCE

5.1 MALFUNCTIONS

Before taking any particular measures, always check that:

- the power supply is present: 230 V ± 10% 50 Hz with an effective ground plant;
- the gas supply is present;
- the gas pressure and flow rate must be in the range specified by the manufacturer.

A lower pressure than that indicated by the manufacturer corresponds to an insufficient gas supply. The causes may include:

- insufficient gas flow meter;
- excessive length/number of bends in the gas pipe for the dia. in use.

Only if the appliance passes these basic checks, proceed to troubleshoot the problem in question.

Before opening the appliance's side hatch to access its electrical panel, SHUT OFF POWER to the appliance with the master power switch on its power cable.

Table 5.1

LED ON	DESCRIPTION OF MALFUNCTION	CAUSE	RESPONSE
steady	Flame locked out due to failure to ignite burner	• The ignition electrodes are broken or badly located. • The detection electrode is broken or badly located, or is in contact with the appliance's metal frame. • Circuit board/electrical connection failure. • Gas valve/electrical connection failure. • Ineffective ground plant. • Air in the gas hose or no gas supply. • Incorrect gas valve setting.	Reposition or replace the electrodes. Reposition or replace the electrode. Replace the circuit board. Replace the gas valve. Restore the ground plant. Vent the air in the gas hose. Reset the gas valve. Once the cause of the malfunction has been identified and eliminated, press button B on the wall panel (see figure 4.1 → 29).
flashing (on: 4 sec; off: 1 sec)	Limit thermostat tripped due to overheated heat exchangers.	• Dirt accumulation on the air intake. • Delivery outlet blocked. • Fan malfunction. • Generator power failure during operation.	Once the cause of the malfunction has been identified and eliminated, reset the limit thermostat pressing button B on the wall panel (see figure 4.1 → 29).
flashing (on: 1 sec; off: 4 sec)	Blower failure.	• Poor electrical connections. • Blower motor malfunction. • Poor performance.	The malfunction indication is automatically reset once the cause of the malfunction has been eliminated.
malfunction NOT indicated by wall panel	The burner switches off and does not start again even if the room temperature requires it to do so.	• The room thermostat is positioned in such a way as to be affected by sources of heat or the flow of hot air.	Reposition the room thermostat.

Malfunctions.

5.2 CLEANING THE REMOVABLE BURNER

The burner of series B15 generators can be removed: this is especially useful for cleaning.

The burner should be cleaned **every two years**. If the appliance is installed in especially dirty conditions (in the presence of welding and grinding equipment or other machinery) clean the burner **once a year** before the start of the winter season.

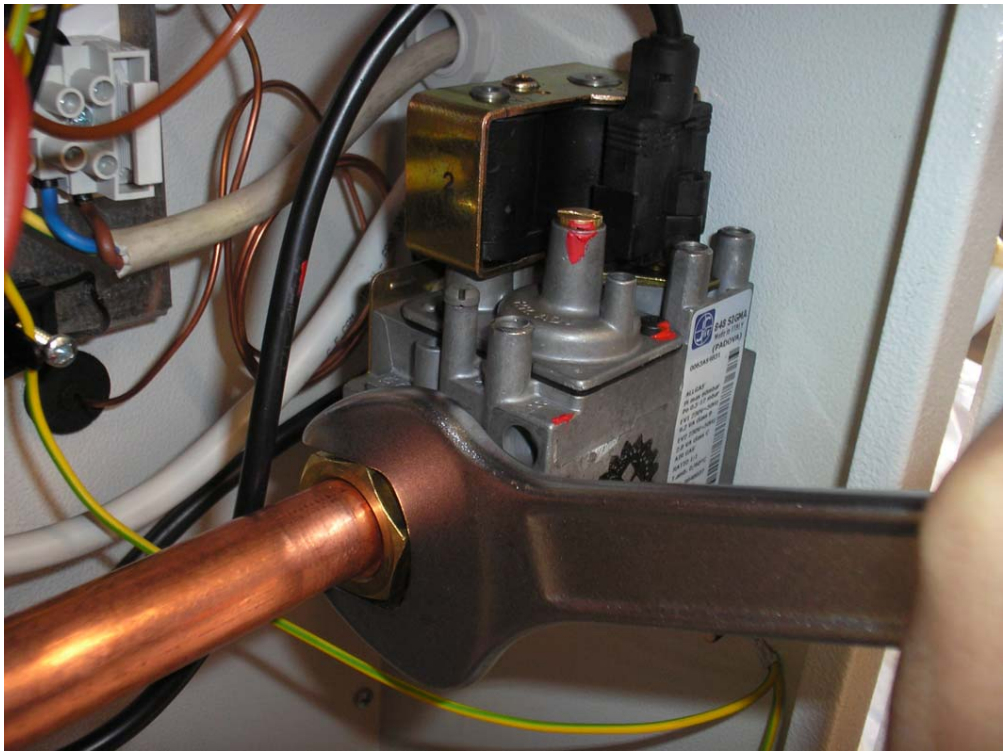
The burner must be removed and cleaned by **professionally qualified personnel**. Incorrect or careless assembly of the gas circuit can result in hazardous gas leaks along the circuit, especially in the areas directly affected.

To clean the burner, proceed as explained below (see Figure 5.1 → 32).

You will need: generator powered off, with master power switch set to "OFF" and gas valve set to "CLOSED".

1. Open the generator's hatch.
2. Undo the hexagonal ring nut connecting the gas pipe to the nozzle mount fitting.
3. Move the gas pipe aside and remove the nozzle.
4. Undo the four bolts securing the blower screw.
5. Remove the deflector and its gasket.
6. Slacken off the four bolts securing the burner and when it is resting on the base, completely unscrew it and remove it.
7. Fit a tube into the burner (do not bend, damage or tamper with the deflector inside the burner), and exert upwards pressure to extract the burner.
8. Clean the burner with compressed air.
9. Refit the burner (with its cavity uppermost).
10. Fit the lower bolts, then the upper ones and then tighten them all down in a crosswise pattern.
11. Refit the diaphragm and its gasket.
12. Fit the blower screw with its four bolts.
13. Fit the nozzle and its gasket into the nozzle mount.
14. Tighten down the hexagonal ring nut connecting the gas pipe to the nozzle mount fitting.

Figure 5.1



LEGEND
* use a 30 mm wrench on the gas tube connection nut.

Removing the gas tube.

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

Robur Mission

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